Hudson River PCBs Site
EPA Phase 1 Evaluation Report

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March 2010

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Hudson River PCBs Federal Superfund Site

Report on Observations from Phase 1 Dredging Oversight

Recommendations on Changes for Phase 2

New York State Department of Environmental Conservation
Division of Environmental Remediation
February 2010

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New York State Report on Observations from Phase 1 Dredging Oversight and Recommendations on Changes for Phase 2

Executive Summary

Section 1 - Introduction

This report is intended to convey to USEPA the State's initial thoughts on issues which were identified during the State's extensive oversight during Phase 1 which the State believes should be addressed in revisions to the design for Phase 2 of the project, and / or in possible revisions to the Engineering Performance Standards for Phase 2. It was prepared with a view toward informing USEPA on issues where a change is appropriate; it does not reflect NYSDEC's view on the overall performance of the Phase 1 work. In moving forward with Phase 1 of the remedial action for the Hudson River PCBs Site, USEPA has been able to accomplish the critical first step in completing the overall remedial action for the site. NYSDEC believes that the overall benefit associated with the removal of an estimated twenty tons of PCB from the river greatly outweighs the short-term impacts associated with the work. NYSDEC recognizes that Phase 1 was conceived of as an opportunity to not only perform a significant portion of the dredging work, but to also allow for lessons learned during Phase 1 to assist in guiding decisions on changes to project design to improve project quality, better meet the human health and environmental risk reduction objectives in the Record of Decision, and to reduce negative project impacts. The State will continue to work with USEPA to accomplish these goals, and will continue to evaluate the results of the Phase 1 efforts and to work with USEPA in developing the project design between now and the start of Phase 2.

For each of the issues identified, a recommendation has been developed by the State to address the concerns raised.

Section 2 – Resuspension Performance Standard

The State has identified multiple issues which arose during the Phase 1 work which contributed to the elevated PCB concentrations measured in surface water samples collected at the far field monitoring stations and to the exceedances of the standard. The State also believes that there are problems with the monitoring program design which limited the ability of USEPA and GE to manage the dredge operations as expected.

1) ***Issue:*** The inability of the near field total suspended solids and turbidity monitoring program to accurately reflect the magnitude of PCB release to the water column contributed to the elevated PCB surface water concentrations and exceedances of the resuspension standard. The near field monitoring program was intended to allow for near real time feedback to help manage the dredging operations to control resuspension losses: it was assumed that PCB resuspension would be correlated with suspended solids. Unfortunately, this approach did not work in Phase 1. As a result, the dredging operations were typically managed by utilizing the far field PCB monitoring results,

which did not allow for a quantified understanding of the relative contribution of the many different dredging operations.

Recommendation - The State believes that the near field solids monitoring program should be significantly reduced, and the resources reallocated to direct near field and mid field PCB measurements.

2) ***Issue:*** The underestimation of the depth of contamination (DoC) and the volume of material to be removed contributed to the exceedances of the resuspension standard, as well as problems with meeting the residuals and air standards. The State believes that multiple repeated dredge passes contributes to greater releases of PCB, in that each dredge bucket "bite" has the potential for uncontrolled releases to the water column.

   Recommendation: USEPA should ensure that the DoC underestimation is corrected before the Phase 2 design is implemented. This will likely entail a combination of additional data gathering and application of a correction factor to existing calculations in the dredge area delineation process to be applied in redrawing the dredge area boundaries and depths in Phase 2.

3) ***Issue:*** Releases of PCB during dredging in the form of a non-aqueous phase liquid (NAPL) contributed to the elevated PCB surface water concentrations and exceedances of the resuspension standard. The dredging program was designed with the basic assumption that if solids releases were controlled, then the PCB releases would be controlled. Estimates of PCB release rates used in developing the resuspension performance standard did not account for the potential for PCB NAPL to be mobilized; as a result, the technologies evaluated for control of PCB release in the project design did not specifically address this pathway. Efforts at controlling NAPL releases during Phase 1 were not as effective as they could have been, which the State believes was due to both the assumptions made during design (solids driven PCB release) and the need to more effectively implement the available NAPL control technologies once the issue was identified in the field during Phase 1.

   Recommendation: Existing project specifications should be modified and expanded to include not only the existing general broad requirement that NAPL sheens be contained and cleaned up, but also to include an expanded description of the purpose of the specification (to reduce to the extent practical the releases of NAPL to the water column of the river, contributing to increased concentrations in surface water and air), and the minimum effort required to collect and recover the NAPL (response times, staff, equipment and materials to be on hand, require tending of booms / sorbent materials, recovery of sorbent materials within 1 day of deployment or when saturated if sooner than one day).

4) ***Issue:*** Resuspension of contaminated river sediment due to scow / tug traffic contributed to PCB resuspension, which could have been reduced if additional access dredging was done to increase channel depth and allow for more laden draft and propeller driven scour (prop-wash) clearance depth to be available in the channel areas.

Recommendation: Access dredging should be done in areas which would allow full-sized scows to be used in areas which otherwise would be candidates for dredging proposed to be dredged using mini-hoppers. Access dredging in this case would reduce the number of tug trips in a work area to change out the mini-hoppers, allowing for more efficient use of the dredge platforms, and reduce the resuspension due to prop wash and grounding in the shallows.

5) ***Issue:*** Application of the PCB mass load element of the resuspension performance standard was not useful in guiding project operations.

   Recommendation: USEPA should provide a rationale for retaining the load standard. If the standard cannot be used to help guide decisions on managing the dredging operations on a near real time basis, it may be more appropriate to eliminate the PCB mass load standard as an element of the resuspension standard.

6) ***Issue:*** Data developed over the course of Phase 1 has indicated that there is more uncertainty and variability in the far field water sample results than was anticipated.

   Recommendation*:* In order to ensure that the far field surface water monitoring data is usable for the purposes described in the project Quality Assurance Project Plan, supplemental sampling should be done to verify that the data are representative of actual site conditions.

Section 3 – Residuals Performance Standard

The State has identified multiple issues during Phase 1 which impacted the project's ability to meet the Residuals Performance Standard.

1) ***Issue:*** The State believes that, because of the error in DoC in the Phase 1 design, the proportion of river bottom capped during Phase 1 was excessive given that the remedial alternative selected in the ROD was removal.

   Recommendation: The correction of the errors in DoC should result in a significant improvement in the rate at which river bottom is capped in Phase 2.

2) ***Issue:*** Capping decisions at times appeared to be driven not by the ability to successfully remove the inventory of contaminated sediment and achieve the 1 part per million (ppm) PCB residuals standard, but rather by the schedule for ending the dredging season.

   Recommendation: Areas for which there is not remaining time in the dredge season to remove a remaining inventory of un-dredged contaminated sediment should be sampled to determine the remaining surface sediment concentration as well as the remaining thickness of inventory to be removed. In areas where the remaining surface sediment PCB concentration remains significantly elevated, a thin layer of backfill should be placed to stabilize the area until the remaining inventory can be removed the following dredge season.

3) ***Issue:*** The practice of measuring PCB residuals only in nodes that were re-dredged within a given CU creates a downward bias when calculating statistics to determine whether a certification unit meets the residuals standard.

   Recommendation: In evaluating whether or not a CU has complied with the Residuals Performance Standard, the calculations should only include either the results of a complete re-sampling of the entire CU, or use the results of previous sampling at nodes which were not dredged again. This process is necessary to avoid the possible bias associated with the inherent variability in PCB concentrations in Hudson River sediment; it is possible that simply by re-sampling a subset of sample nodes, a CU could be found in compliance due to variability rather than due to an actual change in the mean surface sediment PCB concentrations.

4) ***Issue:*** Current procedures require that half the detection limit be used for non-detect results when calculating certification unit statistics. This substitution can produce statistically invalid results.

   Recommendation: The State recommends that USEPA recalculate Phase 1 Certification Unit statistics using appropriate methods for censored data to determine whether decisions about re-dredging or certification would have been altered. These methods, though more complicated, should be used for Phase 2 unless demonstrated to have had no practical effect on Phase 1 decision making.

5) ***Issue:*** The underestimation of the DoC to be removed contributed to the problems with meeting the residuals standard. The need for multiple iterations of testing for compliance with the standard between dredge passes, caused by the underestimation of the DoC, resulted in delay.

   Recommendation: If the DoC were redefined after the first dredge pass through analysis of the entire cored interval, instead of only analyzing the uppermost samples of a core collected to check for compliance with the standard, then any subsequent dredge pass would be much more likely to be based upon a correct understanding of the remaining un-dredged inventory of contaminated sediment. This change would allow for the setting of up to date target depths for the contractor to meet, take into account any changes to the river bottom since the data upon which the design was based were gathered, and eliminate any potential sampling bias associated with the overlying material on the river bottom which was removed during the first dredge pass.

Section 4 – Productivity Performance Standard

The State also had identified issues which it believes impacted the ability of the project to meet the Productivity Standard.

1) ***Issue:*** Offloading delays at the sediment processing facility decreased empty scow availability and served as a bottleneck relative to productivity.

   Recommendation: The Phase 2 design should include installation of redundant offloading and processing equipment at the offloading wharf. The rate at which scows could be offloaded and returned to the dredge platforms would be increased, and sufficient redundant capacity would be available to allow for maintenance and repair of the equipment to reduce down time.

2) ***Issue:*** Canal traffic throughput has an upper bound which may impact productivity.

   Recommendation: The design for Phase 2 needs to take into account factors which impact the ability of the Champlain Canal to handle the planned traffic during Phase 2, including water flow through the Feeder Canal, canal staffing needs, the increased potential for equipment failure due to increased lockages, and limits on future extensions of the Canal season in the fall.

3) ***Issue:*** USEPA should evaluate whether the Productivity Standard should be considered subordinate to the Resuspension and Residuals Standards.

   Recommendation: USEPA should consider that compliance with the elements of the other engineering and quality of life performance standards intended to protect human health and the environment should be given priority over compliance with the Productivity Standard. The basis for the Productivity Standard is removal of the sediment over a six year time frame (one year for Phase 1, and five years for Phase 2) as described in the ROD. The six year time frame, as the State understands, is based primarily upon the differences in predicted recovery time frames generated during the Feasibility Study process. These predicted recovery time frames were generated using a set of assumptions which included an overly optimistic recovery rate under the scenario where no dredging would be done. An evaluation of the data generated during the baseline monitoring program leads the State to the conclusion that an extension of the project duration if this would result in better compliance with the standards established to protect human health and the environment would be appropriate.

Section 5 – Quality of Life Standard for Air

Issues: The State has identified to date several issues which impacted the ability of the project operations to be conducted within the air standards including the presence of uncontrolled NAPL, the use of mini-hoppers, delays in offloading at the dewatering facility, and the presence of sediment and debris in open stock-piles at the dewatering facility.

Recommendations: The State believes that the Phase 2 design should include revisions to the modeling process used to predict exceedances of the quality of life standard for PCB in air, to take into account the data generated during Phase 1 in order to more accurately predict where standard exceedances may occur. At locations where exceedances are predicted, mitigation measures should be mandated in advance and kept in place during dredging operations. The Phase 2 design should also include specific mitigation measures to control air releases beyond those limited measures taken during Phase 1, including the use of spray-on cover material for use in the scows and more proactive containment and immediate collection of NAPLs generated during dredging operations.

Section 6 – Habitat Reconstruction / Protection

The State has identified several specific detailed issues with the habitat reconstruction program that the State believes need to be addressed in the Phase 2 design in order to better comply with project goals and reduce impacts to post-dredging habitat quality.

1) ***Issue:*** Specific issues related to compliance with project specifications, or the need to modify particular details of specifications, were found. These include disturbances beyond project boundaries, placement of biologs for shoreline stability, and application of backfill along slopes.

   Recommendation: USEPA should follow up on compliance with specifications and ensure that project quality is not impacted by insufficient compliance with project design specifications.

2) ***Issue:*** The State believes that certain elements of the design related to project operations need to be modified.

   Recommendations: Control vessel traffic to limit damage to submerged aquatic vegetation; consider possible omission of sheet piles from the design to limit potential for fish kills; and limit turbidity plumes from backfill operations through further refinement of the backfill placement process.

3) ***Issue:*** Certain constraints contained in the Consent Decree for implementation of the remedy (the 15% limit on additional backfill volume for reestablishment of submerged aquatic vegetation (SAV) habitat and the limits on habitat assessment sample sizes) impact the ability of the project to successfully reconstruct habitat as described in the ROD for this site.

   Recommendation: USEPA should consider revising limits on backfill volume for re-establishment of SAV habitats, and increase the habitat sample sizes for the habitat assessment work.

Section 7 - Additional Recommendations for Changes to Phase 2 Design

The State has also developed specific additional recommendations for changes to the project design for Phase 2.

1 - ***Eliminate intentional decanting***

Decanting should not be allowed as part of the Phase 2 dredging program. Each dredge bucket should be lifted and emptied directly into the scow without intentionally pausing to allow the dredge bucket to drain into the river. The process of decanting water from dredge buckets could have been a significant contributor to the near field PCB surface water concentrations, contributing to the exceedances of the project air standards in the dredge corridor. Decanting is functionally no different than allowing scow overflow back into the river, which was specifically not allowed under project specifications.

2 – *Perform an ongoing review of project performance*

Experience gained during the performance of Phase 1 was important and should be taken into account in developing the final design and work plans for Phase 2. The State also believes that, as Phase 2 moves forward, the process of evaluating project performance and making appropriate changes to project design and work plans should continue. USEPA should continue to evaluate the data generated during project monitoring, and observations made during project oversight, in order to direct necessary changes to project operations to maximize project quality, minimize any negative impacts related to the work, and to maximize the opportunities for the project work to meet the remedial action objectives set in the ROD. These changes may include changes to the monitoring programs and changes to the plans and specifications in the design documents and to the contractor work plans. USEPA needs to reserve the authority to direct these changes in order to ensure that the project moves forward in a manner which is consistent with the ROD, which states on p. 96 that USEPA will continue to monitor, evaluate performance data, and make necessary adjustments.

3 – *Reduce the frequency of near field metals sampling*

The State believes that the reduction of near field metals monitoring implemented during the latter part of Phase 1 was appropriate given the data generated during the dredging work. The metals monitoring should continue in Phase 2, but only such monitoring as would be required to confirm the existing understanding that the magnitude of metals release from the dredging operations is not going to result in exceedances of the State surface water quality standards.

4 -*USEPA should recalculate the Productivity Standard to account for changes in estimated volume for Phase 2*

Since the development of the engineering performance standards, there has been an adjustment to the estimated volume of material to be dredged in the project. The State has recommended that this volume be reevaluated and adjusted as appropriate to take into account the problems associated with the error in DoC found during Phase 1. The State believes that it is appropriate for USEPA to develop a new productivity standard with accounts for these changes in estimated dredge volume.

Section 1 - Introduction

The New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Health (NYSDOH), and the New York State Canal Corporation (NYSCC) provided extensive oversight of the Phase 1 dredging work done by GE. Typically the State's oversight personnel were present during daytime hours performing field oversight, as well as performing reviewing of data generated during the project in the office and in the field, and participating in daily and weekly project meetings throughout the dredging project period. This effort was supplemented by NYSDEC's contractor, CDM, who was brought in to assist NYSDEC in field oversight of the numerous, simultaneous field activities being performed by the dredging and dewatering facility contractors. During most of the field season, the dredging contractor typically had over ten individual operations active at any one time, including operation of the dredge platforms, movement of scows, transfer of sediment from small barge platforms carrying dredged material ("minihoppers") to large scows, survey and monitoring work, and maintenance of resuspension and NAPL capture systems and controls. Simultaneous operations at the dewatering facility included sediment offloading, size separation processing, sediment dewatering/filter press operations, water treatment operations, sediment and debris transfer and stock-piling/storage activities, and rail car preparation and loading operations. As a result of the large number of simultaneous operations, it was common for individual project operations to be active without direct oversight by USEPA or GE project staff. Anticipation of this condition led NYSDEC to bring in CDM to support the State's efforts.

The State oversight of the dredging operations (including debris removal, inventory dredging, residuals dredging, access dredging, scow movement, sediment transfer, survey work, and monitoring work) was done from the point of view that any one operation could result in an exceedance of the project standards or impact project quality. As a result of the State's oversight efforts, there were numerous times when State representatives contacted USEPA to provide information related to active dredging operations where the State was concerned that the performance of those operations may have been performed outside of project specifications or in a manner which could contribute to an exceedance of project standards. As the field season progressed, the focus of the State's oversight efforts became mainly focused on the following: (1) potential exposures as a result of PCB releases to ambient air during dredging and dewatering facility operations; (2) issues related to PCB releases to the water column during dredging, particularly as is pertained to releases of NAPL; and (3) issues related to productivity, primarily offloading operations at the work wharf and the associated scow availability and dredge down time observations.

The State project team communicated with USEPA on a daily basis at a minimum to relay observations and / or identify any issues or concerns that may have arisen related to the project as appropriate. State project personnel also typically attended the daily and weekly job progress meetings between USEPA and GE either in person or by conference call. Consistent with USEPA's project management role, the State project team did not attempt to provide any direction to GE, GE's oversight staff, or GE's contractors.

This report is intended to convey to USEPA the State's initial thoughts on issues which were identified by the State during Phase 1 which the State believes should be addressed in possible revisions to the design for Phase 2 of the project, and in possible revisions to the Engineering Performance Standards for Phase 2. It was prepared with a view toward informing USEPA on issues where a change is appropriate; it does not reflect NYSDEC's view on the overall performance of the Phase 1 work. In moving forward with Phase 1 of the remedial action for the Hudson River PCBs Site, USEPA has been able to accomplish the critical first step in completing the overall remedial action for the site. NYSDEC believes that the overall benefit associated with the removal of an estimated twenty tons of PCB from the river greatly outweighs the short-term impacts associated with the work. NYSDEC recognizes that Phase 1 was conceived of as an opportunity to not only perform a significant portion of the dredging work, but to also allow for lessons learned during Phase 1 to assist in guiding decisions on changes to project design to improve project quality, better meet the human health and environmental risk reduction objectives in the Record of Decision, and to reduce negative project impacts. The State will continue to work with USEPA to accomplish these goals, and will continue to evaluate the results of the Phase 1 efforts and to work with USEPA in developing the project design between now and the start of Phase 2.

The report text is formatted in a manner which summarizes the issues identified by the State during oversight of Phase 1, provides a description of how the issue impacted project quality or compliance with standards, and provides a set of recommendations on how to address each of the issues raised. Attachments are also included which (1) detail specifics related to operation of the Champlain Canal and how these operations need to be taken into account in Phase 2; (2) provide graphs illustrating certain points related to NAPL releases as seen in the water column PCB data; and (3) provide photographs illustrating points raised in the report text.

Section 2 – Issues related to Resuspension Performance Standard

The State has identified multiple issues which arose during the Phase 1 work which contributed to the elevated PCB concentrations measured in surface water samples collected at the far field monitoring stations and to the exceedances of the standard in the first week in August and in the second week in September. The State also believes that there are problems with the monitoring program design which limited the ability of USEPA and GE to manage the dredge operations as expected.

Issues related to the resuspension standard identified by the State oversight efforts are:

1) The inability of the near field total suspended solids and turbidity monitoring program to accurately reflect the magnitude of PCB release to the water column contributed to the elevated PCB surface water concentrations and exceedances of the resuspension standard. The near field monitoring program was intended to allow for near real time feedback to help manage the dredging operations to control resuspension losses: it was assumed that PCB resuspension would be correlated with suspended solids. Unfortunately, this approach did not work in Phase 1. As a result, the dredging operations were typically managed by utilizing the far field PCB monitoring results, which did not allow for a quantified understanding of the relative contribution of the many different dredging operations.

2) The underestimation of the depth of contamination and the volume of material to be removed contributed to the exceedances of the resuspension standard, as well as problems with meeting the residuals and air standards. The State believes that multiple repeated dredge passes leads contributes to greater releases of PCB, in that each dredge bucket "bite" has the potential for uncontrolled releases to the water column. Taking less than full bucket "bites" due to underestimation of the depth of contamination, and then having to come back for further bucket "bites" to get to the newly revised depth of contamination results in greater opportunity for PCB loss to the water column.

3) Releases of PCB during dredging in the form of a non-aqueous phase liquid (NAPL) contributed to the elevated PCB surface water concentrations and exceedances of the resuspension standard. The dredging program was designed with the basic assumption that if solids releases were controlled, then the PCB releases would be controlled. Estimates of PCB release rates used in developing the resuspension performance standard did not account for the potential for PCB NAPL to be mobilized; as a result, the technologies evaluated for control of PCB release in the project design did not specifically address this pathway. Efforts at controlling NAPL releases during Phase 1 were not as effective as they could have been, which the State believes was due to both the assumptions made during design (solids driven PCB release) and the need to more effectively implement the available NAPL control technologies once the issue was identified in the field during Phase 1.

4) Resuspension of contaminated river sediment due to scow / tug traffic contributed to PCB resuspension, which could have been reduced if additional access dredging was done to

increase channel depth and allow for more laden draft and prop (prop-wash) clearance depth to be available in the channel areas.

5) Application of the PCB mass load element of the resuspension performance standard was not useful in guiding project operations.

6) The representativeness of the far field monitoring stations should be verified periodically over the course of the project. Data developed over the course of Phase 1 has indicated that there is more uncertainty and variability in the far field water sample results than was anticipated. In order to ensure that the far field surface water monitoring data is usable for the purposes described in the project Quality Assurance Project Plan, the State believes that supplemental sampling should be done to verify that the data are representative of actual site conditions.

Section 2.1 – *Near Field TSS and turbidity monitoring program did not reflect the magnitude of PCB releases*

<u>Assumed TSS surrogate relationship was not observed in near field monitoring results</u>

The Phase 1 Engineering Performance Standards were predicated on the assumption that TSS concentration was a suitable surrogate for PCB concentration in the water column. As part of the Phase 1 near field monitoring program, TSS concentrations were measured both during transect monitoring (twice per day during daylight hours) and buoy monitoring (every 6 hours). This near field monitoring occurred at the compliance point located 300 meters from the dredging operation(s). The monitoring program reported measured TSS concentrations that generally remained well below the near-field resuspension performance standard (control level - 100 mg/l for a daily dredging period). Despite these low near field measurements, the far field measured PCB concentrations varied widely, exceeding the far field performance control level of 350 ng/L (control level) as well as the EPA/DOH resuspension standard (or threshold) of 500 ng/L(which is equal to the USEPA/NYSDOH MCL). Exceedances of the resuspension standard/DOH MCL in the far field occurred at the Thompson Island Dam station on a number of separate occasions. The dredging was shut down due to verified exceedance of the far field standard two times during the Phase 1 project. Because the near field measurements of TSS did not predict the violations of the resuspension standard for PCB's in the far field, and because the far field PCB control standard exceedance caused dredging operations to be suspended, a special monitoring program was proposed by GE and was implemented in August 2009. This special monitoring included water column samples for PCB, POC/DOC and TSS analysis at nine locations within the Phase 1 dredging area. At seven locations, samples were collected along transects perpendicular to river flow to capture PCB transport along the full cross section of the river. The other two individual, depth-integrated, composite samples were collected inside the sheet piling and silt curtains deployed in the EGIA . The purpose of the monitoring program was to quantify the Thompson Island Far-Field PCB concentrations attributable to various dredge certification units. The results of this special monitoring program indicated that the near field PCB concentrations also correlated poorly with TSS and that a very high proportion of measured PCB in the near field was of the dissolved form and not the total form. Since dissolved PCB would not necessarily be associated with particulates, its concentration cannot be represented by resuspension of particulates during dredging.   Therefore, the results of the Phase 1 monitoring indicate that the underlying assumption regarding the suitability of TSS as a surrogate for PCB is not valid.

In order to rectify this situation for Phase 2, some type of direct near field PCB monitoring program should replace the Phase 1 TSS monitoring program. The measured TSS concentrations, in addition to being of little use for predicting PCB concentration, were generally so low as to provide little useful information at all. If TSS is to be measured in Phase 2, it should be at a much reduced frequency. Instead, a monitoring program that includes the direct measurement of PCB in the near field should be implemented and some type of a control level should be designed to provide feedback to provide feedback to the dredge operator so that operations can be modified accordingly. An evaluation level PCB concentration in the near field could be useful to ensure that there will not be forced shut down of the project during Phase 2 due to exceedances of the far field EPA/DOH MCL. The evaluation level would require a quick turnaround time on PCB analyses.

<u>Assumed Turbidity / TSS relationship was not observed in near field monitoring results</u>

Aside from the New York State Water Quality Standard for turbidity which is “no increase that will cause a substantial visible contrast to natural conditions”, turbidity was also used as a surrogate for TSS concentration in the near field. Turbidity measurements in the near-field were conducted at 150 meters and 300 meters downstream from dredging operations. Turbidity measurements were to be used for predicting compliance with the near field TSS resuspension standard prior to receipt of the laboratory TSS results. However, there was no prior explanation of how turbidity measurements in the near field would be used with an established TSS/turbidity relationship to ascertain the need to modify the dredging operation (reduce speed, add silt curtains, etc.). A discussion of the feedback mechanism to the equipment operator, with feedback based on the measured turbidity in the near field, should have been provided prior to dredging and measuring near field constituents. Although turbidity measurements were collected during both transect monitoring and buoy monitoring in the near field, it is not clear whether any decisions were made based on the turbidity measurements or whether anything was ever done with the turbidity data.

Measured turbidity in the near field proved problematic at times. For example measurements reported in May ranged from -0.3 to 1,216.7 NTU (May 16th) and -0.5 to 1,201 NTU (May 18-24).   On May 16th, negative turbidity measurements were reported at Rogers Island west at the 100 m, 300 m and 10 m side channel transects, all in the near field. On the same date, the measured turbidity at the 100 meter upstream buoy was 1,216.7 NTU at 16:30 hoursand a measurement of 530 NTU occurred at a 100 m downstream transect at 13:13 hours. The May 18 – -24 measurement results included negative turbidity measurements at far field automated stations, with 1201 NTU measured at an upstream transect. No explanation was provided regarding these widely divergent results or the negative turbidity measurements.   At near field buoy stations on many dates in May and some dates in June, pH and D.O measurements were also reported as zero. If pH and DO were zero, these results would have violated Water Quality Standards. Also, fish would not be able to survive and fish kills would have been reported throughout these areas. In June there were still negative measurements of turbidity reported for a far field station and also some D.O measurements were approaching zero. By July the negative turbidity measurements subsided, but there were still some very low pH measurements in August. These results indicate recurring problems with meters used at both the near field (buoy and transect) and the far field stations. During the project, no description of actions taken to deal with random meter readings was provided, nor were there any explanations of obvious outlier measurements (negative turbidity readings, zero D. O.). It is important that an evaluation of Phase 1 results discuss the turbidity, pH and D.O. meter readings, how these measurements were evaluated and what if anything was done to fix the problems with the meters. Any recommended changes to procedures should be proposed prior to implementation of Phase 2, as unreliable results are of no use for evaluation of dredging procedures.

A paired buoy TSS/turbidity study was conducted in July 2009 to compare measurements/analytical results at mid depth with those results collected near the bottom. The primary purpose was to determine whether or not there was stratification in the water column. The results of the study compared the two TSS results and the two turbidity meter readings to each other, but did not compare the TSS results to the turbidity results. An evaluation of these already collected TSS results and concurrent turbidity measurements should be undertaken to determine whether or not there is a good correlation between turbidity and TSS. Additionally, the collected data in the near and far field should be compared by date, time and location to determine whether there is a good correlation between turbidity and TSS. Also, a complete evaluation of the collected TSS and turbidity data in the near field should be undertaken to determine whether turbidity proved to be a reliable surrogate for TSS. If the two are not properly correlated, then Phase 2 should not rely on turbidity as a surrogate for TSS. In that case, it might be more appropriate to measure near field PCB concentrations, with a quick turnaround time, in order to provide proper feedback to the dredge operator. An appropriate monitoring program, with feedback based upon the measured turbidity or PCB concentration in the near field, should be developed prior to the Phase 2 dredging.

Section 2.2 - *Depth of Contamination ("DoC") underestimation caused significant problems*

The State believes that the discovery during Phase 1 that the actual thickness of contaminated sediment often greatly exceeded the "depth of contamination" developed using the approach in the dredge area delineation (DAD) process has significant implications for Phase 2. This error in the project design needs to be corrected for a number of reasons, and needs to be corrected prior to finalizing the Phase 2 dredge prisms during completion of the Phase 2 final design report.

The State believes that the underestimation of the DoC is based, at least in part, on an unintentional sampling bias during the Sediment Sampling and Analysis Program (SSAP) element of the remedial design. This sampling bias was likely due to a combination of (1) inadequate penetration during the vibracoring process used in the SSAP; (2) core blockage due to the presence of woody debris, limiting the ability of the vibracoring process to collect full depth representative samples; (3) core compression, which also would limit the ability of the vibracoring process to collect true depth representative samples; and (4) application of inaccurate DoC extrapolation methodologies for incomplete cores.

Correction in the Phase 2 design effort is necessary to ensure that the Phase 2 design complies with the Order on Consent for remedial design and with the Record of Decision for this site. In the Consent Decree, Appendix B, Attachment A (Critical Phase 1 Design Elements) Section 2.4 describes the process for developing the dredge prisms to be provided to the contractor to govern where sediment is to be removed from the river. A significant factor in dredge prism development is how the "surface of sediment depth" is generated using the available core data from the Sediment Sampling and Analysis Program. In order to generate this "surface of sediment depth", core data from the SSAP is applied according to the rules laid out in Section 2.4. Unfortunately, application of the core data following the rules in Section 2.4 resulted in the generation of dredge prisms for Phase 1 with set depths of cut for the dredging contractor that left, in many cases, significant thicknesses of contaminated sediment behind. This was most evident in the east channel at Rogers Island, where in Certification Unit 1 several additional feet of removal was done in an attempt to remove the inventory of contaminated sediment. The need for additional sediment removal due to underestimation of the depth of contamination was not limited to the east channel at Rogers Island, but was most significant there.

Underestimation of the depth of contamination resulted in two errors during development of the dredge prisms. Not only was the contractor provided with inaccurate depths for sediment removal, but the State also believes that it is very likely that core locations which were excluded from dredging in the Phase 1 dredge area delineation report due to insufficient PCB mass per unit area (MPA) calculations (less than 3 grams per square meter), may actually have qualified for removal if the actual thickness of contaminated sediments was correctly identified at each core location.

The State believes that, in order for the Phase 2 dredging work to meet the removal criteria set forth in the ROD, an evaluation will need to be done to refine both the depth of contamination in the areas already delineated for removal, and the mass per unit area (MPA) estimates in areas where the estimated MPA is 50 % or more of the removal criteria for that river section. This work should be done utilizing a sampling process which takes into account the potential causes of sampling bias described above.

Section 2.3 - *NAPL releases during dredging impacted resuspension standard and air standard compliance*

New York State has a Water Quality Standard for oil and floating substances which reads, "No…visible oil film nor globules of grease." Floating sheen blebs, blooms, stringers, and mats were repeatedly observed in the vicinity of dredging operations during Phase 1, and control measures, if implemented, were inadequate.

Over the course of the Phase 1 dredging work, State oversight staff paid particular attention to dredging operations and conditions that resulted in the generation of NAPL releases and the techniques used by the contractor to manage those releases of NAPL from the dredging operations. State oversight staff often typically identified the various NAPL releases by direct observations from a boat traverse immediately downstream of dredging operations, but also made observations from the shore and the fixed structures at Champlain Canal Lock 7, the Fort Edward Terminal Wall (Yacht Basin) and the Route 197 Bridge. When NAPL was observed, State oversight staff would typically contact USEPA by telephone or by email to notify the agency about of the NAPL releases; provide detail about the physical nature (blebs, blooms, stringers, and or mats), the size, and the specific location of the releases; and express the need for response to the releases as appropriate. The State's response to the NAPL releases was in keeping with the State Water Quality Standard and the Project Specification 13801 in Contract 4 – Inventory Dredging.

State oversight staff would also observe the response of GE's contractor when NAPL was observed. When the contractor did respond to the releases of NAPL, the response would often involve the deployment of harbor booms and/or sorbent booms in the immediate vicinity of the specific dredging operation believed to be the source of the observed releases. Unfortunately, the booms were often placed by the contractor and then left unattended for long periods of time or without any active NAPL collection operations; as a result, movement or displacement of the booms by wind, wave action or subsequent dredging operations would allow for uncontrolled downstream releases of NAPL from the deployed booms. State oversight personnel also observed, on several occasions, instances when the booms and secondary sorbent materials used to stem a release of NAPL at a particular operation were left in the river for several days after deployment - a situation conducive to allowing the NAPL contained by the booms or sorbent materials, or which would have sorbed onto the booms or sorbent materials, to be re-released back into the river water column.

On August 7, USEPA recommended that GE proactively place booms around the dredge platforms regardless of the presence or absence of observed sheens as a result of the recurring observations of NAPL releases from the dredging operations. USEPA also recommended to GE at that time to stop decanting from the dredge buckets, to deploy sorbent material as soon as sheens were observed, to minimize the use of minihoppers, to better manage the silt curtain / harbor boom at the south end of the east channel at Rogers Island, and to better manage the number of "bucket bites" to achieve the target cut depths.

The observed releases of NAPL during dredging operations raises several concerns which should be taken into account by USEPA in considering possible changes to the project design for Phase 2 of the project. These concerns include:

1) The PCB mass transfer to the river water column associated with the releases of NAPL was not accounted for, or quantified by, the near field monitoring program. NAPL releases may be responsible for a portion of the "noise" in the far field PCB surface water data gathered at the Thompson Island automated monitoring station. A preliminary evaluation by NYSDEC suggests that the variability in the data may be due to the presence of NAPL. This preliminary analysis looked at the congener distributions from the analyses of duplicate samples collected on the days with the highest PCB concentrations. By examining congener distributions of the duplicate samples, and distribution of the difference between the duplicate samples, one can infer the source of the variability, which NYSDEC believes is the presence of PCB NAPL. See Figure 1 in Attachment 2, which displays the congener distribution of the samples collected on August 6. Figure 2 in Attachment 2 shows the distribution of the difference between the

samples. The congener distribution of the difference appears to closely resemble the congener distribution of aroclor 1016 or aroclor 1242.

2) NAPL releases should be considered as a significant mechanism for PCB transfer to the water column when considering processes and technologies for controlling the downstream movement of PCB from the project area. Controlling NAPL releases may be more important than controlling solids releases from dredging operations.

3) NAPL releases appear to be a significant source of emissions of PCBs to air near dredge operations and sediment handling and storage activities. NYSDEC's evaluation of the ambient air data indicates that NAPL releases need to be controlled and minimized in order to mitigate exceedances of the quality of life standard for PCB in ambient air. A critical evaluation of the techniques and technologies that were evaluated during Phase 1 and shown to be successful should be implemented as mitigation measures in Phase 2. Additional techniques that were not tested during Phase 1 but are proven technologies for NAPL capture and collection, as well as emissions controls, may also need to be examined and incorporated into the Phase 2 design.

Photograph 1 and 2 in Attachment 3 show the typical surface expression of NAPL releases once the droplets of NAPL have coalesced; photograph 3 shows a typical deployment of booms in the vicinity of a dredge platform.

Section 2.4 - *Scow / tug traffic caused resuspension; need to perform additional access dredging*

Operation of the "minihopper" platforms to move dredged material from the dredge areas to the transfer point for loading to a standard scow was driven primarily by limited draft. In some areas, this limited draft was controlled by rock bottom. In many areas, however, the limitations on draft were due to sediment accumulation either within the defined channel or between the defined channel and the dredge area. In these areas, a decision was made to avoid performing access dredging and use the minihopper platforms. This decision led to multiple negative consequences for the project including: (1) increased air releases; (2) increased resuspension due to the increased number of tug trips across areas of shallow draft; and (3) reductions in productivity due to the time needed to repeatedly exchange minihopper platforms. NYSDEC believes that the use of minihopper platforms was a significant contributing factor in air emissions.

The Fort Edward Dam was removed in 1973. This led to the downstream release of contaminated sediment previously held behind the dam and resulted in the mingling of these sediments with the variably contaminated sediments already present downstream of the dam, and / or the covering of the contaminated sediments already present downstream of the dam. As a result of the dam removal and subsequent scouring of the sediments previously held behind the dam, the Hudson River from Rogers Island to a point about one quarter mile below Lock C-7 was clogged with sediment and debris within one year. The NYS Department of Transportation (NYSDOT) conducted two rounds of dredging to clear the river and navigation channel of sediment and debris. During these dredging activities, the presence of PCBs was discovered in the sediments. Because the Hudson River was thoroughly contaminated with PCBs, the State of New York ceased maintenance dredging of the navigational channel in the Hudson River after 1978. The increased complexity and cost of dredging and disposing of the contaminated sediments made maintenance dredging for navigation essentially impossible as a practical matter.

During the next 30 years, the Hudson River has accumulated sediment in the Champlain Canal navigation channel. The continued accumulation of sediment has restricted navigational access in significant sections of the river. Most notably, the Fort Edward Yacht Basin had only 3-4 feet of draft available before Phase 1 dredging began.

Depth restrictions in the navigation channel resulted in GE conducting limited navigational dredging in Phase 1 to enable deeper draft vessels and barges to maneuver in the river. However, the amount of navigational dredging was very limited and many barges were only partially filled to avoid running aground as they transited the shallow portions of the canal. By only filling barges to half- or less-than-half-full, the number of round trips of barges between the dredge area and the processing facility were substantially increased. In addition to simply increasing the amount of traffic on the river and through Lock C-7, the half-empty barges also resulted in dredges remaining idle for hours each day while they waited for an empty barge to resume dredging.

If additional navigational dredging were included in the design, the productivity of vessel traffic and dredge operating efficiency would be increased substantially. Looking forward to Phase 2, there are additional locations in the River where the available depth will limit the draft of project vessels. As the hauling distance (and therefore round-trip times) between the active dredge areas and the processing facility increases each year in Phase 2, optimizing the number of barge movements will become increasingly important to meeting the productivity standard.

Inadequate draft also contributed to exceedences of the resuspension standards. Vessels occasionally grounded, which caused increased turbidity and water-borne PCB contamination, and significant prop-wash was observed throughout the project, contributing to the same problems.

The State recommends that sufficient access / navigational dredging be conducted during Phase 2 to ensure that vessel draft or navigational limitations do not adversely impact Phase 2 productivity and resuspension. It is notable that USEPA's ROD envisioned dredging approximately 341,000 cubic yards of sediment within the navigational channel. USEPA recognized the productivity and resuspension problems that reduced vessel draft would have on the project and intended to preclude such problems by ensuring adequate channel depth for unimpeded navigation throughout the Canal.

Section 2.5 - *Application of the PCB mass load element of the Resuspension Performance Standard was not useful in guiding project operations*

An element of the Resuspension Standard was the establishment of a standard for how much PCB mass was transported to the Lower Hudson River during dredging. This standard was established based upon modeling exercises, baseline monitoring of the Upper Hudson, and case studies, as described in the documents published by USEPA defining the performance standards.

The modeling work was done to compare the anticipated impacts of the release of PCBs from dredging at the rates for the evaluation level and control level in the resuspension standard with the anticipated monitored natural attenuation (MNA) alternative as laid out in the ROD for the site. USEPA found during this modeling exercise that the predicted future PCB concentrations in the water column and in fish under the evaluation level and control level rate of PCB release were similar to the predicted future PCB concentrations in the water column and in fish under the MNA scenario. USEPA's rationale in the Engineering Performance Standards (EPS) document is that the rates of resuspension at the evaluation or control levels would not result in a long-term negative impact on future PCB concentrations in the water column and in fish and was therefore acceptable.

In considering the application of the PCB mass load standard in Phase 1, the State is concerned that the use of the load standard as a tool to manage the dredging operations in near real time is infeasible. Understanding what the magnitude of the "baseline" load is given the day to day changes in flow during dredging is nearly impossible; USEPA's definition in the EPS of net load is difficult to calculate on a day to day basis, given the need to understand how to account for flow in predicting which baseline concentration to use in calculating background load. USEPA should consider revising this standard to allow it to be used to guide dredging operations, or eliminate this element of the standard.

Section 2.6 - *The representativeness of the far field monitoring stations should be verified periodically over the course of the project.*

During Phase 1, there were several occasions when there were duplicate or triplicate samples collected from the far field surface water automated monitoring stations. In reviewing the data generated from these sampling events, the State has observed that there have been potentially significant differences between the duplicate or triplicate sample results, both in terms of the magnitude of the total PCB measured and in terms of the congener pattern of the PCB measured in the sample. The State is concerned that this could indicate that the representativeness of the monitoring results is in question.

In GE's Phase 1 Data Compilation Report, there is also a presentation of data generated during sampling events where samples from the automated station were analyzed and compared to manually collected transect samples from the river water column at the automated sampler location. In these paired data, it appears that there may be a difference in the results such that a daytime manual sample is typically ~50% higher than the automated sample. USEPA should closely evaluate the available data to ensure that the data from the automated sampling stations is representative, and include in the Phase 2 design any supplemental data collection activities such as are needed to confirm that the data from the far field automated monitoring stations are representative and usable to enforce the resuspension standard. NYSDEC and NYSDOH suggest that if the data variability is shown to be sufficiently large, than alternatives to the program including but not limited to reevaluation of the Resuspension Standard should be considered by USEPA.

Section 3 – Issues related to the Residuals Performance Standard

The State has identified multiple issues during Phase 1 which impacted the project's ability to meet the Residuals Performance Standard. These issues are:

1) The State believes that the proportion of river bottom capped during Phase 1 was excessive given that the remedial alternative selected in the ROD was removal. The correction of the errors in DoC should result in a significant improvement in the rate at which river bottom is capped in Phase 2.

2) Capping decisions at times appeared to be driven not by the ability to successfully remove the inventory of contaminated sediment and achieve the 1 part per million (ppm) PCB residuals standard, but rather by the schedule for ending the dredging season.

3) The application of the residuals standard and placement of caps resulted in construction of caps which will complicate the ability of the Canal Corporation to successfully maintain channel depth.

4) The practice of measuring PCB residuals only in nodes that were redredged within a given CU creates a downward bias when calculating statistics to determine whether a certification unit meets the residuals standard.

5) Current procedures require that half the detection limit be used for non-detect results when calculating certification unit statistics. This substitution can produce statistically invalid results.

6) The underestimation of the DoC to be removed contributed to the problems with meeting the residuals standard. The need for multiple iterations of testing for compliance with the standard between dredge passes, caused by the underestimation of the DoC, resulted in delay.

Section 3.1 - *Excessive capping occurred in the Phase 1 Certification Units*

Over one third of river bottom which was dredged during Phase 1 ended up with a cap being constructed after failure to meet the residuals performance standard. The State believes that several issues contributed to this result, including (as described below) schedule / end of season issues and the problems associated with the underestimation of the DoC during design.

The Residual EPS (p. 21) notes that proper design of dredging cut lines would be an "important factor in minimizing the number of redredging attempts." The EPS also predicted (on p. 22) that, at most, 8% of target areas in Phase 1 and Phase 2 would be capped - "Conservative estimates indicate that exceedances of the PL action levels will require redredging or capping of 33 acres, or 8% of the total area targeted for removal." GE's inability to accurately define depth of contamination led to capping approximately 36% of areas dredged during Phase 1, more than four times the percentage contemplated by the Performance Standard.

The State believes that, given the remedial alternative selected in the ROD was a removal alternative which was specifically chosen over a capping alternative, the proportion of river bottom capped in Phase 2 should not approach the amount capped in Phase 1. The correction of the errors in DoC should result in a significant improvement in the rate at which river bottom is capped in Phase 2.

Section 3.2 - *Capping decisions were impacted by schedule*

In several certification units (CUs), the decisions to cap certain portions of the CU (or the entire CU) were apparently driven not by the concentration standards defined in the Residuals Performance Standard, but by the need to close out the unit prior to the close of the dredging season. The remedy as described in the ROD for the site is a dredging remedy; the decision to select the dredging remedy over the capping remedial alternative was made by USEPA for the reasons described in the ROD. The Residuals Performance Standard was developed with a view toward compliance with the ROD; as a result, concentration standards were included in the standard, with allowances for capping in areas where meeting the standards was infeasible due to specific conditions found in that CU. Unfortunately, the condition arose such that the end of the dredging season (not envisioned as an element of the Residuals Performance Standard) drove the decision to cap certain CUs or portions of CUs outside of the parameters set in the Residuals Standard.

The State believes that the decision to cap should not be driven by schedule. CUs containing a remaining removable inventory of undredged contaminated sediment should not be capped until that inventory has been removed. This approach would be consistent with the intent of the ROD and with the Residuals Standard. Areas for which there is not sufficient time at the end of the dredge season to remove a remaining inventory of undredged contaminated sediment, should be sampled to determine the remaining surface sediment concentration as well as the remaining thickness of inventory to be removed. In areas where the remaining surface sediment PCB concentration remains significantly elevated, a thin layer of backfill should be placed to stabilize the area until the remaining inventory can be removed the following dredge season.

The most extreme example of the schedule driving the decision to cap is the example of CU-1. In CU-1, the entire navigation channel was capped with a goal of providing a nominal navigation depth of 12 feet in the navigation channel. CU-1 is located in the Fort Edward Yacht Basin and is adjacent to the Fort Edward Terminal Wall. Nearly the entire basin between the Terminal Wall and Rogers Island is within the navigation channel at CU-1.

Residual contamination beneath the cap in CU-1 is greater than 50 parts per million (ppm) total PCBs for almost the entire CU. Concentrations as high as 534 ppm total PCBs are present within the top two feet immediately beneath the cap. Concentrations of this magnitude indicate that the intent of the Residuals Standard was disregarded and a cap was placed in CU-1 as an expediency to meet schedule demands at the end of the dredge season. It appears that the goal in CU-1 at the end of the season was to meet the 12 -feet navigational requirement instead of reaching a residual of 1.0 ppm PCBs, and that undredged inventory was left behind beneath the cap in this area.

Section 3.3 - *Depth of water over caps compromises future channel maintenance*

The cap, as placed by GE, does not provide for a full 12 feet of depth in the entire navigation channel. As can be seen in the as-built drawings for CU-1, significant areas of CU-1 did not meet the design requirement for 12 feet of depth within the navigation channel.

Because CU-1 was dredged with a revised goal of meeting the navigation depth (even though it was not entirely successful) and the areas surrounding CU-1 were not dredged at all, the remedial dredging effectively created a “bathtub” within the surrounding sediments. The pre-dredge bathymetry in and surrounding CU-1 was only 4-5 feet deep. Post-dredge bathymetry shows that water depth in areas surrounding CU-1 remain at 4-5 feet and surround those areas within the dredge area with steep, 7-8 foot plunging sediment walls to the new basin floor at a water depth of about 12 feet. The State is concerned that the steep, 7-8 foot walls of the “bathtub” will erode into the newly created basin within CU-1, resulting in a need for maintenance dredging within the next few years which would likely not exist had stable side slopes been established at the margins of CU-1.

Further, given the project’s underestimated extent of contamination in Phase 1 areas, the State believes there is a strong probability that the areas immediately surrounding CU-1 (including the remainder of the navigation channel that was excluded from the boundaries of CU-1) are likely to contain total PCBs greater than 50 ppm. Erosion of these sediments into CU-1 and onto the cap will create a significant problem for the Canal Corporation. If NYSCC were to attempt dredging of this material, it would likely exceed existing NYSDEC requirements for special handling and disposal of the sediments. In addition, NYSCC is likely to damage and/or penetrate the cap in CU-1 if it were to make any attempt at maintenance dredging. Penetration of the cap in CU-1 would expose sediments that contain over 50 ppm total PCBs at the surface of the river bottom (and in many locations, the concentrations would also be greater than 50 ppm Tri+ PCB). This and could ultimately compromise the effectiveness of the remedy in this area.

NYSCC is required by its regulations (21 NYCRR 155) to maintain a design depth of 12 feet within the navigable channel of the Champlain Canal. When NYSCC identifies an area where significant refill has occurred that affects the navigability of the canal, that area will be scheduled for maintenance dredging. When conducting maintenance dredging, NYSCC routinely incorporates an “over-cut” in the dredge area to ensure that continuing refill will not rapidly compromise the channel depth.

Section 3.4 - *Sampling bias affects calculations for Residuals Standard*

Conformance with the Residuals Standard was determined using statistics calculated from cores associated with 40 nodes within each CU. Multiple dredging passes were required in many locations. In calculating the statistics for Residual Standard, new cores were taken only from redredged nodes - previously obtained values from cores from undredged nodes were retained for the analysis. This procedure will cause a downward bias in the calculated statistics that increases with each dredging pass and set of calculations. The extent of the bias will depend on the spatial granularity of PCBs and the consequent extent to which a single core is representative of the entire node. The downward bias will increase with greater fine scale variability in PCB concentrations and can become considerable.

Section 3.5 - *Treatment of non-detect values may bias calculations for residuals standard*

The substitution of half the detection limit for PCB results that are below the detection limit can produce statistically incorrect results (e.g., Helsel. 2005. Nondetects and data analysis: Statistics for censored environmental data. Hoboken, N.J. Wiley Interscience). Phase 1 procedures nonetheless required this substitution when calculating CU statistics used to make decisions about additional dredging and capping. Whether this substitution had a meaningful effect on the decisions made during Phase 1 is unknown; USEPA should evaluate whether the calculations used during Phase 1 were impacted by this substitution, and modify how non-detects are used in the calculations during Phase 2.

Section 3.6 - *The underestimation of the depth of contamination to be removed contributed to the problems with meeting the Residuals Standard*

The need for multiple iterations of testing for compliance with the standard caused by the underestimation of the DoC led to multiple iterations of delay between dredge passes. As the season progressed, it became apparent to the State that there were avoidable delays associated with the underestimation in DoC; after each dredge pass, there was a round of sampling and survey work to develop the data necessary to determine if the design cut lines and Residuals Standard were met. The DoC underestimation resulted in the need for multiple interations of this process, which could have been avoided if the initial DoC determinations/estimates were correct. The number of iterations can be reduced through confirmation of the DoC prior to the start of Phase 2 (discussed below) and through a change in the sampling and analysis program for the Residuals Standard compliance sampling. If the DoC were reconfirmed after the first dredge pass through analysis of the entire cored interval, instead of only analyzing the uppermost samples of a core collected to check for compliance with the standard, then any subsequent dredge pass would be much more likely to be based upon a more accurate understanding of the remaining undredged inventory of contaminated sediment.

<u>Section 4 – Issues related to the Productivity Performance Standard</u>

The State has also identified issues which it believes impacted the ability of the project to meet the Productivity Standard, or may in the future. These issues are:

1) Offloading delays at the sediment processing facility decreased empty scow availability and served as a bottleneck relative to productivity. Improving the offloading operations should increase the maximum production rate of the dredging operations.

2) Canal traffic throughput has an upper bound which may impact productivity. The design for Phase 2 needs to take into account factors which impact the ability of the Champlain Canal to handle the planned traffic during Phase 2.

Section 4.1 - *Offloading delays at the sediment processing facility*

Throughout the Phase 1 dredging season, NYSDEC oversight staff and contractors observed that the amount of dredge platform “down time” increased as the week progressed. This delay was observed to be directly related to the availability of empty scows. Early in the week, empty scows were typically available - a result of continued offloading operations at the processing facility on Sundays. The processing facility offloading process ran on Sundays to catch up while dredge operations were suspended for maintenance/time off and typically did not operate on Sundays. As the week progressed, and the rate of dredge production exceeded the rate of sediment offloading at the dewatering facility, the availability of empty scows declined to the point where dredge platforms sat idle waiting for scows to be offloaded and made available to be filled.

Evaluations of the productivity of the dredging operations need to take into account this source of “down time”. The State believes that just by simply improving the offloading operations, the potential maximum production rate of the dredging operations can be significantly increased.

Section 4.2 - *Canal traffic throughput has an upper bound which may impact productivity*

Attachment 1 contains a detailed discussion of the potential limits due to the nature of canal operations on productivity during Phase 2. In summary, there are four issues which need to be accounted for in the Phase 2 design relative to Champlain Canal operations.

1) The Feeder Canal may not be able to provide sufficient water flow throughout Phase 2.
2) NYSCC staffing during Phase 2 will need to be supplemented.
3) Increased Canal lock usage creates the increased potential for equipment failures or other problems with respect to sufficient water flow availability.
4) The Canal navigation season can not be routinely extended for the dredging project due to impacts on the need to perform annual maintenance of Canal structures during the off season.

Section 5 – Issues related to the Quality of Life Standard for Air

The State has identified to date several issues which impacted the ability of the project operations to be conducted within the air standards. They are:

1) Presence of uncontrolled NAPL in dredge areas and in scows
2) Use of minihoppers contributed to exceedances of the air standard
3) Delays in offloading at the dewatering facility
4) Presence of sediment and debris in open stock-piles within the temporary material storage basins established in the open areas of the offloading wharf
5) Accumulations of sediment within the Type 1 Storm Water Storage Basin at the north end of the offloading wharf
6) Use of the sheet pile enclosure in the East Griffin Island Area

Section 5.1 - *The presence of uncontrolled NAPL in the dredge areas and in the scows contributed to the elevated PCB concentrations in air measured during Phase 1*

Estimates of PCB concentrations in air made during project design were modeled based upon the data available during design, and did not include the presence of PCB as a separate phase in the contaminated sediment, or as droplets or a film on the surface of the water. Predictions made during design included predicted exceedances of the air standards when dredging in specific CUs. Actual measured exceedances during Phase 1 were often at locations near in-river operations including debris removal and the dredge operations which yielded significant NAPL, near the locations where scows containing NAPL were moored, or at the dewatering facility where scows containing NAPL were staged prior to offloading. The highest air concentrations were measured when heavy sheens of NAPL were observed and where mitigation measures that were supposed to be implemented were not. The monitoring program was not designed to specifically differentiate the source of the exceedances; as a result, the relative impact of PCB releases due to NAPL must be inferred.

NAPL sheens were observed throughout the course of the dredging in the vicinity of CU-2, CU-3 and CU-4. These sheens led to frequent elevated PCB concentrations in air. The monitoring program was adjusted in this area to assess the impacts to nearby receptors. Active collection of the NAPL sheens would have reduced the potential for releases of PCBs to the air. The State believes the collection of NAPL in a closed and sealed container should be incorporated into the Phase 2 design. A device that would vacuum the sheens into a closed container or tank needs to be designed. The contents of the tank would be delivered to the Process Plant water treatment facility through a dedicated closed pumping system. This would minimize the volatilization of the sheens and air exccedances associated with their presence. Capturing NAPL releases should be considered an integral component of the project design on par with the dredging activities.

Other methods to minimize the impacts of NAPL presence beyond vacuuming would be the to deploy Mycelex sorbent booms in areas where sheens are slight, and to use Mycelex pads as a cover in the water in scows where sheens are present. These booms and pads should be collected after a predetermined time following deployment.

The decanting of the buckets containing NAPL also allowed for the aerosolization of PCB, contributing to the elevated PCB concentrations in air. NAPL releases within the sheet pile wall in CU-18 also contributed to elevated PCB concentrations in air.

Photographs 4 – 6 in Attachment 3 show a typical scow load of sediment generated during Phase 1. Note the volume of material above the water in the scow, and the presence of the NAPL within the scow. The State believes that the lack of a water cap on the transported barges, and the uneven loading of the barges allowing dredge material to be exposed to the wind, also contributed to the elevated PCB concentrations in air.

Section 5.2 – *Use of minihoppers contributed to exceedances of the air standard*

In planning for Phase 1, estimates were made of predicted PCB concentrations in air based upon the results of a modeling effort which took into account a number of factors. Areas where exceedances of the air standard were predicted were identified. During Phase 1, it was found that the monitoring results indicated exceedances in areas beyond those where the modeling work predicted exceedances. The State believes that the use of mini hoppers, particularly in high concentration areas where exceedances were predicted, contributed to the number and magnitude of exceedances of the air standard. Mini hoppers offer less containment of sediment (reduced freeboard), required additional decanting of the dredge buckets (thereby reducing the amount of water in the sediment) to maintain stability, and required additional handling operations to unload the sediment into larger barges for transport to the sediment processing site. The mechanical agitation of dredge material during transfer from mini-hoppers to larger barges also likely contributed to air releases. Mini hoppers should be excluded from use in Phase 2 areas that exhibit similar sediment conditions as CUs 2, 3, and 18.

Section 5.3 - *Delays in offloading scows at the dewatering facility contributed to exceedances*

The State believes that the exceedances of the air standard measured in the vicinity of the offloading wharf at the dewatering facility were due in part to the increased magnitude of the source at this location, driven by the increased number of loaded scows at the work wharf. Delays in offloading the scows led the contractors to stage increased number of scows at the wharf.

Section 5.4 - *The presence of sediment and debris in open stock-piles within the temporary material storage basins established in the open areas of the offloading wharf contributed to the elevated PCB concentrations in air measured during Phase 1*

The State believes that the exceedances of the air standard measured in the vicinity of the offloading wharf at the dewatering facility were due in part to the presence of sediment and debris in open-stock piles within the temporary material storage basins established in the open areas of the offloading wharf. Contributions from this source were potentially driven by the volume of the material being held, the PCB concentrations within the material being held, active working and reworking of exposed material, and inadequate cover. Delays in outbound rail shipments and the associated steady loss of storage space within designated material storage enclosures and basins at the dewatering facility resulted in the need for the construction and use of these temporary material storage basins at the offloading wharf.

PCB air measurements at the northeastern perimeter air monitoring location near Lock 8 were low during the month of May generally between 2-20 ng/m3. In July and August, PCB levels at this sample location increased and exceeded 110 ng/m3 on 1 occasion (at a level of 140.9 ng/m3). Most notably, in September PCB levels exceeded 110 ng/m3 on 7 occasions and the commercial standard of 260 ng/m3 on 1 occassion with a maximum concentration of 328.3 ng/m3. This increase in PCB levels measured during the month of September may be a result of the storage of sediment at the unloading wharf, which began in early September, or may be related to the nature and extent of sediment unloaded at the wharf or a combination of factors. The impact to air related to the temporary storage of sediment at the unloading wharf should be further evaluated to determine if this is an acceptable practice for Phase 2.

Section 5.5 - *Accumulations of sediment within the Type 1 Storm Water Storage Basin at the north end of the offloading wharf contributed to the elevated PCB concentrations in air measured during Phase 1*

The State believes that the exceedances of the air standard measured in the vicinity of the offloading wharf at the dewatering facility were due in part to the accumulations of sediment within the Type 1 Storm Water Storage Basin at the north end of the offloading wharf. Contributions from this source were potentially driven by the volume and PCB concentration of the solid material flowing into the basin during storm water events and/or flushed into the basin as a part of operations at the offloading wharf; the volume and PCB concentrations of the solid material being held within the basin; water level fluctuations within the basin and the related exposure of emergent sediment to the air; and the potential for PCBs as a separate phase in the contaminated sediment within the basin to form uncontrolled droplets or a film on the surface of the water during inflow events, episodes of sediment reworking, etc.

Section 5.6 - *Use of the sheet pile enclosure in the East Griffin Island Area may have contributed to the air exceedances measured at this location*

At Griffin Island, PCB levels in air became elevated when dredging began within the sheet pile enclosure. The PCB levels measured near CUs 17 and 18 were lower than those measured near the east channel of Rogers Island but were elevated, exceeding the applicable residential standard (and the commercial standard) on several occasions. Removal of the sheet pile wall reduced PCB levels in air measured at the shoreline. Within the sheet pile enclosure several water samples were collected and analyzed for PCBs, and the maximum level of PCBs measured within the enclosure was 26,000 ng/L. Oils were also observed within the enclosure and downstream. The containment and collection of NAPLs within enclosures must be considered as an element of the Phase 2 design to reduce air releases from within the enclosures, including where there are no active dredging activities. (Exceedances of the project air standard were measured during inactive periods in the vicinity of the sheet pile enclosure in CU 17/18.) While the sheet pile contained impacted water and may have reduced resuspension releases downstream, it created isolated impacts to air along the shore. Any consideration of using sheet piles or similar enclosures during Phase 2 must evaluate the potential impacts on air quality and depending on proximity of the dredge area to residents or occupied properties, additional planning may be necessary to endure that operations are protective.

Section 6 – Issues related to Habitat Reconstruction / Protection

The State has identified several specific detailed issues with the habitat reconstruction program that the State believes need to be addressed in the Phase 2 design in order to better comply with project goals and reduce impacts to post-dredging habitat quality. They are:

1) Specific issues related to compliance with project specifications, or the need to modify particular details of specifications, were found. These include disturbances beyond project boundaries, placement of biologs for shoreline stability, and application of backfill along slopes.

2) The State believes that certain elements of the design related to project operations need to be modified, including controlling vessel traffic to limit damage to submerged aquatic vegetation, possible omission of sheet piles from the design, and limiting turbidity plumes from backfill operations.

3) The State believes that the project protocol for follow up after fish kill events needs to be better adhered to in Phase 2.

4) Certain constraints contained in the Consent Decree for implementation of the remedy (the 15% limit on additional backfill volume for reestablishment of submerged aquatic vegetation habitat and the limits on habitat assessment sample sizes) impact the ability of the project to successfully reconstruct habitat as described in the ROD for this site.

Section 6.1 - *Compliance with or modifications to project specifications*

Project specifications require no disturbance of the shoreline beyond an elevation of 119 feet. Contrary to these specifications, backfill covered wetlands beyond the dredging limit and Type P armor stone was placed at elevations above 119 feet. The excess fill on the wetlands constitutes serious habitat damage and the armor stone will hinder natural revegetation and reduce habitat quality for many animals.

The State observed that the placement of biologs for shoreline stabilization and as breakwaters for reconstructed wetlands according to specifications was determined to be impractical. Ad hoc procedures were used instead. The State recommends that EPA evaluate and develop specifications for anchoring biologs and consider the use of other non-structural methods to protect shorelines and reconstructed wetlands.

During backfill operations, Type 1 backfill was found to be unstable on slopes at the design slope of 3 horizontal to 1 vertical. It was necessary to substitute Type 2 backfill in these areas, potentially limiting the habitat quality in these areas. During Phase 1 design, EPA's consulting fluvial morphologist predicted that 3:1 slopes would not be stable and recommended side slopes of between 6 and 10 to 1. In light of the failure of Type 1 backfill on 3:1 slopes and the advantages of Type 1 backfill over Type 2 backfill for plant and animal habitat, the State recommends that EPA consider more gentle side slopes that would have greater stability and support the placement of Type 1 backfill.

Section 6.2 - *Modifications to project operations*

Powerful tug boats and numerous water taxis moving at considerable speeds, along with anchored barges, may adversely affect submerged aquatic vegetation (SAV). The State believes that limits on vessel traffic, including speed, should be considered by USEPA in areas where vessel traffic could impact SAV.

The sheet pile wall used at Certification Unit 18 produced conditions unfavorable for biota, including a minor fish kill. The State believes an evaluation should be performed by USEPA which considers the benefits and drawbacks of using sheet piles.

Backfilling operations produced extensive sediment plumes. The specific techniques used in the placement of backfill should be evaluated and revised as necessary to reduce, to the extent practicable, the solids plumes generated during backfilling.

Section 6.3 - *Fish kill follow up*

Procedures established in the project specifications for investigating distressed fish and fish kills do not appear to have been followed. The response to two small fish kills highlights the need for improved procedures including unambiguous identification of the species involved, collection of dead fish, and involvement of a qualified fisheries biologist in assessment of the cause.

Section 6.4 - *Constraints on remedy implementation*

Project design allocated an additional 15% backfill to raise bottom elevations to a depth that would better support growth of submerged aquatic vegetation (SAV) in reconstructed habitat areas. This allocation of 15% additional backfill appears to be insufficient to support adequate reconstruction of submerged aquatic vegetation. It appears that the vast majority of the 15% additional backfill allocated for SAV restoration in the 18 planned Phase 1 certification units was placed in the 60% of Phase 1 Certification Units that were completed in 2009. This indicates that the 15% backfill was likely to have been insufficient if the entire planned acreage for Phase 1 had been completed.

Existing limits on habitat assessment sample sizes have constrained the rigor with which habitat reconstruction success for submerged aquatic vegetation can be evaluated. The State recommends that sample sizes for habitat assessment be sufficient to provide high confidence that habitats were successfully reconstructed.

Section 7 Recommendations for Changes to Project Design for Phase 2

NYSDEC has several recommendations, listed below, which are intended to address the issues related to project design which were identified during oversight of Phase 1.

Section 7.1 - *Control NAPL releases*

One of the project specifications in Contract 4, 13801, reads as follows:

Contract 4 Specification 13801 - Inventory dredging

Section 1.07 Material to be Removed

A. (Second Paragraph)

All pollutants, other than sediment, that occur onsite during construction shall be handled and disposed of in a manner that does not contaminate surface water runoff. Equipment shall not be fueled while operating per Section 01140 – Work Restrictions. Any sheens due to leakage or spills, or that occur during dredging operations from any source, shall be contained by a boom and cleaned up with oil absorbent materials.

The State believes that this specification clearly required that the NAPL releases generated by the dredging operations were to be contained and removed by the contractor. However, during discussions with USEPA and GE during the Phase 1 dredging operations, GE staff expressed the position that this specification did not require containment and recovery of the NAPL sheens. This specification should be modified and expanded to include not only the existing general broad requirement that NAPL sheens be contained and cleaned up, but also to include an expanded description of the purpose of the specification (to reduce to the extent practical the releases of NAPL to the water column of the river, contributing to increased concentrations in surface water and air), and the minimum effort required to collect and recover the NAPL (response times, staff, equipment and materials to be on hand, require tending of booms / sorbent materials, recovery of sorbent materials within 1 day of deployment or when saturated if sooner than one day). An example of a control technology would be the collection of NAPL using a skimmer system, with collection in a closed container, which would reduce the surface area of NAPL available for volatilization.

Section 7.2 - *Eliminate intentional decanting*

At the direction of USEPA, GE performed sampling of the water being decanted from the dredge buckets in three sampling events between August 13 and August 19. Results of this sampling were reported on November 4 in a technical memorandum by Anchor QEA. In the technical memorandum, an estimate of the relative contribution of the decanting process to the overall estimate of the far field total PCB load at Thompson Island is approximately 3 percent or less of the load. No estimate is made, however, as to how much the near field PCB concentrations were increased as a result of the decanting process, or of how much NAPL was released as a result of the decanting process. The process of decanting could have been a significant contributor to the near field PCB surface water concentrations, contributing to the exceedances of the project air standards in the dredge corridor.

The State does not believe that decanting should be allowed as part of the Phase 2 dredging program. From the point of view of the State, each dredge bucket should be lifted and emptied directly into the scow without intentionally pausing to allow the dredge bucket to drain into the river. Decanting is functionally no different than allowing scow overflow back into the river, which was specifically not allowed under project specifications.

PCB releases due to the decanting process should not be judged solely by the estimated proportion of the PCB releases due to decanting as compared to other mechanisms of PCB release. A relatively simple change to project operations which can reduce or eliminate a known source of additional PCB release, such as this change, should be implemented.

Section 7.3 - *Perform additional access dredging to improve productivity, reduce resuspension, and reduce air releases*

USEPA should direct that an evaluation be done as part of the Phase 2 design and work planning process which estimates how the performance of access dredging would impact the performance of the work. Access dredging in this context is defined as sediment removal beyond the scope of the removals needed to meet the ROD goals for mass per unit area or surface sediment concentration, but which is performed as needed to allow for such removal to be done in a manner which is more efficient and allows the project to better meet the project standards.

Access dredging would, for example, potentially allow full-sized scows to be used in areas which otherwise would be candidates for dredging proposed to be dredged using minihoppers. Access dredging in this case would reduce the number of tug trips in a work area to change out the minihoppers, allowing for more efficient use of the dredge platforms, and reduce the resuspension due to prop wash and grounding in the shallows. Access dredging in this case would also reduce the likelihood of scows grounding, which caused significant resuspension events during Phase 1.

Section 7.4 - *Dredge to the depth of contamination on the initial dredge pass*

The project dredging operations should be specifically designed to dredge to the depth of contamination on the initial pass. This would entail multiple changes; the most important of which is confirmation of the depth of contamination in Phase 2 areas. While there are several approaches that could be followed to revise the Phase 2 dredging work to more closely meet the removal criteria in the ROD, the State recommends that USEPA perform a field sampling program under which a representative number of core locations could be resampled, both within existing delineated dredge areas and adjacent to existing delineated dredge areas, in order to gather sufficient data to develop revised dredge prisms which are likely to meet the removal criteria in the ROD. This resampling would need to be done using a method which is designed to overcome any anticipated sampling bias which may have led to the underestimation in DoC and mass per unit area found during the Phase 1 dredging work. This approach is similar to that used during Phase 1 design in sampling a representative number of near shore areas to determine if the dredge cut lines could be moved off of shorelines. USEPA could then use the data gathered in this sampling program to inform a process similar to the first option above, where the information gathered would allow for a correction to the dredge area boundaries both laterally and with depth for use in the development of revised dredge prisms for Phase 2.

Section 7.5 – *Perform an ongoing review of project performance*

The State believes that the experience gained during the performance of Phase 1 was important and should be taken into account in developing the final design and work plans for Phase 2. The State also believes that as Phase 2 moves forward, the process of evaluating project performance and making appropriate changes to project design and work plans should continue. USEPA should continue to evaluate the data generated during project monitoring, and observations made during project oversight, in order to direct necessary changes to project operations to maximize project quality, minimize any negative impacts related to the work, and to maximize the opportunities for the project work to meet the remedial action objectives set in the ROD. These changes may include changes to the monitoring programs and changes to the plans and specifications in the design documents and to the contractor work plans. USEPA needs to reserve the authority to direct these changes in order to ensure that the project moves forward in a manner which is consistent with the ROD, which states on p. 96 that USEPA will continue to monitor, evaluate performance data, and make necessary adjustments.

Section 7.6 - *Provide redundant offloading and processing equipment at the unloading wharf to reduce delays associated with offloading "bottleneck"*

The State believes that the Phase 2 design should include installation of redundant offloading and processing equipment at the offloading wharf. The rate at which scows could be offloaded and returned to the dredge platforms would be increased, and sufficient redundant capacity would be available to allow for maintenance and repair of the equipment to reduce down time.

Section 7.7 - *Provide proactive mitigation to reduce the frequency, duration and magnitude of exceedances of the quality of life standard for PCB in air*

The State believes that the Phase 2 design should include revisions to the modeling process used to predict exceedances of the quality of life standard for PCB in air, to take into account the data generated during Phase 1 in order to more accurately predict where standard exceedances may occur. At locations where exceedances are predicted, mitigation measures should be mandated in advance and kept in place during dredging operations. The Phase 2 design should also include specific mitigation measures to control air releases beyond those limited measures taken during Phase 1, including the use of spray-on cover material for use in the scows and more proactive containment and immediate collection of NAPLs generated during dredging operations. The monitoring program for air should include the use of fixed dredge corridor monitors that are not moved or shut down, in order to systematically evaluate the effectiveness of mitigation measures.

Section 8 Recommendations for Changes to Performance Standards for Phase 2

Section 8.1 – *Recommended Changes to the Resuspension Standard*

NYSDEC has several recommendations, listed below, which are intended to address the issues related to Engineering Performance Standards which were identified during oversight of Phase 1.

8.1.1 - *Reduce near field solids monitoring*

The State believes, as discussed above, that the near field solids monitoring was of little use in helping to understand or predict PCB concentrations. As such, these data were of little use in helping direct the dredging operators in managing their operations to reduce PCB losses due to resuspension at the dredge. The State believes that the near field solids monitoring program should be significantly reduced, and the resources reallocated to direct PCB measurements. Such a change would require a modification to the Remedial Action Monitoring - Quality Assurance Project Plan (RAM QAPP) for Phase 2.

8.1.2 - *Reduce near field metals monitoring*

The State believes that the reduction of near field metals monitoring implemented during the latter part of Phase 1 was appropriate given the data generated during the dredging work. The metals monitoring should continue in Phase 2, but only such monitoring as would be required to confirm the existing understanding that the magnitude of metals release from the dredging operations is not going to result in exceedances of the State surface water quality standards.

8.1.3 - *Include near field surface water PCB transect sampling*

The State believes that the data quality objectives for near field PCB transect monitoring should include the gathering of such data as would be required to (1) quantify the rate of PCB release from each dredge operation; (2) compare the rate of PCB release during different conditions such as varying river flow rates / flow velocities, sediment types, debris presence and composition, NAPL presence and composition, and specific dredge operational characteristics (ie. depth of cut, size of bucket, rate of bucket movement); (3) understand the phase in which the PCB is being released (NAPL, dissolved, sorbed); and (4) quantify the source strength for use in estimating rates of PCB release to air associated with the dredging operations.

8.1.4 - *Include "mid field" surface water PCB transect sampling*

The State believes that the surface water monitoring program should include PCB transect sampling at locations between dredging operations. The data quality objectives for this monitoring program would include: (a) to quantify changes in relative proportion of sorbed / dissolved / NAPL phases (as needed); (b) to track changes in PCB concentration and makeup over distance and time as water impacted by resuspended material moves away from dredging operations; and (c) to differentiate between impacts of different dredging operations.

8.1.5 - *Develop an approach to application of the mass loading standard to inform decision making on project operations in near real time, or consider eliminating this portion of the standard*

The basis for the load standard includes a conceptual site model under which there are anticipated significant declines in water column and fish PCB concentrations under a MNA scenario. Measured PCB concentrations in water column and in fish over the several years since issuance of the ROD have shown, however, that the predicted reductions in PCB concentrations have not occurred; as a result, the benefits of the MNA remedy scenario appear to have been overstated. The State believes that, if the PCB mass load standard is to be useful in guiding project operations, it is important to update the understanding of site conditions to include a realistic trend in PCB concentrations under the MNA scenario, and use this updated realistic understanding of site conditions to help inform and revise the load standard.

The State also believes that USEPA should provide a rationale for retaining the load standard. If the standard can not be used to help guide decisions on managing the dredging operations on a near real time basis, and the PCB mass that the standard represents is not put into perspective as discussed above, it may be more appropriate to eliminate the PCB mass load standard as an element of the resuspension standard.

8.1.6 - *Verify the representativeness of the far field automated monitoring stations*

USEPA should closely evaluate the available data to ensure that the data from the automated monitoring stations are representative, and include in the Phase 2 design any supplemental data collection activities such as are needed to confirm that the data from the far field automated monitoring stations are representative and usable to enforce the resuspension standard. This verification could include regular periodic sampling to compare results from river samples and samples from the automated sampler, as well as regular periodic duplicate samples from the automated samplers. NYSDEC and NYSDOH suggest that if the data variability is shown to be sufficiently large, than alternatives to the program including but not limited to reevaluation of the Resuspension Standard should be considered by USEPA. USEPA should also consider setting criteria by which to judge the representativeness of the data from the automated sampler. A review of the program by which the automated sampling apparatus is maintained and cleaned may also be appropriate.

Section 8.2 – Recommended Changes to the Residuals Standard

8.2.1 - *Eliminate capping due to the end of the dredge season*

The State believes that the decision to cap should not be driven by schedule. CUs containing a remaining removable inventory of undredged contaminated sediment should not be capped until that inventory has been removed. This approach would be in keeping with the intent of the ROD and with the residuals standard. The State believes that allowing undredged inventory of contaminated sediments within areas delineated for removal under the project design is not consistent with the ROD for the site.

Areas for which there is not remaining time in the dredge season to remove a remaining inventory of undredged contaminated sediment should be sampled to determine the remaining surface sediment concentration as well as the remaining thickness of inventory to be removed. In areas where the remaining surface sediment PCB concentration remains significantly elevated, a thin layer of backfill should be placed to stabilize the area until the remaining inventory can be removed the following dredge season.

8.2.2 - *The depth of contamination (DoC) should be redefined after each dredge pass*

If the DoC were redefined after the first dredge pass through analysis of the entire cored interval, instead of only analyzing the uppermost samples of a core collected to check for compliance with the standard, then any subsequent dredge pass would be much more likely to be based upon a correct understanding of the remaining undredged inventory of contaminated sediment. This change would allow for the setting of up to date target depths for the contractor to meet, take into account any changes to the river bottom since the data upon which the design was based were gathered, and eliminate any potential sampling bias associated with the overlying material on the river bottom which was removed during the first dredge pass.

8.2.3 - *The entire certification unit should be sampled when evaluating compliance with the Residuals Standard after a second or subsequent dredge pass, or the existing data should be used for non-redredged nodes*

In evaluating whether or not a CU has complied with the Residuals Performance Standard, the calculations should only include either the results of a complete resampling of the entire CU, or use the results of previous sampling at nodes which were not dredged again. This process is necessary to avoid the possible bias associated with the inherent variability in PCB concentrations in Hudson River sediment; it is possible that simply by resampling a subset of sample nodes, a CU could be found in compliance due to variability rather than due to an actual change in the mean surface sediment PCB concentrations.

8.2.4 - *The calculations used to determine if the Residuals Standard has been met should take into account the potential for bias associated with the use of ½ the detection limit for non-detect results*

The State recommends that USEPA recalculate Phase 1 CU unit statistics using appropriate methods for censored data to determine whether decisions about redredging or certification would have been altered. These methods, though more complicated, should be used for Phase 2 unless demonstrated to have had no practical effect on Phase 1 decision making.

Section 8.3 – Recommended Changes to the Productivity Standard

8.3.1 - *USEPA should evaluate whether, in managing Phase 2, the agency should consider the Productivity Standard a "second tier" standard*

The State recommends USEPA consider that compliance with the elements of the other engineering and quality of life performance standards intended to protect human health and the environment should be given priority over compliance with the Productivity Standard. The basis for the Productivity Standard is removal of the sediment over a six year time frame (one year for Phase 1, and five years for Phase 2) as described in the ROD. The six year time frame, as the State understands, is based primarily upon the differences in predicted recovery time frames generated during the Feasibility Study process. These predicted recovery time frames were generated using a set of assumptions which included an overly optimistic recovery rate under the scenario where no dredging would be done. An evaluation of the data generated during the baseline monitoring program leads the State to the conclusion that an extension of the project duration would be appropriate if this would result in better compliance with the standards established to protect human health and the environment.

8.3.2 - *USEPA should recalculate the Productivity Standard to account for changes in estimated volume for Phase 2*

Since the development of the engineering performance standards, there has been an adjustment to the estimated volume of material to be dredged in the project. The State has recommended that this volume be reevaluated and adjusted as appropriate to take into account the problems associated with the error in DoC found during Phase 1. The State believes that it is appropriate for USEPA to develop a new productivity standard with accounts for these changes in estimated dredge volume.

Attachment 1:

Evaluation of Canal System and Potential Impacts on Traffic and Productivity

Description of Champlain Canal System

The New York State Canal System is comprised of four historic waterways, the Erie, the Champlain, the Oswego, and the Cayuga-Seneca Canals, all under the jurisdiction of the New York State Canal Corporation (NYSCC). Spanning 524 miles across New York State, the waterway links the Hudson River, Lake Champlain, Lake Ontario, the Finger Lakes and the Niagara River with communities rich in history and culture.

The Champlain Canal, which first opened in 1823, is approximately 63 miles in length from the Hudson River in Waterford to Lake Champlain in Whitehall. In order to accommodate larger vessels, the State of New York enlarged the canals and the Champlain Canal as it exists today was opened in 1913. As it approaches its 100th birthday, the infrastructure on the Champlain Canal has been rebuilt and maintained and the waterway continues to be operated in much the same manner as it was a century ago.

Between Troy and Fort Edward, the Champlain Canal and the Hudson River share a common navigation channel. Locks C-1 through C-6 are all associated with dams on the river and provide navigational access around these obstructions. Upon reaching Fort Edward, the Champlain Canal separates from the Hudson River, south of Lock C-7, and then proceeds through a man-made canal to Whitehall. The sediment processing facility is located on the Champlain Canal between Locks C-7 and C-8. Therefore, all barges transporting contaminated sediment must pass through Lock C-7 to reach the processing facility.

Topographically, the Champlain Canal continues to climb in elevation up to the level between Locks C-8 and C-9. From there, the canal gradually drops in elevation from Lock C-9 to Lock C-12 at Whitehall. The pool between Locks C-8 and C-9 is the summit level of the Champlain Canal. Water is supplied to this summit from the Hudson River via the Glens Falls Feeder Canal (feeder canal). All traffic transiting Lock C-7 draws water from the summit elevation, requiring equal volumes of water to be replaced by the feeder canal.

The feeder canal is approximately 7 miles long and much of its infrastructure predates the construction of the modern Champlain Canal in 1913. Historically, the feeder canal has experienced problems with dissolution of the limestone that underlies it in some areas. When this has occurred, the feeder canal has leaked large volumes of water until repairs could be made. Leaks of this nature are not infrequent and can be expected to occur at least every few years. Larger failures may also occur. A feeder canal embankment failure occurred near the end of navigation season a decade ago, when piping action washed out the embankment into the Hudson River. While the feeder canal was shut down for the remainder of the season, low traffic and non-drought conditions allowed the Champlain Canal to remain open until the normal closing date. However, lockings were not allowed on demand, but were done on a schedule, to preserve the remaining limited source of water. If a similar situation were to occur during Phase 2, there would not be enough water available to accommodate project traffic.

The available flow to the feeder canal from the Hudson River has been estimated at approximately 300 cfs. However, this information dates from 1905 and only estimates flow entering the feeder canal. A 1951 report (Schermerhorn) indicated that reconfiguration of the supply gates at the feeder dam have reduced the available flow. He indicates that unless 2 -foot flash boards are installed at the feeder dam, there is insufficient head to maintain 250 cfs entering the feeder canal. Currently, flash boards are present on the dam, but the gate configuration was redesigned again in 1985. The maximum flow available at the feeder dam gates under the current configuration is not known. The Canal Corporation will be investigating the flow conditions at the feeder dam in 2010.
Schermerhorn reported about 122 cfs entered the summit level from a combination of the feeder canal and the natural flow in Bond Creek in 1951. Additionally, losses within the feeder itself approached 30 cfs. Assuming that Bond Creek contributed a small fraction of the total water, losses in the feeder canal can be assumed to have been no less than 20-25% in 1951. Present-day losses in the feeder canal are unknown, but are expected to be significant, based on visual observations and inspections. The NYSCC cannot predict how the feeder canal will respond to sustained high flow rates resulting from large amounts of project traffic in Phase 2. The potential for the feeder canal to develop significant leaks or to become obstructed with debris and leaves leading to localized flooding will also increase as the flow in the feeder canal increases.

During Phase 1, water levels above Lock C-8 were unusually consistent for most of the season. In most years seasonal rainfall variations will affect the ability of the feeder canal to maintain a stable water elevation at the summit level. The only problem experienced in 2009 was during a brief dry period in September when the summit level was one foot below normal for about one week until a rain storm was able to replenish the water level. During Phase 2, seasonal variations must be expected to occur and their impact on the feeder canal cannot be fully predicted.

Analysis of Phase 2 Traffic – Lock C-7

At Lock C-7, average vessel traffic during the 2009 dredging season was approximately 29 vessels per day (both project-related and non-project-related), accounting for an average of 18 lockings per day. The table below illustrates the traffic patterns observed at Lock C-7 between May 1 and October 31, 2009.

Table 1: Lock C-7 Traffic between May 1 and October 31

	Project Vessels	Non-Project Vessels	Total Vessels	Project Lockings	Non-Project Lockings	Total Lockings
Daily Maximum	40	35	60*	23	22	34*
Daily Average	20.2	9.1	29.3	11.5	6.8	17.6**

* Numbers do not add up because peak project traffic and peak non-project traffic occurred on different days.

** Numbers do not add up because a small number of lockings contained both project and non-project vessels. NYSCC staff at Lock C-7 passed project and non-project traffic through separate lockings whenever possible during the season. Predictions for Phase 2 assume project and non-project traffic are kept separate.

In general, the NYSCC was able to efficiently balance and manage both project and non-project traffic during the dredging season. This was accomplished in part because operational staffing was supplemented at Locks C-7 and C-8, through an agreement with, and funded by, General Electric. This agreement allowed 24-hour lock access to project vessels. The production rate in Phase 2 and the availability of additional operational staff funding will determine the NYSCC's ability to continue to successfully manage all traffic on the Champlain Canal.

Instead of analyzing the whole navigation season, NYSCC recommends focusing on the peak of the navigation season, from July 1 to September 30. During this time period, non-project traffic is at its peak and project traffic is expected to be operating at full production. Daily impacts on canal operations can be more conservatively predicted using this approach. The remainder of this analysis is conducted using traffic data from the three month peak period.

Table 2: Lock C-7 Traffic Between July 1 and September 30

	Project Vessels	Non-Project Vessels	Total Vessels	Project Lockings	Non-Project Lockings	Total Lockings
Daily Maximum	38	30	60*	23	22	34*
Daily Average	24.5	12.3	36.8	13.7	8.5	21.3**

* Numbers do not add up because peak project traffic and peak non-project traffic occurred on different days.
** Numbers do not add up because a small number of lockings contained both project and non-project vessels. NYSCC staff at Lock C-7 passed project and non-project traffic through separate lockings whenever possible during the season. Predictions for Phase 2 assume project and non-project traffic are kept separate.

The Phase 2 production rate was originally projected to increase from 260,000 cy in Phase 1 to 306,000 cy per year in Phase 2 (Phase 2 DAD). In light of the fact that Phase 1 discovered far more contaminated sediments than anticipated around Rogers Island and did not address CUs 9-16, those additional Phase 1 sediments must also be included in the Phase 2 totals. Furthermore, a conservative assumption is that the remaining Phase 1 dredge areas will also be more extensively contaminated than previously believed as well as some of the Phase 2 dredge areas. Three scenarios are presented below; representing that anticipated Phase 2 dredge volumes will increase by 0%, 25% and 50%, respectively. All analyses are based on the peak navigation season, from July 1 – September 30.

Table 3: Traffic Projection Scenarios for Phase 2

	Phase 1 (actual values)	Phase 2 Scenario 1 (projected values)	Phase 2 Scenario 2 (projected values)	Phase 2 Scenario 3 (projected values)
Annual Sediment Volume (cy)	296,000	306,000	382,500	450,000
Percent Increase From Phase 2 Design Volume	N/A	0%	25%	50%
Percent Increase From Actual Phase 1 Volume	N/A	3.4%	29%	52%

Barge and other project traffic at Lock C-7 are assumed to be proportional to the volume of sediment being removed in Phase 2. The following table illustrates predicted traffic volumes at Lock C-7 during the various Phase 2 scenarios. Peak total traffic (project traffic plus non-project traffic) is modeled using simple linear regression, assuming that the same non-project traffic patterns experienced in Phase 1 will continue unchanged in Phase 2.

Table 4: Lock C-7 Traffic Projections for Phase 2

		Project Vessels*	Non-Project Vessels**	Total Vessels***	Project Lockings*	Non-Project Lockings**	Total Lockings***
Phase 1 (Actual)	Daily Maximum	38	30	60	23	22	34
	Daily Average	24.5	12.3	36.8	13.7	8.5	21.3
Phase 2 Scenario 1	Daily Maximum	39.3	30	51.5 (37-66)	23.8	22	30.7 (23-38)
	Daily Average	25.3	12.3	37.6	14.2	8.5	22.7
Phase 2 Scenario 2	Daily Maximum	49	30	61.1 (46-76)	29.7	22	36.1 (28-44)
	Daily Average	31.6	12.3	43.9	17.7	8.5	26.2
Phase 2 Scenario 3	Daily Maximum	57.8	30	69.8 (54-85)	35	22	41 (33-49)
	Daily Average	37.2	12.3	49.5	20.8	8.5	29.3

* Average and Peak Project Traffic are assumed to be proportional to total sediment volume.

** Non-Project Traffic is assumed to be constant year-after-year.

*** Peak Total Traffic is not a simple sum of project and non-project traffic because the peaks of both types of traffic do not occur simultaneously. A simple linear regression model is assumed to represent the relationship between project traffic and total traffic. Regression was performed using StatCrunch web-based software (www.statcrunch.com). Peak Total Traffic Values are reported as the predicted value from the regression model along with the 95% confidence interval.

These analyses indicate that Lock C-7 is expected to experience between 23 and 29 lockings per day, on average, during Phase 2. This value is larger than what was experienced in Phase 1, but is not likely to be an unreasonable amount of traffic, assuming funding for 24-hour staffing is provided. However, the peak traffic analysis indicates that Phase 2 could generate peak traffic levels that would be challenging for the NYSCC staff and could very well tax the infrastructure to a level not seen in several decades.

In 1951, a study (Schermerhorn) of the water supply available for the summit level of the Champlain Canal concluded that, "unless some changes are made in the manner of supplying water to that portion of the Champlain Canal from above Lock No. 7 to Lock No. 9 the canal cannot be satisfactorily operated under present traffic conditions, not to mention more serious consequences if traffic were to increase." The Schermerhorn report is attached as an appendix to this report.

Combining the findings of the Schermerhorn report with the above predictions for traffic during Phase 2 (Scenario 3), the peak water demand at the summit from the feeder canal would approach 150 cfs. Given estimated losses of 50 cfs in the Champlain Canal itself, approximately 200 cfs would be needed from the feeder canal to maintain the summit level. If conveyance losses in the feeder canal are estimated at 20-25%, then upwards of 250 cfs would be needed at the feeder dam gates. As noted above, the maximum flow available at the feeder dam gates under their current configuration is not known. The Canal Corporation will be investigating the flow conditions at the feeder dam in 2010.

Traffic that regularly approaches 35-40 lockings per day for more than a few days could present problems if any adverse conditions accompany the peak. Adverse conditions might include poor weather leading to high river flows, drought leading to insufficient water supply to the canal, mechanical failures of the lock or equipment, or problems with the feeder canal's ability to supply water to the Champlain Canal. Many of the same problems could occur regardless of the volume of project-related traffic in Phase 2. The adverse conditions in themselves have varying risks of occurring, i.e. droughts or major feeder failures will bring long term water supply problems, extending well beyond a week or partial week issue; mechanical failures traditionally can be repaired relatively quickly, although there is always the possibility of a more serious issue.

An issue of major concern is the availability of water from the Great Sacandaga Lake (GSL) as this is the primary source of water conveyed by the Hudson River for the feeder canal. In an average year, there is sufficient water in the Hudson River to divert 300 cfs into the Feeder Canal. However, during extremely dry years, there has been insufficient water to maintain normal navigation, which has resulted in an implementation of scheduled lockings to conserve water. The most extreme circumstance in recent times, occurred when there were problems with the structural integrity of the feeder canal (as referenced above).

As a result of competition for water in the GSL, the Hudson River Black River Regulating District (HRBRRD) that manages the GSL changed its operations in 1999 through the Upper Hudson/Sacandaga River Offer of Settlement (OoS). Therefore the historical perspective may not reflect current conditions. The OoS established higher minimum GSL water levels that are to be maintained during the summer months (Memorial Day through Labor Day) each year as well as a settlement target elevation curve that is used to establish releases from the GSL.

The OoS; however, includes drawdown exceptions during the Champlain Canal Navigation Season, as follows:

> "*During the Champlain Canal Navigation Season (approximately May 1 through mid-November), if the elevation of Great Sacandaga Lake drops below level 1.2 (interpolated between Level Curves 1 and 2) and an interim minimum average daily flow has not been invoked per subsection 3.4.3, the minimum average daily flow on the Hudson River just below the confluence with the Sacandaga River shall be increased by the flow being diverted from the Hudson River to the Feeder Canal. The resulting minimum average daily flow will remain in effect until either Great Sacandaga Lake rises above level 1.2 or an interim minimum average daily flow is established per subsection 3.4.3.*"

However, since 1999 there has not been a drought of sufficient magnitude coupled with a high Champlain Canal traffic volume such that the canal drawdown exception has had to be implemented.

There was a drought in 2002 where the regulating district did not release the minimum flows listed in the OoS due to several reasons.[1] What changes the HRBRRD will be willing to accommodate during Phase 2 is beyond the Canal Corporation's ability to predict.

The NYSCC cannot guarantee any specific level of service, but the projected Phase 2 traffic patterns at Lock C-7 appear to be manageable with supplemented staffing, barring any unforeseen complications. However, if such problems occur, or if the volume of sediment in Phase 2 is substantially larger than estimated, the probability of experiencing project delays at Lock C-7 begins to increase accordingly.

Analysis of Phase 2 Traffic – Locks C-1 to C-6

Locks C-1 to C-6 ("the river locks") on the Champlain Canal are located on the Hudson River and therefore do not rely on a supplemental supply of water to function. Consequently, the river locks are not as vulnerable to drought and interruptions in water supply as Lock C-7.

However, the traffic projections made above for Lock C-7 are not adequate to predict traffic patterns at the river locks. Lock C-7 did not experience any project traffic related to backfilling or capping operations. The backfill barges were directly loaded at the GP property facility in Moreau and never had to transit Lock C-7. When evaluating traffic at the river locks in Phase 2, the additional traffic from backfill barges will need to be added to the dredging scows and other equipment that was counted at Lock C-7.

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[1] These included low water levels on GSL and the effect on the public of accelerated lake level reductions.

In addition, all general project traffic that originated at the Work Support Marina (survey boats, crew boats, etc.) will also need to be incorporated into the traffic impact analysis for the river locks.

Because little information is presently available regarding future marina or backfill loading operations to potentially be located at downriver locations, making estimate of traffic at river locks is difficult. However, it should be assumed that some fraction of the backfill and general project traffic will be transiting locks in River Sections 2 and 3.

Consideration must be given to the productivity standard's dependence on uninterrupted access to all locks on the Champlain Canal. To the extent that any one of the locks experiences a significant mechanical problem, the entire project can be delayed accordingly. Additional consideration should be given to the increased likelihood of mechanical problems and the increased need for maintenance when the number of daily lockings begins to regularly exceed recent normal levels.

The Role of Lock C-8

While very little project traffic actually passed through Lock C-8 during Phase 1 and the same could be the case in Phase 2, this lock plays a major role in the success of the project. The feeder canal meets the Champlain Canal approximately 1.6 miles north of Lock C-8. Any and all water used for locking vessels through Lock C-7 must first pass through Lock C-8.

NYSCC policy and procedures prohibit the passing of water through a lock by use of the lock chamber and miter gates, except in very extreme situations. This would not allow any regulation of the passing volume and result in loss of pool levels. Instead, when water must be passed through a lock without a conventional locking, it is passed through the valves. In the case of the GE dredging project, since Lock C-7 was operated much more than Lock C-8, water had to be passed from the summit level on a regular basis. This was accomplished by "valving" the water, a practice that involves opening the valves in the lock to pass water from the upper to the lower level. During days with high non-project traffic volumes, the valves at Lock C-8 cannot be left open since they must be used to regulate lockings instead. This can lead to a situation, observed several times during Phase 1, when project traffic at Lock C-7 causes a drop in the pool elevation between Locks C-7 and C-8 that cannot be adequately replaced during the day. In these circumstances, the pool level above Lock C-7 could take all day to recover any lost volume. When forecasting the effects of increased traffic during Phase 2, it will be important to consider the "valving" of water through Lock C-8 as a choke point for managing water levels, even if the feeder canal (discussed above) can supply adequate volumes of water to the summit level. The practice of "valving" also has its own inherent problems. The wear and tear on the valves, operating machinery and valve tunnels is magnified and creates another possible failure mode that could lead to costly maintenance and unscheduled down time.

Length of Navigation Season

The Champlain Canal regularly opens on May 1 and closes on November 15 each year. Operational hours from approximately Memorial Day to Labor Day are 7 AM to 10 PM, while during the remainder of the Navigation Season the locks operate from 7 AM to 5 PM. During Phase 1, the canal was kept open to accommodate the dredging project until November 24 and 24-hour service was provided during this entire time through an agreement with GE that included funding for the additional resources. In addition, Lock C-7 remained open for local project traffic until mid-December. While the NYSCC accommodated the project's need to extend the navigation season during Phase 1, it cannot continue to do so every year.

Each winter, the Champlain Canal has numerous maintenance needs including the scheduled dewatering of selected locks for major maintenance. The winter dewatering and maintenance of locks usually requires all of the non-navigation season to complete. Any delays in beginning the work increases the likelihood of delaying the opening of the canal the following May. Additionally, floating stock assigned to the Champlain Canal normally winters over in the Waterford Flight, utilizing the Waterford Dry Dock for any necessary maintenance and/or repairs. Subsequently, the delay in closing the Champlain Canal in 2009 had a substantial effect on the Waterford Section of the Erie Canal and the ability of Corporation staff to drain the Waterford flight and initiate winter work projects.

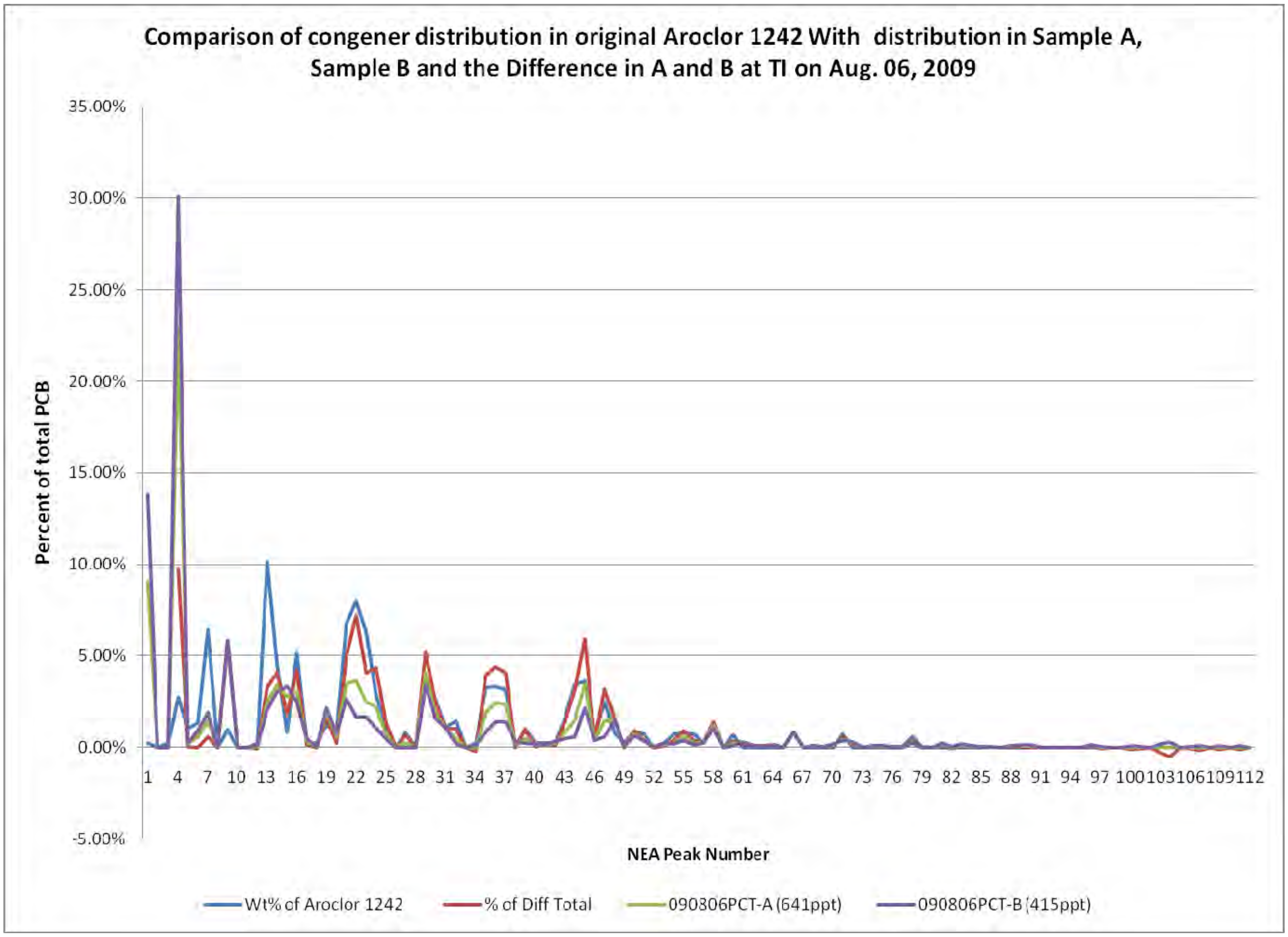
It is apparent in hindsight that the season extension in Phase 1 was largely due to the inadequate characterization of the depth of contamination (DoC) in the Phase 1 dredge areas. The discovery of significant contamination at depths well below the previously assumed DoC caused dredging activities to extend almost until the end of October. Consequently, the backfill and capping of the final CUs required barges to be demobilized through the canal as late as November 23. Incidental near-shore backfill and restoration continued past November 23, and lasted until December 7. Keeping the Champlain Canal open until November 23 had a substantial impact on the Corporation's ability to place dams at, and dewater, Locks C-2 and C-3 for winter work projects. In addition, as mentioned above, these delays also impacted the Corporation's ability to conduct winter work projects on the Erie Canal in Waterford.

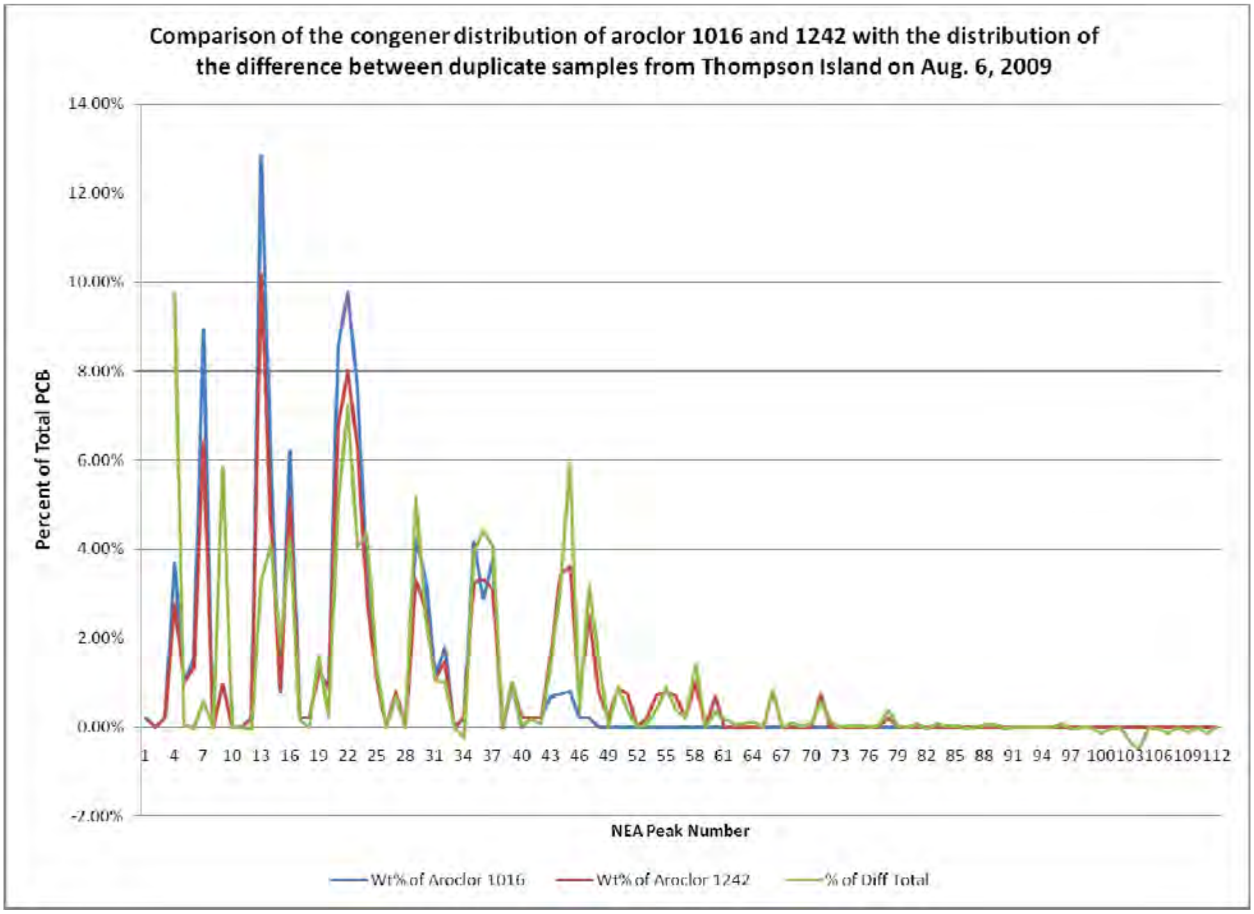
While the rest of the Champlain Canal was able to close on November 23, the last locking at Lock C-7 occurred on December 11, well beyond any date that NYSCC can accommodate on an annual basis.

Weather conditions can dramatically impact the closing schedule and operations in the Champlain Canal. Because the weather can be greatly unpredictable, any operations beyond November 1, other than demobilization, should be discouraged and all backfill and capping work should be scheduled for completion by the end of October. The Canal Corporation recommends that Phase 1 schedules be evaluated to estimate the latest date a new CU should be "opened" for dredging in order to ensure that the inventory dredging, residual dredging, and all backfilling and capping will be completed by the end of October.

NYSCC believes that planning for all work to be completed by October 31 will allow enough flexibility in the remaining two weeks of the season to accommodate unexpected changes in dredging/backfilling volumes, weather delays, or other conditions that would otherwise require an extension of the navigation season. During Phase 2, NYSCC will insist that all project-related operations, including winterization, will be completed by November 15 of each year.

Attachment 2 – Congener Distribution of Selected Samples





Comparison of the congener distribution of aroclor 1016 and 1242 with the distribution of the difference between duplicate samples from Thompson Island on Aug. 6, 2009
Percent of Total PCB
NEA Peak Number
Wt% of Aroclor 1016
Wt% of Aroclor 1242
% of Diff Total

Attachment 3 – Select Project Photographs

Photo 1: Taken at Canal Lock C-7 on Sept. 11; shows typical expression of NAPL sheen after NAPL droplets have coalesced

Photo 2: Taken at Canal Lock C-7 on Sept. 11; shows typical expression of NAPL sheen after NAPL droplets have coalesced

Photo 3: Taken in CU-17 on July 24. Note the layout of the booms intended to control NAPL releases from the dredging operation

Photo 4: Taken at Canal Lock C-7 on July 31, showing a loaded scow in transit through the lock.

Photo 5: Closer view of scow transiting Canal Lock C-7 on July 31; note the nature of the dredged material

Photo 6: Close-up view of scow transiting Canal Lock C-7 on July 31; note NAPL on surface of water within scow

Photo 1

Photo 2 

Photo 3 

Photo 4

Photo 5 

Photo 6 

Hudson River PCBs Site
Review of Phase 1 Implementation

NYSDEC Observations and Recommendations

February 2010

Overview of Presentation - 1

- Purpose of State's presentation – first, bring historical perspective to peer review process
- Provide insight on where the data gathered during 2009 fits in with the historical data set
- Show long term trends in water / fish PCB measurements

Overview of Presentation - 2

- Second purpose of presentation – describe observations of work done during Phase 1
- In general, work went reasonably well
- Deficiencies in design and implementation noted which led to exceedances of standards

Overview of presentation - 3

- Third purpose of presentation – Offer suggested changes to project design and implementation as well as to standards in order to improve project quality, better meet human health and environmental protection objectives in ROD, and better meet project standards

2009 in Historical Perspective

2009 in Historical Perspective

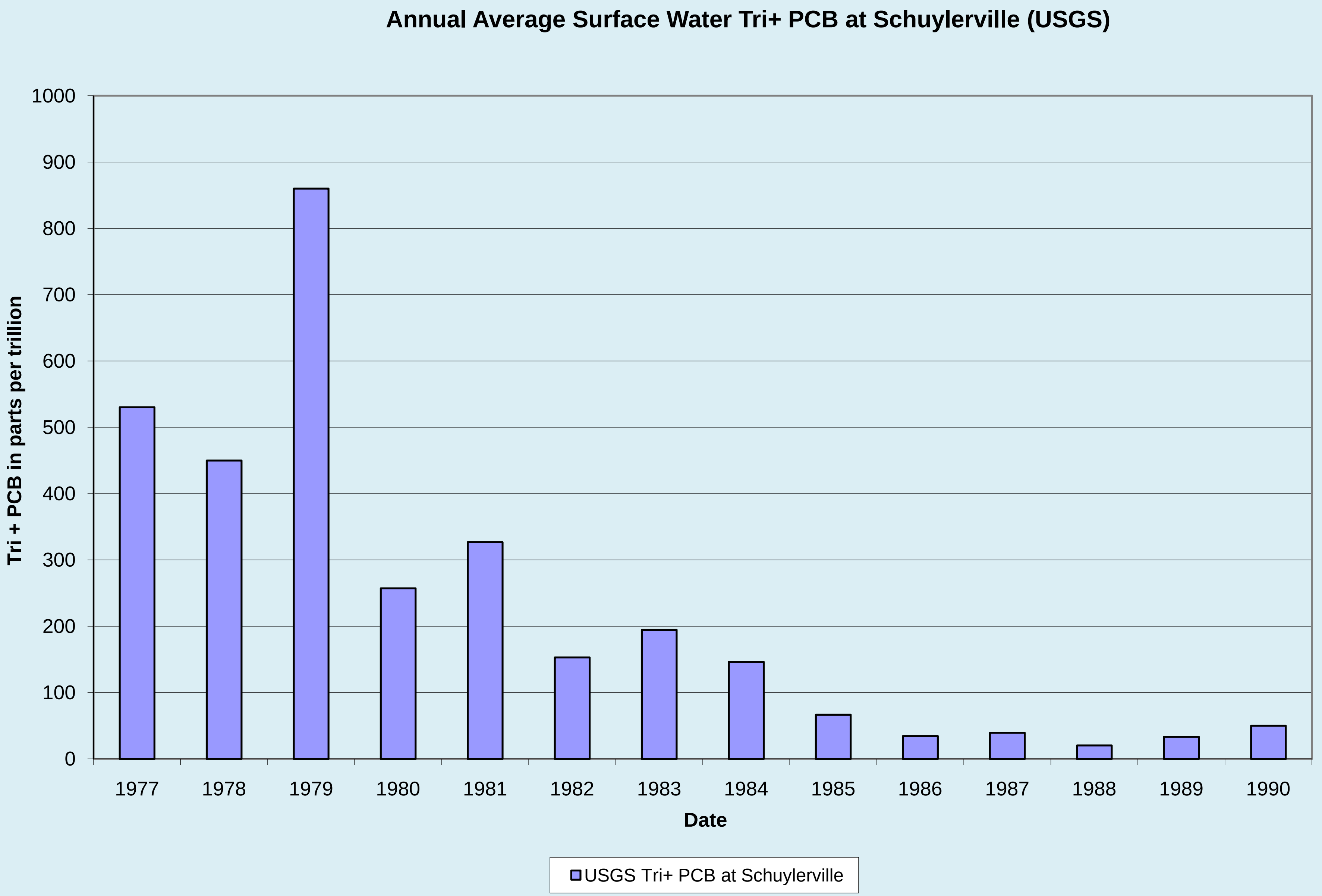
- History of PCB use at capacitor plants from 1947 to 1977; used “neat” as dielectric fluid
- Initially used aroclor 1254, transition to aroclor 1242, subsequent use of aroclor 1016
- Until 1977, untreated discharges to Hudson River containing PCB liquid
- Abatements in late 1970s which reduced releases from capacitor plant sites

2009 in Historical Perspective

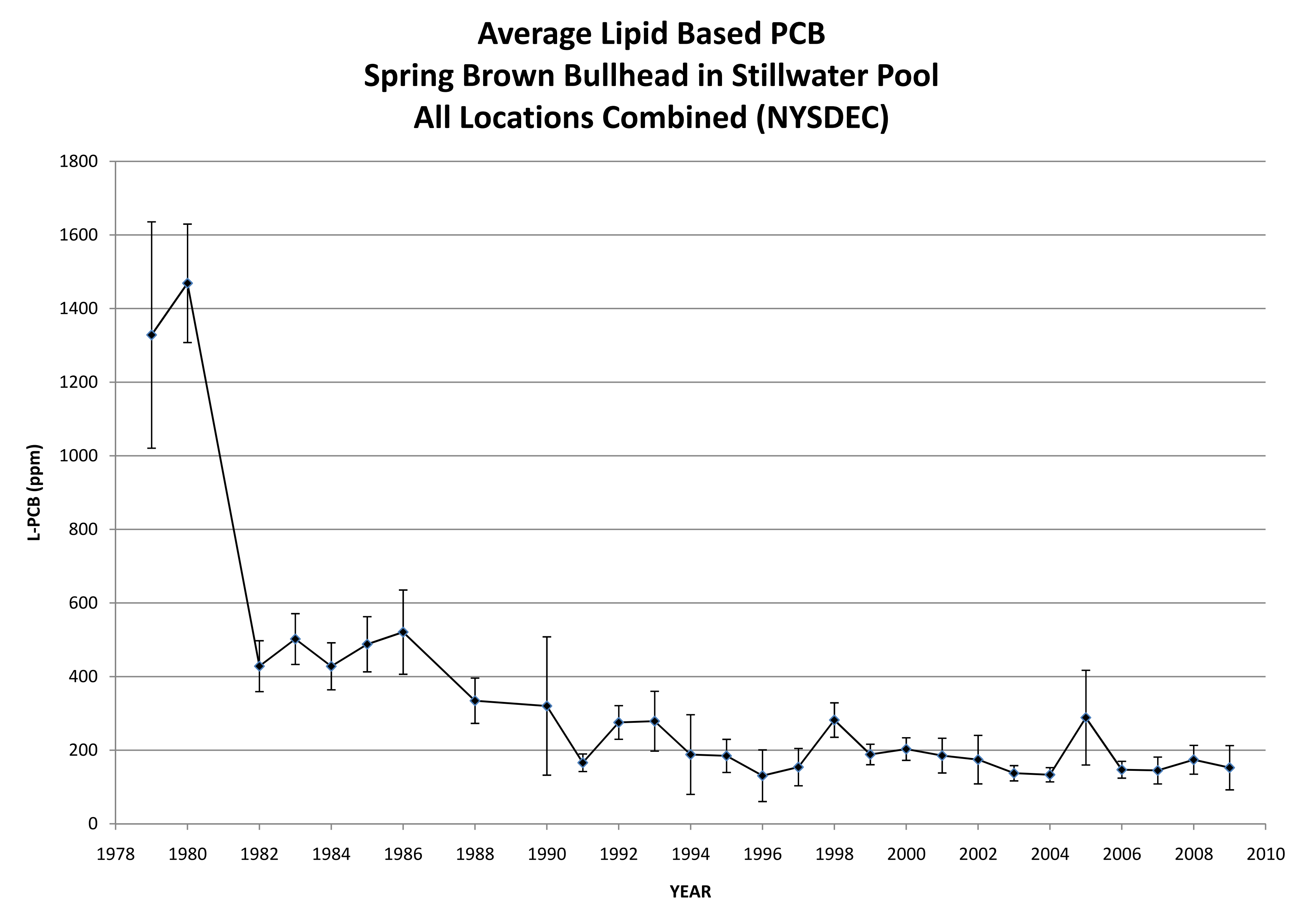
- 1973 removal of Fort Edward Dam immediately upstream of Rogers Island; allowed material upstream of dam to be mobilized and deposited in the channels around the island, on top of the sediments impacted by PCB releases between 1947 and 1973
- Much, but not all, of the material mobilized after the dam removal is dredged in 1970s by NYSDOT from the channels around Rogers Island

2009 in Historical Perspective

- Water column and fish flesh PCB showed declining concentration between the late 1970s and the mid 1980s; one basis for 1984 EPA interim “No Action” ROD
- Water column and fish flesh PCB trended toward stability by the late 1980s



Annual Average Surface Water Tri+ PCB at Schuylerville (USGS)
Tri + PCB in parts per trillion
1000
900
800
700
600
500
400
300
200
100
0
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
Date
USGS Tri+ PCB at Schuylerville

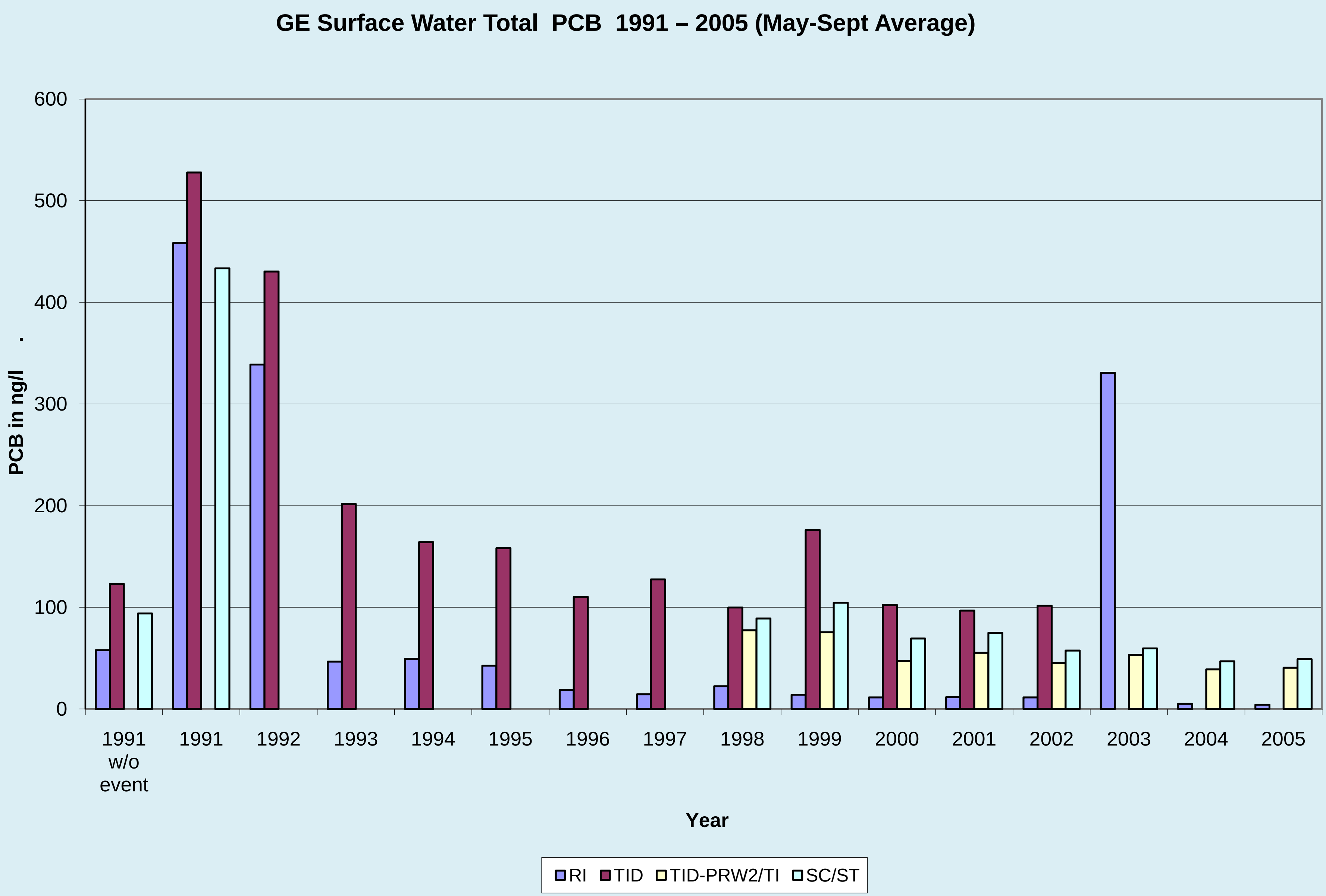

Average Lipid Based PCB
Spring Brown Bullhead in Stillwater Pool
All Locations Combined (NYSDEC)
L-PCB (ppm)
0
200
400
600
800
1000
1200
1400
1600
1800
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
YEAR

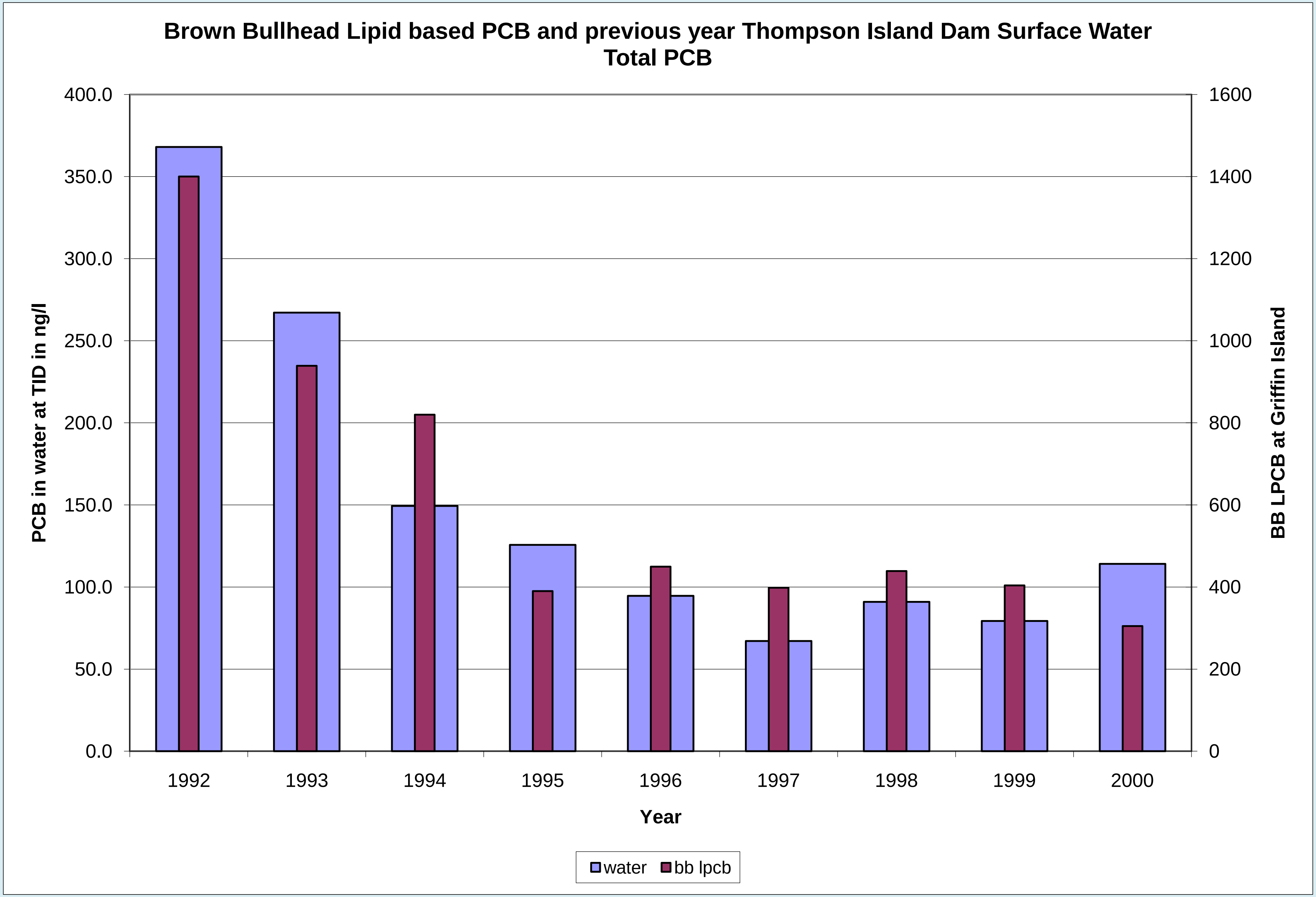
2009 in Historical Perspective

- Sudden releases from the GE Hudson Falls plant site between late 1991 and early 1993 triggered increases in water column and fish PCB concentrations, especially in the area immediately downstream of the capacitor plant sites
- Interim Remedial Measures 1993 – 95 abated the primary mechanisms of PCB release from the capacitor plant site.

2009 in Historical Perspective

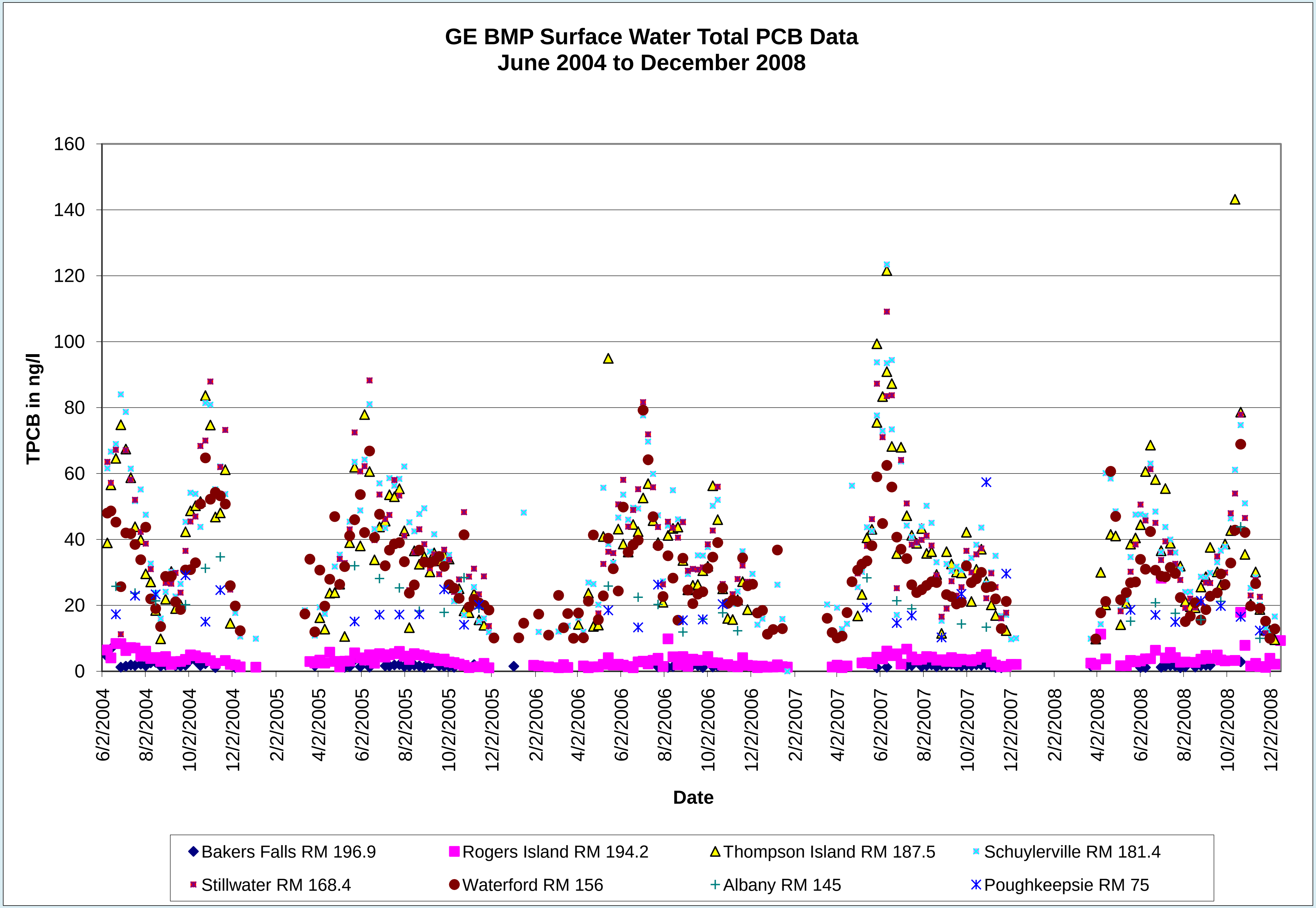
- Once the primary PCB release mechanisms from the capacitor plant sites were abated, PCB concentrations in water and fish quickly returned to pre-release conditions; appeared to be a one year lag between IRMs and response in fish flesh PCB concentrations
- <u>PCB concentrations in water and fish react fairly quickly to changes in source conditions</u>


GE Surface Water Total PCB 1991 – 2005 (May-Sept Average)
PCB in ng/l
600
500
400
300
200
100
0
1991 w/o event
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year
RI
TID
TID-PRW2/TI
SC/ST


Brown Bullhead Lipid based PCB and previous year Thompson Island Dam Surface Water Total PCB
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
PCB in water at TID in ng/l
1600
1400
1200
1000
800
600
400
200
0
BB LPCB at Griffin Island
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
water
bb lpcb

2009 in Historical Perspective

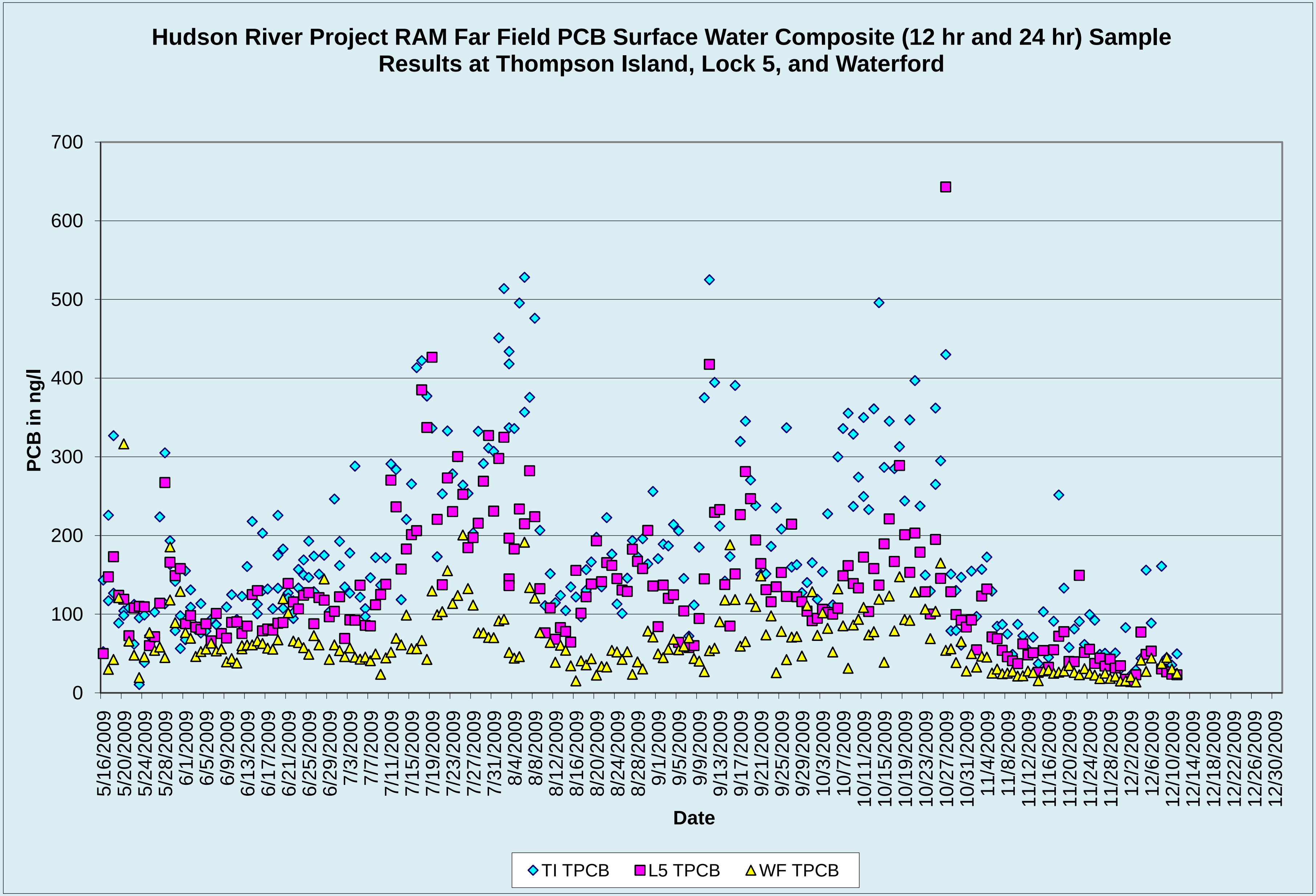
- After 1995, trends in water column and fish flesh PCB concentrations again stabilized , with only slow, gradual declines over time
- BMP began in 2004 with issuance of EPA ROD and agreement by GE to conduct project design, resulting in further changes to monitoring locations and techniques
- BMP water column data continue to show only slow, gradual decline in PCB concentrations



GE BMP Surface Water Total PCB Data
June 2004 to December 2008
TPCB in ng/l
0
20
40
60
80
100
120
140
160
6/2/2004
8/2/2004
10/2/2004
12/2/2004
2/2/2005
4/2/2005
6/2/2005
8/2/2005
10/2/2005
12/2/2005
2/2/2006
4/2/2006
6/2/2006
8/2/2006
10/2/2006
12/2/2006
2/2/2007
4/2/2007
6/2/2007
8/2/2007
10/2/2007
12/2/2007
2/2/2008
4/2/2008
6/2/2008
8/2/2008
10/2/2008
12/2/2008
Date
Bakers Falls RM 196.9
Rogers Island RM 194.2
Thompson Island RM 187.5
Schuylerville RM 181.4
Stillwater RM 168.4
Waterford RM 156
Albany RM 145
Poughkeepsie RM 75

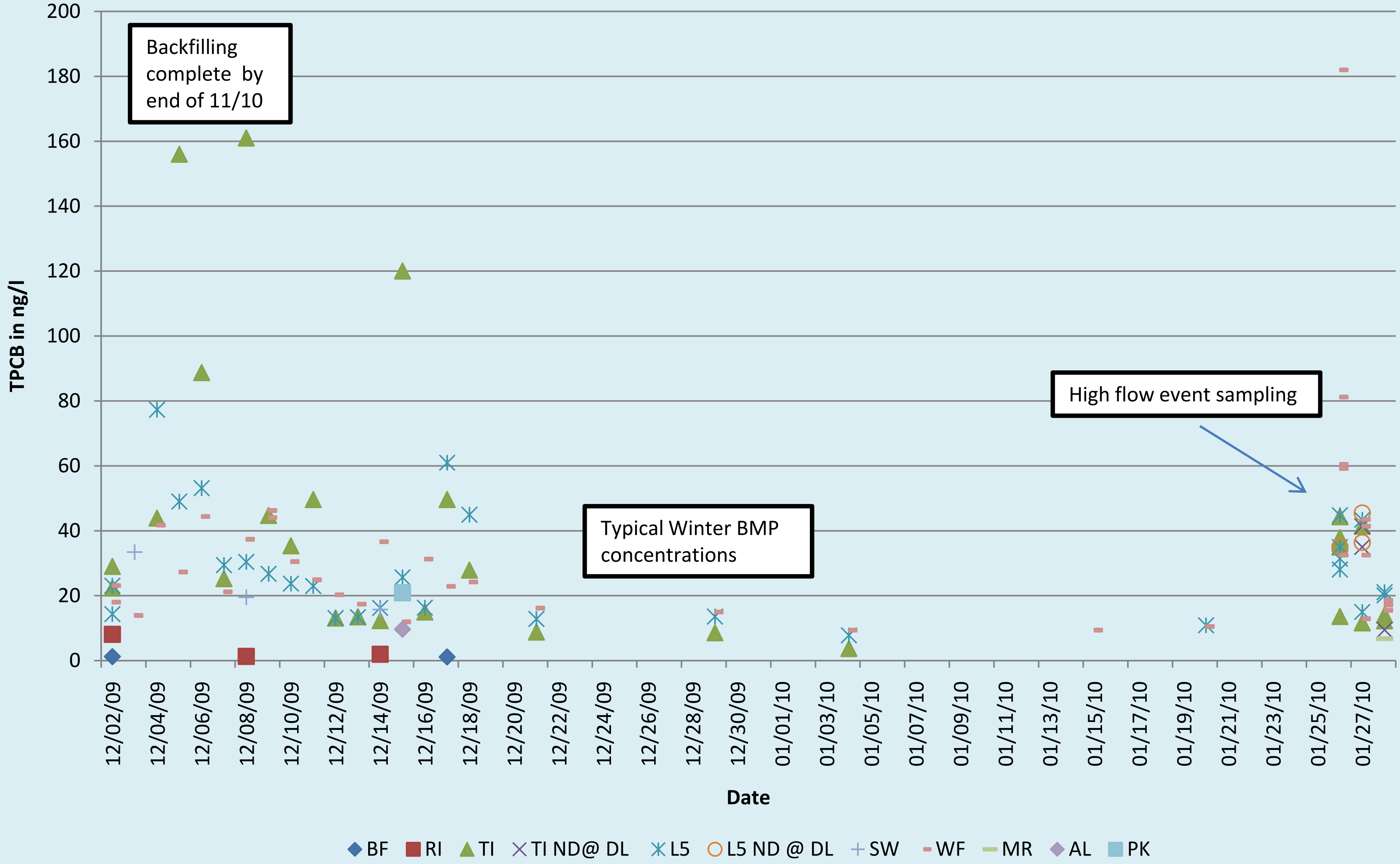
2009 in Historical Perspective

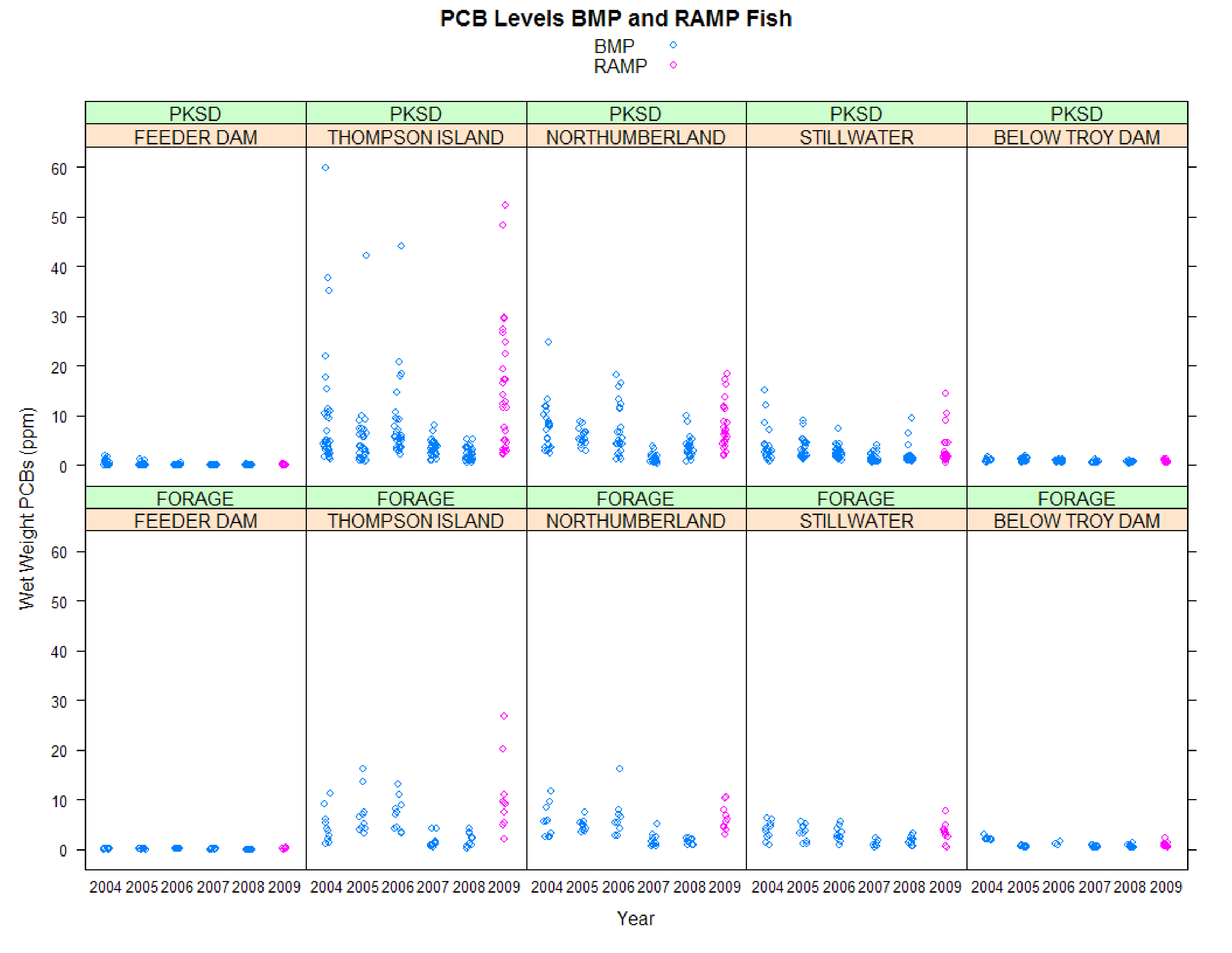
- Dredging began in May 2009
- Water column concentrations increased, abated ~ 3 weeks after backfilling was completed
- Fish collected in spring 2009 may or may not represent impacts of dredging work done at start of project
- Fish collected in fall 2009 showed impact in vicinity of dredging work



Hudson River Project RAM Far Field PCB Surface Water Composite (12 hr and 24 hr) Sample Results at Thompson Island, Lock 5, and Waterford
PCB in ng/l
0
100
200
300
400
500
600
700
Date
5/16/2009
5/20/2009
5/24/2009
5/28/2009
6/1/2009
6/5/2009
6/9/2009
6/13/2009
6/17/2009
6/21/2009
6/25/2009
6/29/2009
7/3/2009
7/7/2009
7/11/2009
7/15/2009
7/19/2009
7/23/2009
7/27/2009
7/31/2009
8/4/2009
8/8/2009
8/12/2009
8/16/2009
8/20/2009
8/24/2009
8/28/2009
9/1/2009
9/5/2009
9/9/2009
9/13/2009
9/17/2009
9/21/2009
9/25/2009
9/29/2009
10/3/2009
10/7/2009
10/11/2009
10/15/2009
10/19/2009
10/23/2009
10/27/2009
10/31/2009
11/4/2009
11/8/2009
11/12/2009
11/16/2009
11/20/2009
11/24/2009
11/28/2009
12/2/2009
12/6/2009
12/10/2009
12/14/2009
12/18/2009
12/22/2009
12/26/2009
12/30/2009
TI TPCB
L5 TPCB
WF TPCB

Hudson River Surface Water TPCB Data Post Dredging / Backfilling 12/1/09 to 1/31/10 Bakers Falls, Rogers Island, Thompson Island, Lock 5, Stillwater, Waterford, Mohawk River, Albany, Poughkeepise





PCB Levels BMP and RAMP Fish
BMP
RAMP
PKSD
FEEDER DAM
PKSD
THOMPSON ISLAND
PKSD
NORTHUMBERLAND
PKSD
STILLWATER
PKSD
BELOW TROY DAM
FORAGE
FEEDER DAM
FORAGE
THOMPSON ISLAND
FORAGE
NORTHUMBERLAND
FORAGE
STILLWATER
FORAGE
BELOW TROY DAM
Wet Weight PCBs (ppm)
0
10
20
30
40
50
60
2004 2005 2006 2007 2008 2009
Year

2009 in Historical Perspective

- Based upon observations in 1990s, expect to see increased PCB concentrations in fish collected in spring 2010 in response to elevated water column concentrations during dredging in 2009
- Fall 2010 forage fish concentrations , and spring 2011 resident fish concentrations, will likely respond to the conditions during spring and summer 2010

Observations from Phase 1 Dredging Oversight by State

Recommendations for Phase 2

Observations from Phase 1

- State performed extensive oversight during Phase 1 implementation
- Oversight by NYSDEC, NYSDOH, NYS Canal Corporation
- Report containing observations and recommendations for Phase 2 provided to EPA
- Highlights of these observations and recommendations follows

Observations from Phase 1

- The near field total suspended solids and turbidity monitoring program did not accurately reflect the magnitude of PCB release to the water column
- The underestimation of the depth of contamination (DoC) and the volume of material to be removed contributed to the exceedances of the resuspension standard, as well as problems with meeting the residuals and air standards

Observations from Phase 1

- Releases of PCB during dredging in the form of a non-aqueous phase liquid (NAPL) contributed to the elevated PCB surface water concentrations and exceedances of the resuspension standard. The State believes that the observed sheens were only a fraction of the total PCB released as NAPL. The dredging program was designed with the assumption that if solids releases were controlled, then the PCB releases would be controlled.

Observations from Phase 1

- Estimates of PCB release rates used in developing the resuspension performance standard did not account for the potential for PCB NAPL to be mobilized; as a result, the technologies evaluated for control of PCB release in the project design did not specifically address this pathway

Observations from Phase 1

- Resuspension of contaminated river sediment due to scow / tug traffic contributed to PCB resuspension, which could have been reduced if additional access dredging was done to increase channel depth and allow for more laden draft and propeller driven scour (prop-wash) clearance depth to be available in the channel areas.

Observations from Phase 1

- Due to the error in DoC in the Phase 1 design, the proportion of river bottom capped during Phase 1 was excessive given that the remedial alternative selected in the ROD was removal
- Capping decisions at times appeared to be driven not by the ability to successfully remove the inventory of contaminated sediment and achieve the 1 part per million (ppm) PCB residuals standard, but rather by the schedule for ending the dredging season

Observations from Phase 1

- The underestimation of the DoC to be removed contributed to the problems with meeting the residuals standard. The need for multiple iterations of testing for compliance with the standard between dredge passes, caused by the underestimation of the DoC, resulted in delay

Observations from Phase 1

- Offloading delays at the sediment processing facility decreased empty scow availability and served as a bottleneck relative to productivity
- Canal traffic throughput has an upper bound which may impact productivity

Observations from Phase 1

- Several issues were identified which impacted the ability of the project operations to be conducted within the air standards including the presence of uncontrolled NAPL, the use of mini-hoppers, delays in offloading at the dewatering facility, and the presence of sediment and debris in open stock-piles at the dewatering facility

Recommendations for Phase 2

- USEPA should evaluate whether the Productivity Standard should be considered subordinate to the Resuspension and Residuals Standards
- The Phase 2 design should also include specific mitigation measures to control air releases beyond those limited measures taken during Phase 1, including the use of spray-on cover material for use in the scows and more proactive containment and immediate collection of NAPLs generated during dredging operations

Recommendations for Phase 2

- USEPA should continue to evaluate the data generated during project monitoring, and observations made during project oversight, in order to direct necessary changes to project operations to maximize project quality, minimize any negative impacts related to the work, and to maximize the opportunities for the project work to meet the remedial action objectives set in the ROD

Recommendations for Phase 2

- The near field solids monitoring program should be significantly reduced, and the resources reallocated to direct near field and mid field PCB measurements
- The DoC underestimation should be corrected before the Phase 2 design is implemented. This will likely entail a combination of additional data gathering and application of a correction factor to existing calculations in the dredge area delineation process to be applied in both redrawing the dredge area boundaries and in resetting the dredging depths in Phase 2

Recommendations for Phase 2

- Existing project specifications should be modified and expanded to include not only the existing general broad requirement that NAPL sheens be contained and cleaned up, but also to include an expanded description of the purpose of the specification, and the minimum effort required to collect and recover the NAPL released during dredging

Recommendations for Phase 2

- Access dredging should be done in areas which would allow fullsized scows to be used in areas which otherwise would be candidates for dredging proposed to be dredged using mini-hoppers. Access dredging in this case would reduce the number of tug trips in a work area to change out the mini-hoppers, allowing for more efficient use of the dredge platforms, and reduce the resuspension due to prop wash and grounding in the shallows

Recommendations for Phase 2

- Areas for which there is not remaining time in the dredge season to remove a remaining inventory of un-dredged contaminated sediment should be sampled to determine the remaining surface sediment concentration as well as the remaining thickness of inventory to be removed. In areas where the remaining surface sediment PCB concentration remains significantly elevated, backfill should be placed to stabilize the area until the remaining inventory can be removed the following dredge season

Recommendations for Phase 2

- DoC should be redefined after the first dredge pass through analysis of the entire cored interval, instead of only analyzing the uppermost samples of a core collected to check for compliance with the standard
- Any subsequent dredge pass would be much more likely to be based upon a correct understanding of the remaining un-dredged inventory of contaminated sediment. This change would take into account any changes to the river bottom since the data upon which the design was based were gathered, and eliminate any potential sampling bias associated with the overlying material on the river bottom which was removed during the first dredge pass

Recommendations for Phase 2

- The Phase 2 design should include installation of redundant offloading and processing equipment at the offloading wharf. The rate at which scows could be offloaded and returned to the dredge platforms would be increased, and sufficient redundant capacity would be available to allow for maintenance and repair of the equipment to reduce down time

Recommendations for Phase 2

- The Phase 2 design should include specific mitigation measures to control air releases beyond those limited measures taken during Phase 1, including the use of spray-on cover material for use in the scows and more proactive containment and immediate collection of NAPLs generated during dredging operations

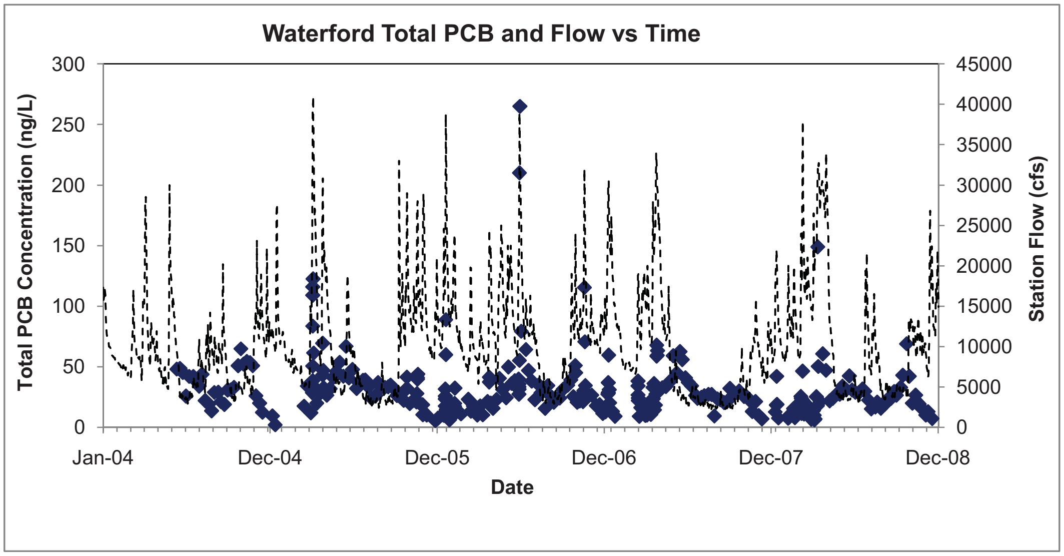
Lessons Learned

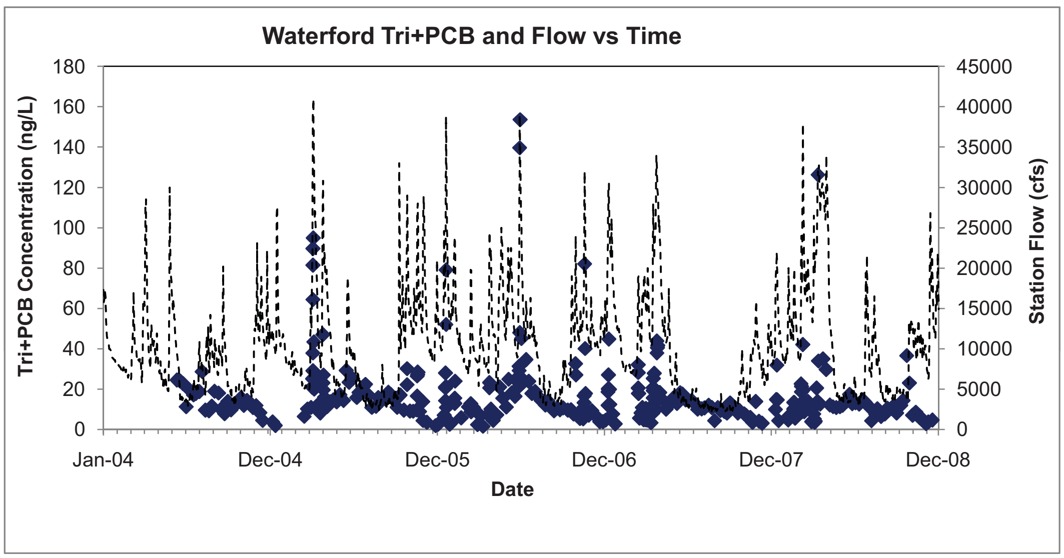
- The State believes that the experience gained by performance of Phase 1 should allow for revisions to the design for Phase 2 to improve project performance and better meet the Performance Standards
- The State believes that revisions to Phase 2 should not be limited solely to changes in the Performance Standards, but rather the lessons learned by studying the results of Phase 1 should be applied to the design of Phase 2

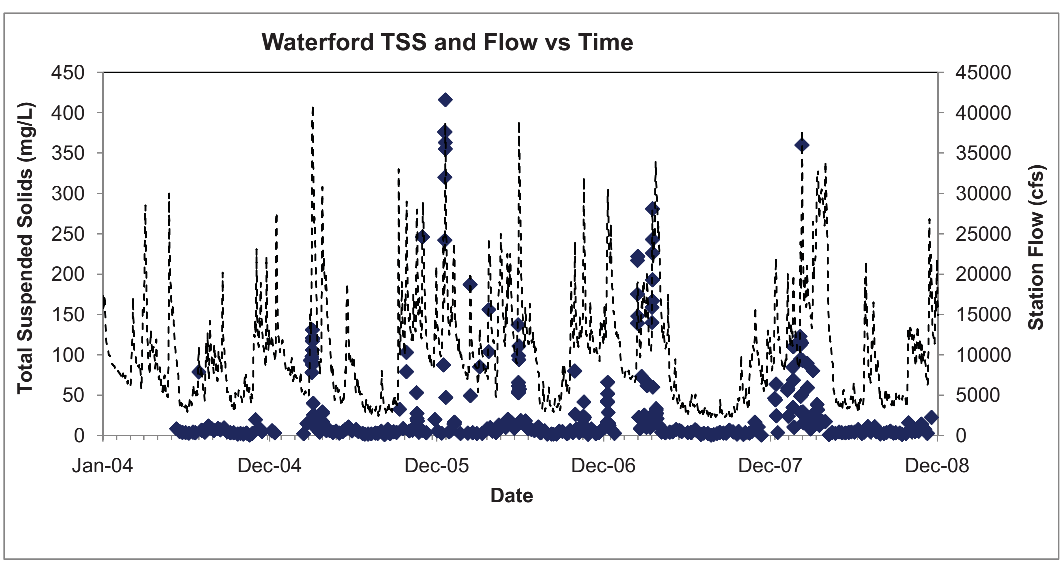
CHAPTER I RESUSPENSION APPENDICES

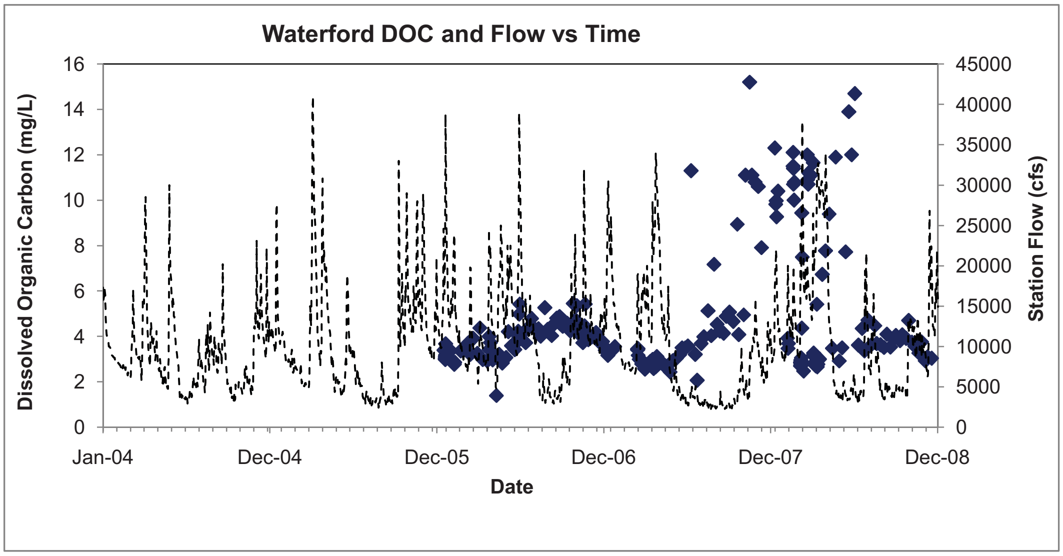
Appendix I-A-1

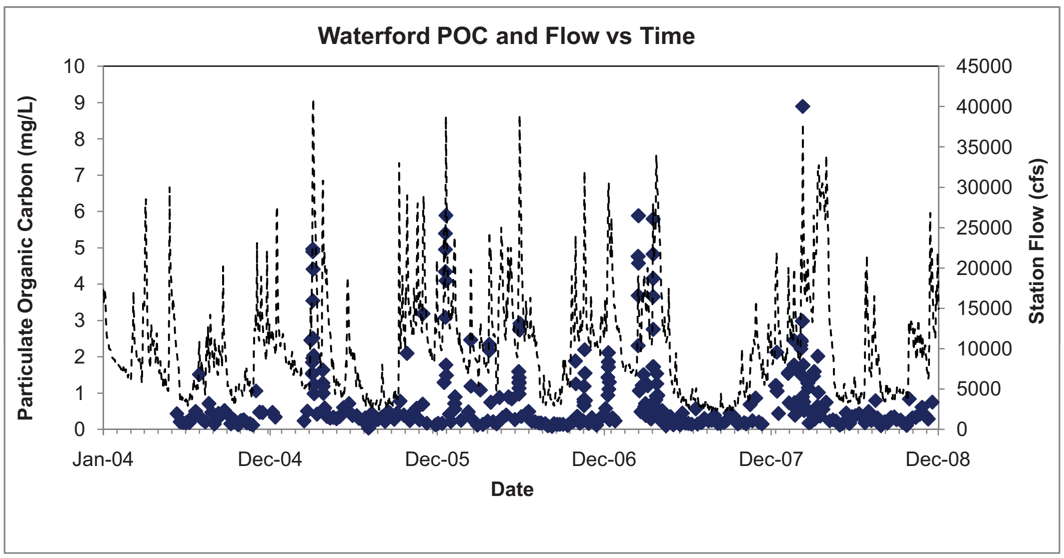
Temporal profiles of Total PCB, Tri+ PCB, TSS, POC, DOC and Flows during the BMP

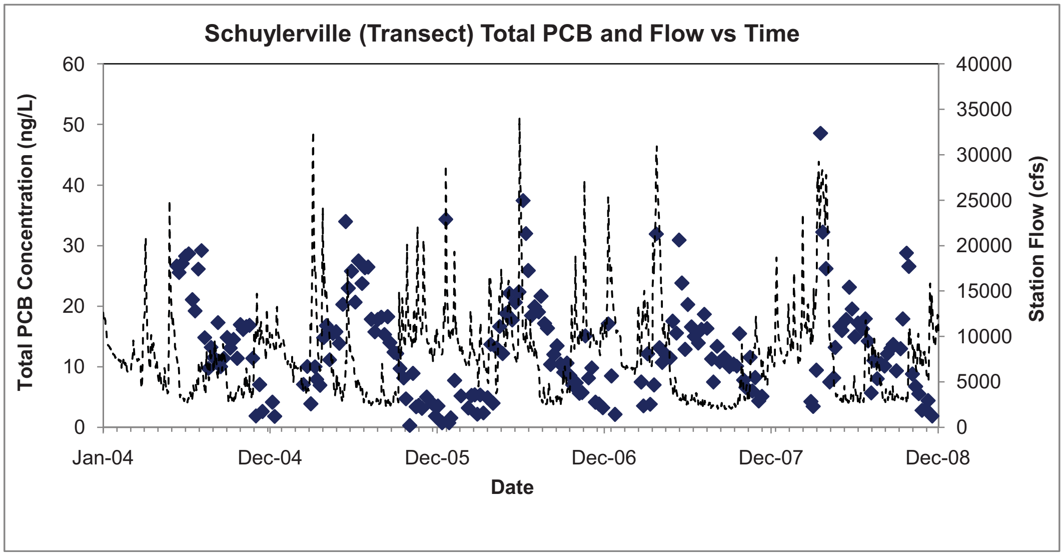

Waterford Total PCB and Flow vs Time
Total PCB Concentration (ng/L)
Station Flow (cfs)
Date
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

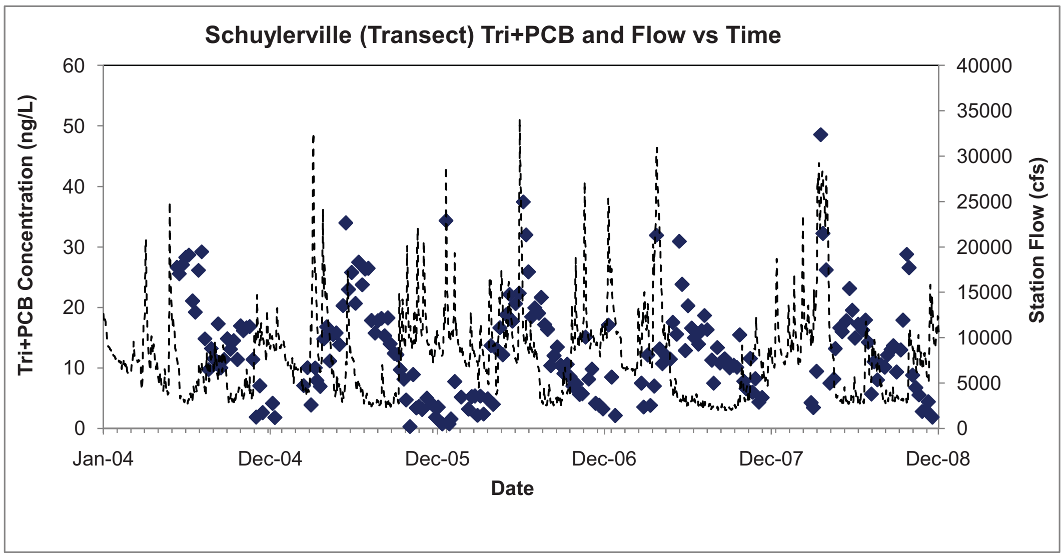

Waterford Tri+PCB and Flow vs Time
Tri+PCB Concentration (ng/L)
Station Flow (cfs)
Date
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

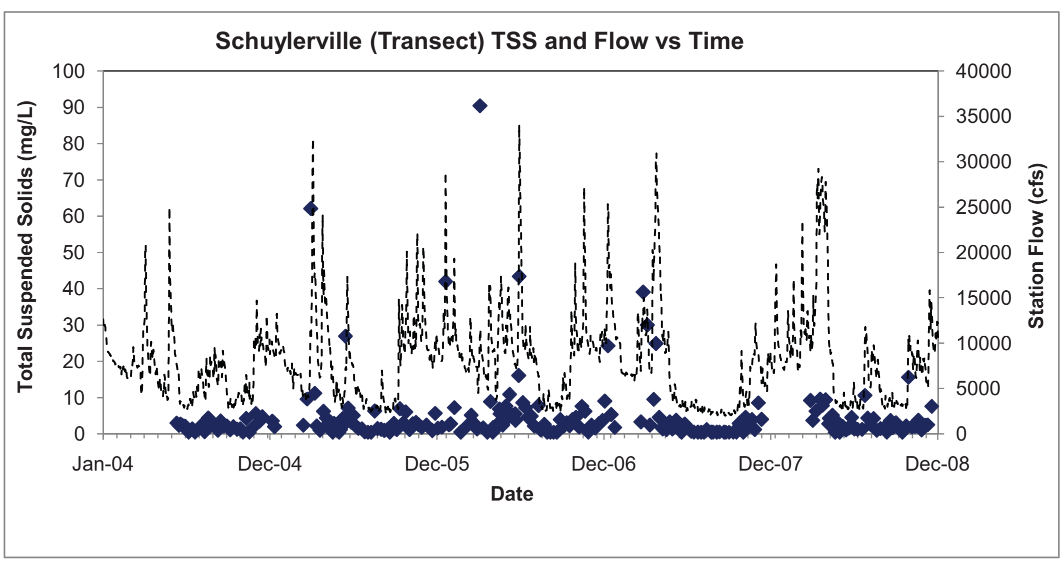

Waterford TSS and Flow vs Time
Total Suspended Solids (mg/L)
Station Flow (cfs)
Date
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

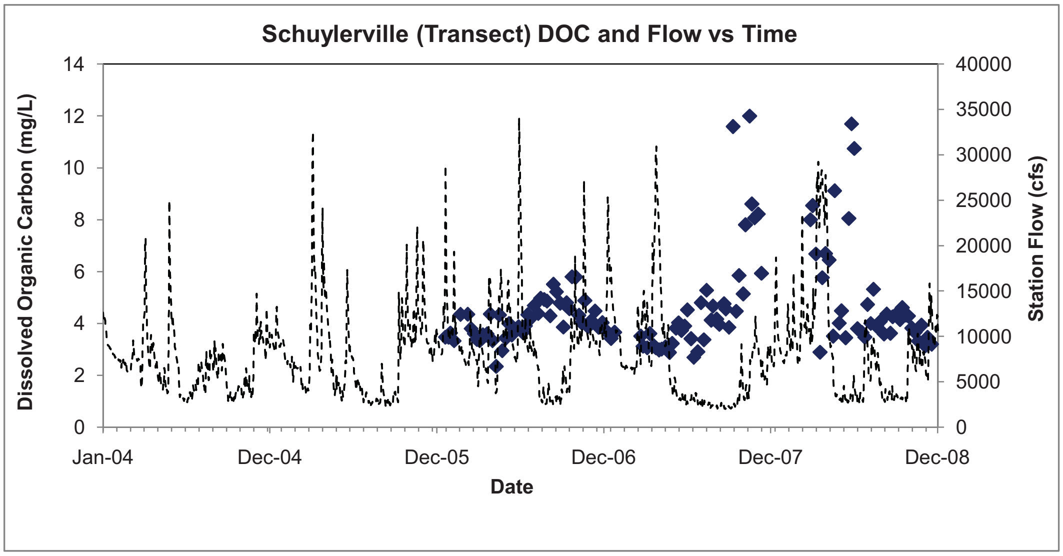

Waterford DOC and Flow vs Time
Dissolved Organic Carbon (mg/L)
Station Flow (cfs)
Date
0
2
4
6
8
10
12
14
16
0
5000
10000
15000
20000
25000
30000
35000
40000
45000
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

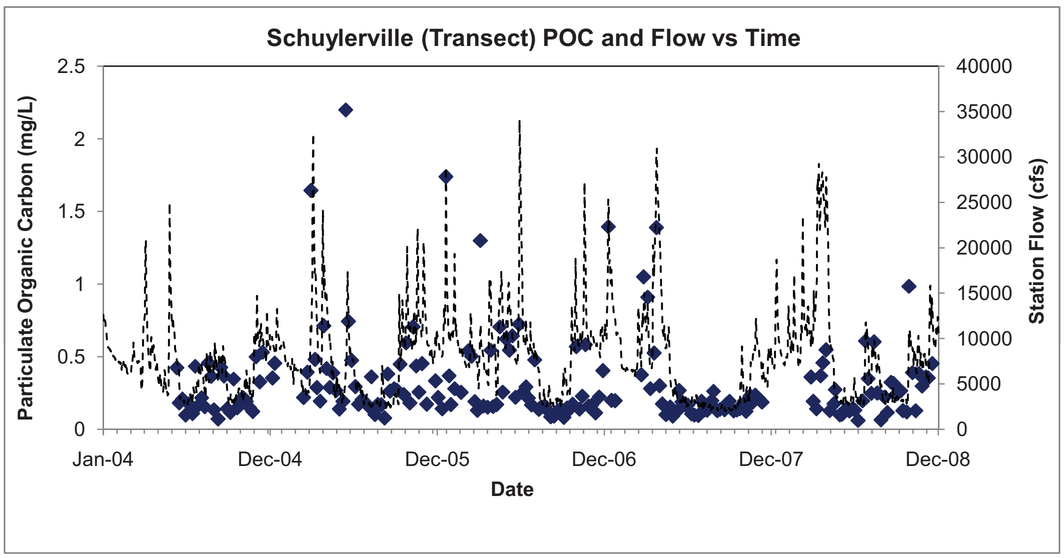

Waterford POC and Flow vs Time
Particulate Organic Carbon (mg/L)
Station Flow (cfs)
Date
0
1
2
3
4
5
6
7
8
9
10
0
5000
10000
15000
20000
25000
30000
35000
40000
45000
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

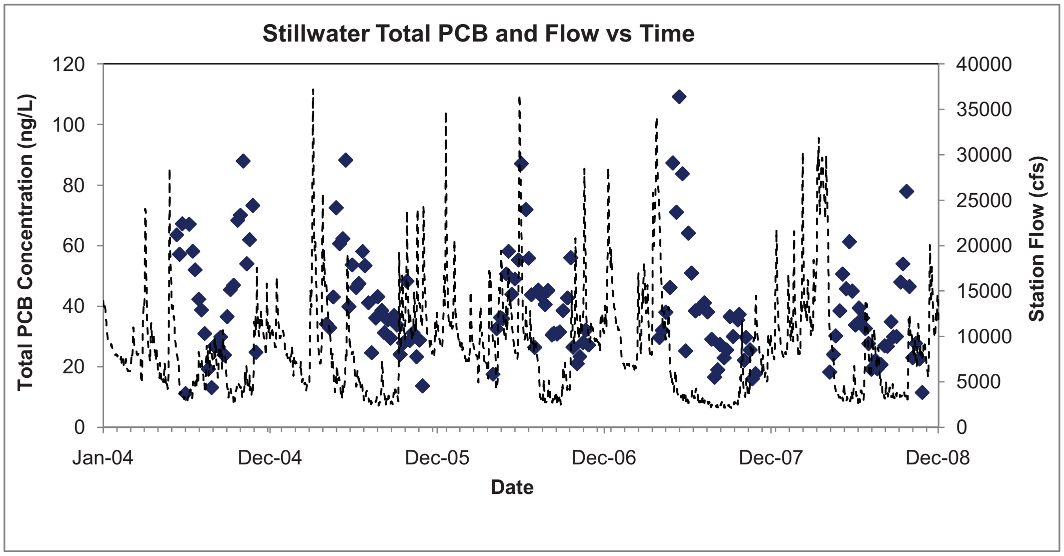

Schuylerville (Transect) Total PCB and Flow vs Time
Total PCB Concentration (ng/L)
Station Flow (cfs)
Date
0
10
20
30
40
50
60
0
5000
10000
15000
20000
25000
30000
35000
40000
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

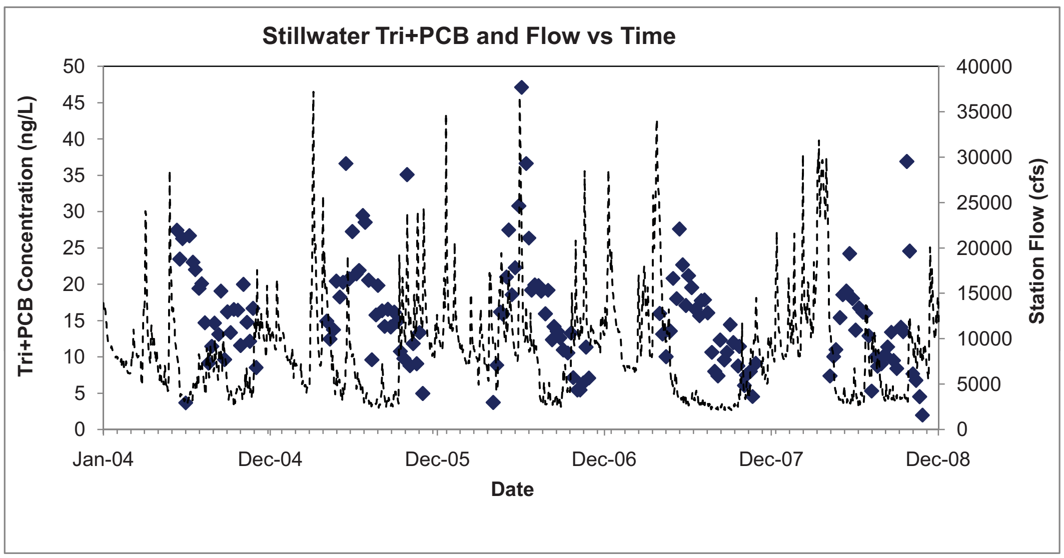

Schuylerville (Transect) Tri+PCB and Flow vs Time
Tri+PCB Concentration (ng/L)
Station Flow (cfs)
Date
0
10
20
30
40
50
60
0
5000
10000
15000
20000
25000
30000
35000
40000
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

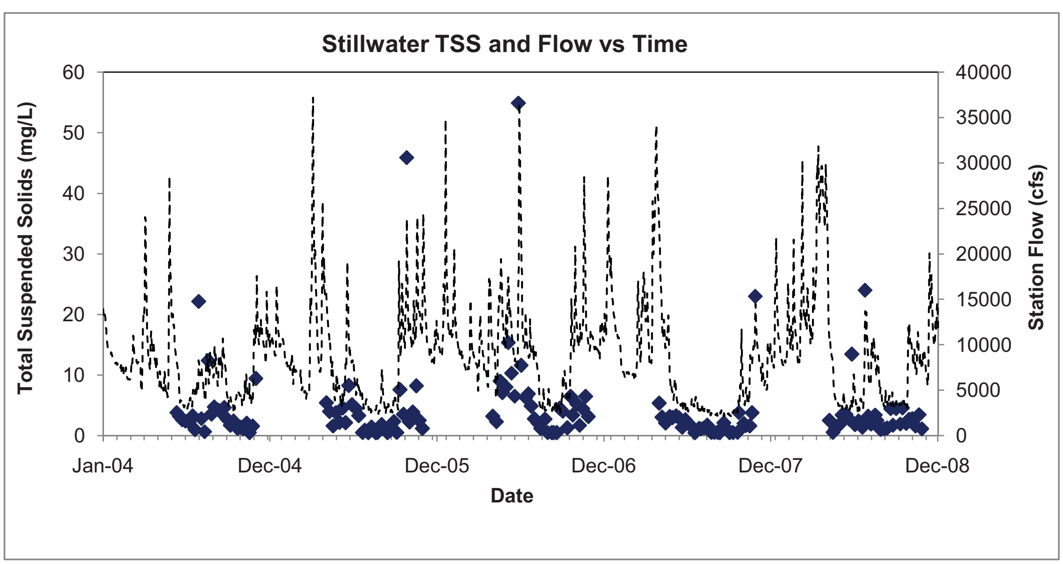

Schuylerville (Transect) TSS and Flow vs Time
Total Suspended Solids (mg/L)
Station Flow (cfs)
Date
0
10
20
30
40
50
60
70
80
90
100
0
5000
10000
15000
20000
25000
30000
35000
40000
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

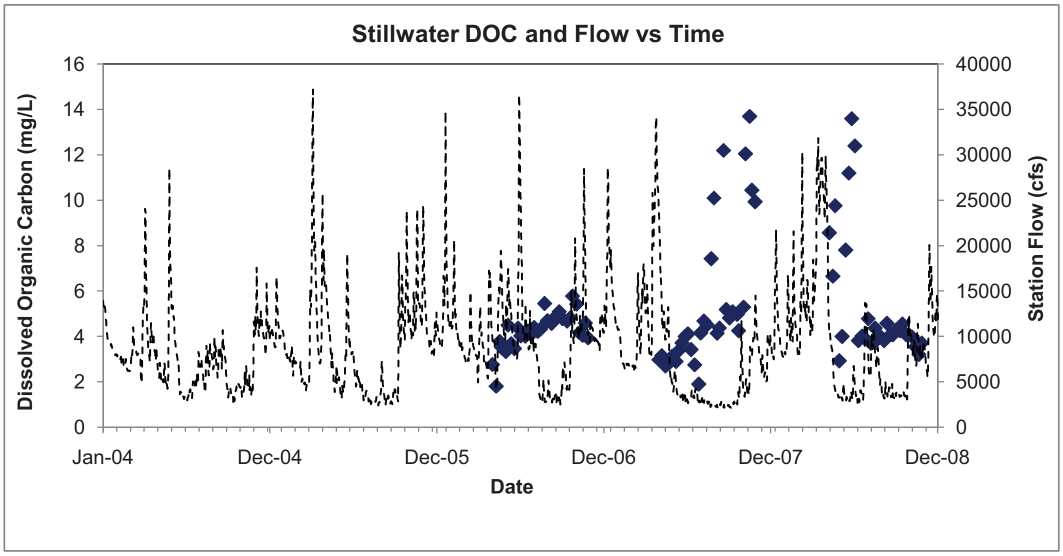

Schuylerville (Transect) DOC and Flow vs Time
Dissolved Organic Carbon (mg/L)
Station Flow (cfs)
Date
0
2
4
6
8
10
12
14
0
5000
10000
15000
20000
25000
30000
35000
40000
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

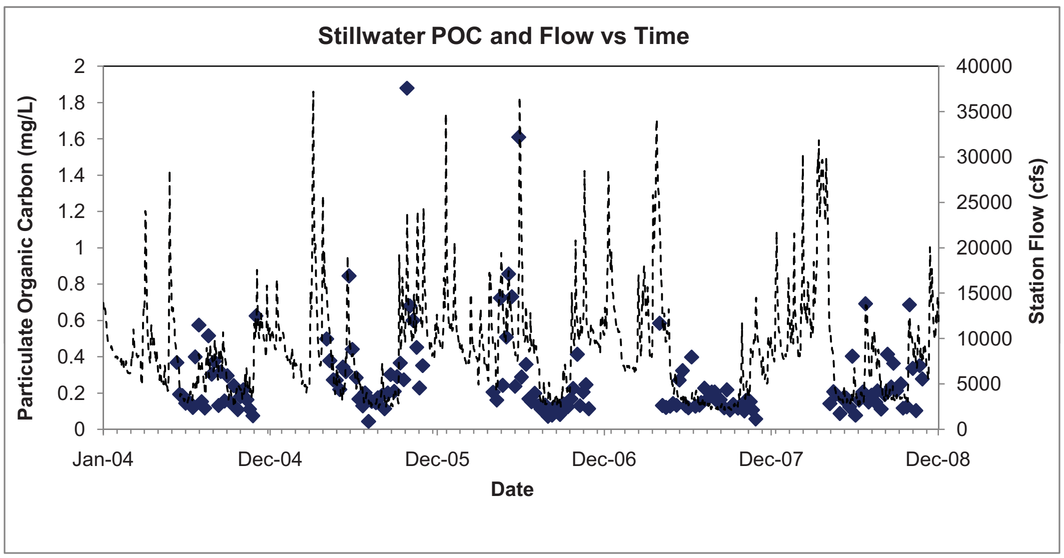

Schuylerville (Transect) POC and Flow vs Time
Particulate Organic Carbon (mg/L)
Station Flow (cfs)
Date
0
0.5
1
1.5
2
2.5
0
5000
10000
15000
20000
25000
30000
35000
40000
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

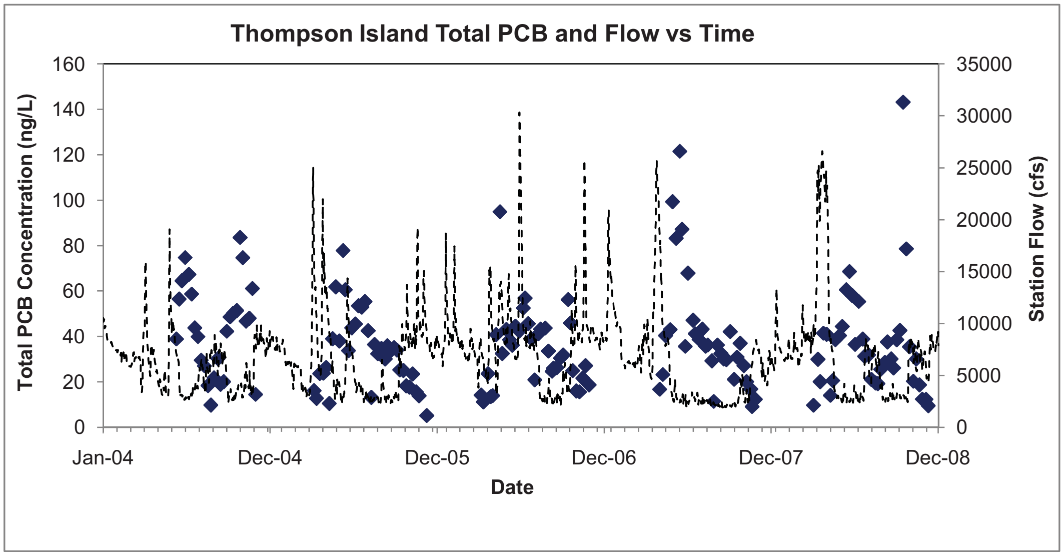

Stillwater Total PCB and Flow vs Time
Total PCB Concentration (ng/L)
120
100
80
60
40
20
0
40000
35000
30000
25000
20000
15000
10000
5000
0
Station Flow (cfs)
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date

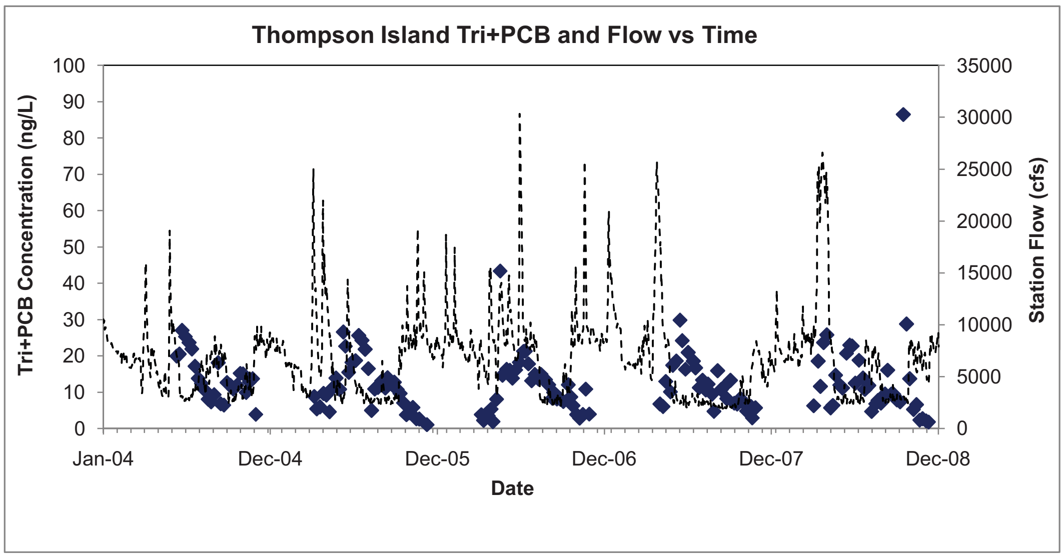

Stillwater Tri+PCB and Flow vs Time
Tri+PCB Concentration (ng/L)
50
45
40
35
30
25
20
15
10
5
0
40000
35000
30000
25000
20000
15000
10000
5000
0
Station Flow (cfs)
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date

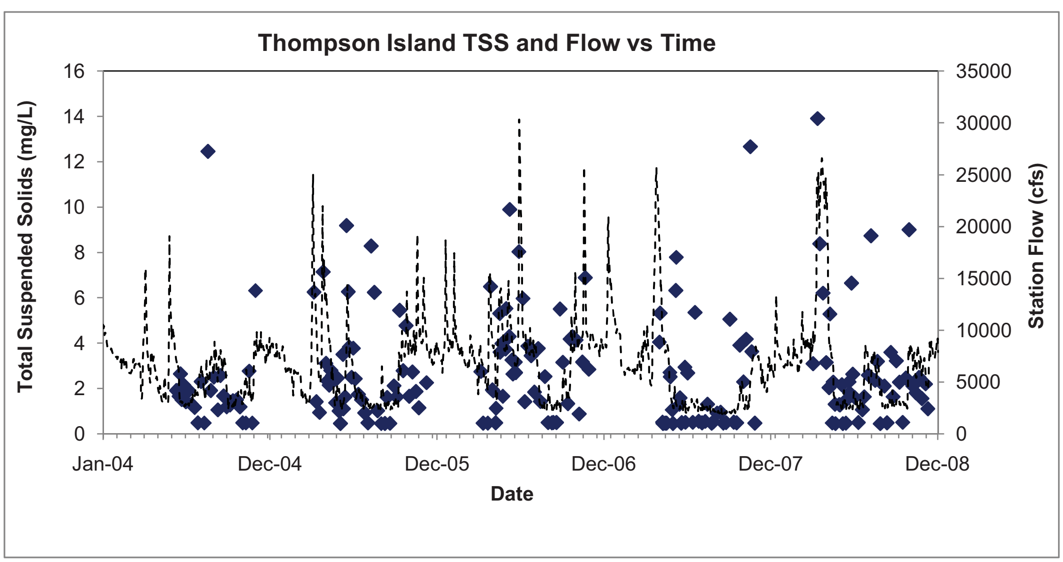

Stillwater TSS and Flow vs Time
Total Suspended Solids (mg/L)
60
50
40
30
20
10
0
40000
35000
30000
25000
20000
15000
10000
5000
0
Station Flow (cfs)
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date

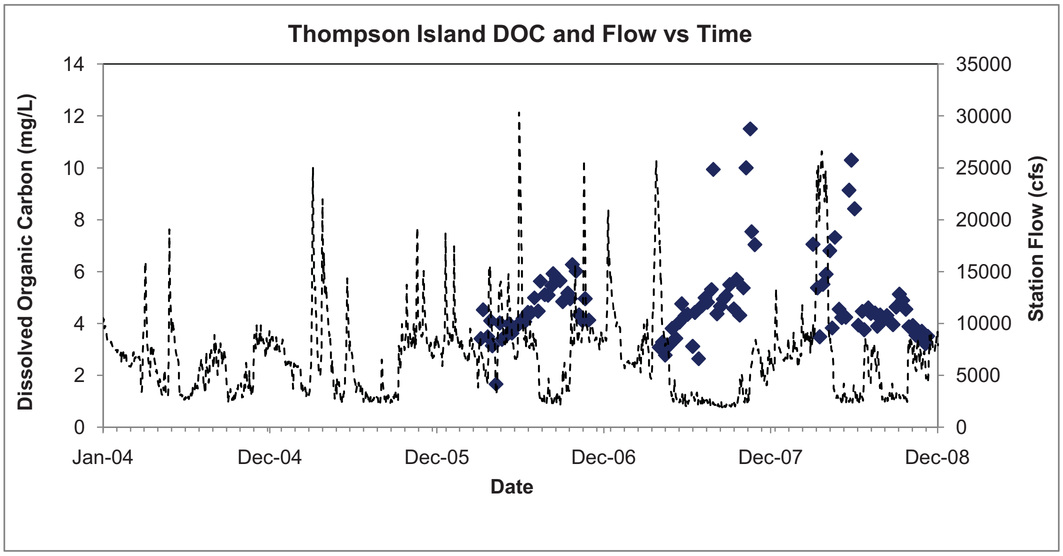

Stillwater DOC and Flow vs Time
Dissolved Organic Carbon (mg/L)
Station Flow (cfs)
Date
16
14
12
10
8
6
4
2
0
40000
35000
30000
25000
20000
15000
10000
5000
0
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

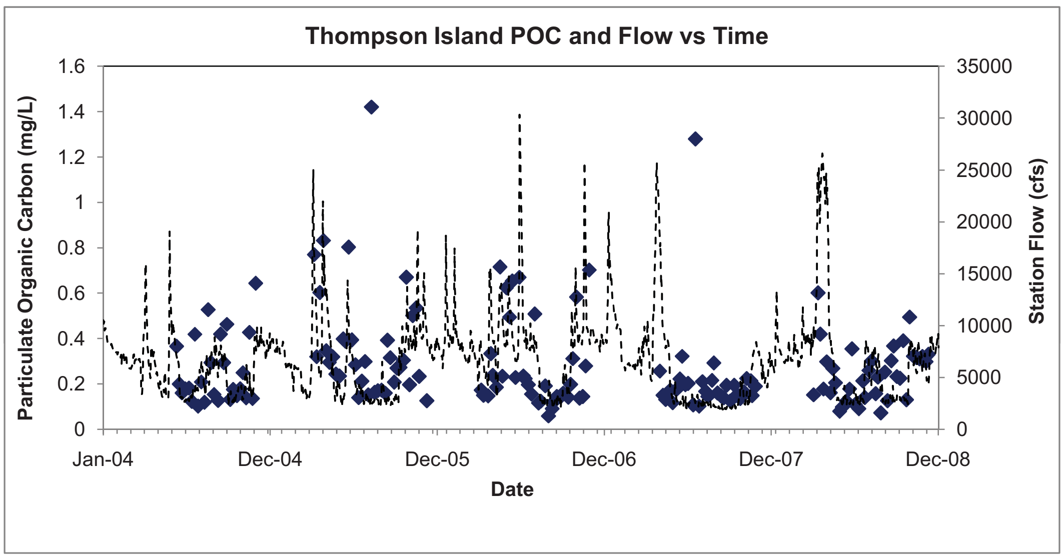

Stillwater POC and Flow vs Time
Particulate Organic Carbon (mg/L)
Station Flow (cfs)
Date
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
40000
35000
30000
25000
20000
15000
10000
5000
0
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

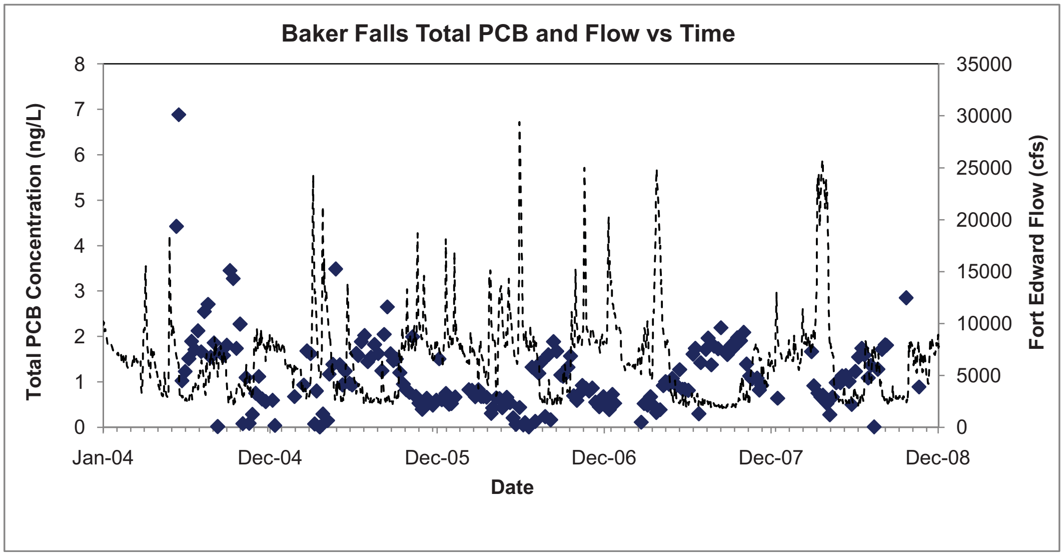

Thompson Island Total PCB and Flow vs Time
Total PCB Concentration (ng/L)
160
140
120
100
80
60
40
20
0
35000
30000
25000
20000
15000
10000
5000
0
Station Flow (cfs)
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date

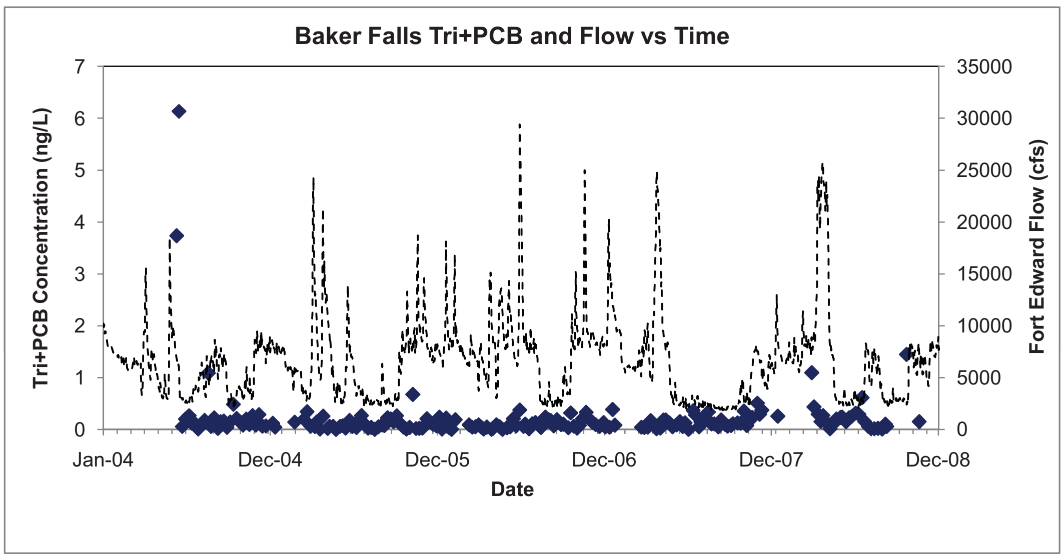

Thompson Island Tri+PCB and Flow vs Time
Tri+PCB Concentration (ng/L)
100
90
80
70
60
50
40
30
20
10
0
35000
30000
25000
20000
15000
10000
5000
0
Station Flow (cfs)
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date

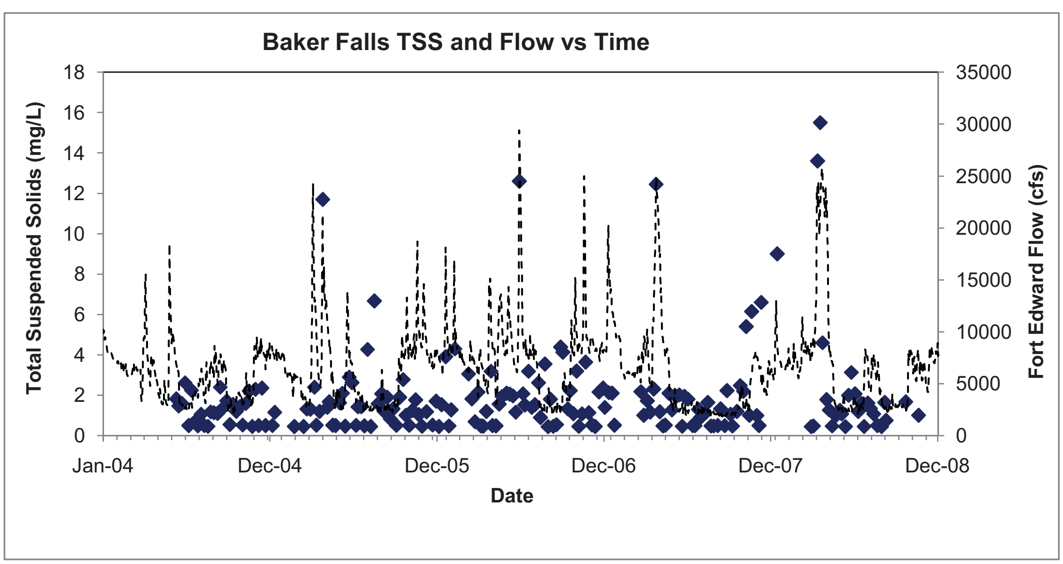

Thompson Island TSS and Flow vs Time
Total Suspended Solids (mg/L)
16
14
12
10
8
6
4
2
0
35000
30000
25000
20000
15000
10000
5000
0
Station Flow (cfs)
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date

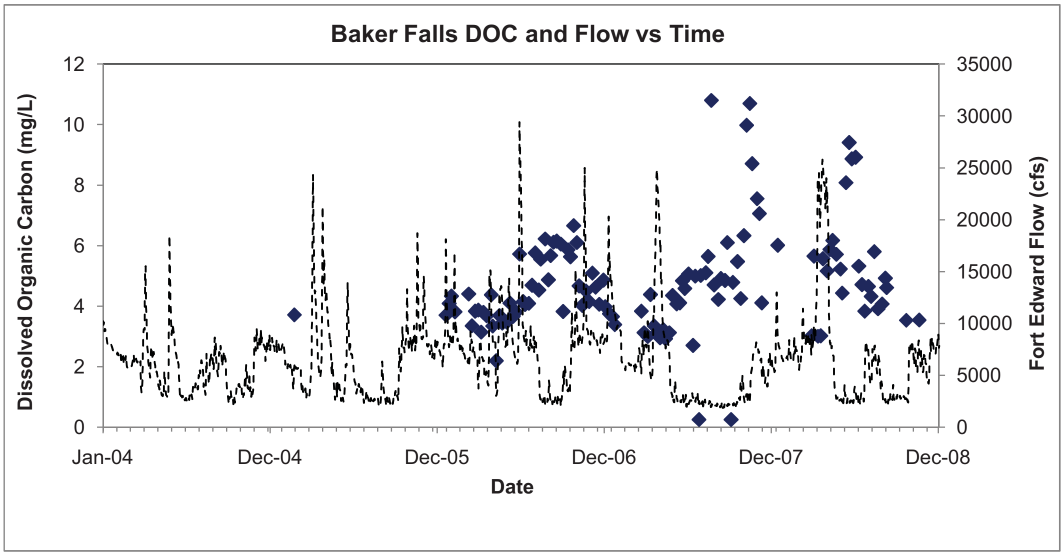

Thompson Island DOC and Flow vs Time
Dissolved Organic Carbon (mg/L)
14
12
10
8
6
4
2
0
35000
30000
25000
20000
15000
10000
5000
0
Station Flow (cfs)
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date

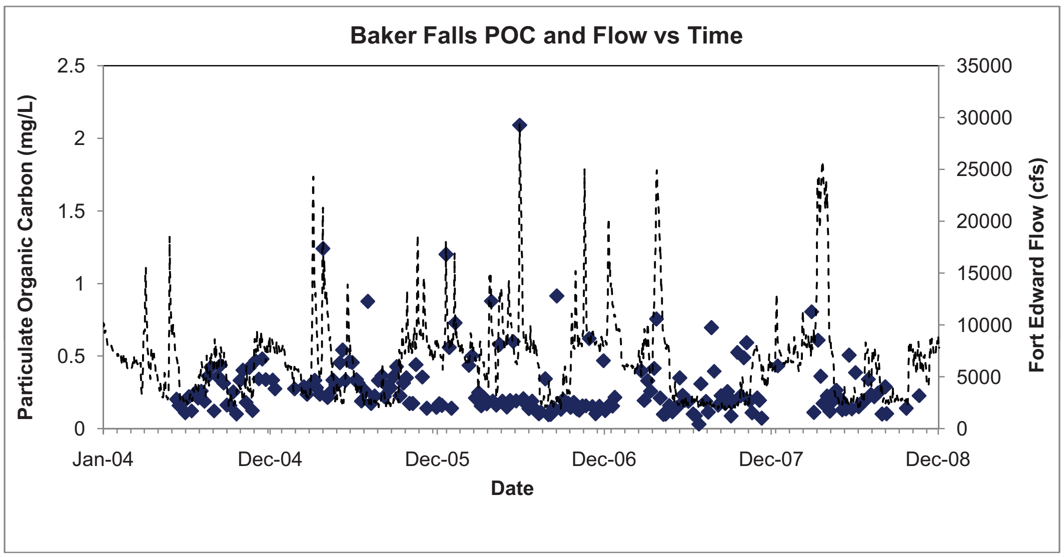

Thompson Island POC and Flow vs Time
Particulate Organic Carbon (mg/L)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
35000
30000
25000
20000
15000
10000
5000
0
Station Flow (cfs)
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date

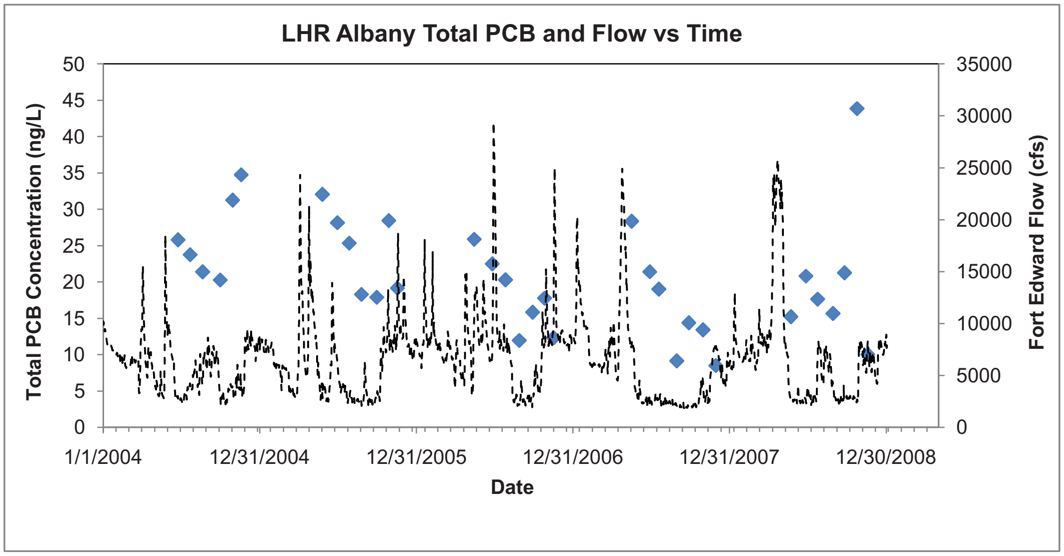

Baker Falls Total PCB and Flow vs Time
Total PCB Concentration (ng/L)
Fort Edward Flow (cfs)
Date
0
1
2
3
4
5
6
7
8
0
5000
10000
15000
20000
25000
30000
35000
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

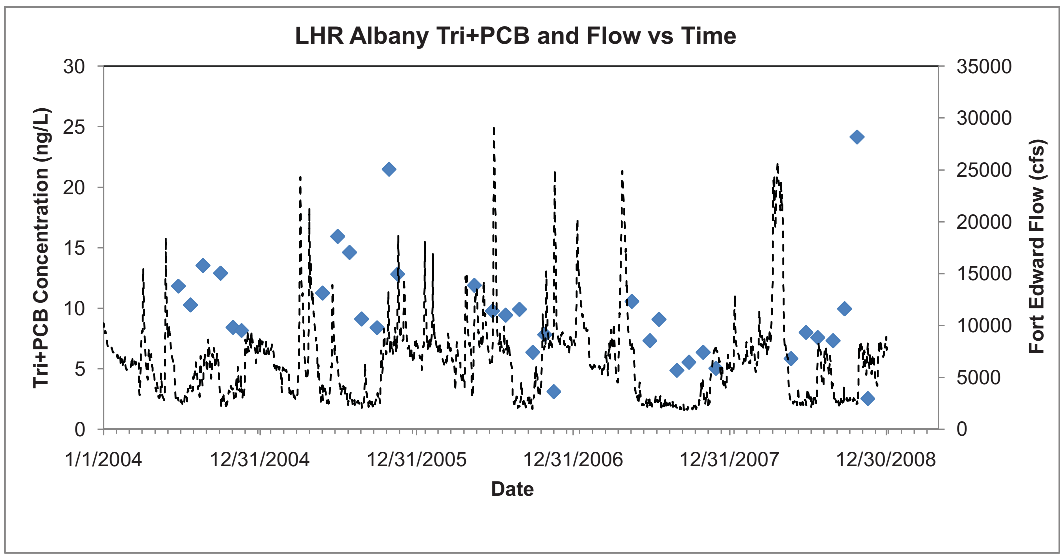

Baker Falls Tri+PCB and Flow vs Time
Tri+PCB Concentration (ng/L)
Fort Edward Flow (cfs)
Date
0
1
2
3
4
5
6
7
0
5000
10000
15000
20000
25000
30000
35000
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

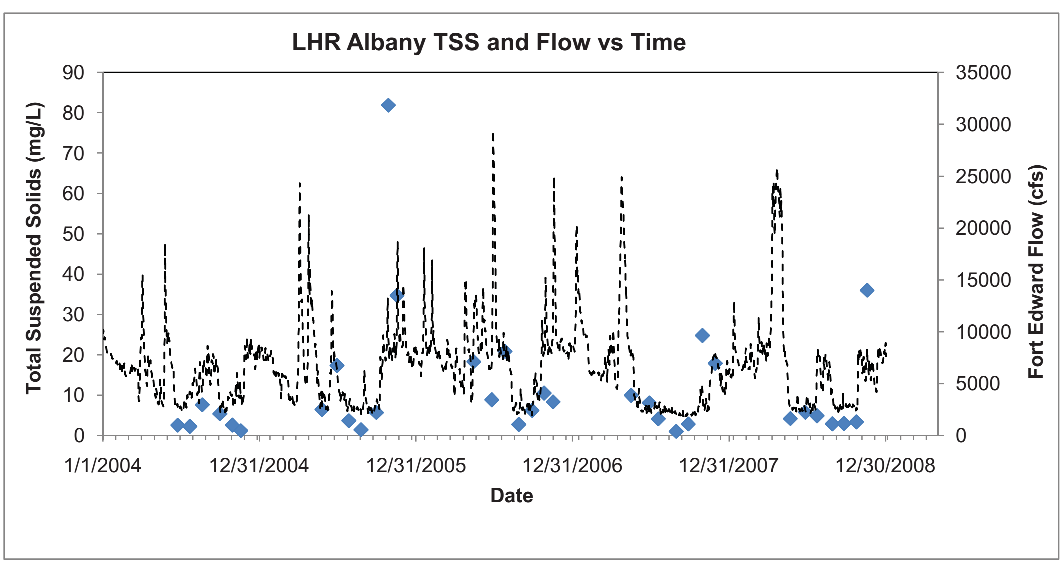

Baker Falls TSS and Flow vs Time
Total Suspended Solids (mg/L)
Fort Edward Flow (cfs)
Date
0
2
4
6
8
10
12
14
16
18
0
5000
10000
15000
20000
25000
30000
35000
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

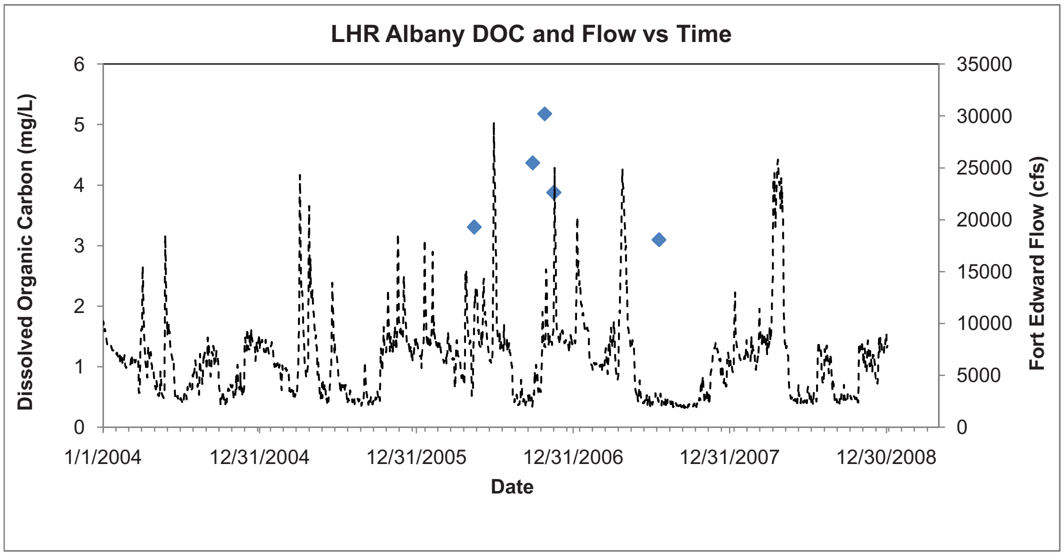

Baker Falls DOC and Flow vs Time
Dissolved Organic Carbon (mg/L)
Fort Edward Flow (cfs)
Date
0
2
4
6
8
10
12
0
5000
10000
15000
20000
25000
30000
35000
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08


Baker Falls POC and Flow vs Time
Particulate Organic Carbon (mg/L)
Fort Edward Flow (cfs)
Date
0
0.5
1
1.5
2
2.5
0
5000
10000
15000
20000
25000
30000
35000
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

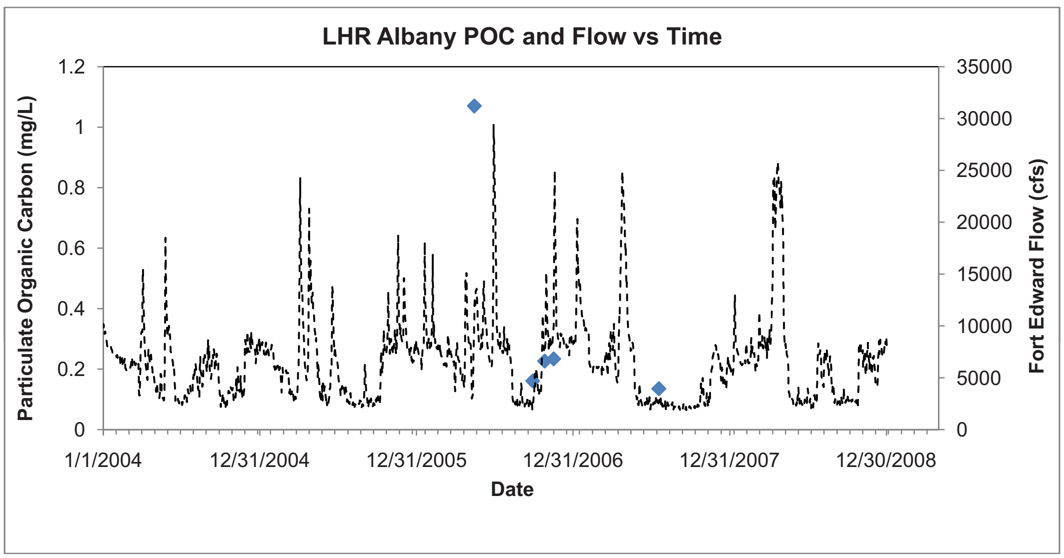

LHR Albany Total PCB and Flow vs Time
Total PCB Concentration (ng/L)
50
45
40
35
30
25
20
15
10
5
0
35000
30000
25000
20000
15000
10000
5000
0
Fort Edward Flow (cfs)
1/1/2004
12/31/2004
12/31/2005
12/31/2006
12/31/2007
12/30/2008
Date


LHR Albany Tri+PCB and Flow vs Time
Tri+PCB Concentration (ng/L)
30
25
20
15
10
5
0
35000
30000
25000
20000
15000
10000
5000
0
Fort Edward Flow (cfs)
1/1/2004
12/31/2004
12/31/2005
12/31/2006
12/31/2007
12/30/2008
Date

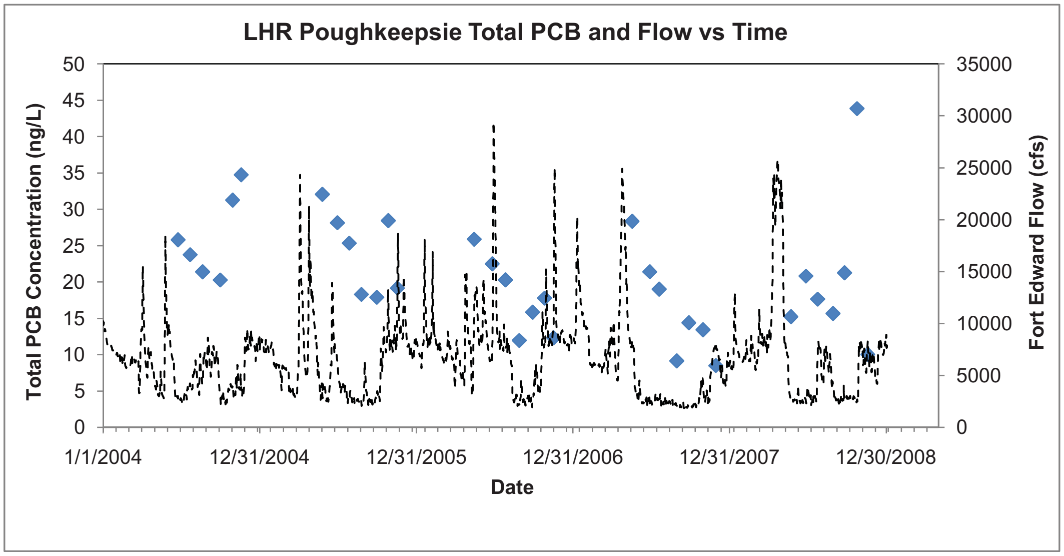

LHR Albany TSS and Flow vs Time
Total Suspended Solids (mg/L)
90
80
70
60
50
40
30
20
10
0
35000
30000
25000
20000
15000
10000
5000
0
Fort Edward Flow (cfs)
1/1/2004
12/31/2004
12/31/2005
12/31/2006
12/31/2007
12/30/2008
Date

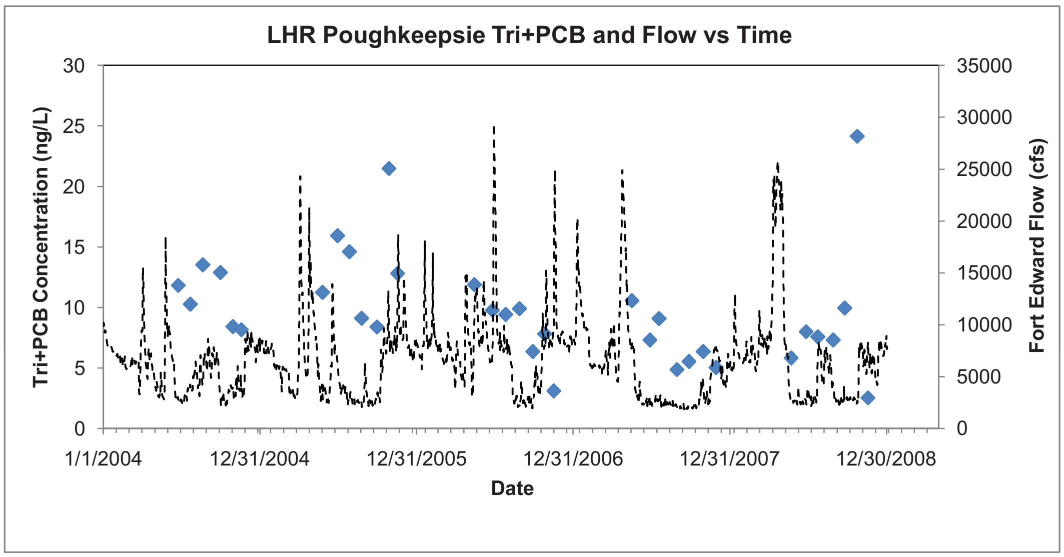


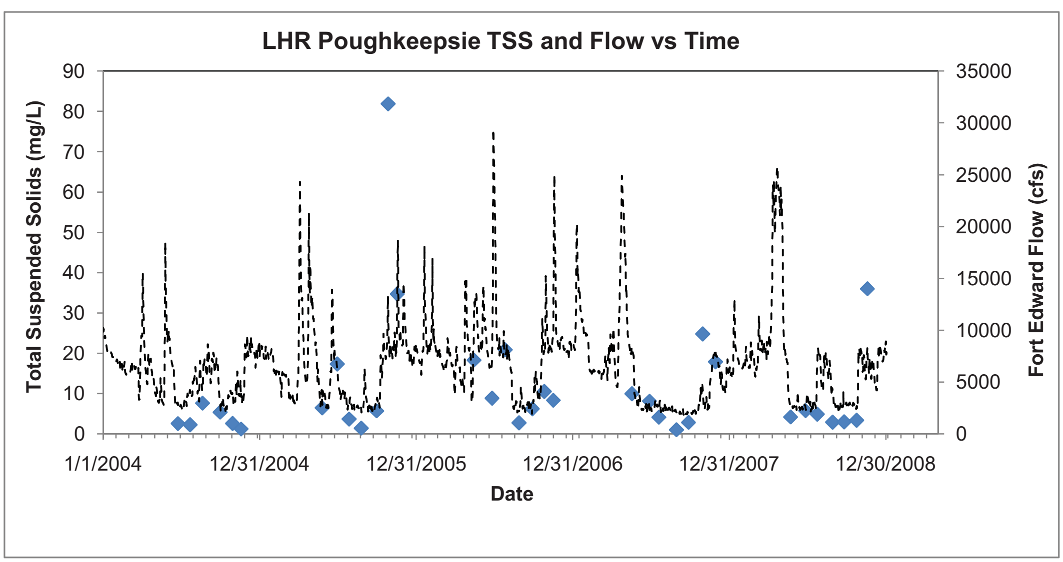
LHR Albany DOC and Flow vs Time
Dissolved Organic Carbon (mg/L)
0
1
2
3
4
5
6
Fort Edward Flow (cfs)
0
5000
10000
15000
20000
25000
30000
35000
1/1/2004
12/31/2004
12/31/2005
12/31/2006
12/31/2007
12/30/2008
Date

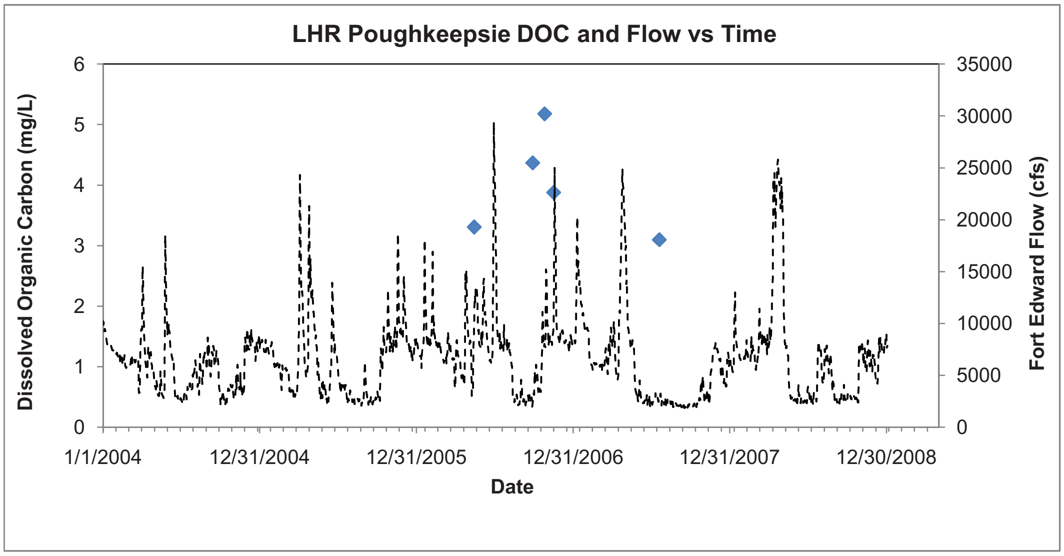


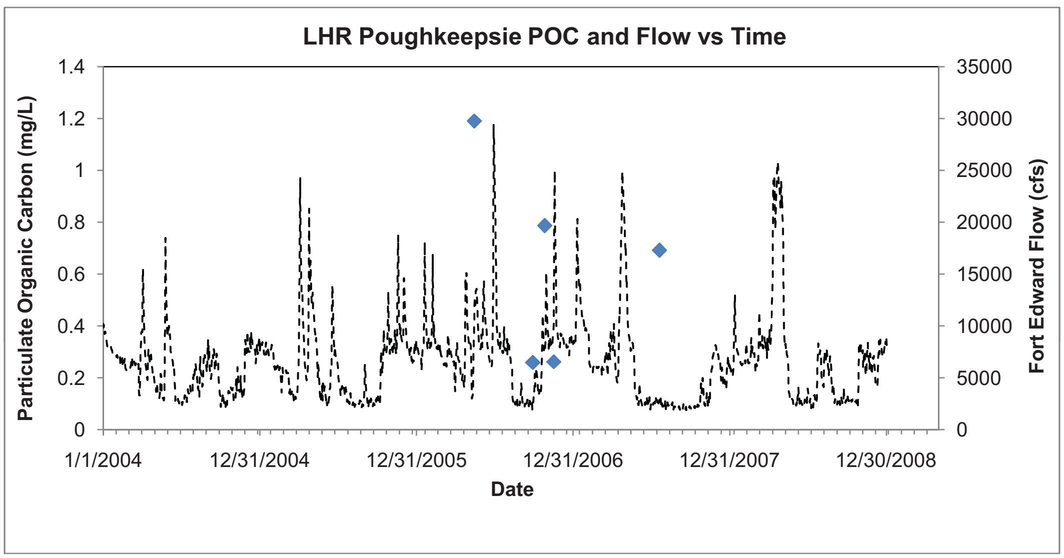
LHR Albany POC and Flow vs Time
Particulate Organic Carbon (mg/L)
0
0.2
0.4
0.6
0.8
1
1.2
Fort Edward Flow (cfs)
0
5000
10000
15000
20000
25000
30000
35000
1/1/2004
12/31/2004
12/31/2005
12/31/2006
12/31/2007
12/30/2008
Date

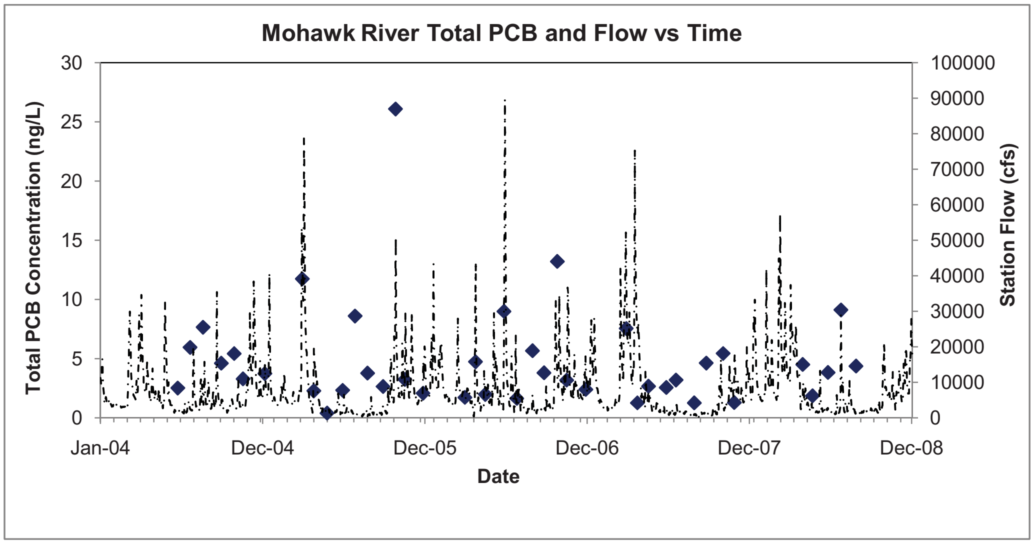

LHR Poughkeepsie Total PCB and Flow vs Time
Total PCB Concentration (ng/L)
0
5
10
15
20
25
30
35
40
45
50
Fort Edward Flow (cfs)
0
5000
10000
15000
20000
25000
30000
35000
1/1/2004
12/31/2004
12/31/2005
12/31/2006
12/31/2007
12/30/2008
Date

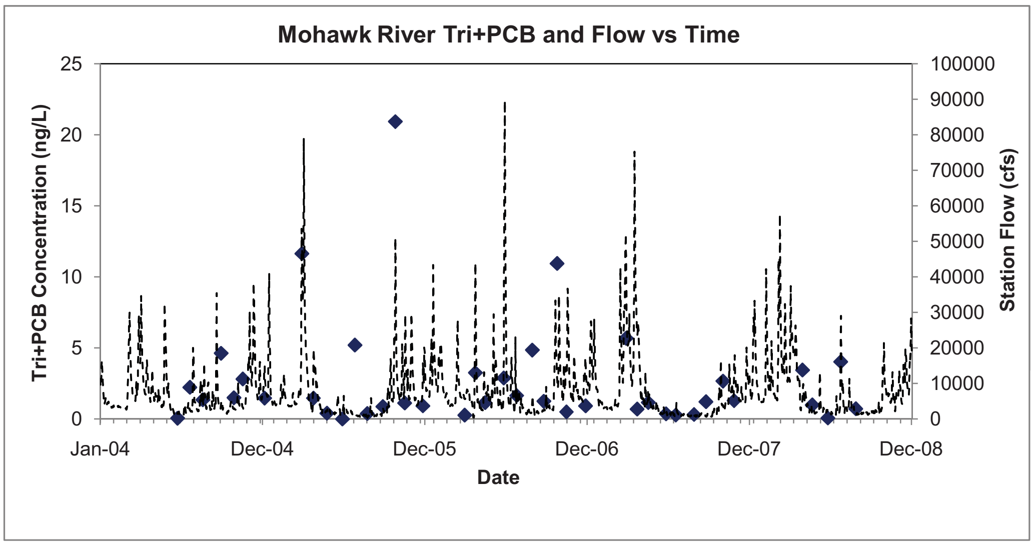

LHR Poughkeepsie Tri+PCB and Flow vs Time
Tri+PCB Concentration (ng/L)
0
5
10
15
20
25
30
Fort Edward Flow (cfs)
0
5000
10000
15000
20000
25000
30000
35000
1/1/2004
12/31/2004
12/31/2005
12/31/2006
12/31/2007
12/30/2008
Date

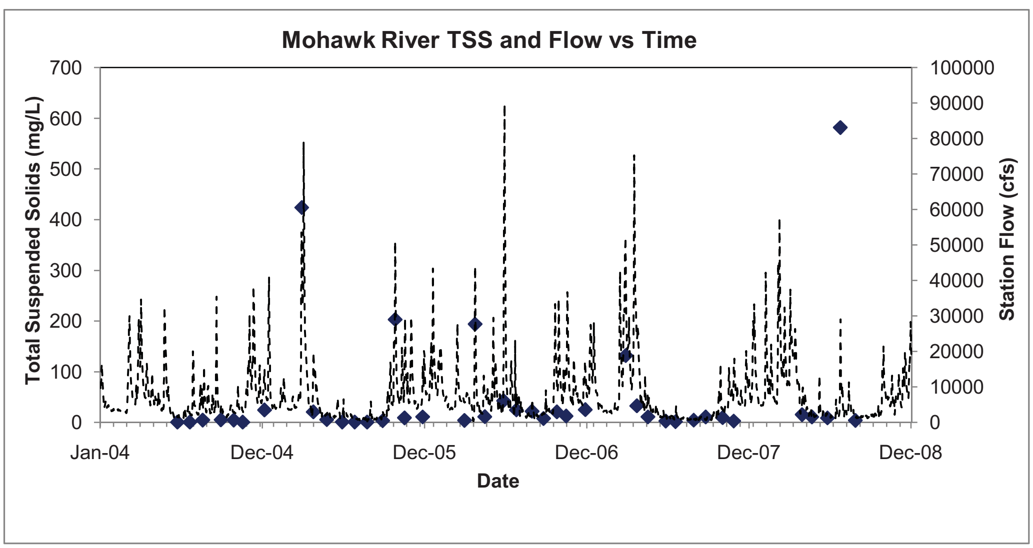

LHR Poughkeepsie TSS and Flow vs Time
Total Suspended Solids (mg/L)
0
10
20
30
40
50
60
70
80
90
Fort Edward Flow (cfs)
0
5000
10000
15000
20000
25000
30000
35000
1/1/2004
12/31/2004
12/31/2005
12/31/2006
12/31/2007
12/30/2008
Date

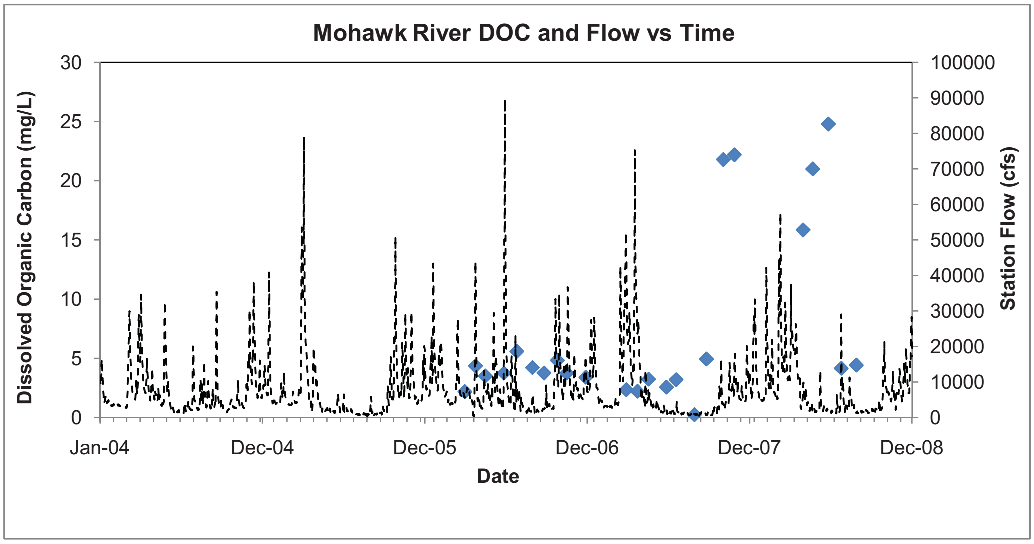

LHR Poughkeepsie DOC and Flow vs Time
Dissolved Organic Carbon (mg/L)
Fort Edward Flow (cfs)
Date
6
5
4
3
2
1
0
35000
30000
25000
20000
15000
10000
5000
0
1/1/2004
12/31/2004
12/31/2005
12/31/2006
12/31/2007
12/30/2008

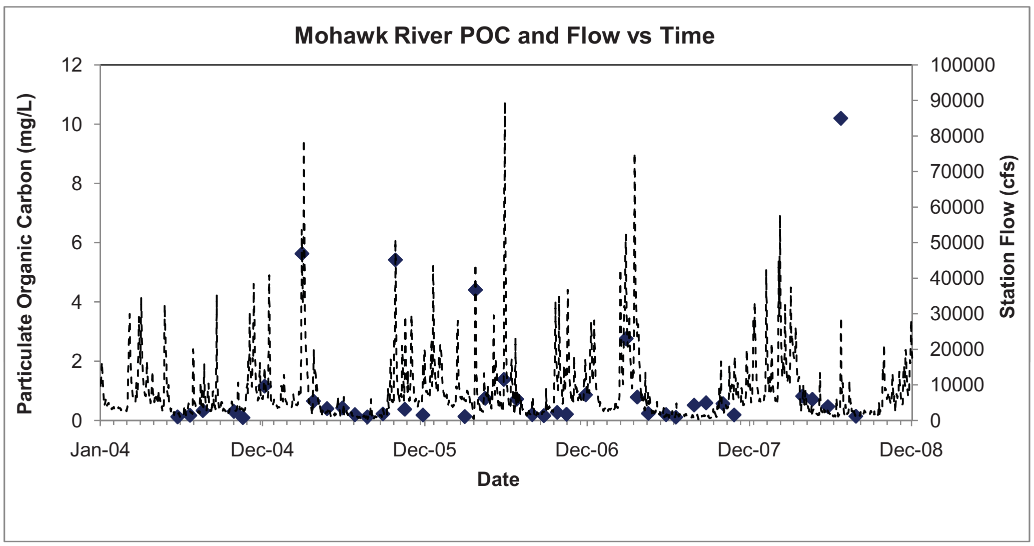

LHR Poughkeepsie POC and Flow vs Time
Particulate Organic Carbon (mg/L)
Fort Edward Flow (cfs)
Date
1.4
1.2
1
0.8
0.6
0.4
0.2
0
35000
30000
25000
20000
15000
10000
5000
0
1/1/2004
12/31/2004
12/31/2005
12/31/2006
12/31/2007
12/30/2008

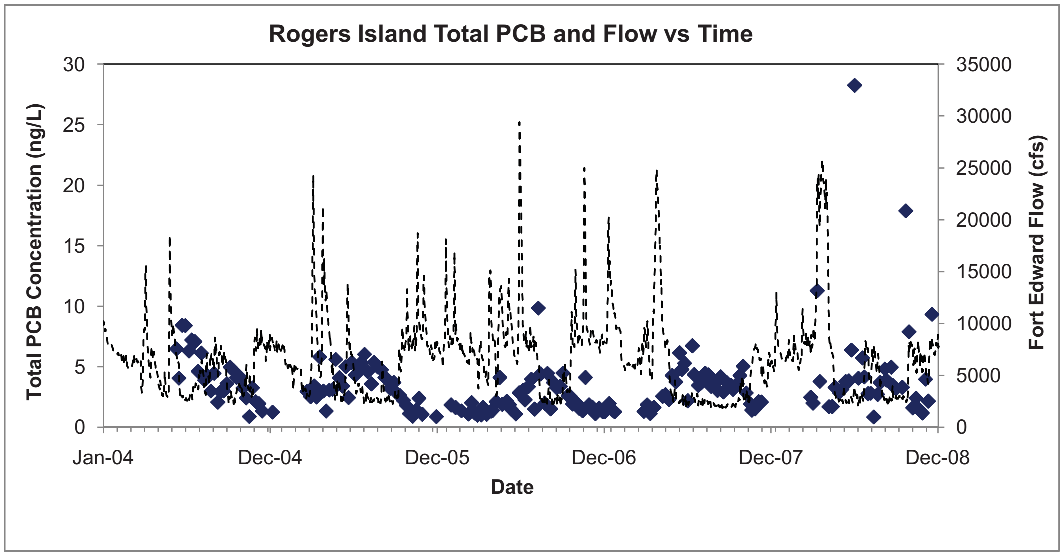

Mohawk River Total PCB and Flow vs Time
Total PCB Concentration (ng/L)
30
25
20
15
10
5
0
Station Flow (cfs)
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date

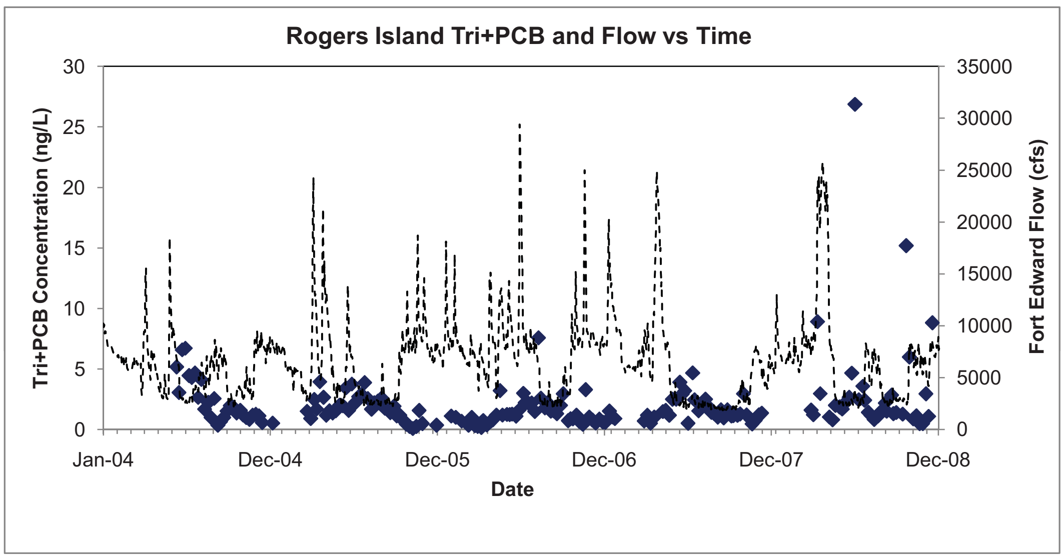

Mohawk River Tri+PCB and Flow vs Time
Tri+PCB Concentration (ng/L)
25
20
15
10
5
0
Station Flow (cfs)
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date

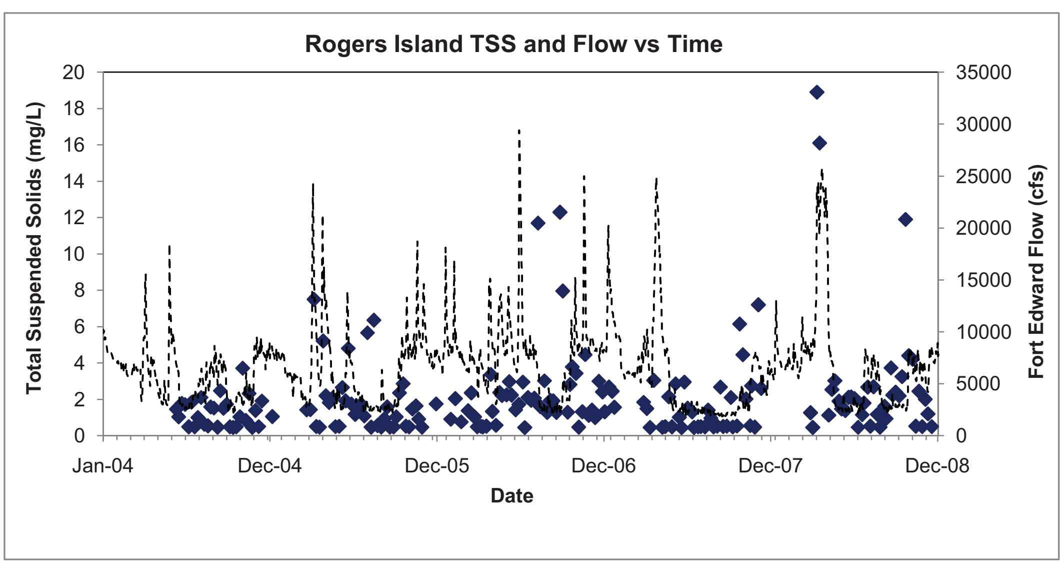

Mohawk River TSS and Flow vs Time
Total Suspended Solids (mg/L)
700
600
500
400
300
200
100
0
Station Flow (cfs)
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date

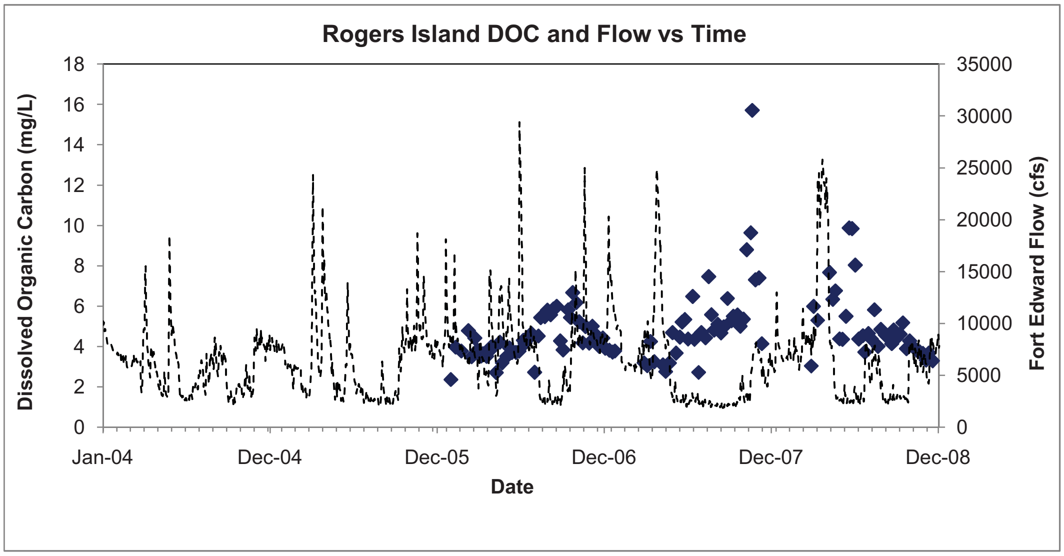

Mohawk River DOC and Flow vs Time
Dissolved Organic Carbon (mg/L)
30
25
20
15
10
5
0
Station Flow (cfs)
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date

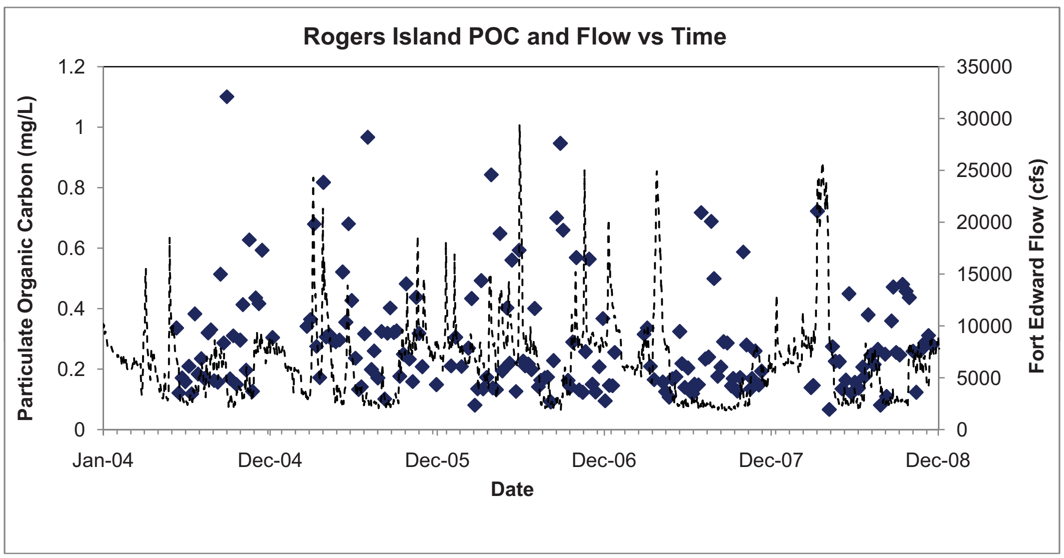

Mohawk River POC and Flow vs Time
Particulate Organic Carbon (mg/L)
12
10
8
6
4
2
0
Station Flow (cfs)
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date


Rogers Island Total PCB and Flow vs Time
Total PCB Concentration (ng/L)
30
25
20
15
10
5
0
35000
30000
25000
20000
15000
10000
5000
0
Fort Edward Flow (cfs)
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date


Rogers Island Tri+PCB and Flow vs Time
Tri+PCB Concentration (ng/L)
30
25
20
15
10
5
0
35000
30000
25000
20000
15000
10000
5000
0
Fort Edward Flow (cfs)
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date


Rogers Island TSS and Flow vs Time
Total Suspended Solids (mg/L)
20
18
16
14
12
10
8
6
4
2
0
35000
30000
25000
20000
15000
10000
5000
0
Fort Edward Flow (cfs)
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Date


Rogers Island DOC and Flow vs Time
Dissolved Organic Carbon (mg/L)
Fort Edward Flow (cfs)
Date
18
16
14
12
10
8
6
4
2
0
35000
30000
25000
20000
15000
10000
5000
0
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08


Rogers Island POC and Flow vs Time
Particulate Organic Carbon (mg/L)
Fort Edward Flow (cfs)
Date
1.2
1
0.8
0.6
0.4
0.2
0
35000
30000
25000
20000
15000
10000
5000
0
Jan-04
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08

Appendix I-A-2: Statistical Analysis of TPCB and Tri+ PCB Concentration during BMP for Thomson Island, Schuylerville and Waterford and Fort Edward Flows.

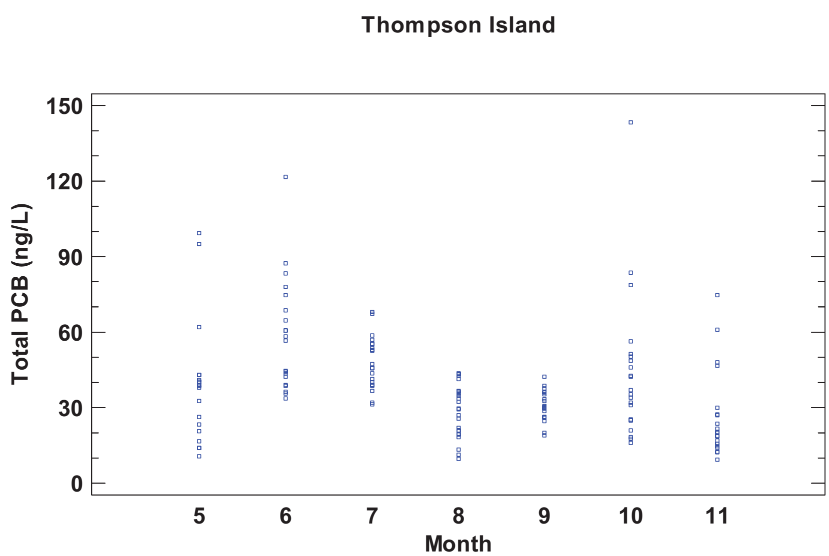
Thompson Island Results

1) Kruskal-Wallis Test for Thompson Island Total PCB (ng/L) by Month

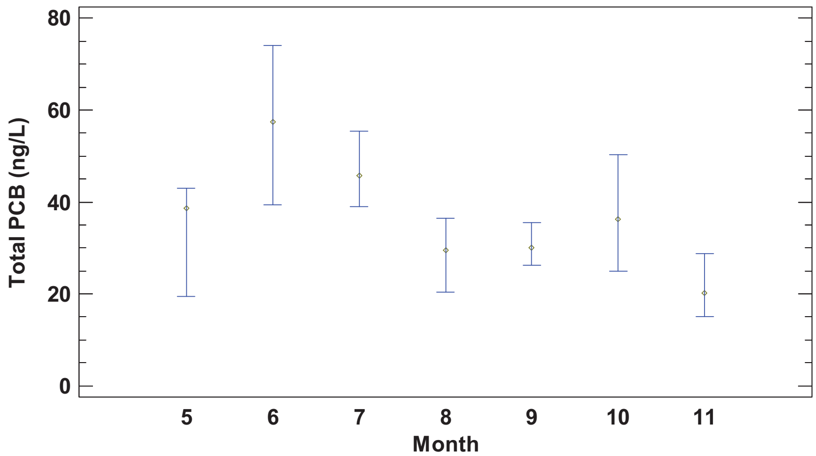
Month	*Sample Size*	*Average Rank*
5	19	72.0
6	20	115.5
7	21	106.286
8	24	53.7083
9	21	56.9524
10	22	79.6818
11	21	41.8095

Test statistic = 51.6034   P-Value = 2.24063E-9

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 7 months are the same. The data from all the month was first combined and ranked from smallest to largest. The average rank was then computed for the data in each month. Since the P-value is less than 0.05, there is not a statistically significant difference amongst the medians at the 95.0% confidence level.



Thompson Island Median Plot with 95% Confidence Intervals



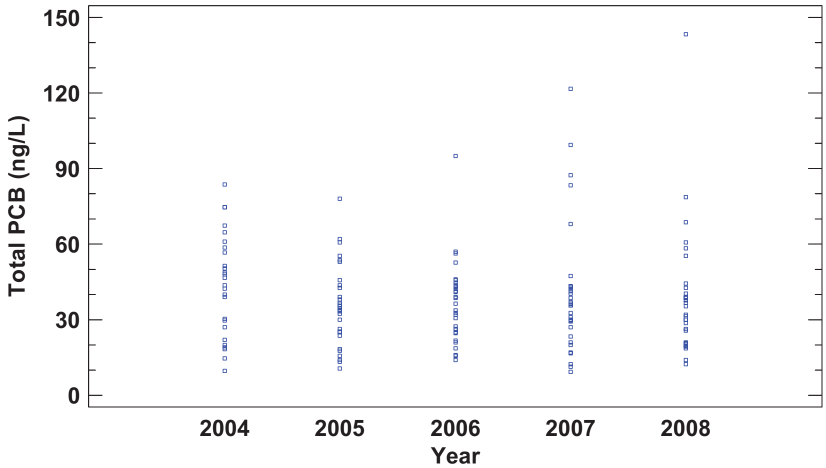
2) Kruskal-Wallis Test for Thompson Island Total PCB (ng/L) by Year

Year	*Sample Size*	*Average Rank*
2004	26	88.8077
2005	30	69.5333
2006	31	73.2581
2007	31	72.1613
2008	30	70.7667

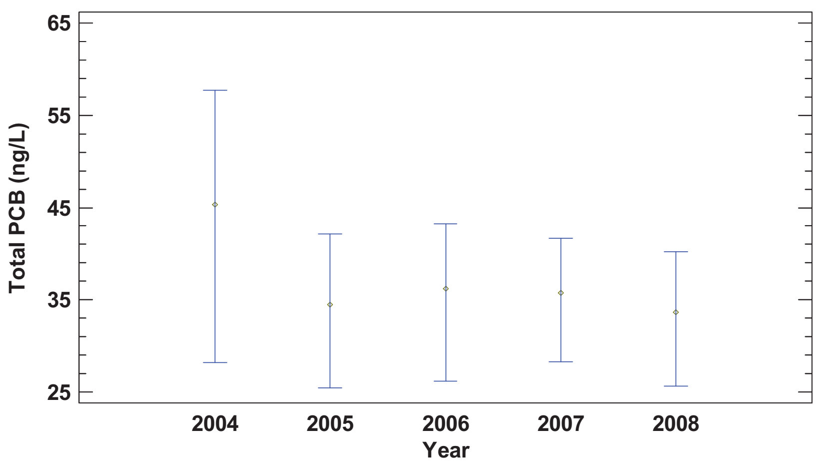
Test statistic = 3.64484   P-Value = 0.4562

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 5 years are the same. The data from all the years is first combined and ranked from smallest to largest. The average rank is then computed for the data in each year. Since the P-value is greater than or equal to 0.05, there is not a statistically significant difference amongst the medians at the 95.0% confidence level.

Thompson Island



Thompson Island Median Plot with 95% Confidence Intervals

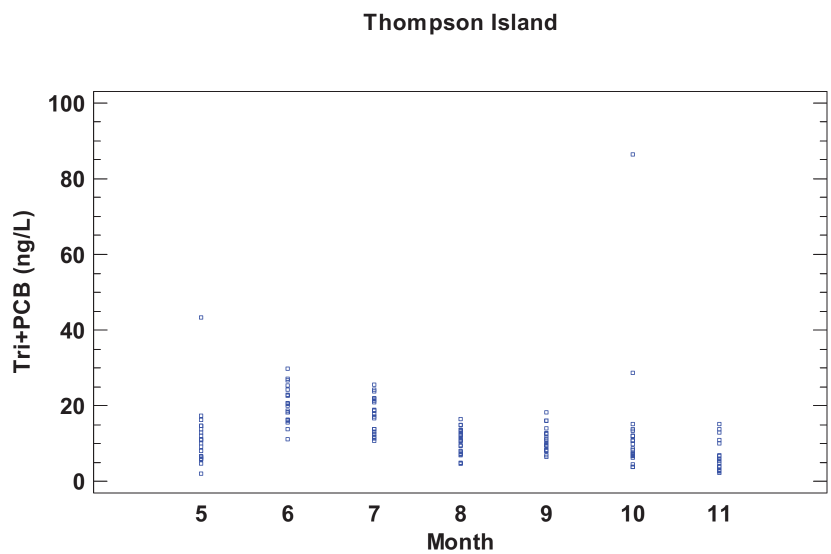


3) Kruskal-Wallis Test for Thompson Island Tri+PCB (ng/L) by Month

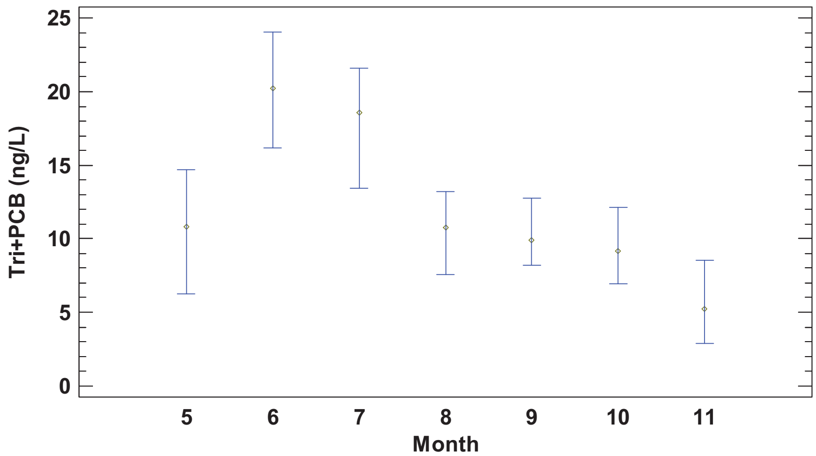
Month	*Sample Size*	*Average Rank*
5	19	65.9474
6	20	124.1
7	21	113.619
8	24	64.0417
9	21	66.8095
10	22	60.5455
11	21	30.1429

Test statistic = 71.9386   P-Value = 0

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 7 months are the same. The data from all the month was first combined and ranked from smallest to largest. The average rank was then computed for the data in each month. Since the P-value is less than 0.05, there is a statistically significant difference amongst the medians at the 95.0% confidence level.



Thompson Island Median Plot with 95% Confidence Intervals

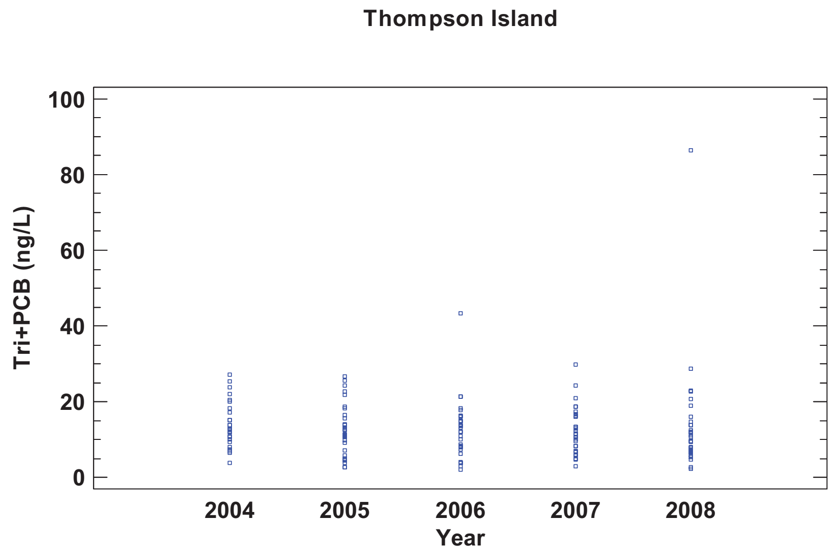


4) Kruskal-Wallis Test for Thompson Island Tri+PCB (ng/L) by Year

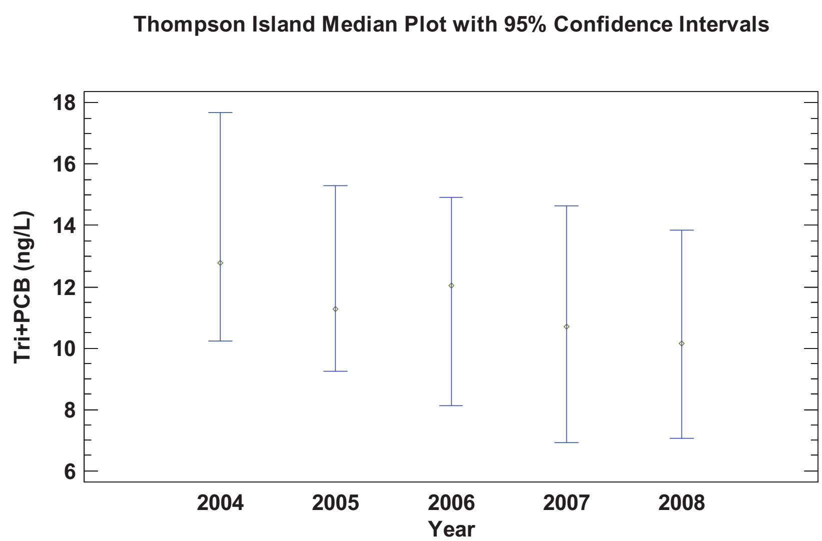
Year	*Sample Size*	*Average Rank*
2004	26	86.4231
2005	30	75.2
2006	31	73.7097
2007	31	70.1935
2008	30	68.7333

Test statistic = 2.88559 P-Value = 0.57715

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 5 years are the same. The data from all the years is first combined and ranked from smallest to largest. The average rank is then computed for the data in each year. Since the P-value is greater than or equal to 0.05, there is not a statistically significant difference amongst the medians at the 95.0% confidence level.



Thompson Island
100
80
60
40
20
0
Tri+PCB (ng/L)
2004
2005
2006
2007
2008
Year



Thompson Island Median Plot with 95% Confidence Intervals
18
16
14
12
10
8
6
Tri+PCB (ng/L)
2004
2005
2006
2007
2008
Year

5) Simple Regression - Thompson Island Total PCB (ng/L) vs. Flow (cfs)

Dependent variable: Total PCB (ng/L)
Independent variable: Flow (cfs)
Linear model: Y = a + b*X

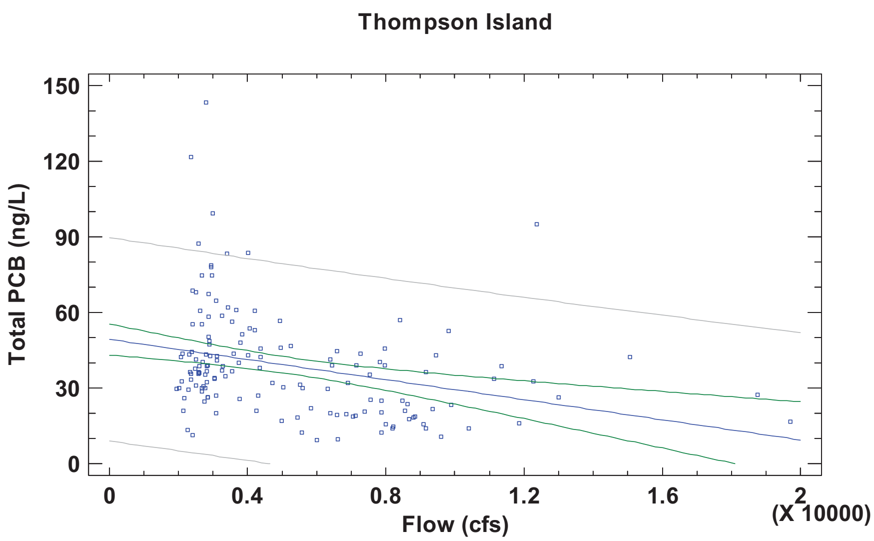
Coefficients

	Least Squares	*Standard*	*T*	
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
Intercept	49.3089	3.11617	15.8235	0.0000
Slope	-0.00199408	0.000504562	-3.95209	0.0001

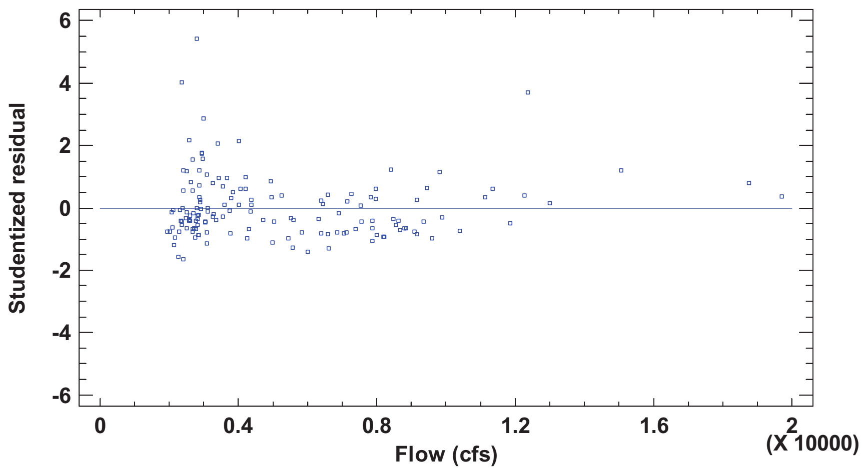
Analysis of Variance

Source	*Sum of Squares*	*Df*	*Mean Square*	*F-Ratio*	*P-Value*
Model	6372.38	1	6372.38	15.62	0.0001
Residual	59566.2	146	407.988		
Total (Corr.)	65938.6	147			

Correlation Coefficient = -0.310872
R-squared = 9.66412 percent
R-squared (adjusted for d.f.) = 9.04538 percent
Standard Error of Est. = 20.1987
Mean absolute error = 14.6877



Thompson Island
Total PCB vs Flow Residual Plot



6) Simple Regression - Thompson Island Tri+PCB (ng/L) vs. Flow (cfs)

Dependent variable: Tri+PCB (ng/L)
Independent variable: Flow (cfs)
Linear model: Y = a + b*X

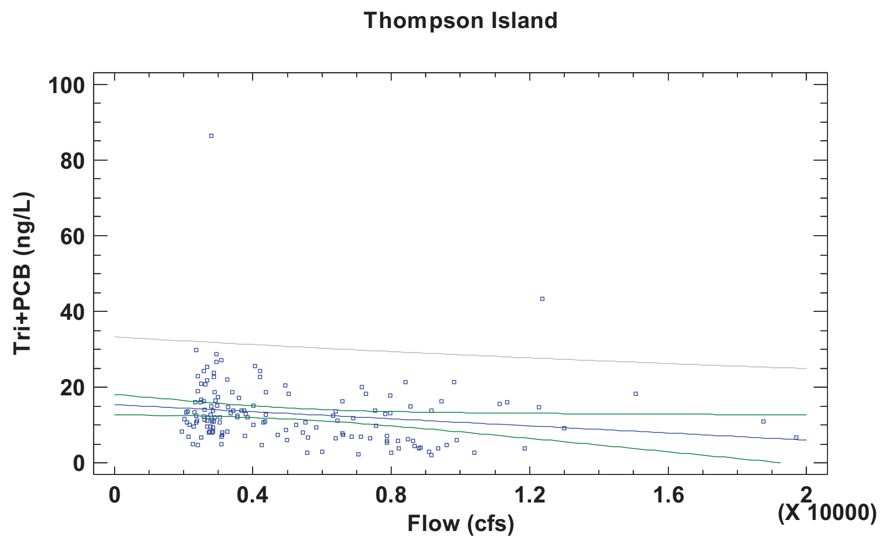
Coefficients

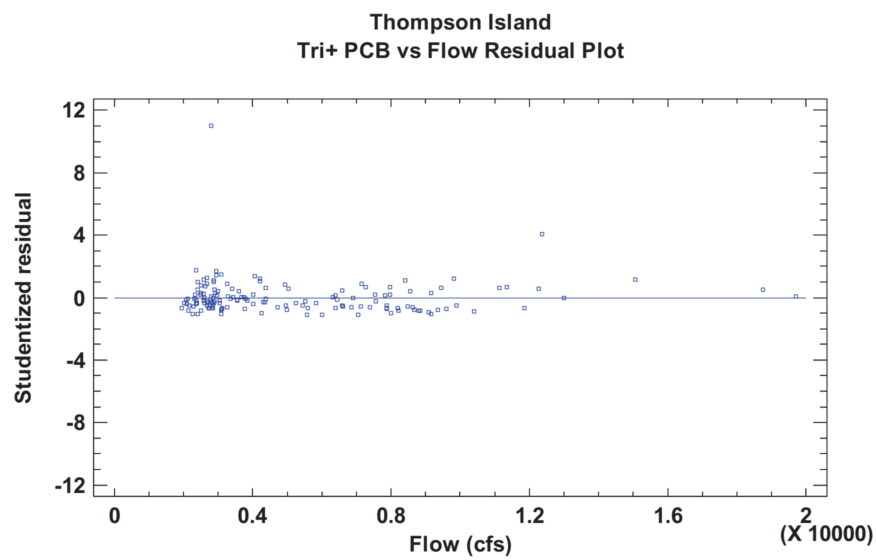
	Least Squares	*Standard*	*T*	
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
Intercept	15.3746	1.37876	11.151	0.0000
Slope	-0.000469163	0.000223246	-2.10155	0.0373

Analysis of Variance

Source	*Sum of Squares*	*Df*	*Mean Square*	*F-Ratio*	*P-Value*
Model	352.748	1	352.748	4.42	0.0373
Residual	11661.0	146	79.8701		
Total (Corr.)	12013.8	147			

Correlation Coefficient = -0.171353
R-squared = 2.9362 percent
R-squared (adjusted for d.f.) = 2.27137 percent
Standard Error of Est. = 8.93701
Mean absolute error = 5.67061


Thompson Island
Tri+PCB (ng/L)
100
80
60
40
20
0
0
0.4
0.8
1.2
1.6
2
(X 10000)
Flow (cfs)


Thompson Island
Tri+ PCB vs Flow Residual Plot
Studentized residual
12
8
4
0
-4
-8
-12
0
0.4
0.8
1.2
1.6
2
(X 10000)
Flow (cfs)

7) Multiple Regression – Thompson Island Total PCB (ng/L)

Dependent variable: Total PCB (ng/L)
Independent variables:
Flow (cfs)
Jun
Jul
Aug
Sept
Oct
Nov
Flow_Jun
Flow_Jul
Flow_Aug
Flow_Sep
Flow_Oct
Flow_Nov

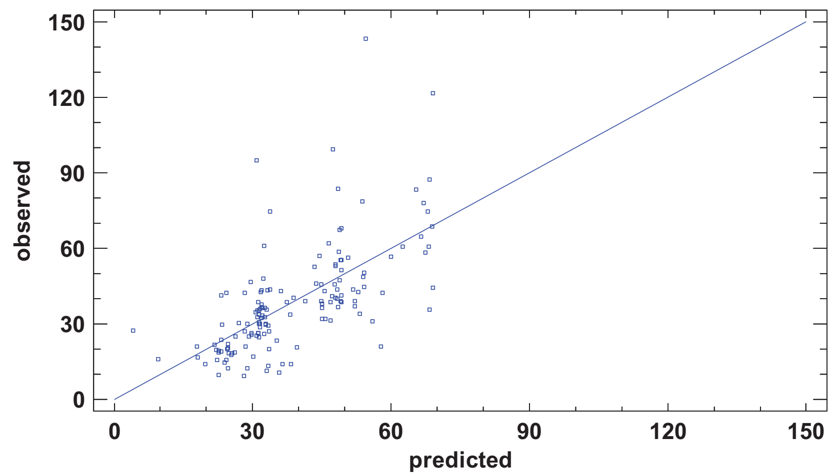
Parameter	*Estimate*	*Standard Error*	*T Statistic*	*P-Value*
CONSTANT	52.615	8.03785	6.54591	0.0000
Flow (cfs)	-0.00175427	0.00089542	-1.95916	0.0522
Jun	24.8675	10.4959	2.36925	0.0193
Jul	-1.34663	11.5784	-0.116305	0.9076
Aug	-13.6555	11.6045	-1.17674	0.2414
Sept	-16.0153	12.2782	-1.30437	0.1943
Oct	15.733	11.0209	1.42757	0.1557
Nov	-13.2083	11.6536	-1.13341	0.2591
Flow_Jun	-0.00177969	0.00137572	-1.29364	0.1980
Flow_Jul	0.000953098	0.00188038	0.506865	0.6131
Flow_Aug	-0.00070948	0.00205035	-0.346029	0.7299
Flow_Sep	-0.000137801	0.00285426	-0.0482791	0.9616
Flow_Oct	-0.00319857	0.001601	-1.99786	0.0478
Flow_Nov	-0.000127065	0.00139876	-0.0908411	0.9278

Analysis of Variance

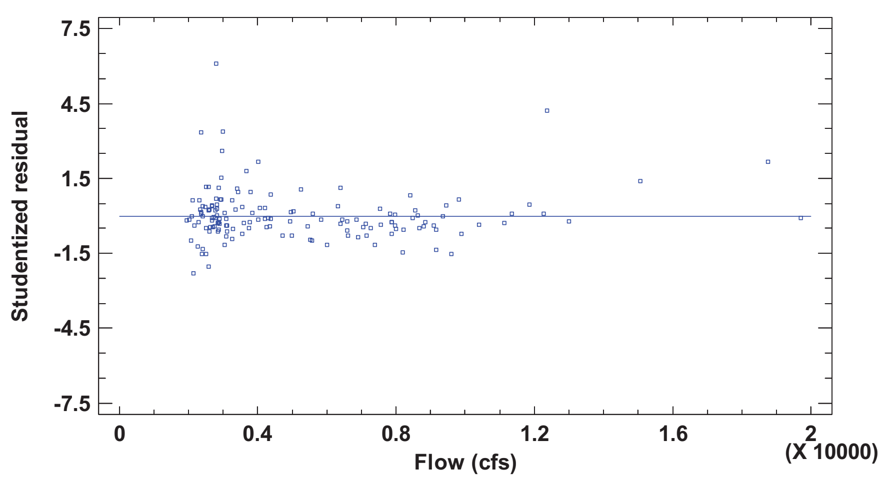
Source	*Sum of Squares*	*Df*	*Mean Square*	*F-Ratio*	*P-Value*
Model	27229.0	13	2094.54	7.25	0.0000
Residual	38709.6	134	288.877		
Total (Corr.)	65938.6	147			

R-squared = 41.2945 percent
R-squared (adjusted for d.f.) = 35.5992 percent
Standard Error of Est. = 16.9964
Mean absolute error = 10.6442

Plot of Total PCB (ng/L)



Residual Plot



8) Multiple Regression - Thompson Island Tri+PCB (ng/L)

Dependent variable: Tri+PCB (ng/L)
Independent variables:
- Flow (cfs)
- Jun
- Jul
- Aug
- Sept
- Oct
- Nov
- Flow_Jun
- Flow_Jul
- Flow_Aug
- Flow_Sep
- Flow_Oct
- Flow_Nov

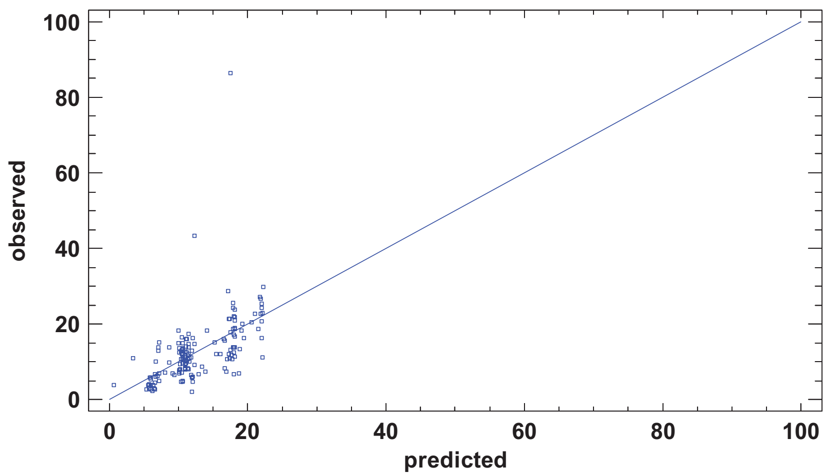
		Standard	*T*	
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
CONSTANT	11.2247	3.76559	2.98086	0.0034
Flow (cfs)	0.0000857102	0.000419488	0.204321	0.8384
Jun	12.4844	4.91716	2.53895	0.0123
Jul	7.2038	5.42427	1.32807	0.1864
Aug	-0.372914	5.43651	-0.0685944	0.9454
Sept	0.965638	5.75212	0.167875	0.8669
Oct	11.4876	5.16308	2.22495	0.0278
Nov	-3.27002	5.45949	-0.598961	0.5502
Flow_Jun	-0.000719782	0.000644501	-1.1168	0.2661
Flow_Jul	-0.000205696	0.000880924	-0.2335	0.8157
Flow_Aug	-0.000190655	0.000960551	-0.198485	0.8430
Flow_Sep	-0.000514372	0.00133717	-0.384672	0.7011
Flow_Oct	-0.00194915	0.00075004	-2.59872	0.0104
Flow_Nov	-0.000327659	0.000655296	-0.500017	0.6179

Analysis of Variance

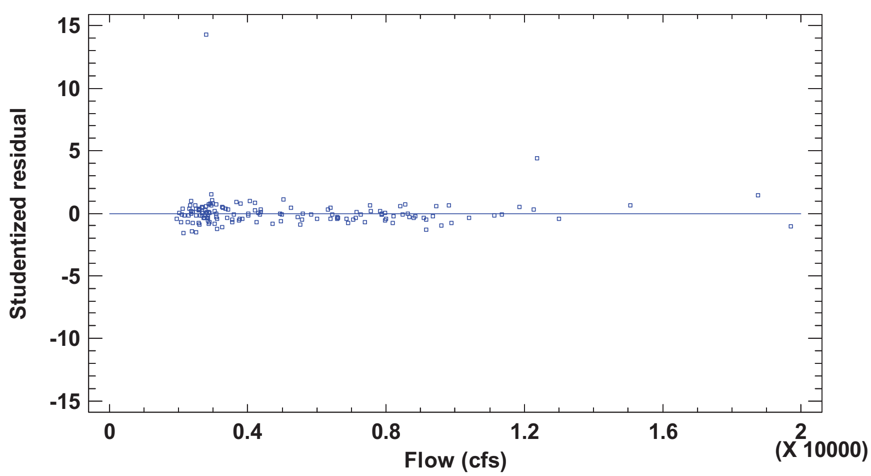
Source	*Sum of Squares*	*Df*	*Mean Square*	*F-Ratio*	*P-Value*
Model	3517.98	13	270.614	4.27	0.0000
Residual	8495.8	134	63.4015		
Total (Corr.)	12013.8	147			

R-squared = 29.2829 percent
R-squared (adjusted for d.f.) = 22.4222 percent
Standard Error of Est. = 7.96251
Mean absolute error = 4.097

Plot of Tri+PCB (ng/L)



Residual Plot



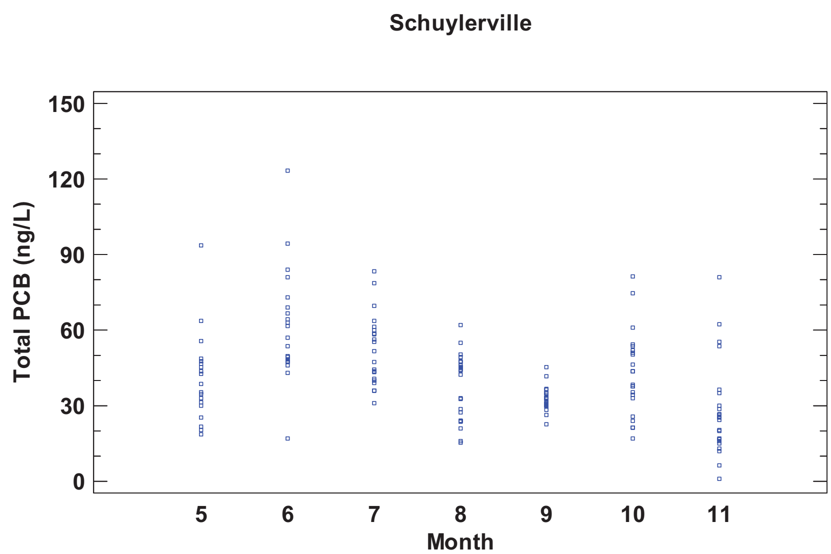
Schuylerville Results

1) Kruskal-Wallis Test for Schuylerville Total PCB (ng/L) by Month

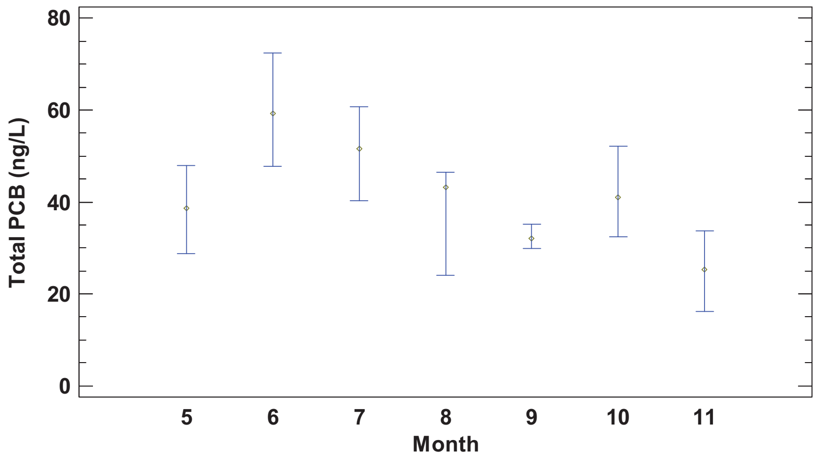
Month	*Sample Size*	*Average Rank*
5	19	72.3158
6	20	116.7
7	21	103.286
8	24	66.3333
9	20	52.0
10	22	78.5
11	23	40.8261

Test statistic = 48.9822 P-Value = 7.51751E-9

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 7 months are the same. The data from all the month was first combined and ranked from smallest to largest. The average rank was then computed for the data in each month. Since the P-value is less than 0.05, there is a statistically significant difference amongst the medians at the 95.0% confidence level.



Schuylerville Median Plot with 95% Confidence Intervals



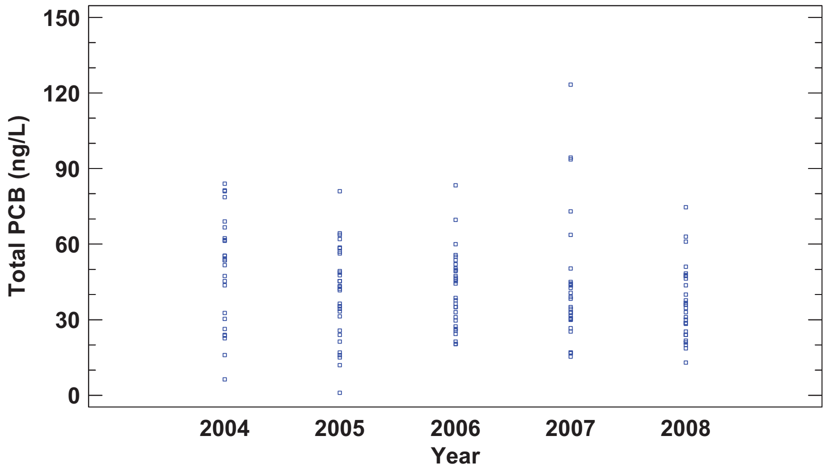
2) Kruskal-Wallis Test for Schuylerville Total PCB (ng/L) by Year

Year	*Sample Size*	*Average Rank*
2004	26	92.8077
2005	31	74.2581
2006	31	77.7097
2007	31	69.4516
2008	30	63.2667

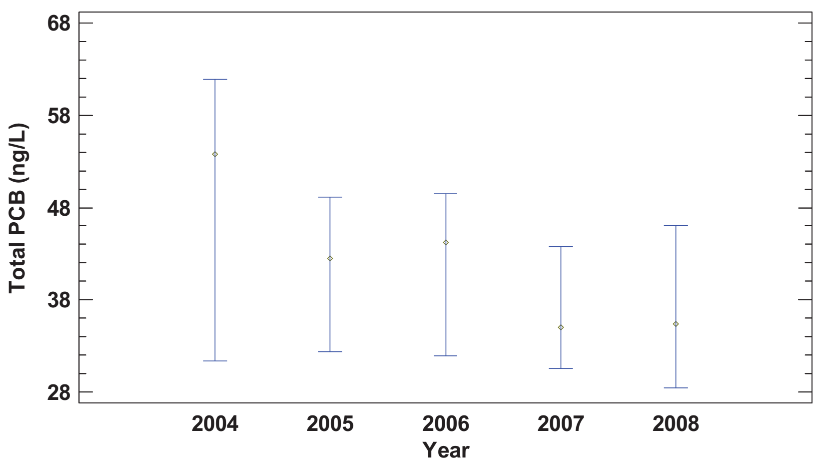
Test statistic = 7.2881 P-Value = 0.121424

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 5 years are the same. The data from all the years is first combined and ranked from smallest to largest. The average rank is then computed for the data in each year. Since the P-value is greater than or equal to 0.05, there is not a statistically significant difference amongst the medians at the 95.0% confidence level.

Schuylerville



Schuylerville Median Plot with 95% Confidence Intervals

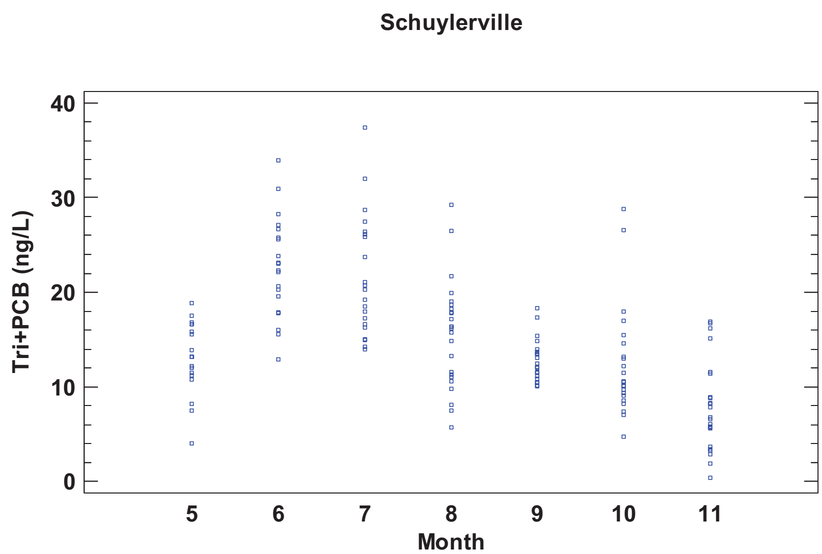


3) Kruskal-Wallis Test for Schuylerville Tri+PCB (ng/L) by Month

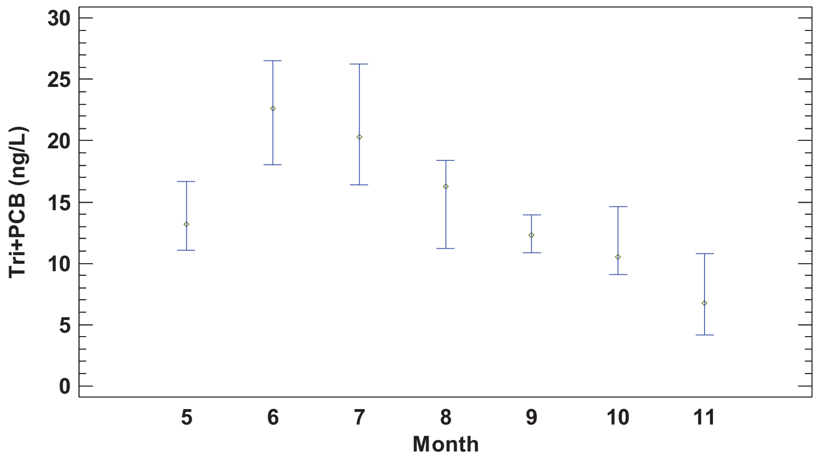
Month	*Sample Size*	*Average Rank*
5	19	65.8947
6	20	121.4
7	21	115.048
8	24	81.375
9	20	61.6
10	22	55.0
11	23	29.7391

Test statistic = 74.5222   P-Value = 0

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 7 months are the same. The data from all the month was first combined and ranked from smallest to largest. The average rank was then computed for the data in each month. Since the P-value is less than 0.05, there is a statistically significant difference amongst the medians at the 95.0% confidence level.



Schuylerville Median Plot with 95% Confidence Intervals



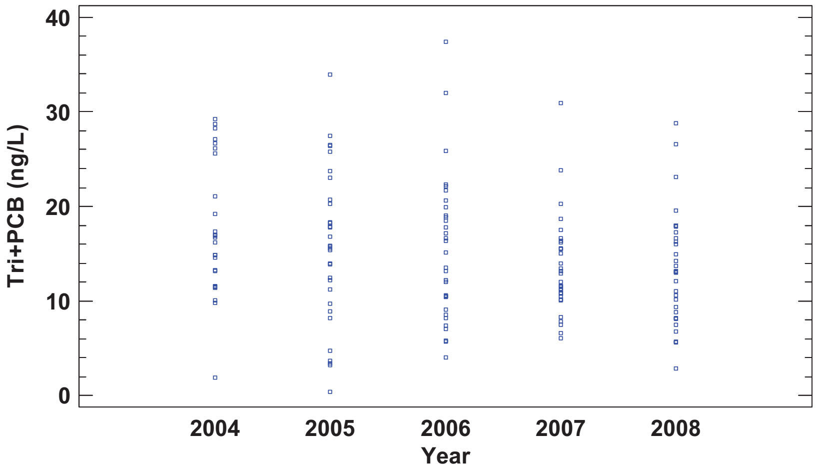
4) Kruskal-Wallis Test for Tri+PCB (ng/L) by Year

Year	*Sample Size*	*Average Rank*
2004	26	89.8077
2005	31	80.2258
2006	31	76.6129
2007	31	64.3226
2008	30	66.1333

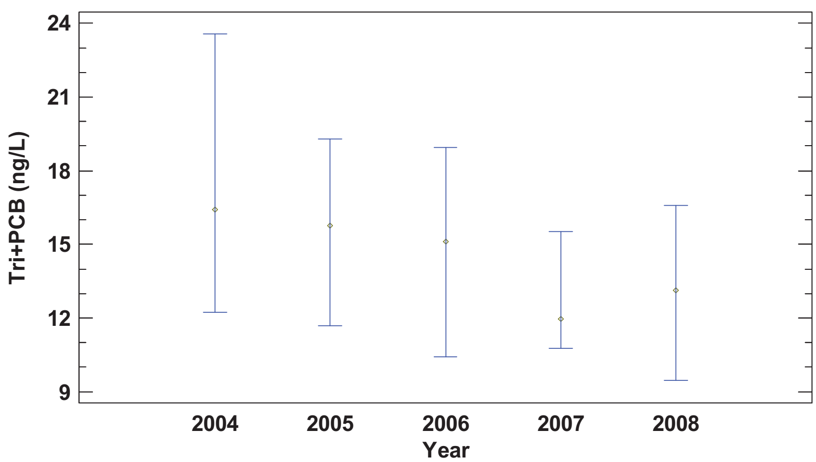
Test statistic = 6.72266   P-Value = 0.151291

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 5 years are the same. The data from all the years is first combined and ranked from smallest to largest. The average rank is then computed for the data in each year. Since the P-value is greater than or equal to 0.05, there is not a statistically significant difference amongst the medians at the 95.0% confidence level.

Schuylerville



Schuylerville Median Plot with 95% Confidence Intervals



5) Simple Regression – Schuylerville Total PCB (ng/L) vs. Flow (cfs)

Dependent variable: Total PCB (ng/L)
Independent variable: Flow (cfs)
Linear model: Y = a + b*X

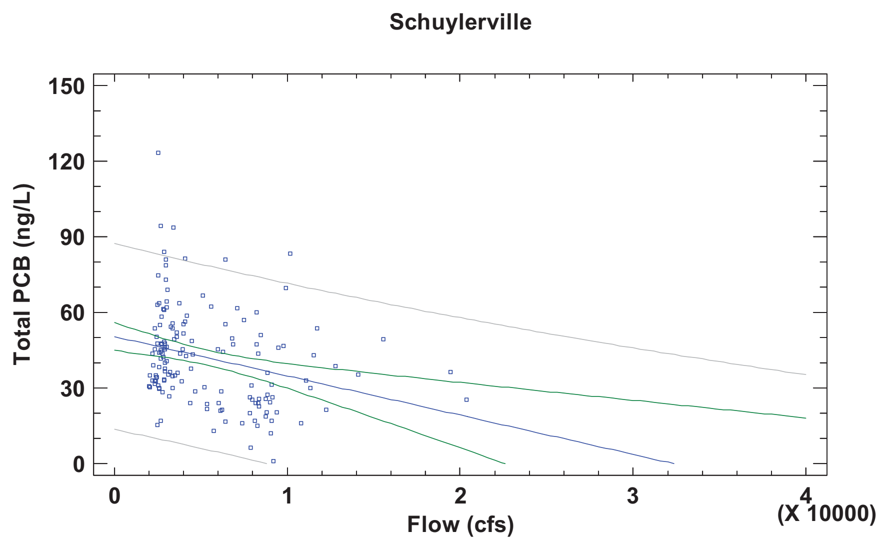
Coefficients

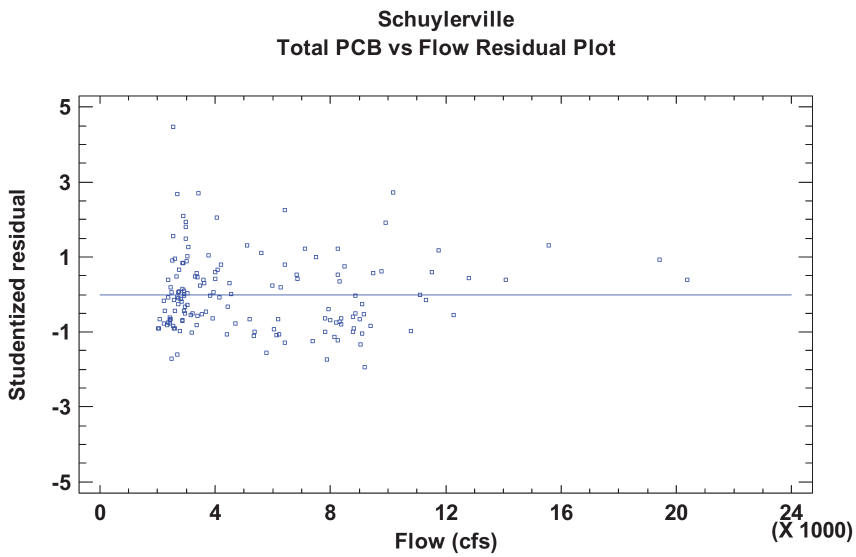
	Least Squares	*Standard*	*T*	
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
Intercept	50.4065	2.81923	17.8795	0.0000
Slope	-0.0015588	0.000438162	-3.55759	0.0005

Analysis of Variance

Source	*Sum of Squares*	*Df*	*Mean Square*	*F-Ratio*	*P-Value*
Model	4294.35	1	4294.35	12.66	0.0005
Residual	49877.3	147	339.302		
Total (Corr.)	54171.7	148			

Correlation Coefficient = -0.281555
R-squared = 7.9273 percent
R-squared (adjusted for d.f.) = 7.30095 percent
Standard Error of Est. = 18.4201
Mean absolute error = 14.3629





6) Simple Regression – Schuylerville Tri+PCB (ng/L) vs. Flow (cfs)

Dependent variable: Tri+PCB (ng/L)
Independent variable: Flow (cfs)
Linear model: Y = a + b*X

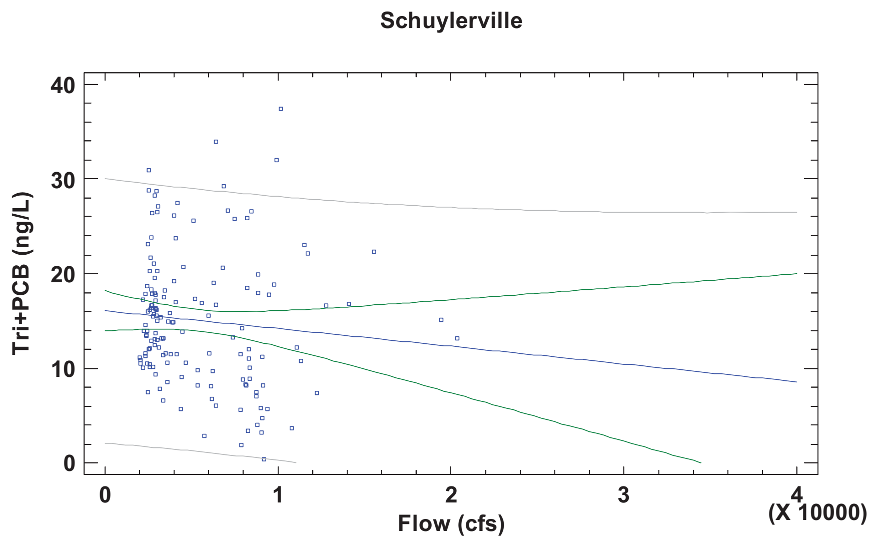
Coefficients

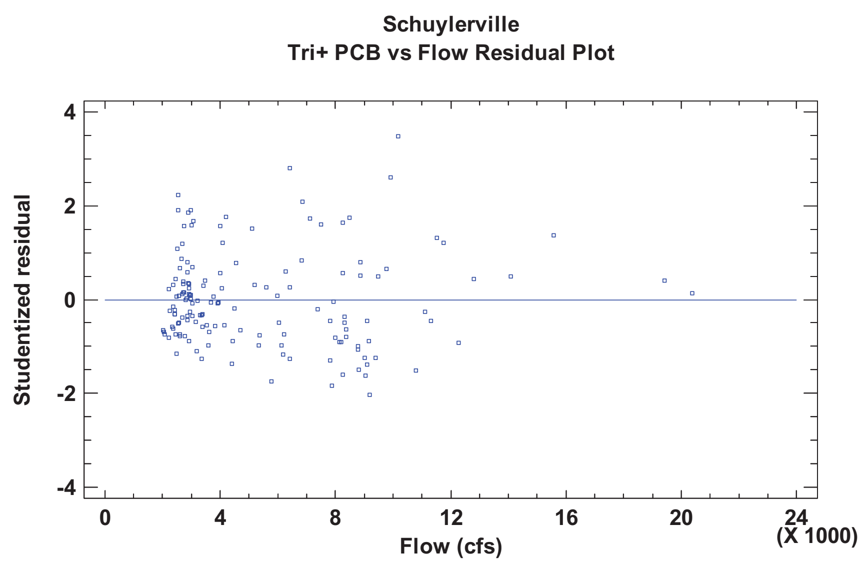
	Least Squares	*Standard*	*T*	
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
Intercept	16.068	1.07089	15.0043	0.0000
Slope	-0.000187605	0.000166437	-1.12718	0.2615

Analysis of Variance

Source	*Sum of Squares*	*Df*	*Mean Square*	*F-Ratio*	*P-Value*
Model	62.2021	1	62.2021	1.27	0.2615
Residual	7196.73	147	48.9574		
Total (Corr.)	7258.94	148			

Correlation Coefficient = -0.0925691
R-squared = 0.856904 percent
R-squared (adjusted for d.f.) = 0.182461 percent
Standard Error of Est. = 6.99695
Mean absolute error = 5.4648


Schuylerville
Tri+PCB (ng/L)
40
30
20
10
0
0
1
2
3
4
(X 10000)
Flow (cfs)


Schuylerville
Tri+ PCB vs Flow Residual Plot
Studentized residual
4
2
0
-2
-4
0
4
8
12
16
20
24
(X 1000)
Flow (cfs)

7) Multiple Regression – Schuylerville Total PCB (ng/L)

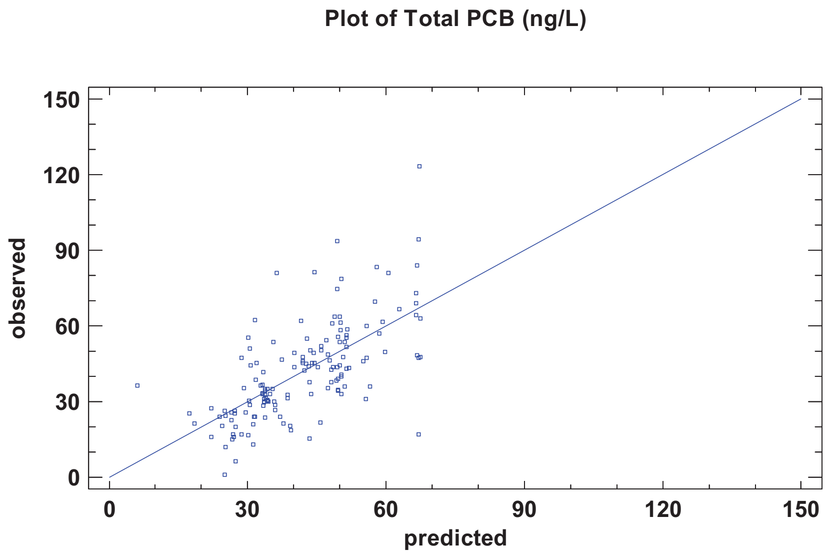
Dependent variable: Total PCB (ng/L)
Independent variables:
Flow (cfs)
Jun
Jul
Aug
Sept
Oct
Nov
Flow_Jun
Flow_Jul
Flow_Aug
Flow_Sep
Flow_Oct
Flow_Nov

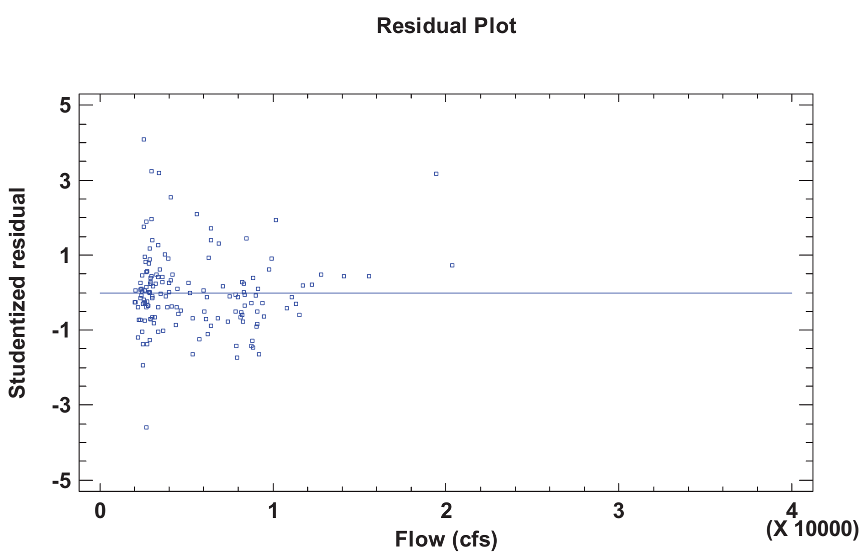
		Standard	*T*	
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
CONSTANT	55.9612	7.05071	7.93696	0.0000
Flow (cfs)	-0.00189677	0.000770846	-2.46064	0.0151
Jun	15.9067	9.3006	1.71029	0.0895
Jul	-8.81185	9.86934	-0.892851	0.3735
Aug	-4.17372	10.1807	-0.409963	0.6825
Sept	-19.1782	10.1381	-1.8917	0.0607
Oct	1.49341	9.48875	0.157388	0.8752
Nov	-14.0608	10.3543	-1.35796	0.1767
Flow_Jun	0.00012542	0.00118456	0.105879	0.9158
Flow_Jul	0.00295388	0.00146372	2.01806	0.0456
Flow_Aug	-0.00145519	0.0017194	-0.846332	0.3989
Flow_Sep	0.000668664	0.00209282	0.319504	0.7498
Flow_Oct	-0.00127301	0.0013996	-0.909553	0.3647
Flow_Nov	0.0000529392	0.00120445	0.0439531	0.9650

Analysis of Variance

Source	*Sum of Squares*	*Df*	*Mean Square*	*F-Ratio*	*P-Value*
Model	23134.0	13	1779.54	7.74	0.0000
Residual	31037.6	135	229.908		
Total (Corr.)	54171.7	148			

R-squared = 42.705 percent
R-squared (adjusted for d.f.) = 37.1877 percent
Standard Error of Est. = 15.1627
Mean absolute error = 10.3186


Plot of Total PCB (ng/L)
observed
predicted
0
30
60
90
120
150


Residual Plot
Studentized residual
Flow (cfs)
(X 10000)
5
3
1
-1
-3
-5
0
1
2
3
4

8) Multiple Regression – Schuylerville Tri+PCB (ng/L)

Dependent variable: Tri+PCB (ng/L)
Independent variables:
- Flow (cfs)
- Jun
- Jul
- Aug
- Sept
- Oct
- Nov
- Flow_Jun
- Flow_Jul
- Flow_Aug
- Flow_Sep
- Flow_Oct
- Flow_Nov

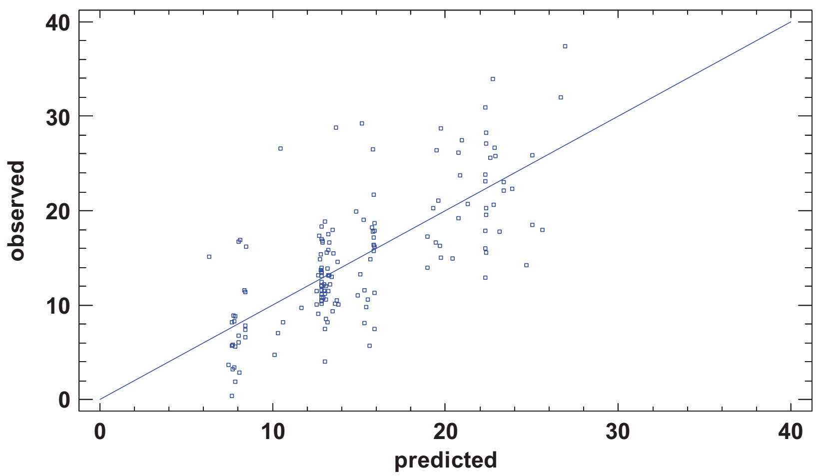
		Standard	*T*	
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
CONSTANT	13.3522	2.36114	5.65496	0.0000
Flow (cfs)	-0.0000346839	0.000258141	-0.13436	0.8933
Jun	8.64436	3.11459	2.77544	0.0063
Jul	3.35551	3.30505	1.01527	0.3118
Aug	2.95566	3.40932	0.866935	0.3875
Sept	-0.382485	3.39505	-0.112659	0.9105
Oct	1.68597	3.1776	0.53058	0.5966
Nov	-4.50147	3.46747	-1.2982	0.1964
Flow_Jun	0.000153933	0.000396686	0.388048	0.6986
Flow_Jul	0.00104022	0.000490172	2.12216	0.0357
Flow_Aug	-0.00013001	0.000575795	-0.225792	0.8217
Flow_Sep	-0.0000183037	0.000700844	-0.0261167	0.9792
Flow_Oct	-0.00050528	0.0004687	-1.07805	0.2829
Flow_Nov	-0.000094913	0.000403346	-0.235314	0.8143

Analysis of Variance

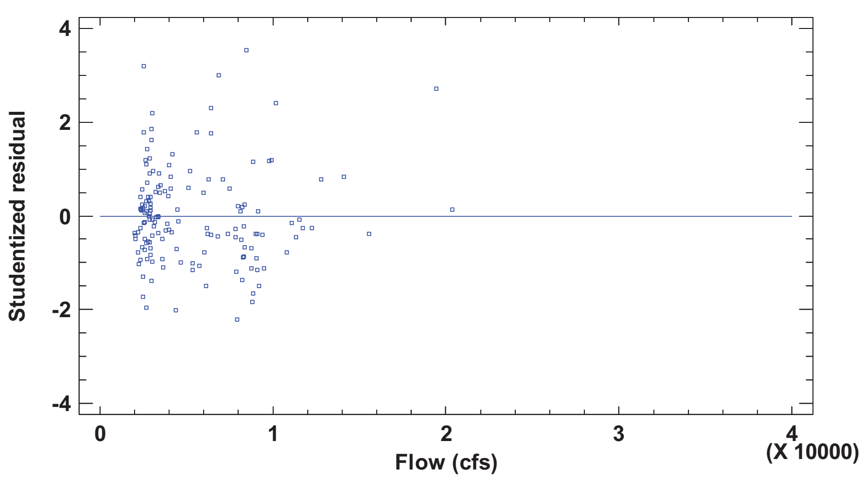
Source	*Sum of Squares*	*Df*	*Mean Square*	*F-Ratio*	*P-Value*
Model	3778.22	13	290.632	11.27	0.0000
Residual	3480.72	135	25.7831		
Total (Corr.)	7258.94	148			

R-squared = 52.0492 percent
R-squared (adjusted for d.f.) = 47.4317 percent
Standard Error of Est. = 5.0777
Mean absolute error = 3.68995

Plot of Tri+PCB (ng/L)



Residual Plot



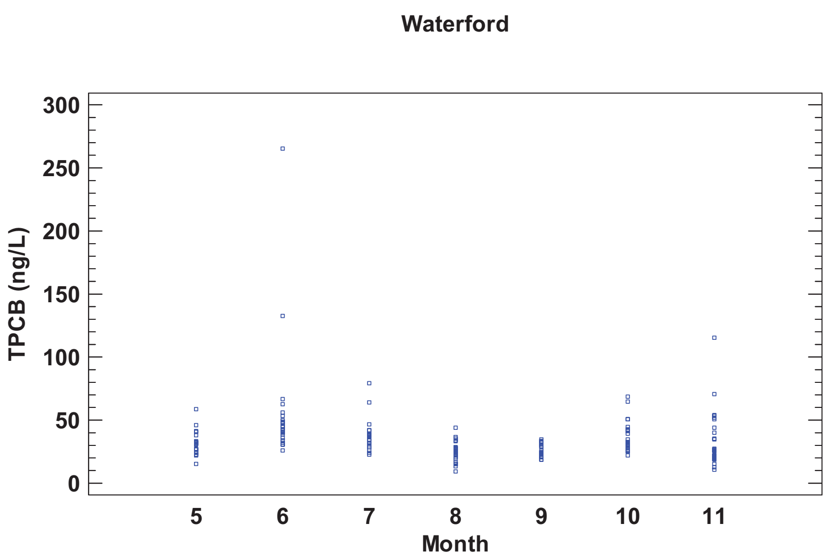
Waterford

1) Kruskal-Wallis Test for Waterford TPCB (ng/L) by Month

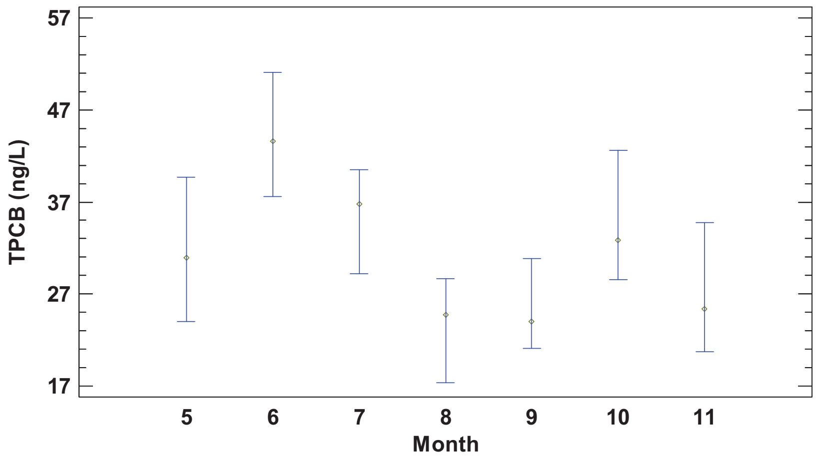
Month	*Sample Size*	*Average Rank*
5	18	80.2778
6	24	125.875
7	21	101.333
8	23	50.6957
9	22	53.1364
10	23	99.3043
11	31	64.1935

Test statistic = 50.7369   P-Value = 3.3449E-9

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 7 months are the same. The data from all the month was first combined and ranked from smallest to largest. The average rank was then computed for the data in each month. Since the P-value is less than 0.05, there is a statistically significant difference amongst the medians at the 95.0% confidence level.



Waterford Median Plot with 95% Confidence Intervals



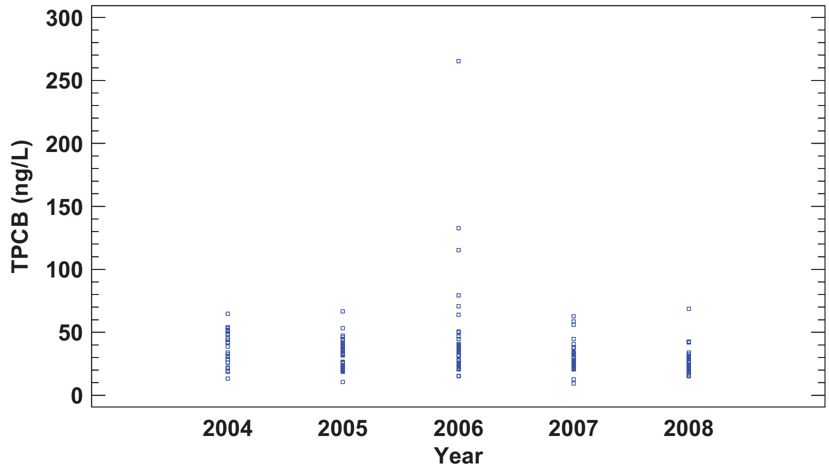
2) Kruskal-Wallis Test for Waterford TPCB (ng/L) by Year

Year	*Sample Size*	*Average Rank*
2004	26	96.4615
2005	36	87.5278
2006	39	89.6282
2007	31	71.9516
2008	30	60.6

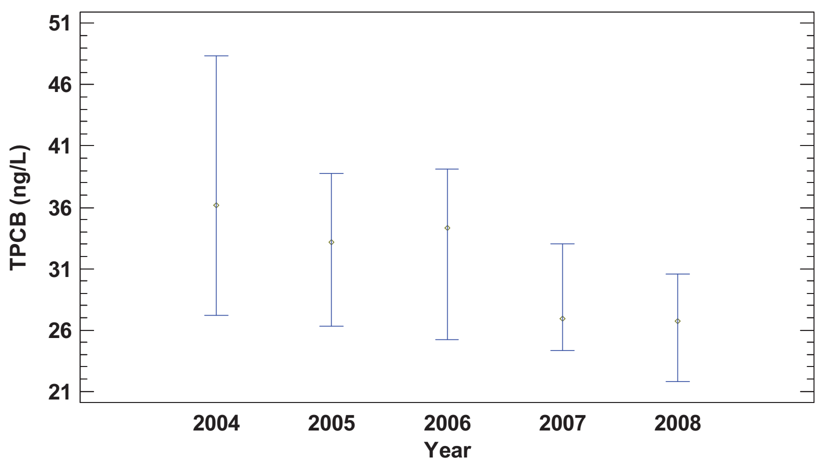
Test statistic = 11.6498   P-Value = 0.201547

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 5 years are the same. The data from all the years is first combined and ranked from smallest to largest. The average rank is then computed for the data in each year. Since the P-value is greater than or equal to 0.05, there is not statistically significant difference amongst the medians at the 95.0% confidence level.

Waterford



Waterford Median Plot with 95% Confidence Intervals

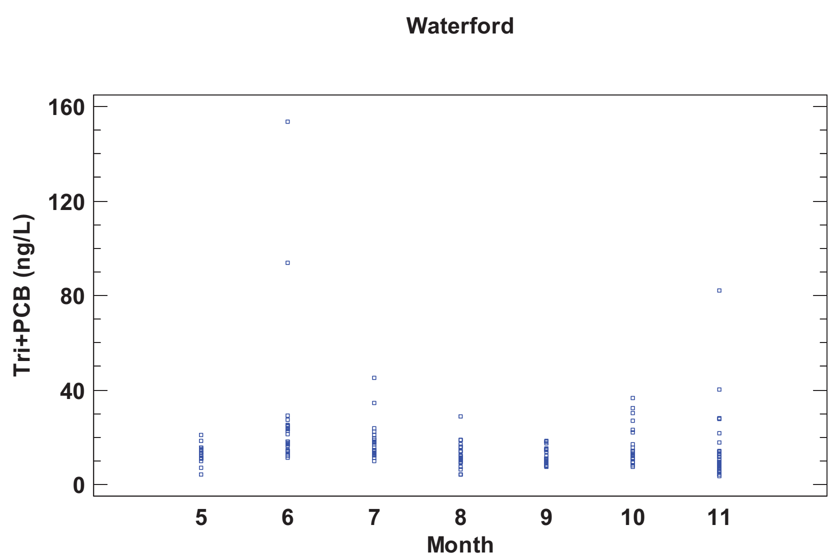


3) Kruskal-Wallis Test for Waterford Tri+ PCB (ng/L) by Month

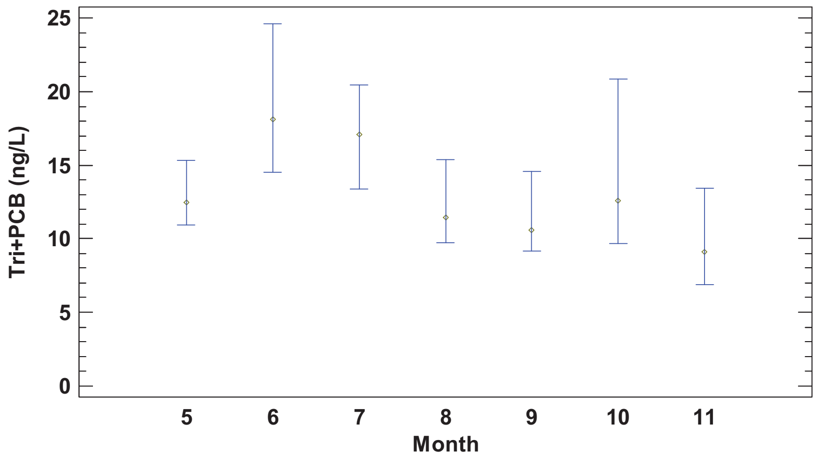
Month	*Sample Size*	*Average Rank*
5	18	75.8889
6	24	121.917
7	21	110.0
8	23	67.913
9	22	61.2727
10	23	83.6087
11	31	57.0323

Test statistic = 40.3255   P-Value = 3.93109E-7

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 7 months are the same. The data from all the month was first combined and ranked from smallest to largest. The average rank was then computed for the data in each month. Since the P-value is less than 0.05, there is a statistically significant difference amongst the medians at the 95.0% confidence level.



Waterford Median Plot with 95% Confidence Intervals



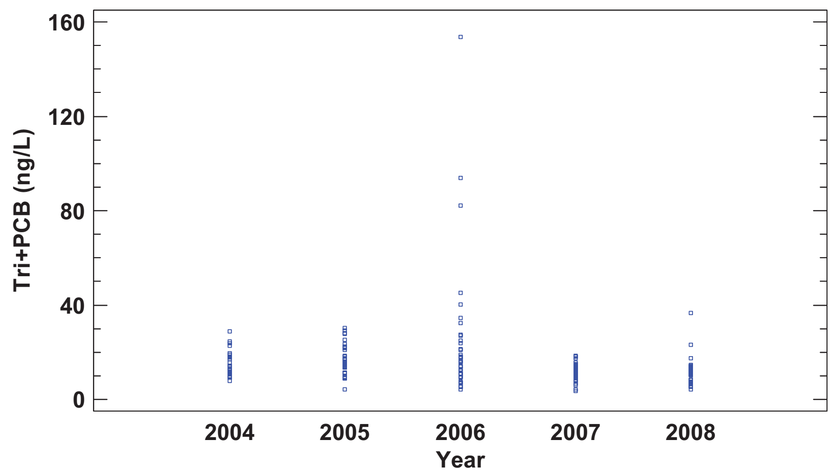
4) Kruskal-Wallis Test for Waterford Tri+ PCB (ng/L) by Year

Year	*Sample Size*	*Average Rank*
2004	26	90.9615
2005	36	98.8056
2006	39	91.4615
2007	31	61.129
2008	30	60.6333

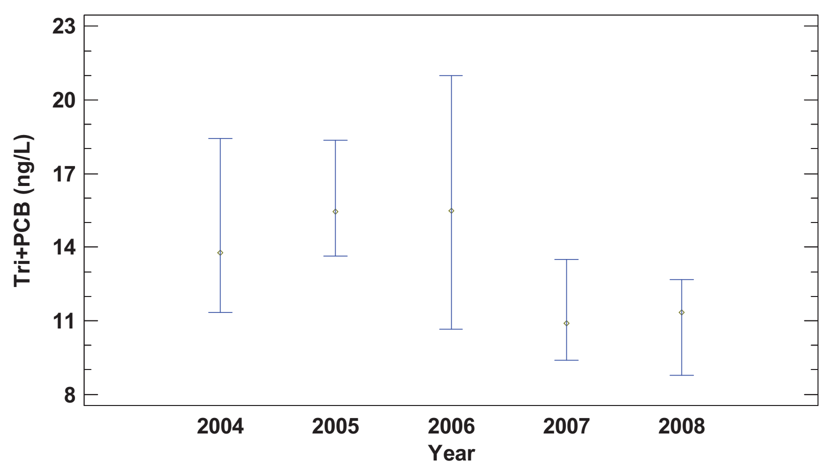
Test statistic = 19.4982   P-Value = 0.000627184

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 5 years are the same. The data from all the years is first combined and ranked from smallest to largest. The average rank is then computed for the data in each year. Since the P-value is less than 0.05, there is a statistically significant difference amongst the medians at the 95.0% confidence level.

Waterford



Waterford Median Plot with 95% Confidence Intervals



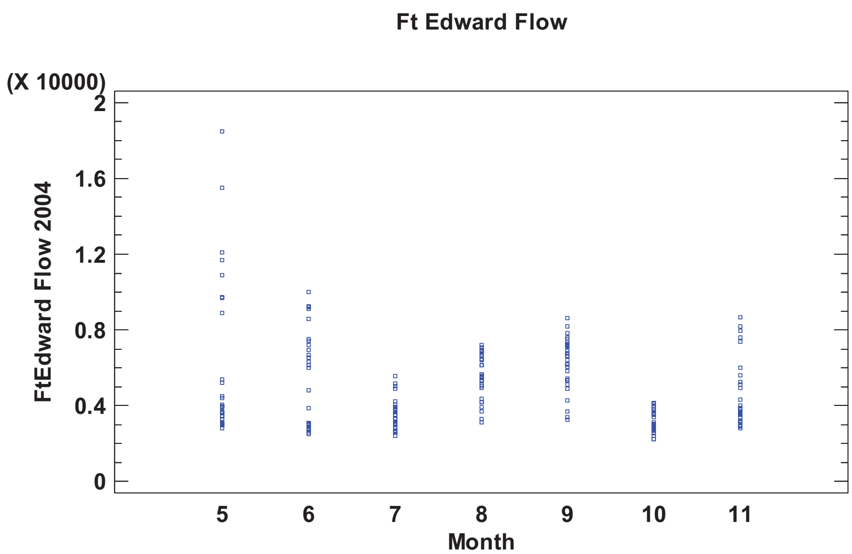
Variability in Fort Edward Flow

1) Kruskal-Wallis Test for Ft Edward Flow 2004 by Month

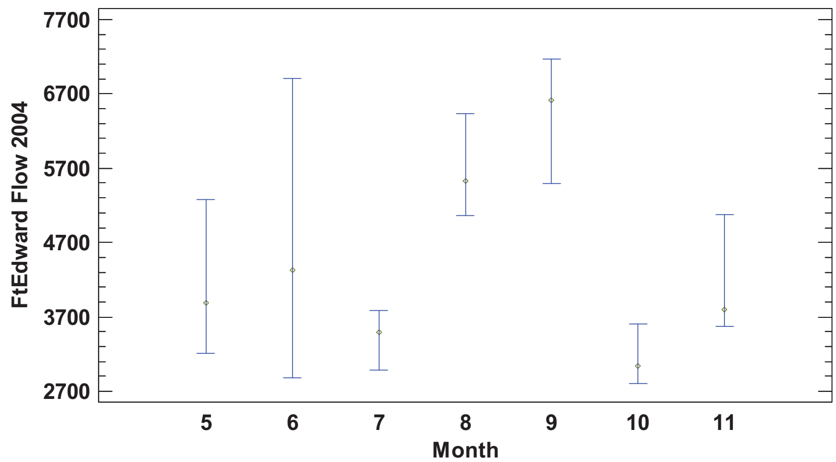
Month	*Sample Size*	*Average Rank*
5	31	112.694
6	30	106.467
7	31	69.5806
8	31	143.419
9	30	159.55
10	31	54.7097
11	30	107.733

Test statistic = 66.0164   P-Value = 2.67442E-12

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 7 months are the same. The data from all the month was first combined and ranked from smallest to largest. The average rank was then computed for the data in each month. Since the P-value is less than 0.05, there is a statistically significant difference amongst the medians at the 95.0% confidence level.



Ft Edward Flow Median Plot with 95.0% Confidence Intervals



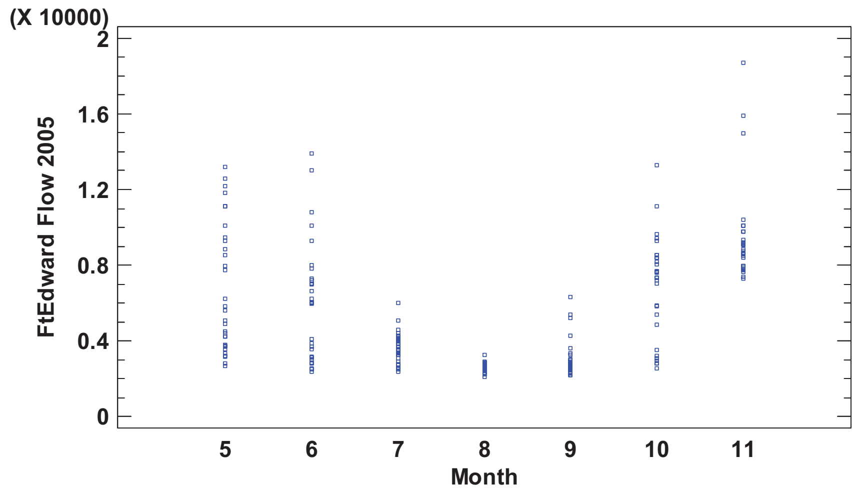
2) Kruskal-Wallis Test for Ft Edward Flow 2005 by Month

Month	*Sample Size*	*Average Rank*
5	31	139.371
6	30	119.417
7	31	88.2419
8	31	34.1935
9	30	53.1167
10	31	139.387
11	30	179.733

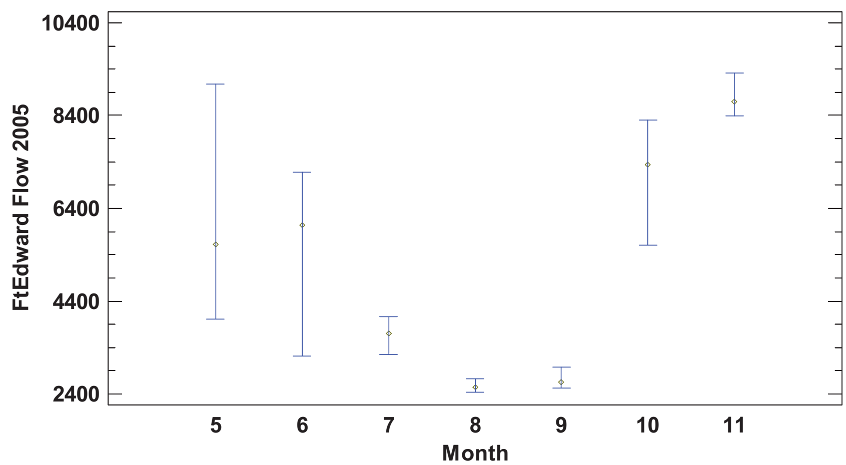
Test statistic = 127.963   P-Value = 0

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 7 months are the same. The data from all the month was first combined and ranked from smallest to largest. The average rank was then computed for the data in each month. Since the P-value is less than 0.05, there is a statistically significant difference amongst the medians at the 95.0% confidence level.

Ft Edward Flow



Ft Edward Flow Median Plot with 95.0% Confidence Intervals

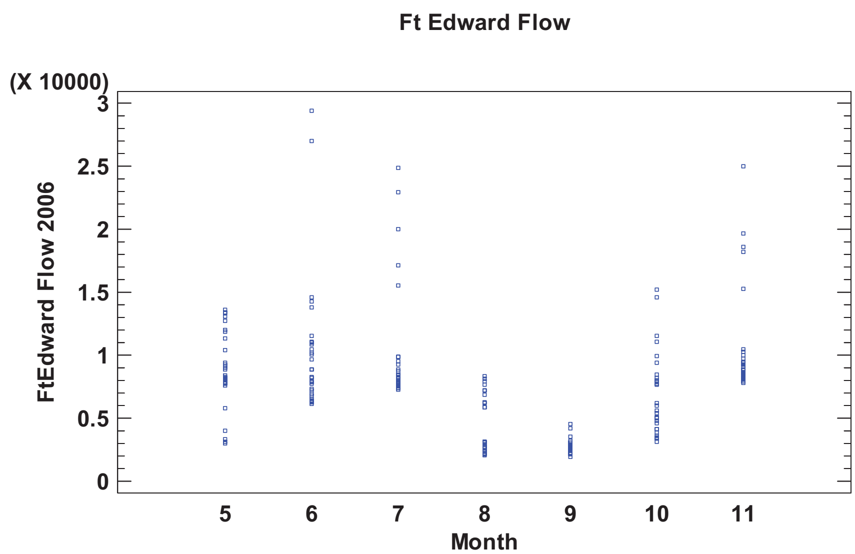


3) Kruskal-Wallis Test for Ft Edward Flow 2006 by <u>Month</u>

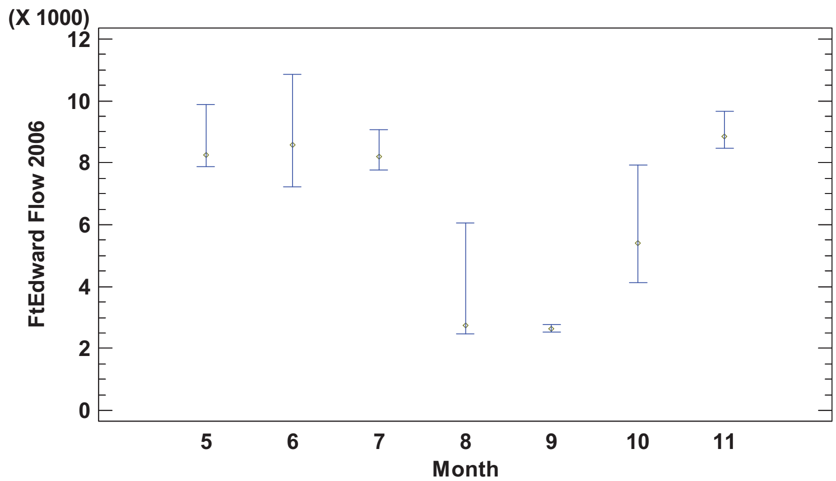
Month	*Sample Size*	*Average Rank*
5	31	137.613
6	30	141.45
7	31	138.677
8	31	49.1452
9	30	28.5667
10	31	97.5968
11	30	159.683

Test statistic = 122.593   P-Value = 0

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 7 months are the same. The data from all the month was first combined and ranked from smallest to largest. The average rank was then computed for the data in each month. Since the P-value is less than 0.05, there is a statistically significant difference amongst the medians at the 95.0% confidence level.



Ft Edward Flow Median Plot with 95.0% Confidence Intervals



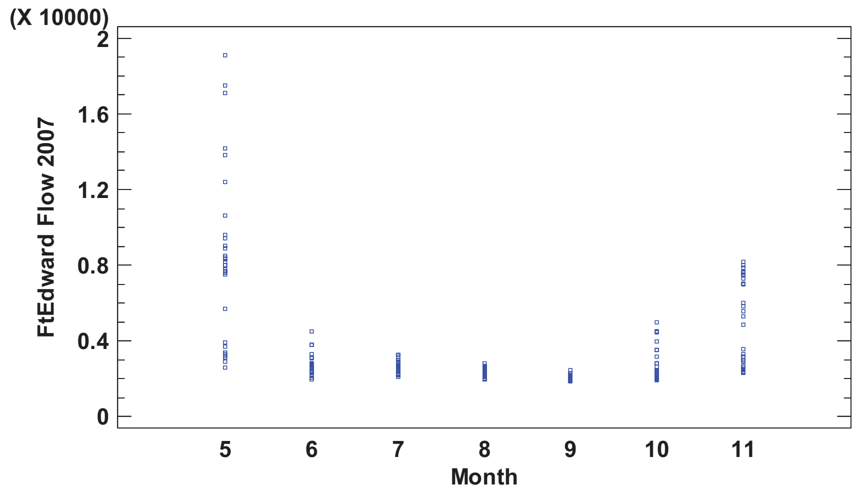
4) Kruskal-Wallis Test for Ft Edward Flow 2007 by <u>Month</u>

Month	*Sample Size*	*Average Rank*
5	31	189.306
6	30	108.483
7	31	109.887
8	31	74.7581
9	30	28.6167
10	31	85.7742
11	30	154.683

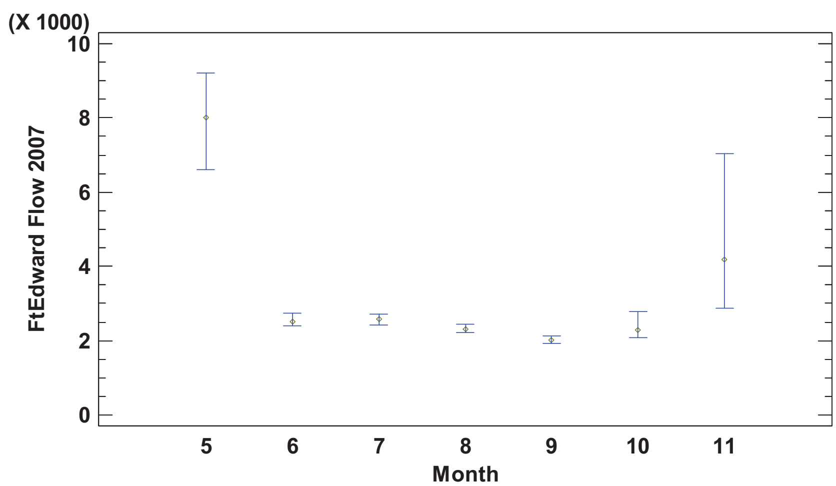
Test statistic = 132.767   P-Value = 0

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 7 months are the same. The data from all the month was first combined and ranked smallest to largest. The average rank was then computed for the data in each month. Since the P-value is less than 0.05, there is a statistically significant difference amongst the medians at the 95.0% confidence level.

Ft Edward Flow



Ft Edward Flow Median Plot with 95.0% Confidence Intervals

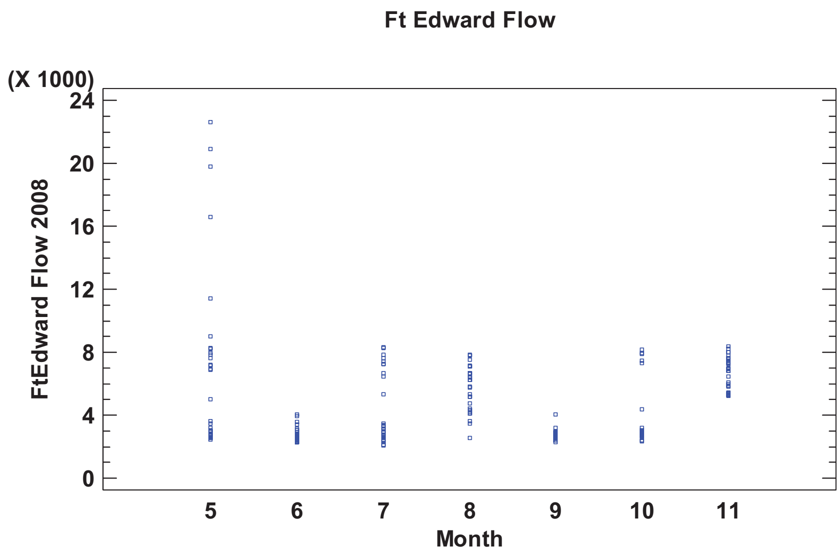


5) Kruskal-Wallis Test for Ft Edward Flow 2008 by Month

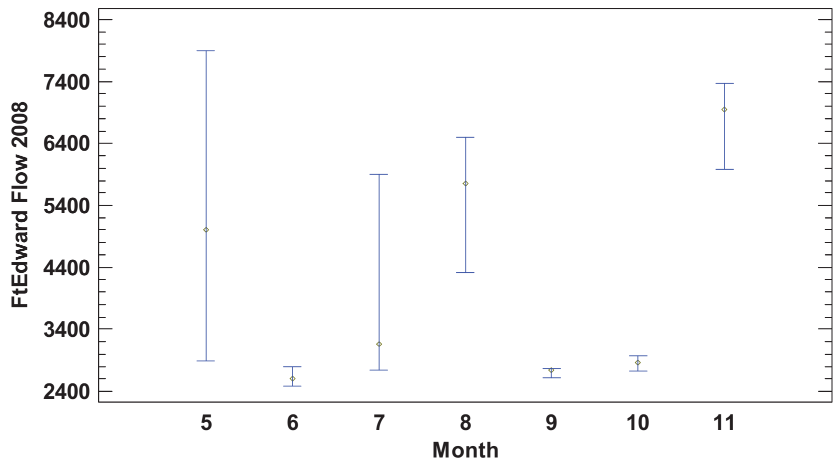
Month	*Sample Size*	*Average Rank*
5	31	134.274
6	30	50.55
7	31	104.016
8	31	144.5
9	30	58.4
10	31	90.1774
11	30	169.15

Test statistic = 93.3752   P-Value = 0

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 7 months are the same. The data from all the month was first combined and ranked from smallest to largest. The average rank was then computed for the data in each month. Since the P-value is less than 0.05, there is a statistically significant difference amongst the medians at the 95.0% confidence level.



Ft Edward Flow Median Plot with 95.0% Confidence Intervals

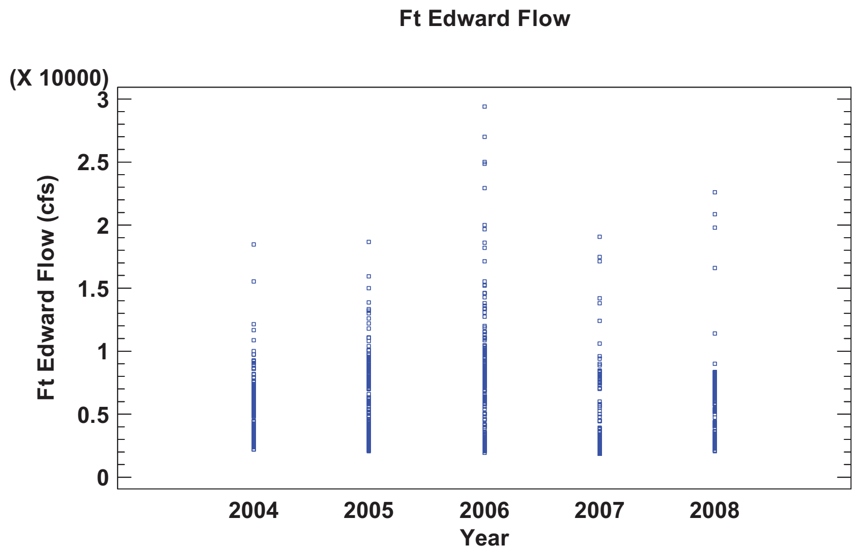


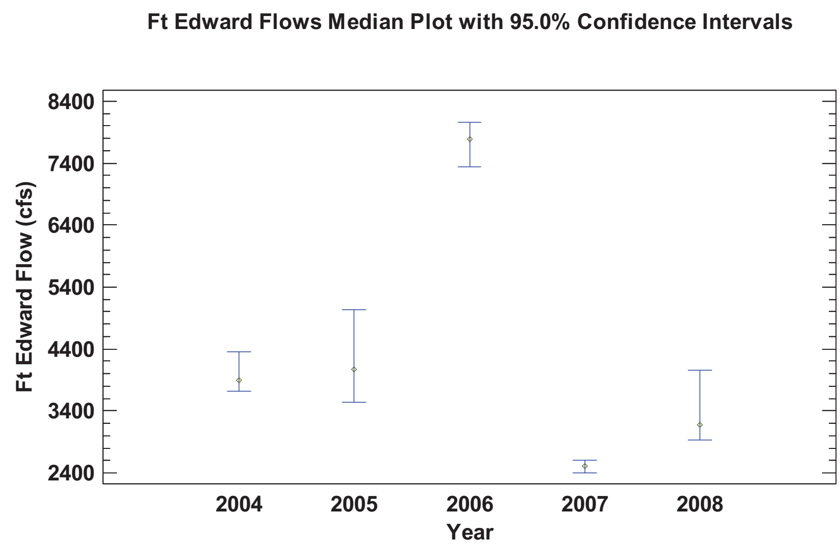
6) Kruskal-Wallis Test for Ft Edward Flow (cfs) by <u>Year</u>

Year	*Sample Size*	*Average Rank*
2004	214	575.21
2005	214	577.542
2006	214	722.014
2007	214	307.016
2008	214	495.717

Test statistic = 205.984   P-Value = 0

The Kruskal-Wallis test tests the null hypothesis that the medians within each of the 5 years are the same. The data from all the years is first combined and ranked from smallest to largest. The average rank is then computed for the data in each year. Since the P-value is less than 0.05, there is a statistically significant difference amongst the medians at the 95.0% confidence level.

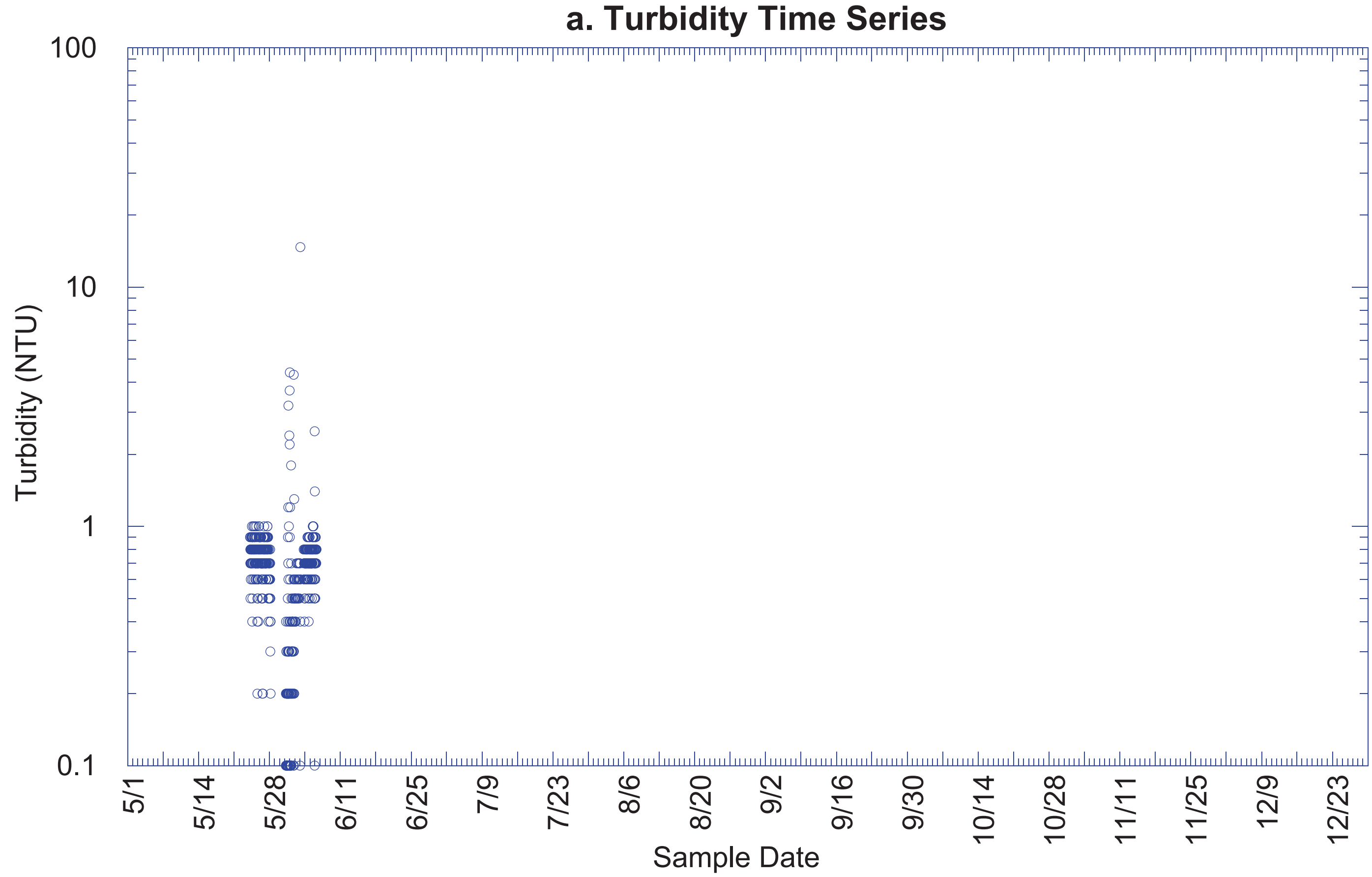

Ft Edward Flow
(X 10000)
3
2.5
2
1.5
1
0.5
0
Ft Edward Flow (cfs)
2004
2005
2006
2007
2008
Year

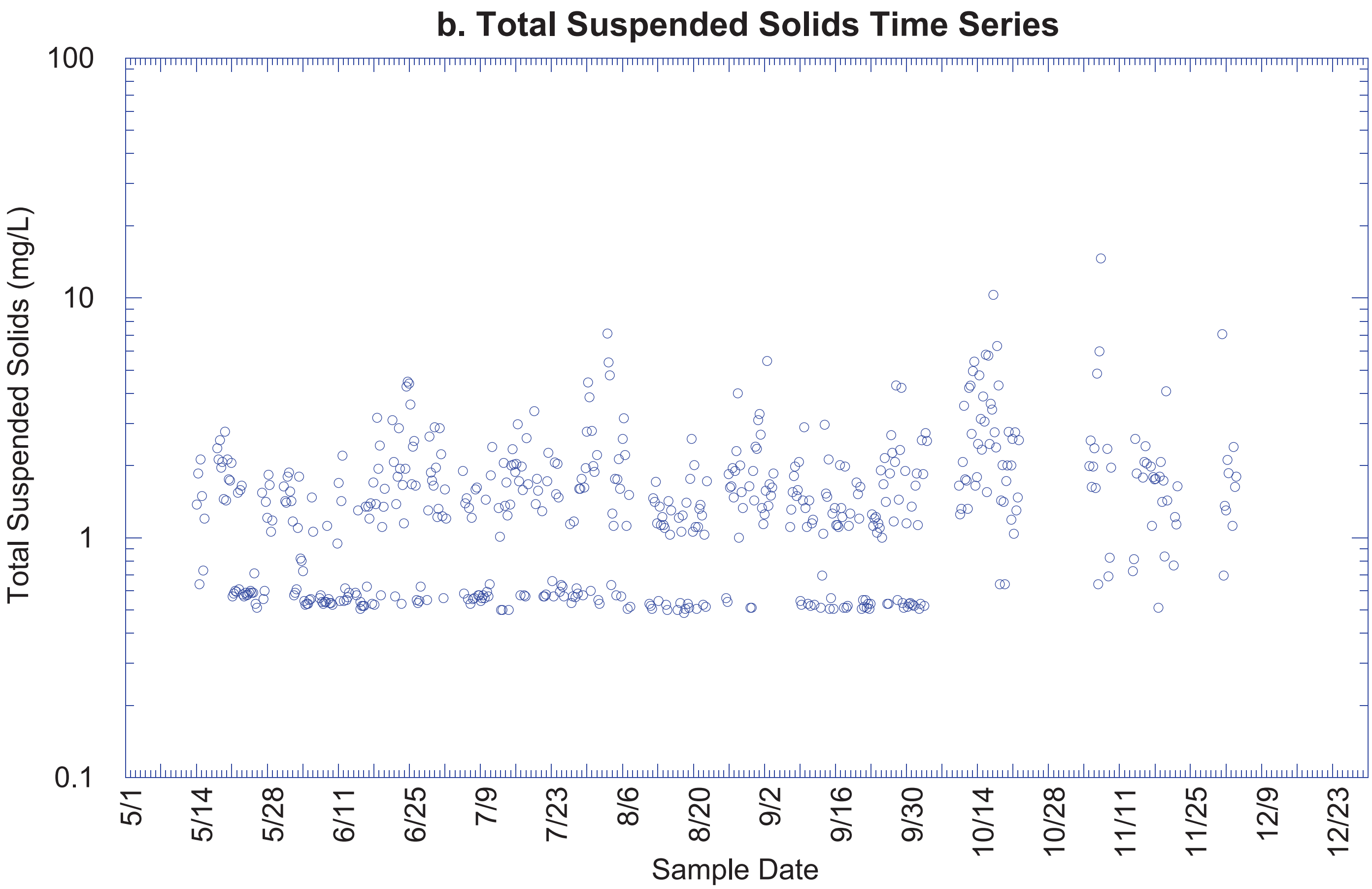

Ft Edward Flows Median Plot with 95.0% Confidence Intervals
8400
7400
6400
5400
4400
3400
2400
Ft Edward Flow (cfs)
2004
2005
2006
2007
2008
Year

Appendix I-B

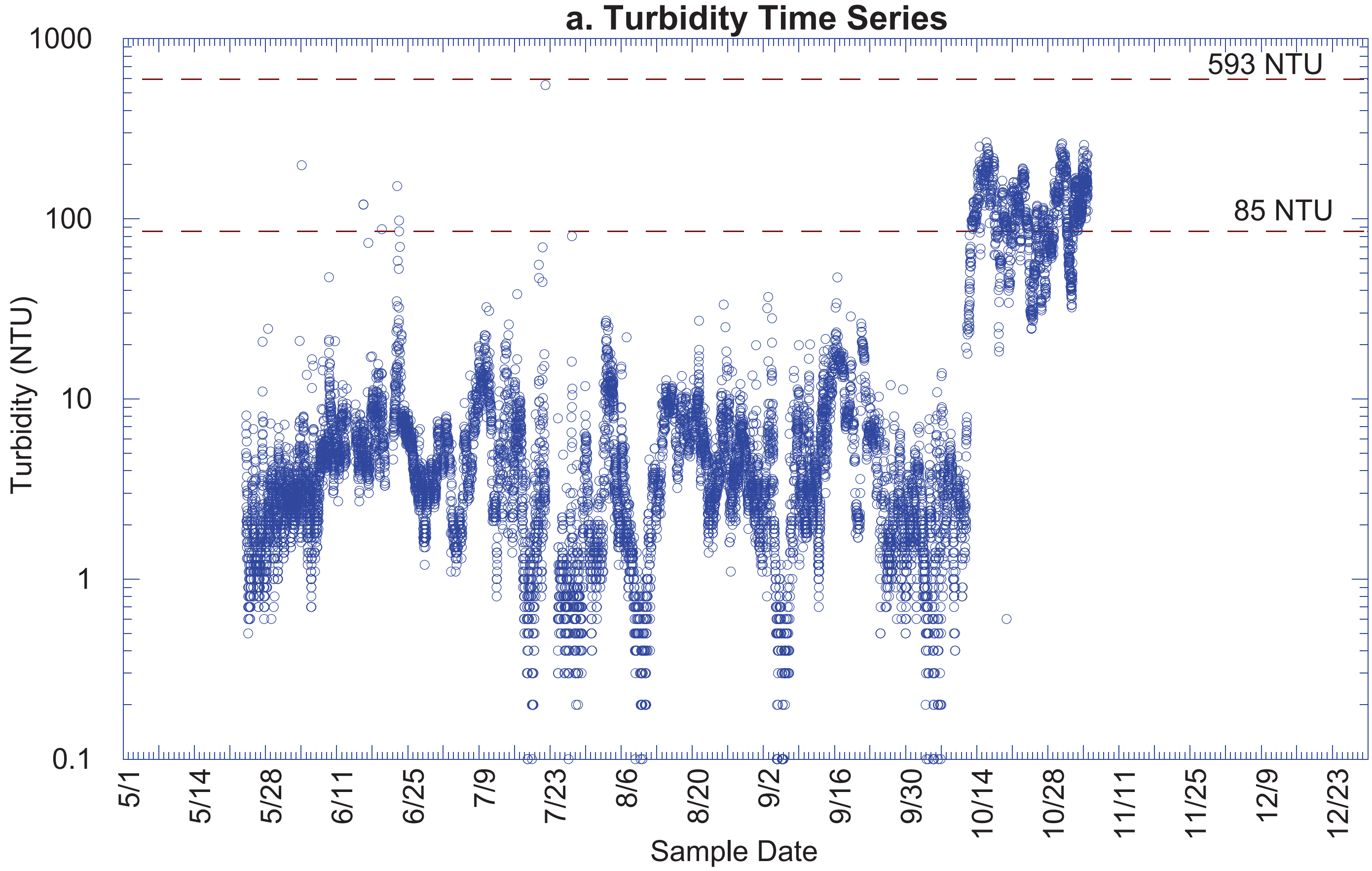
Time Series of TSS Concentrations and Turbidity Measurements in Near Field Buoy and Transect Stations

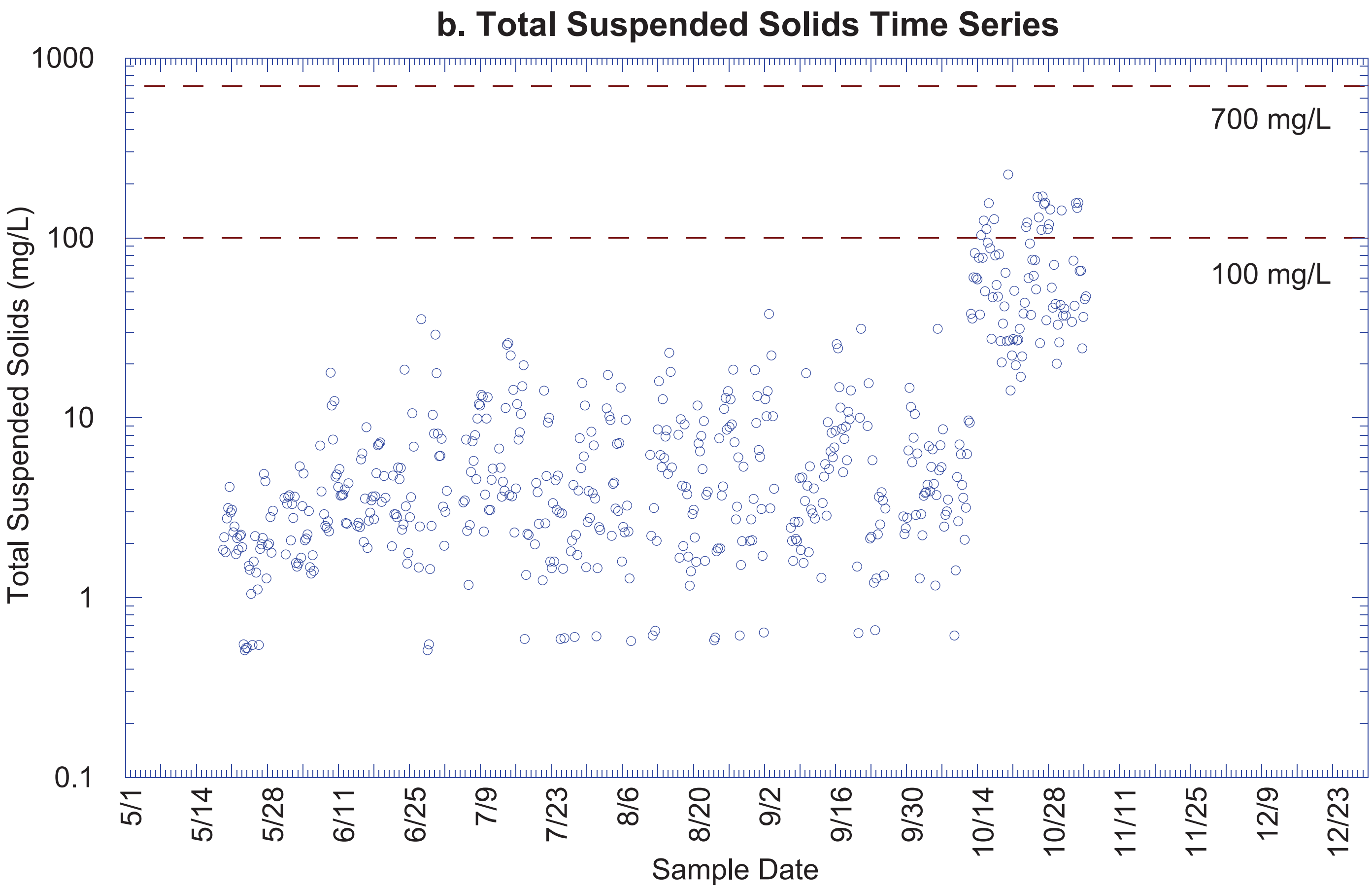
Rogers Island Area Background





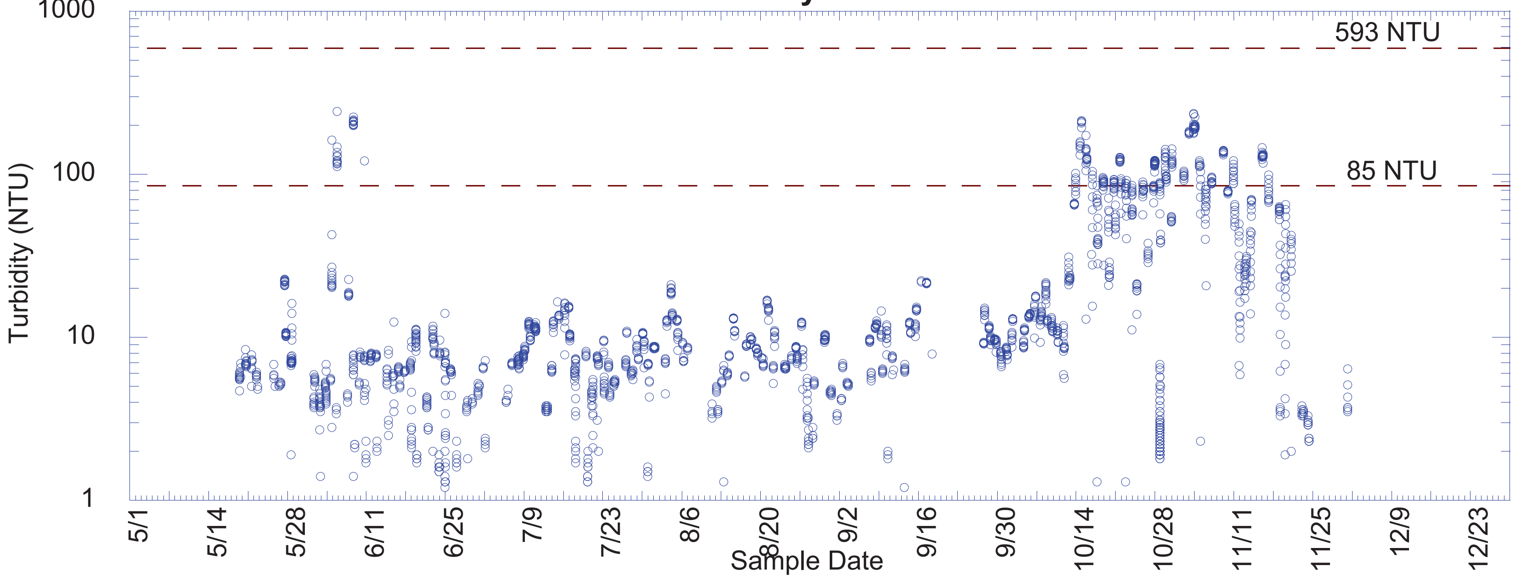
East Channel Rogers Island



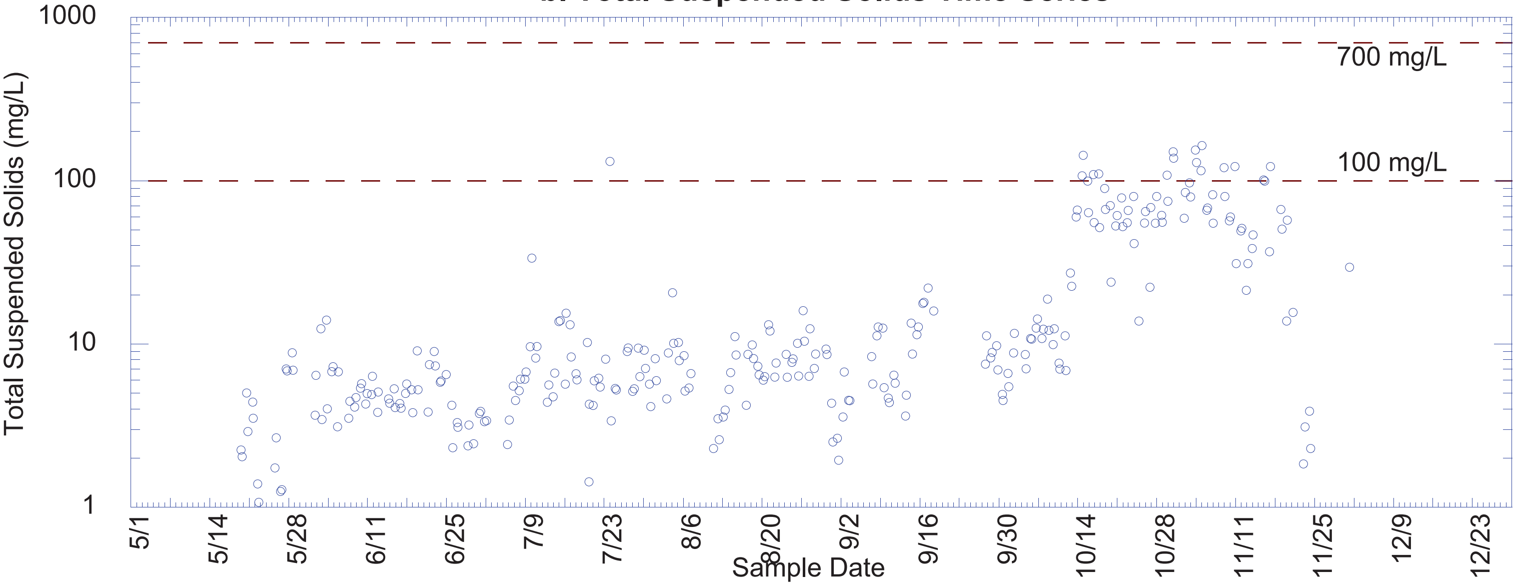


East Channel Rogers Island 25m Downstream Transect

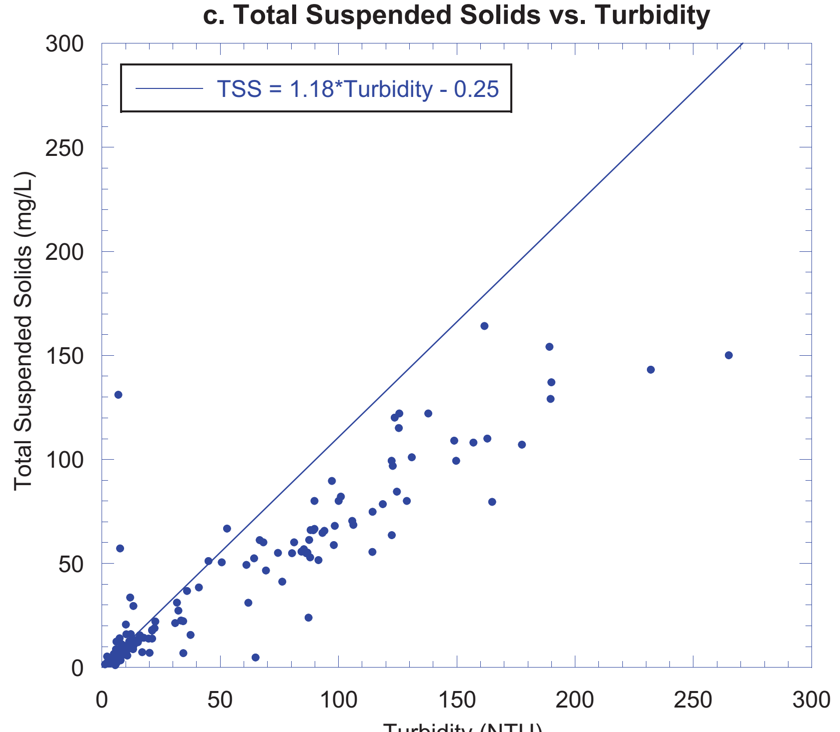
a. Turbidity Time Series



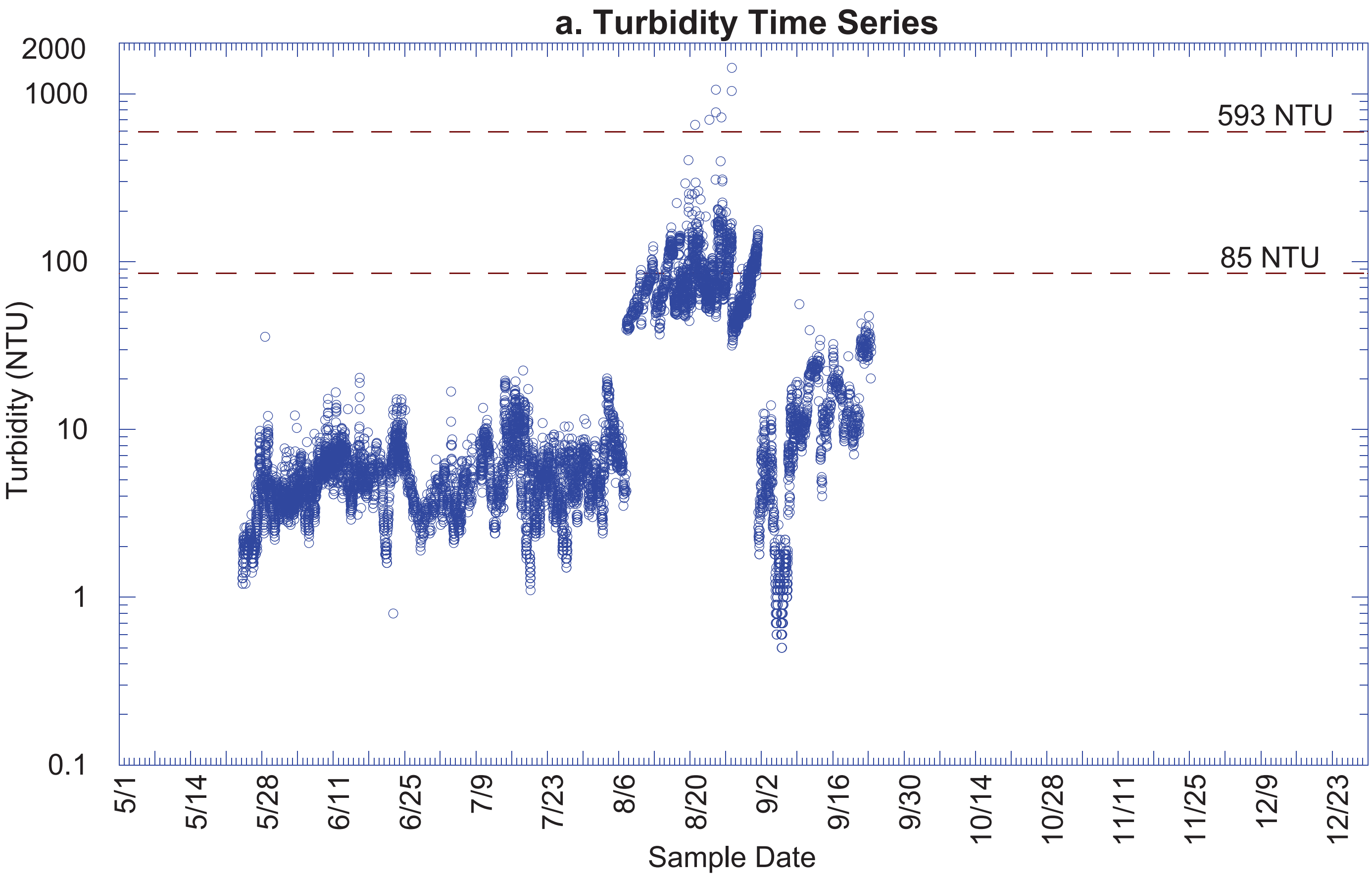
b. Total Suspended Solids Time Series

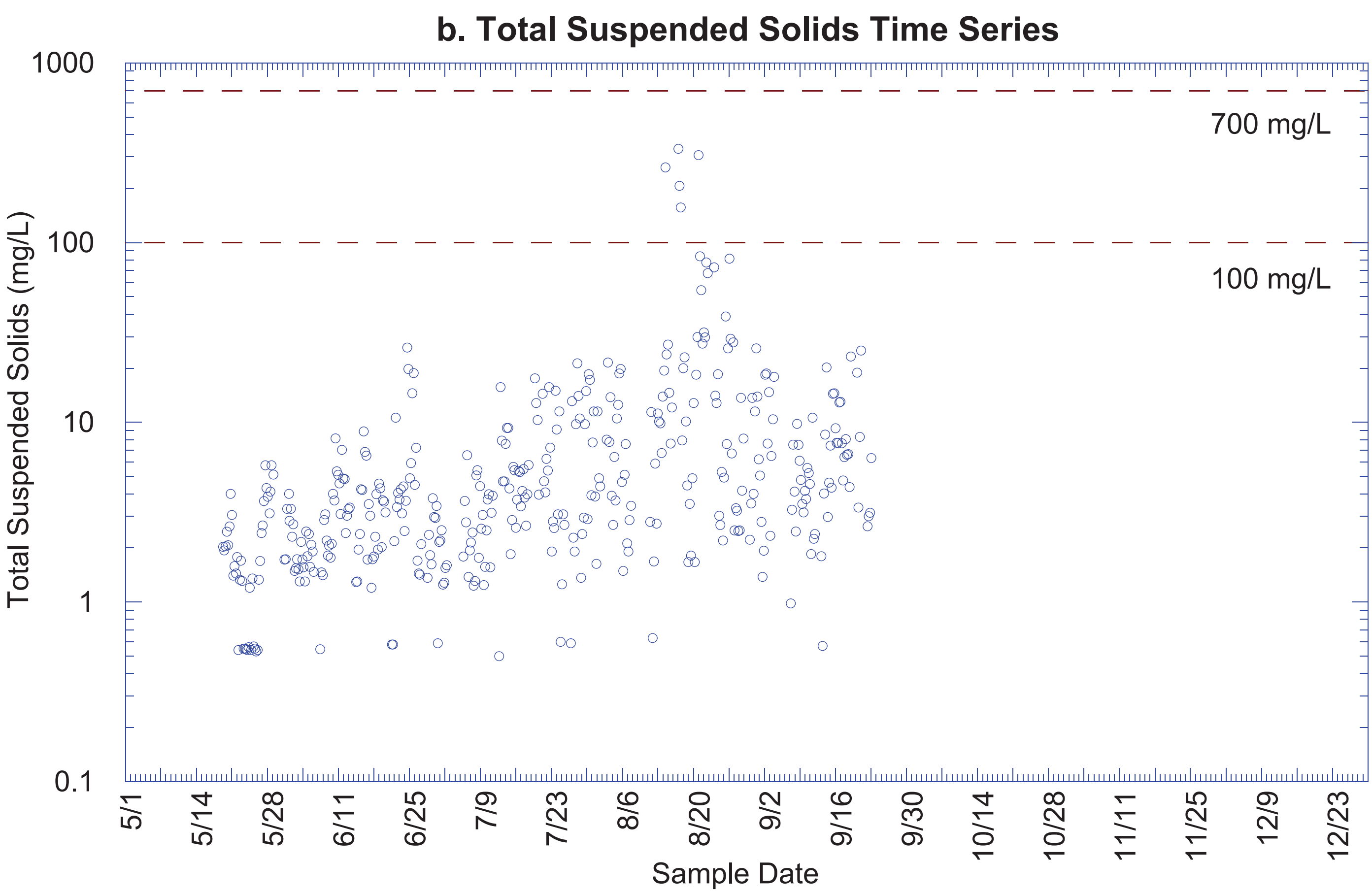


c. Total Suspended Solids vs. Turbidity

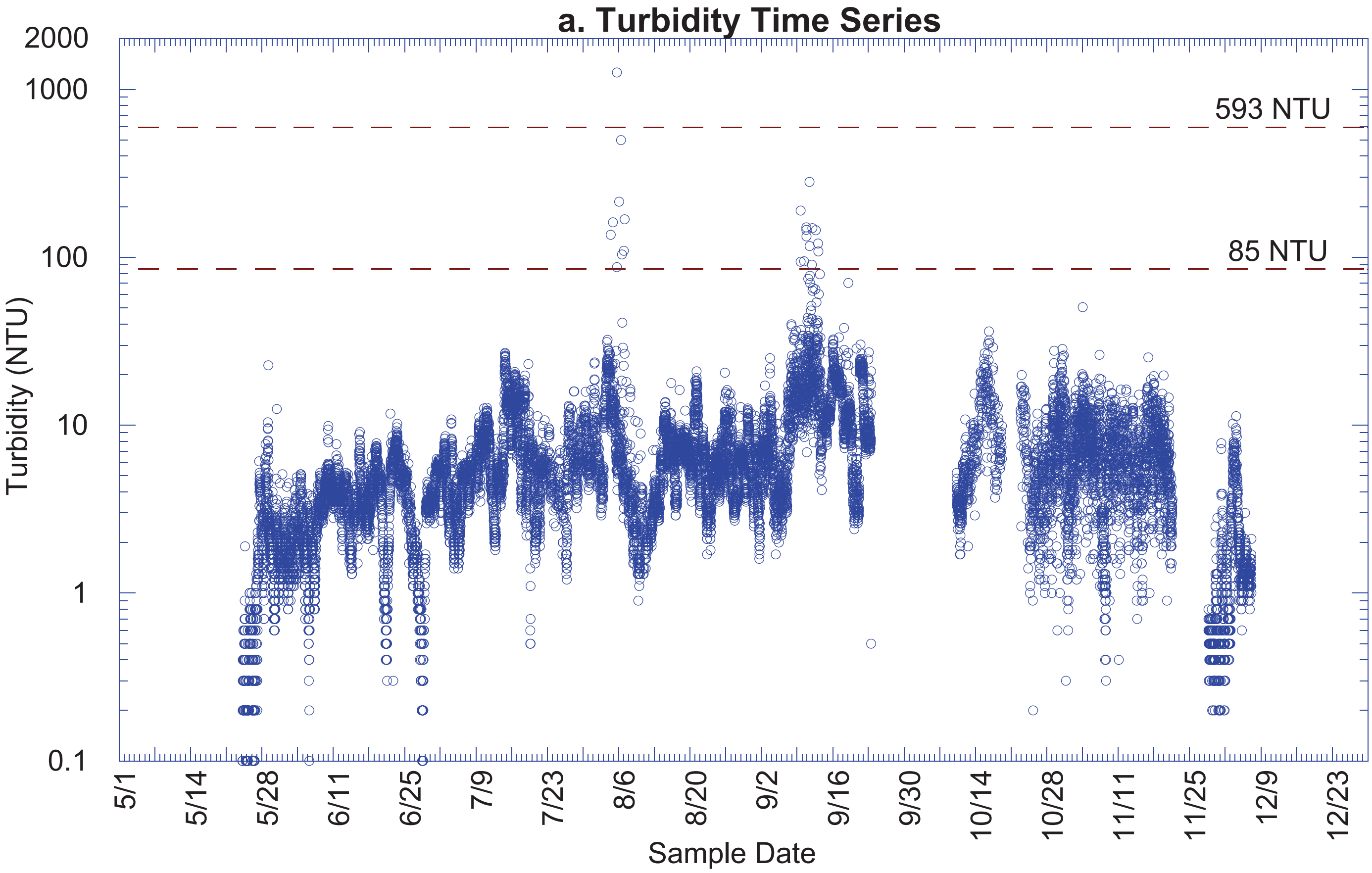


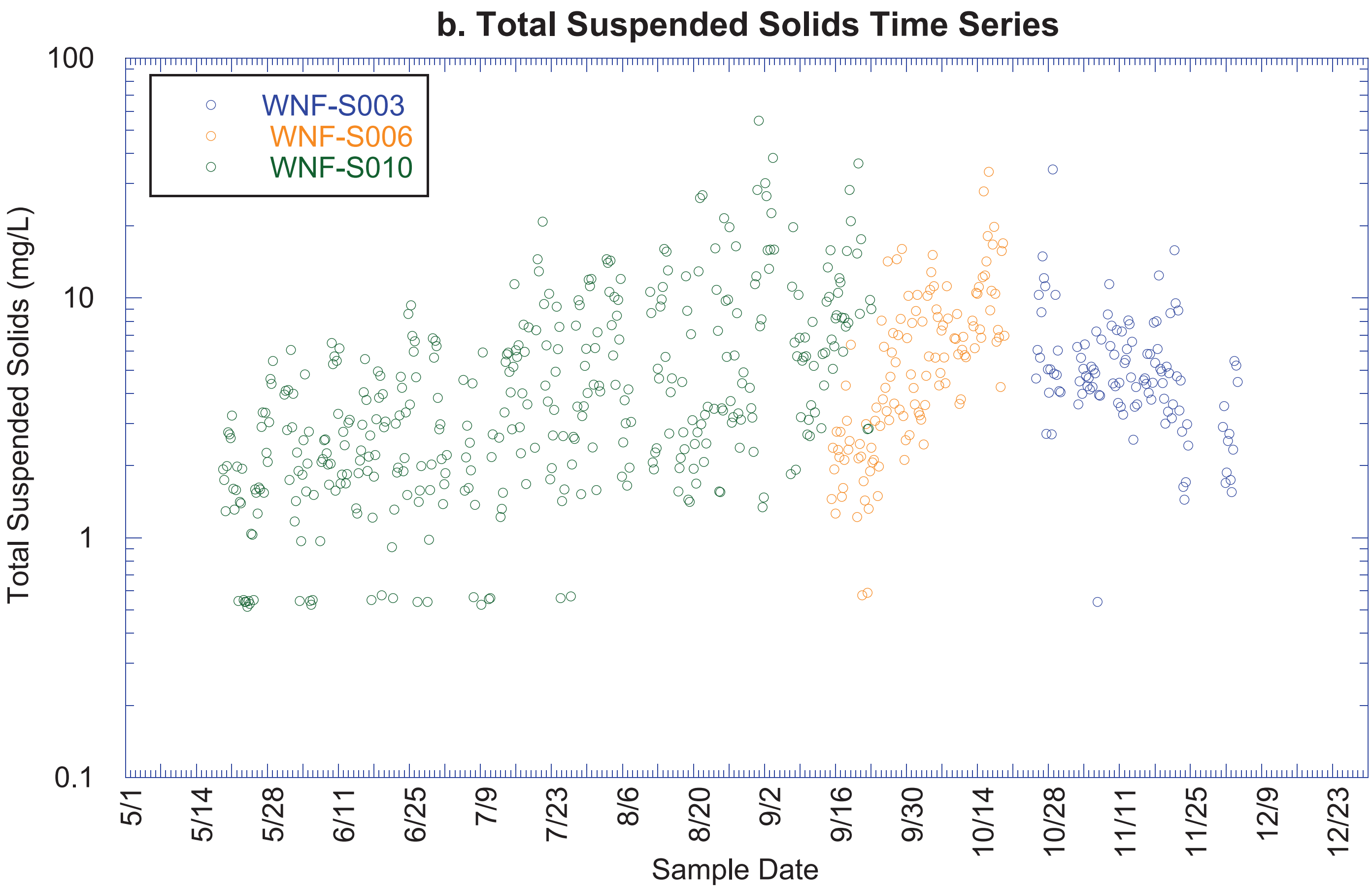
East Channel Rogers Island Downstream West



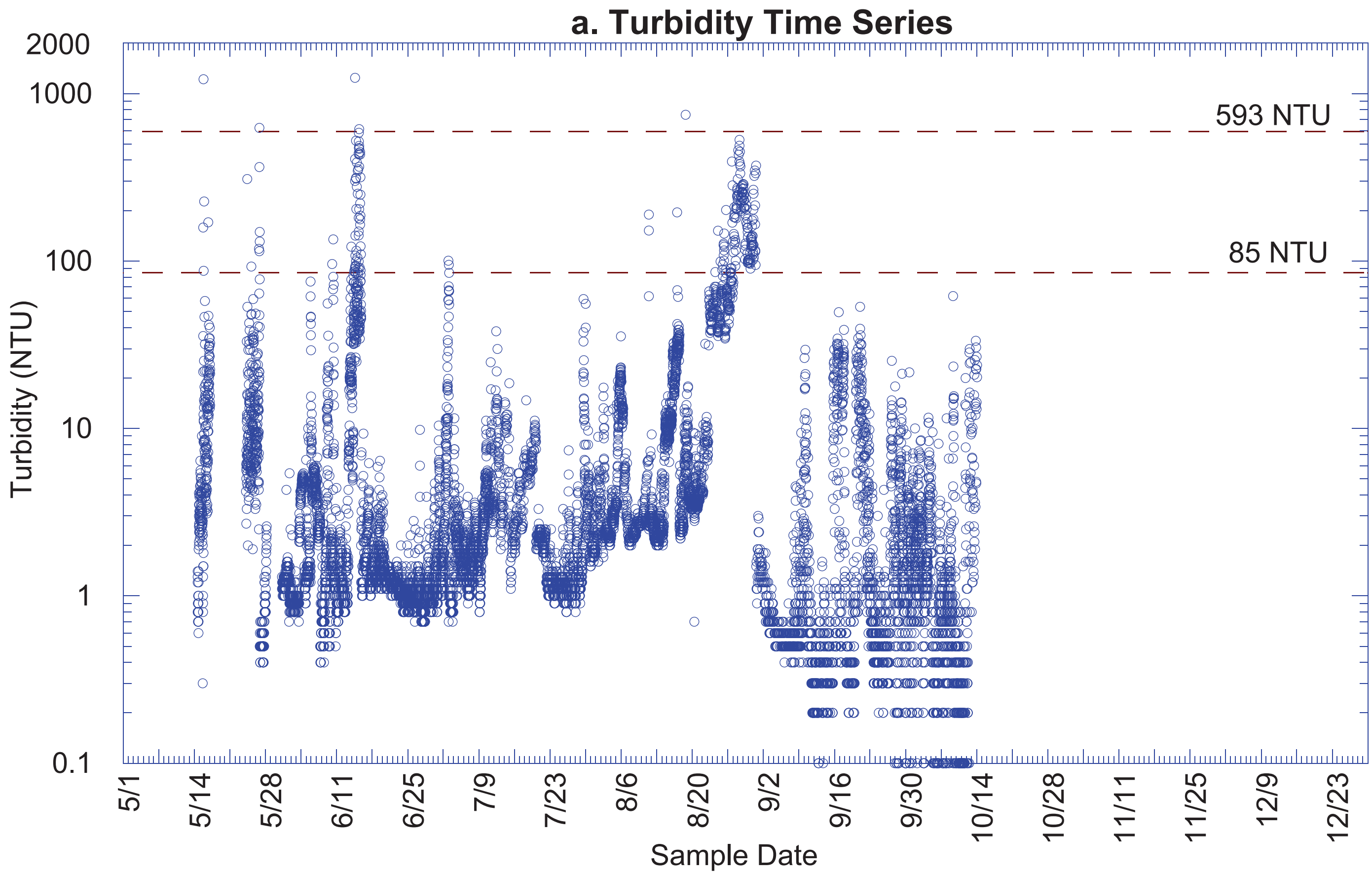


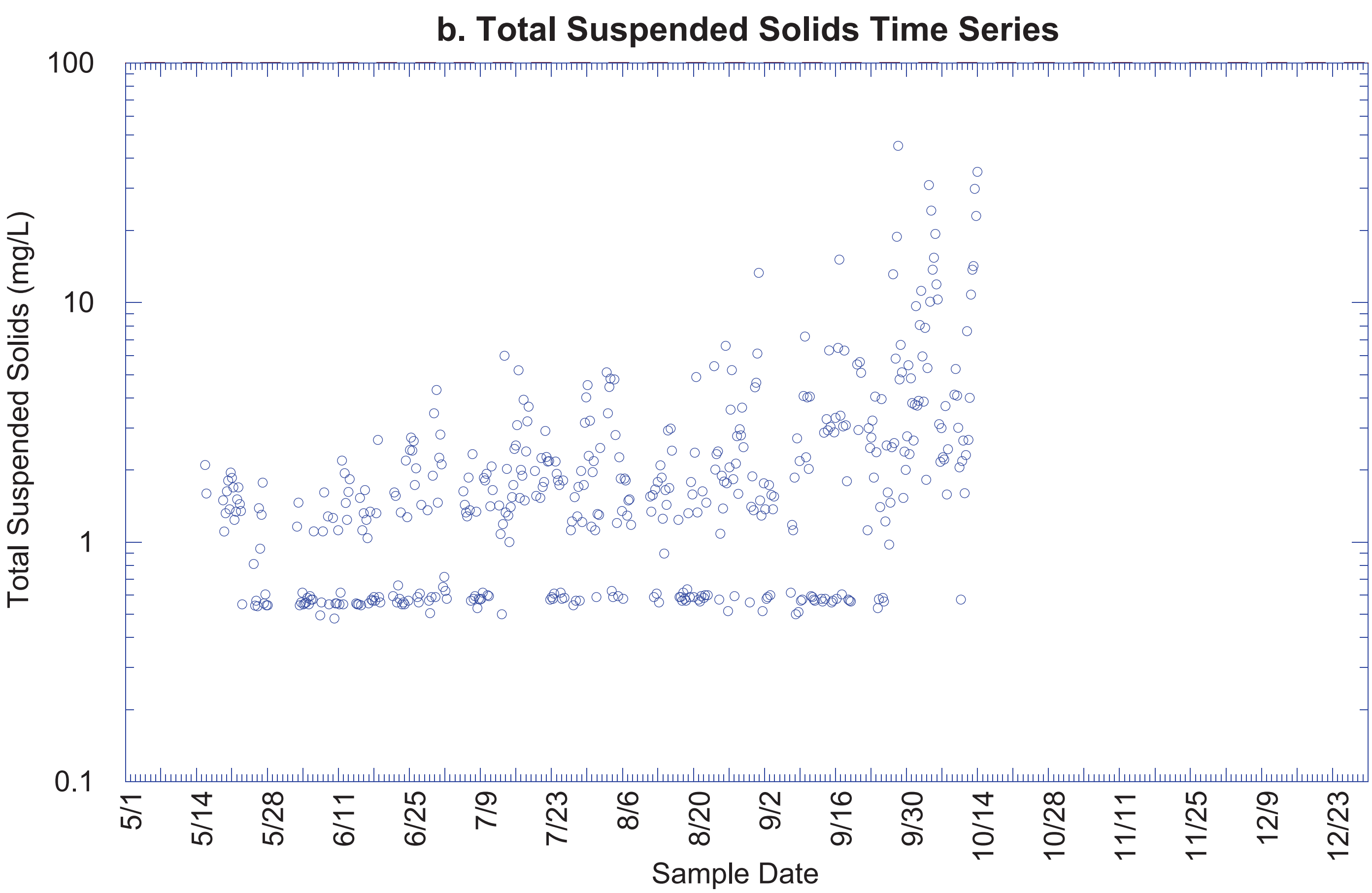
East Channel Rogers Island Downstream East



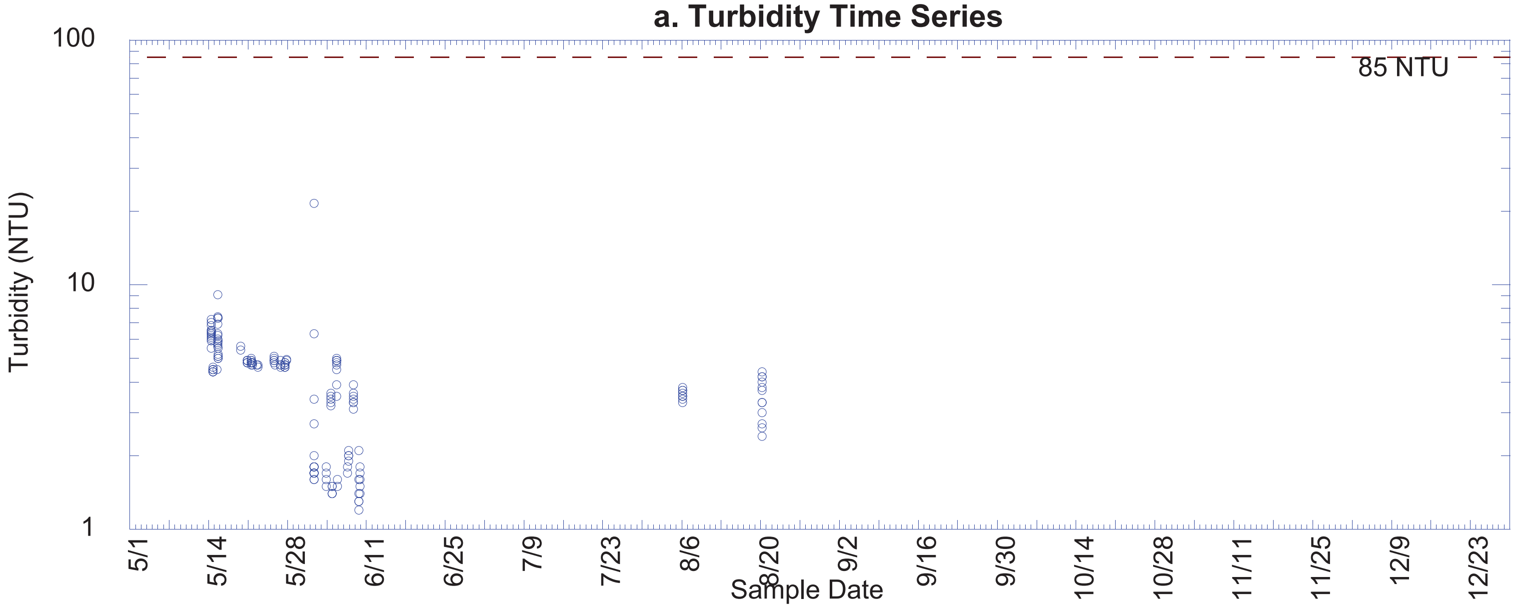


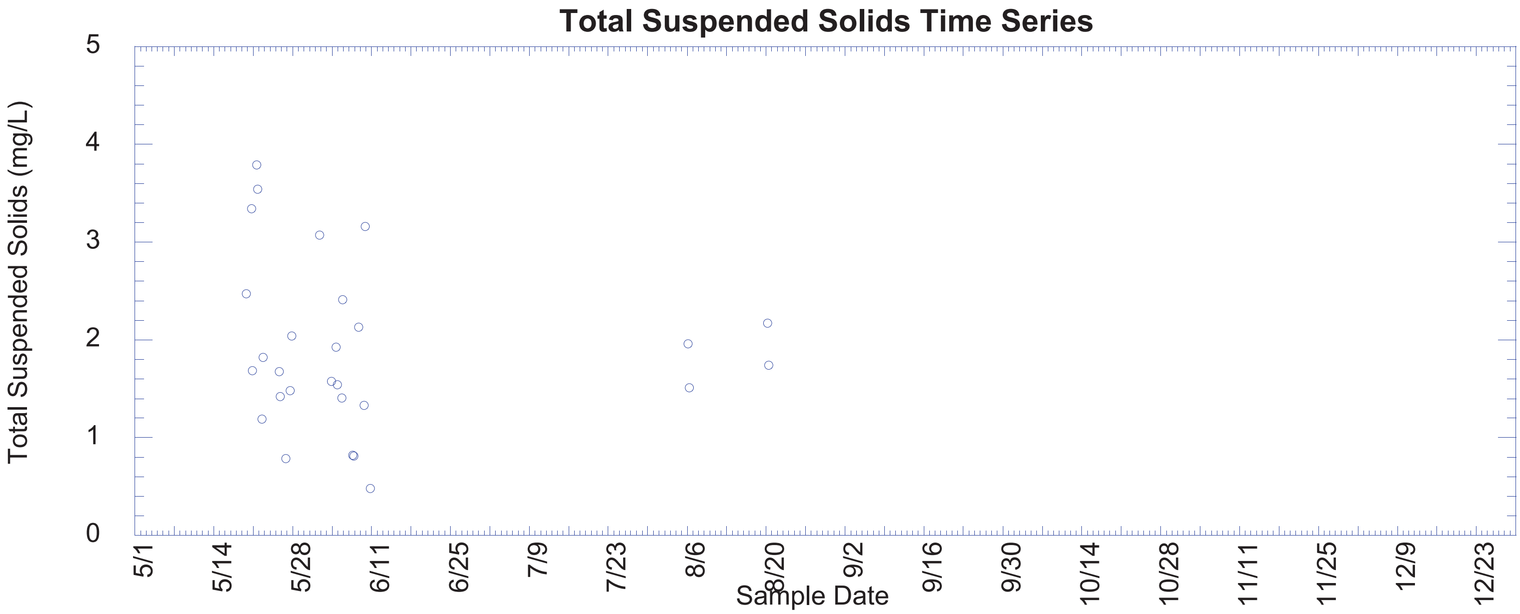
West Rogers Island: Operation #1 - 100m Upstream Buoy

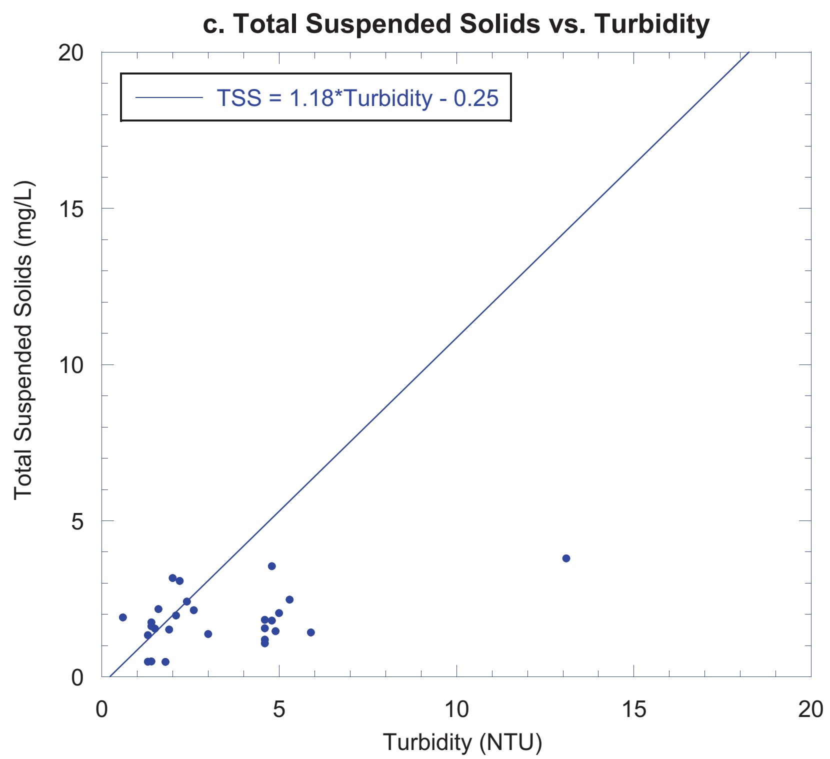




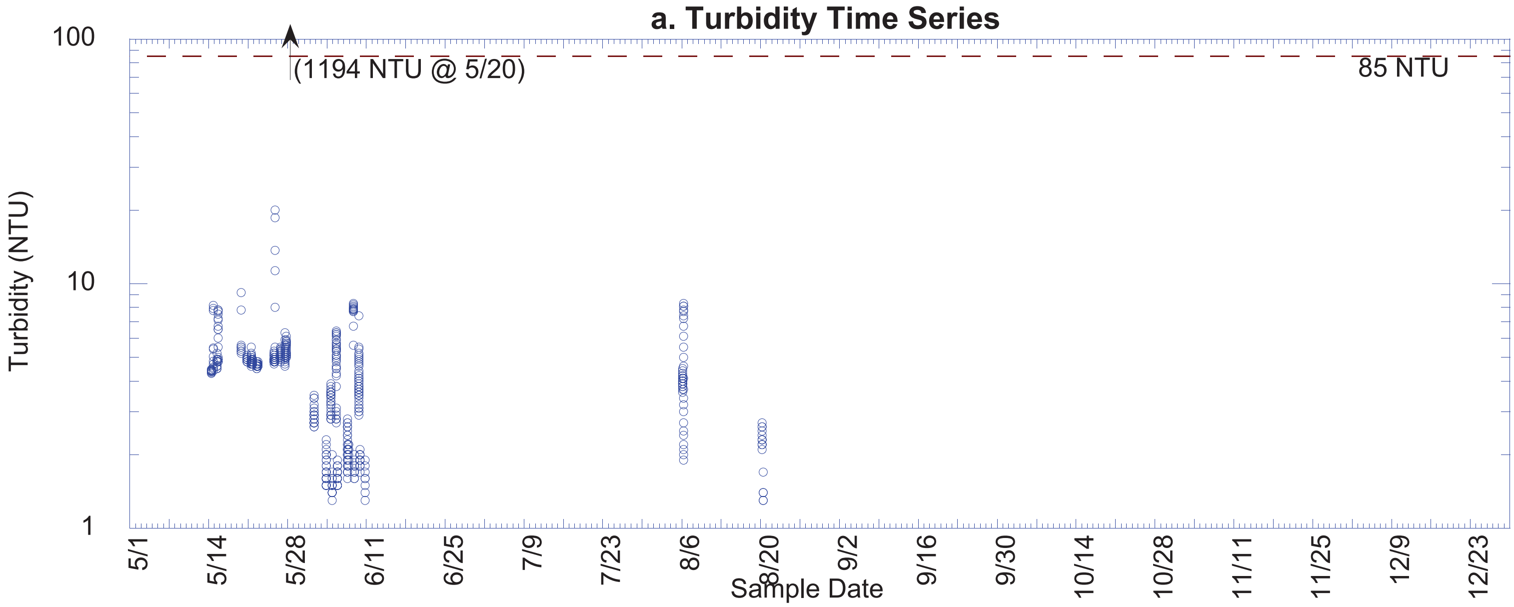
West Rogers Island: Operation #1 - 100m Upstream Transect

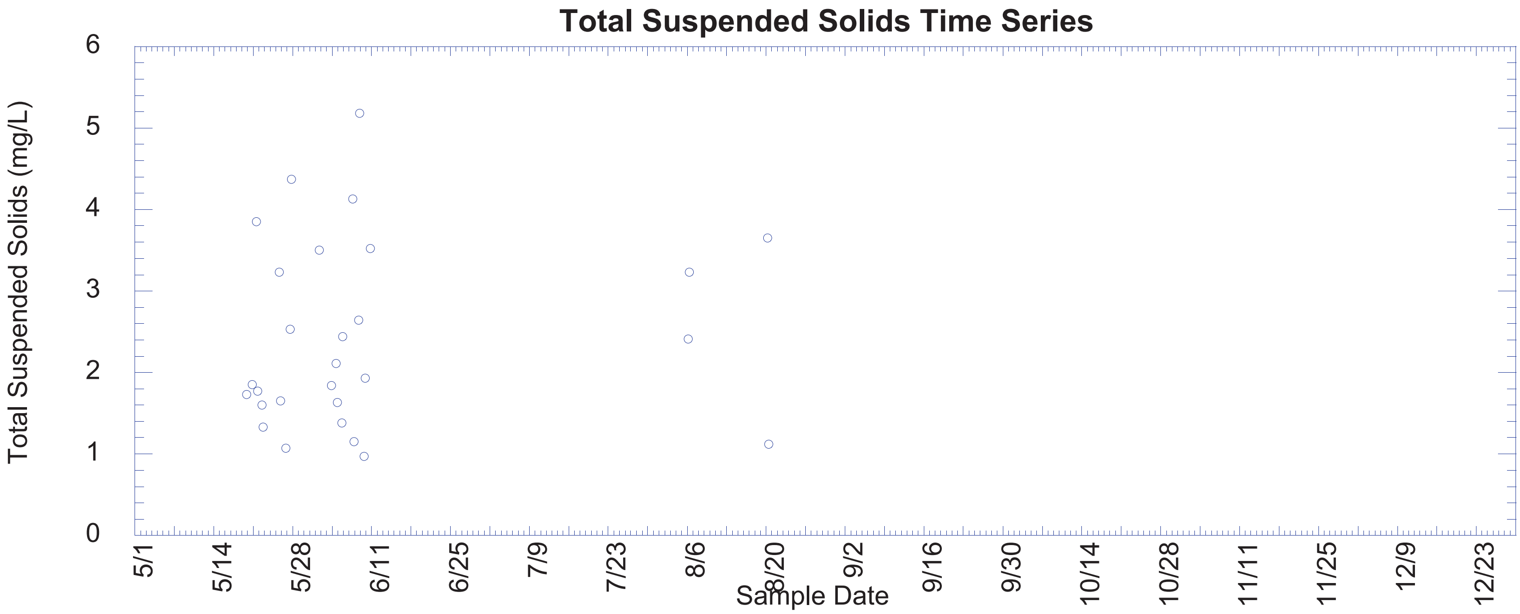


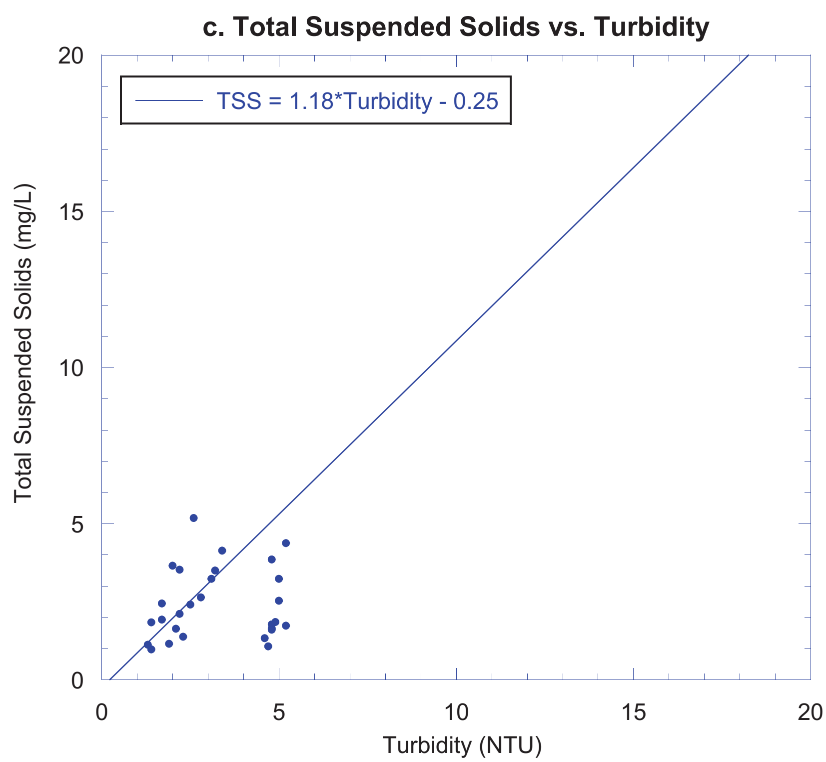




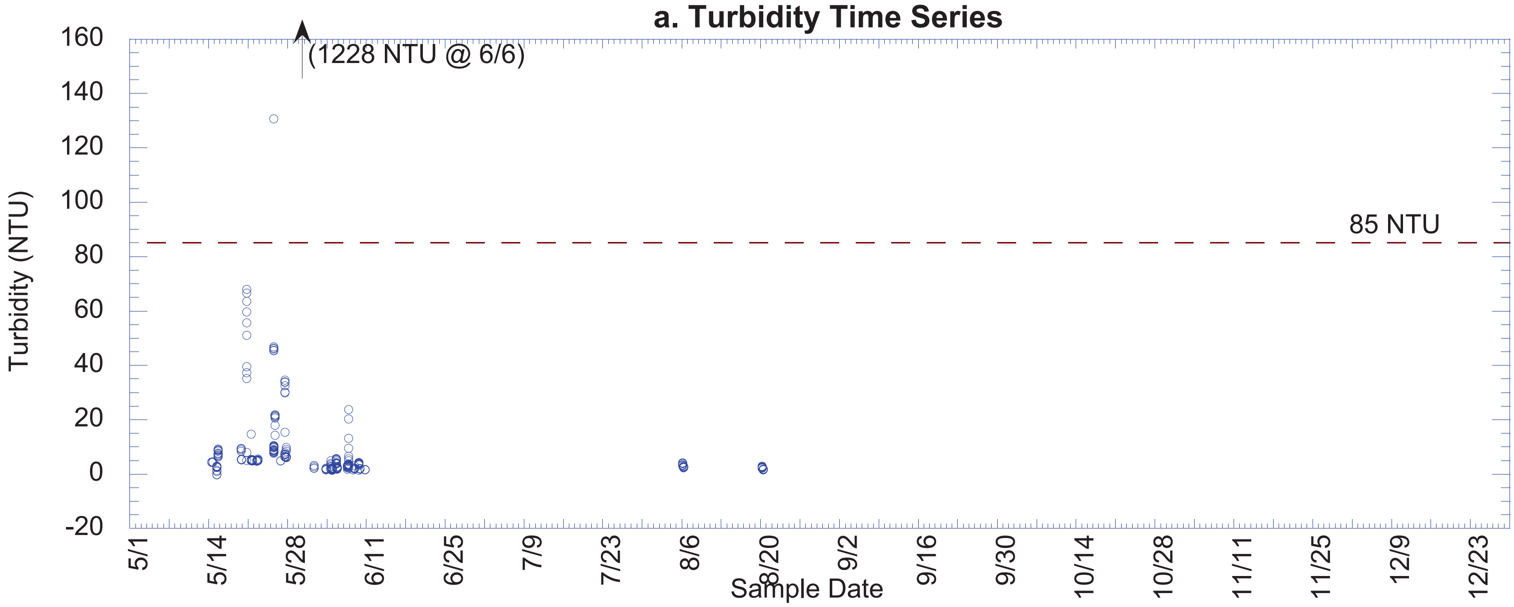
West Rogers Island: Operation #1 - 10m Side Channel Transect

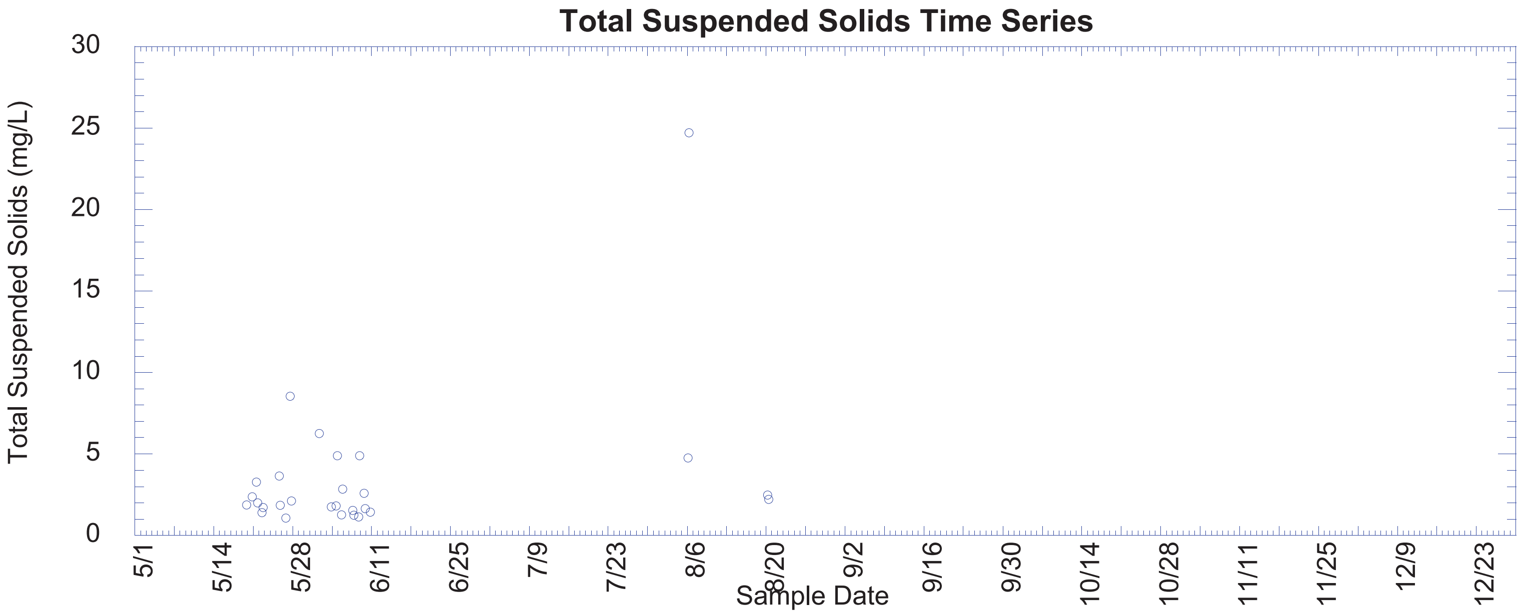


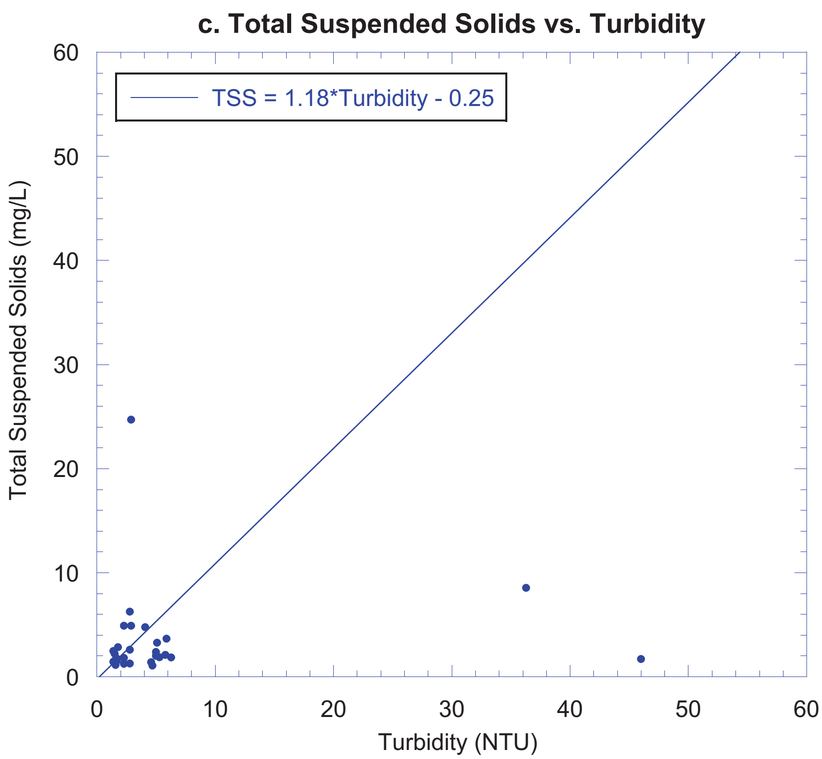




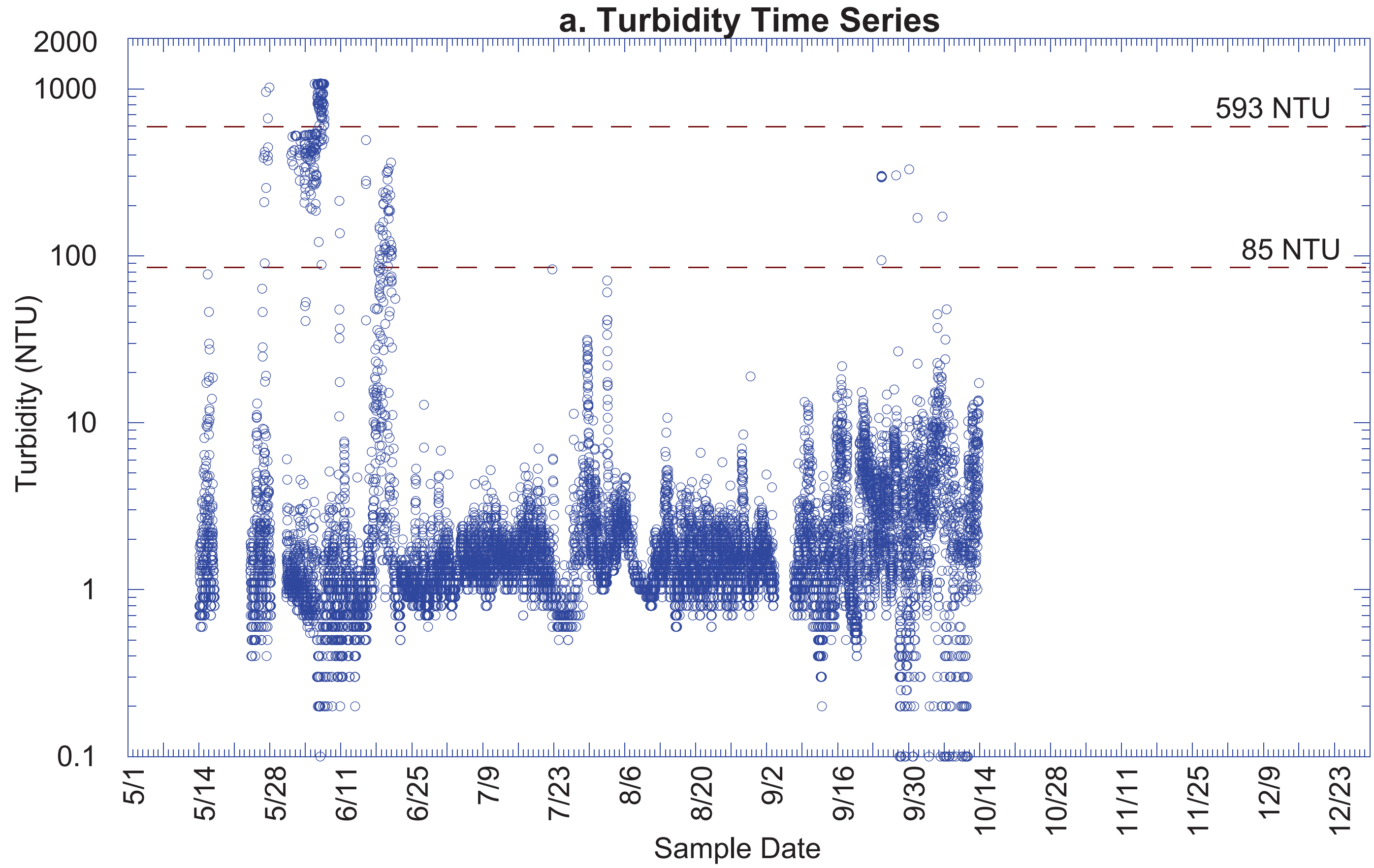
West Rogers Island: Operation #1 - 100m Downstream Transect

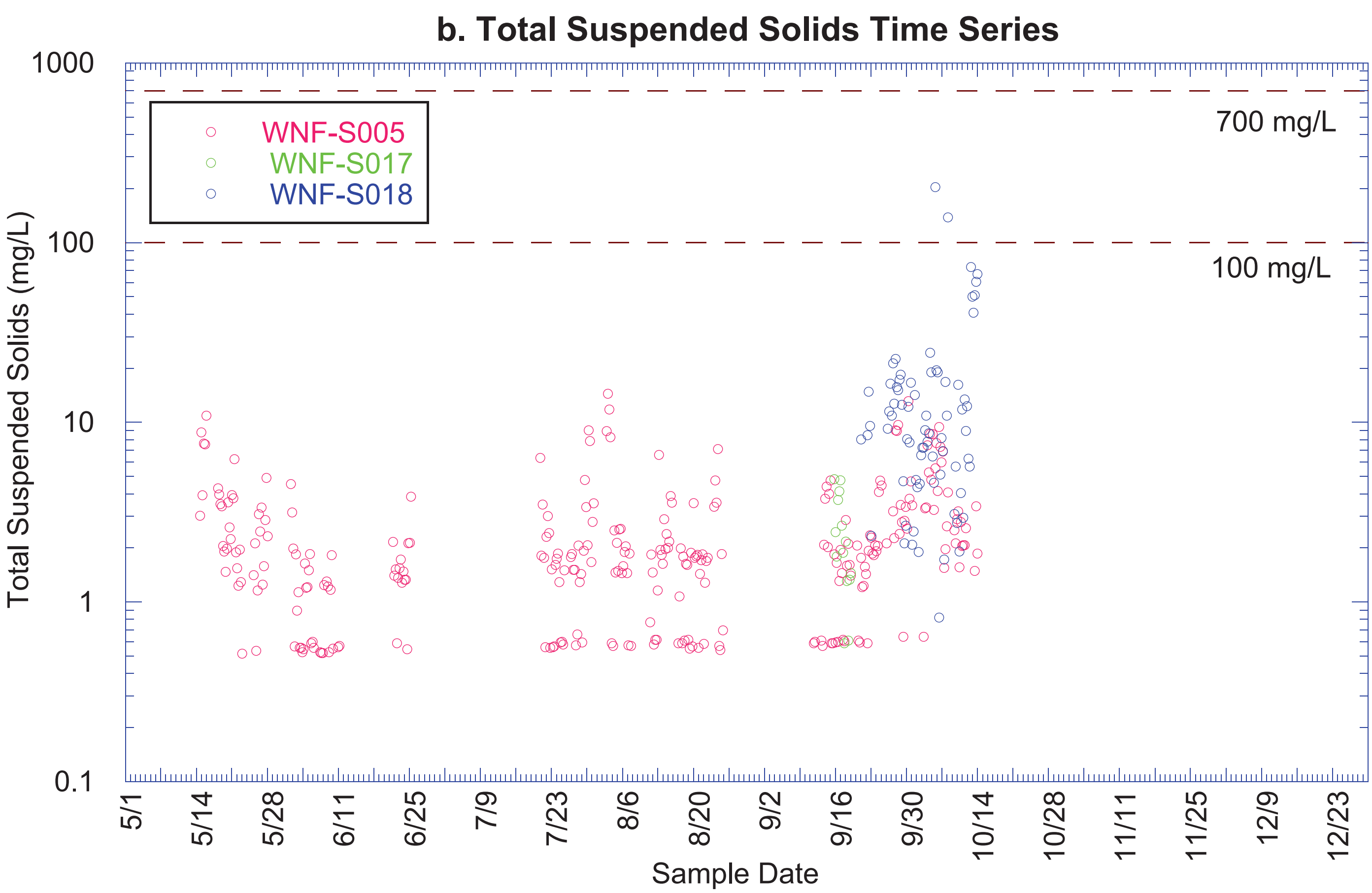




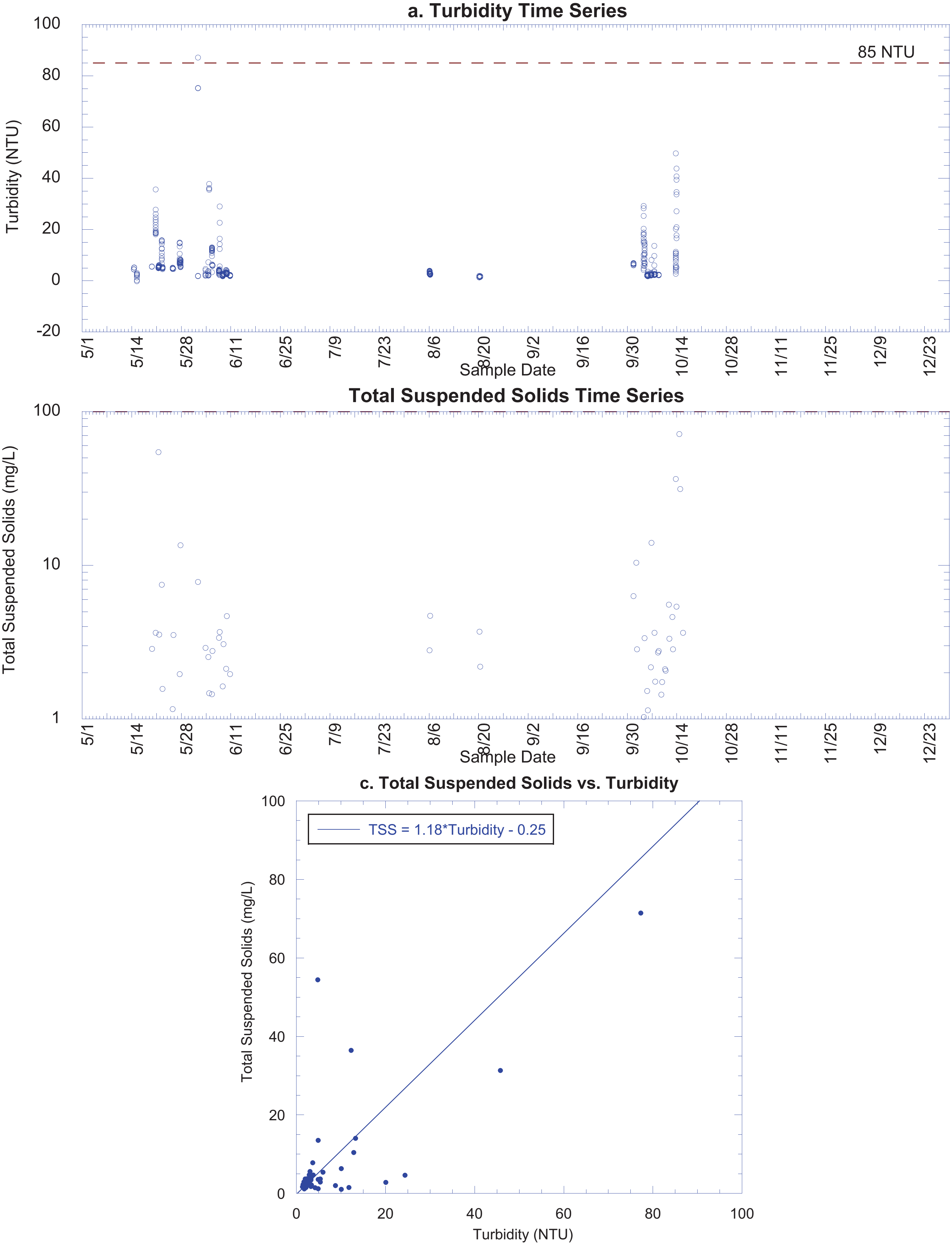


West Rogers Island: Operation #1 - 300m Downstream Buoy

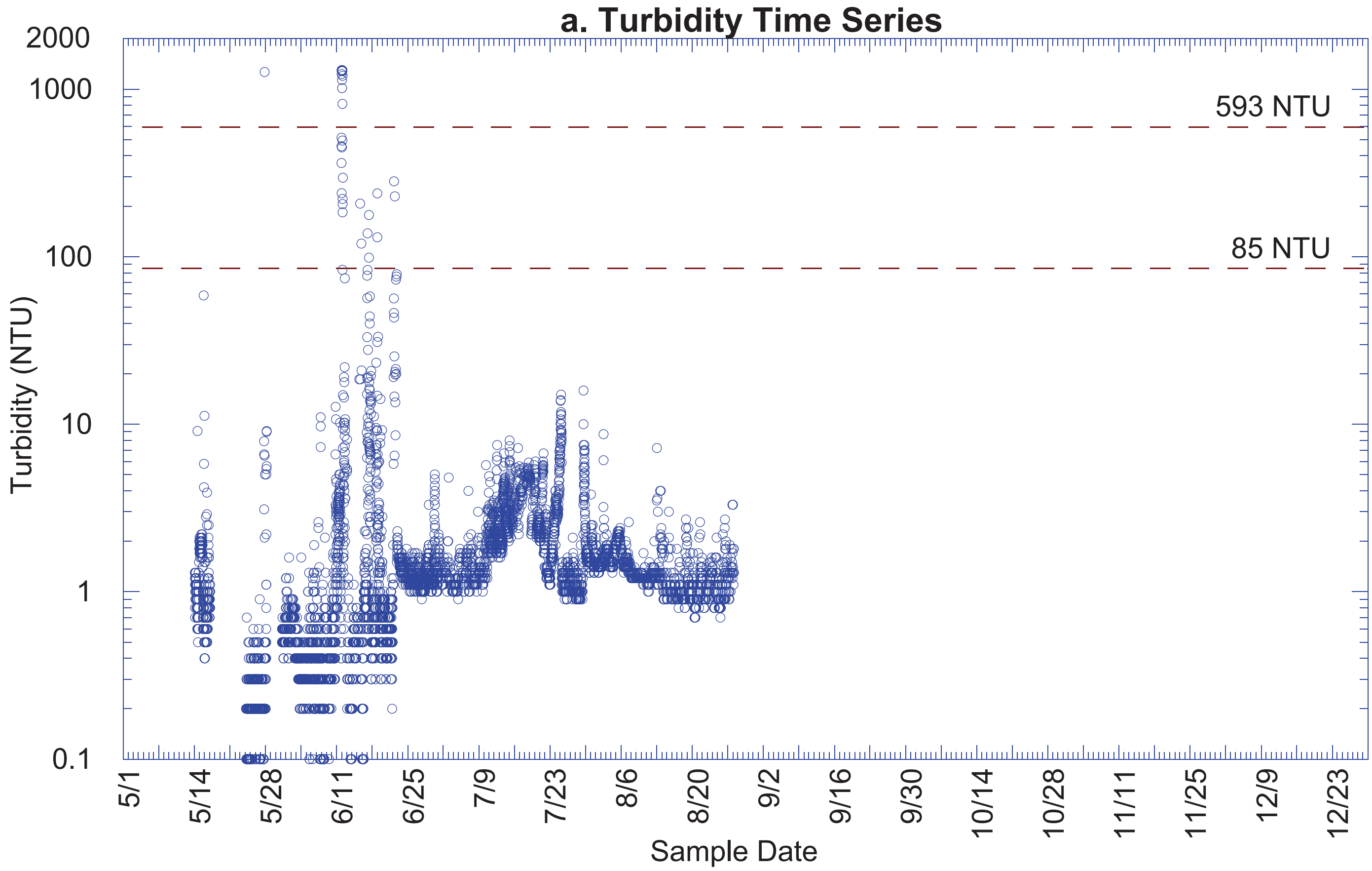


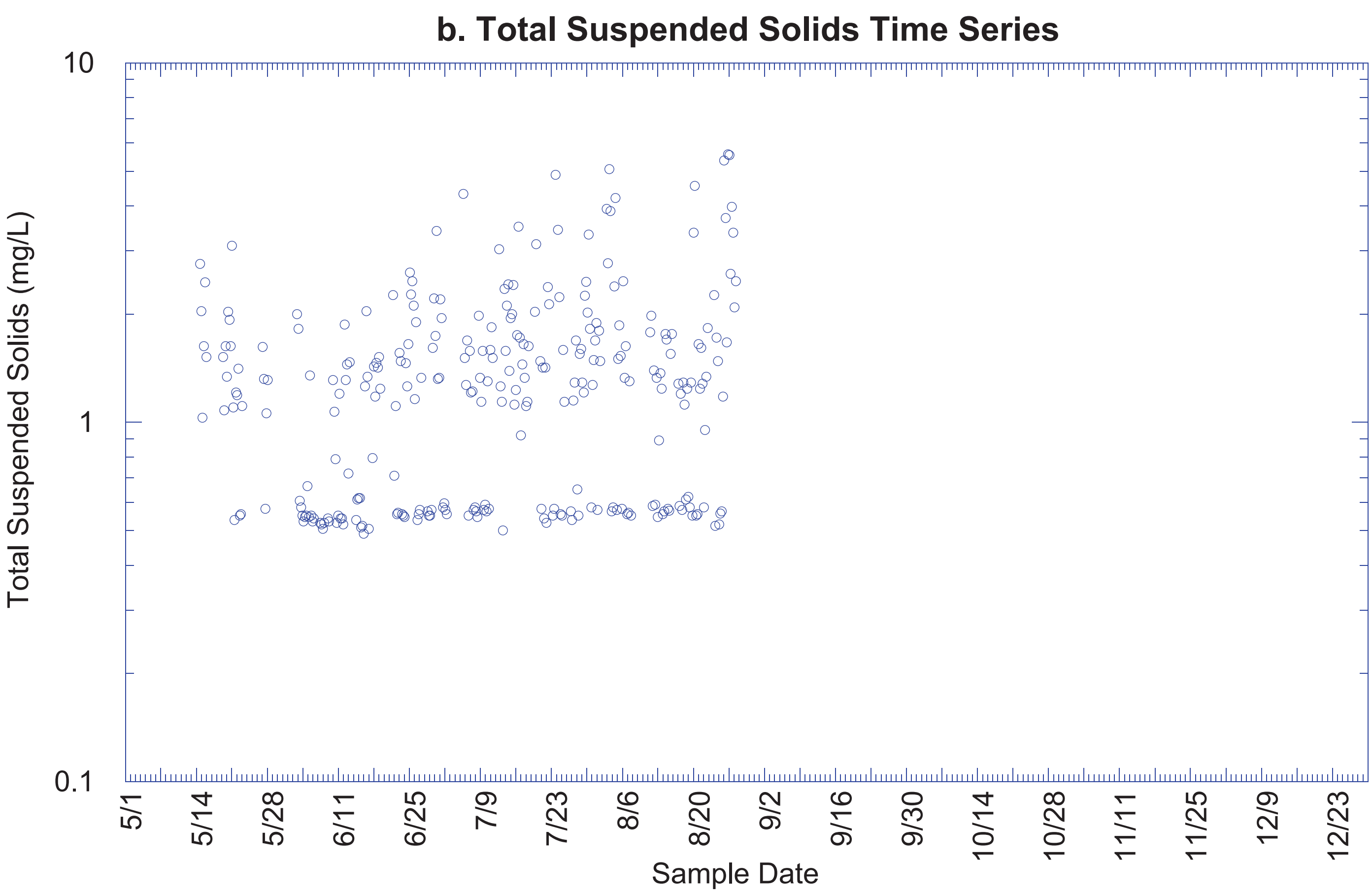


West Rogers Island: Operation #1 - 300m Downstream Transect

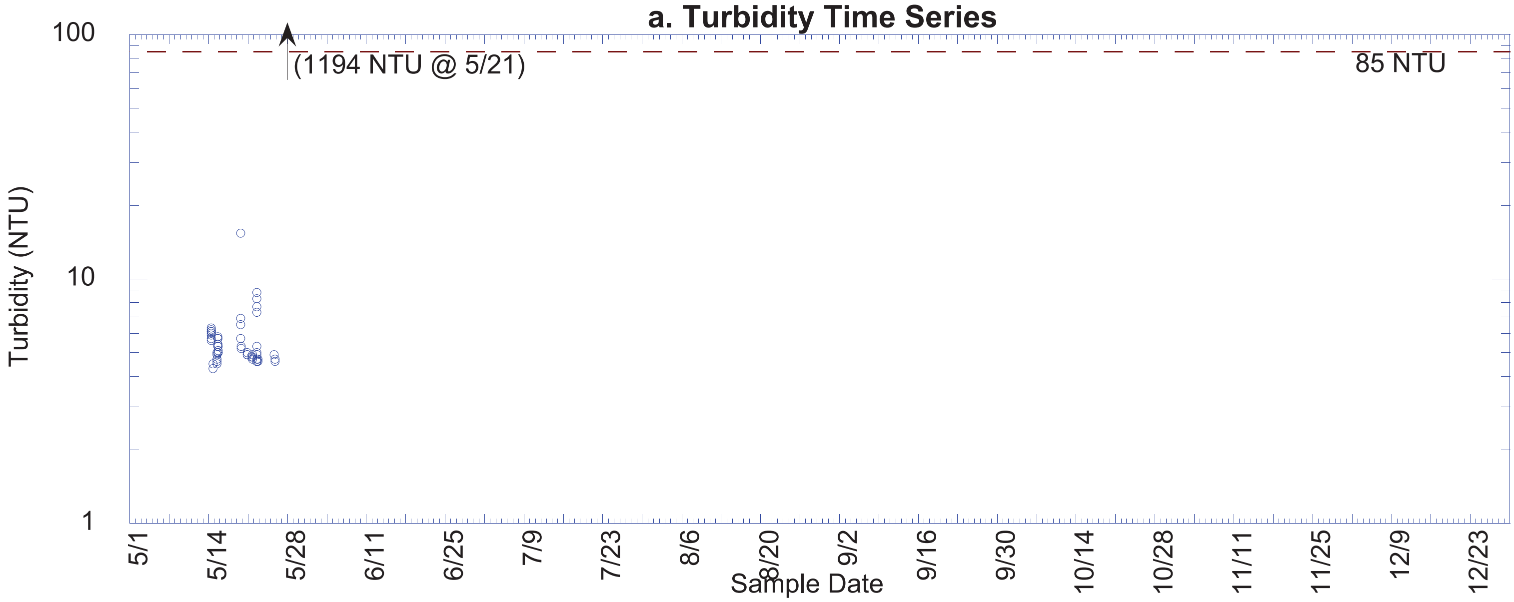


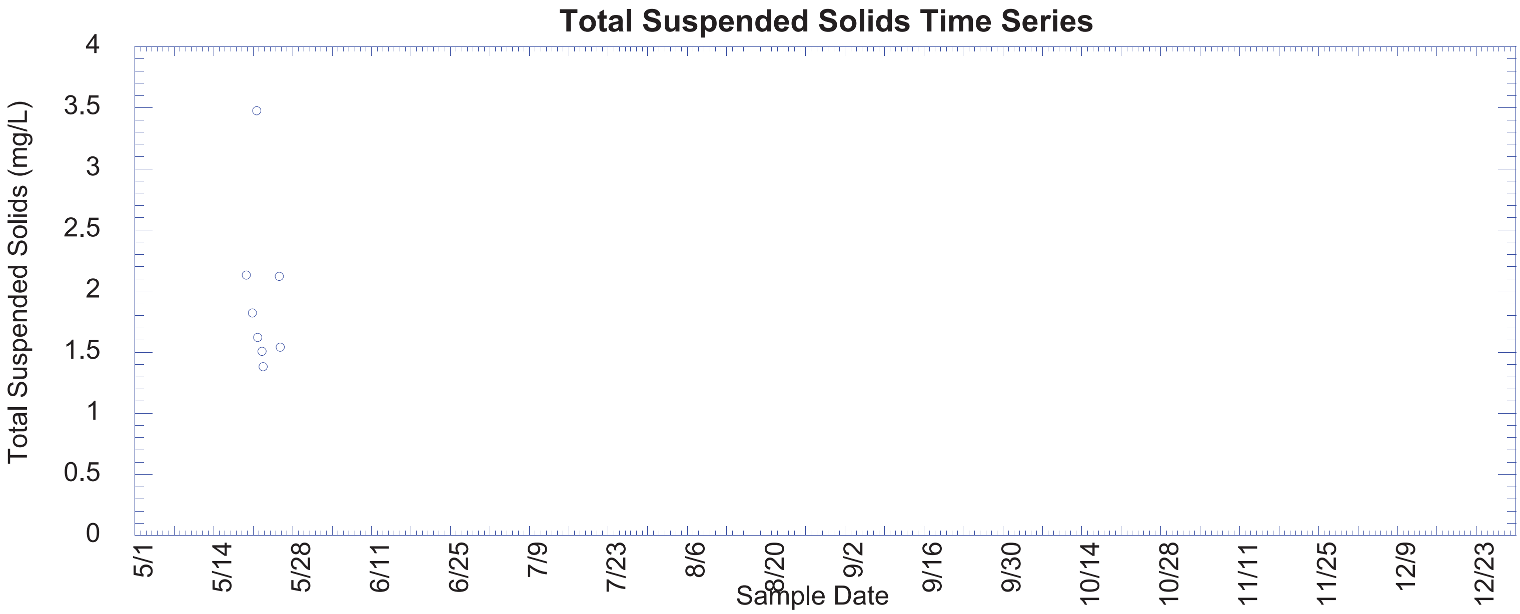
West Rogers Island: Operation #2 - 100m Upstream Buoy

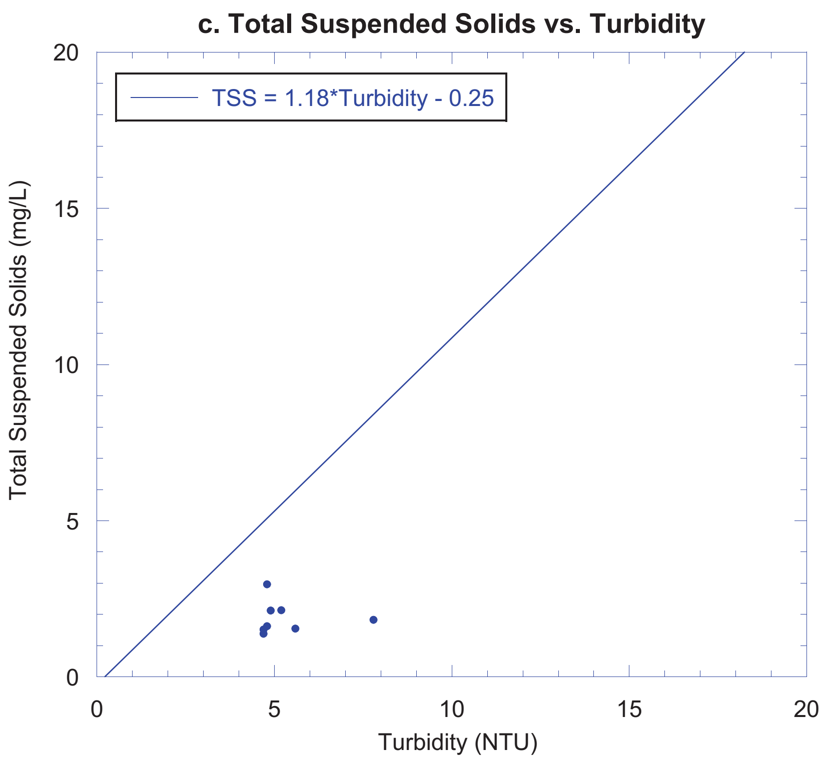




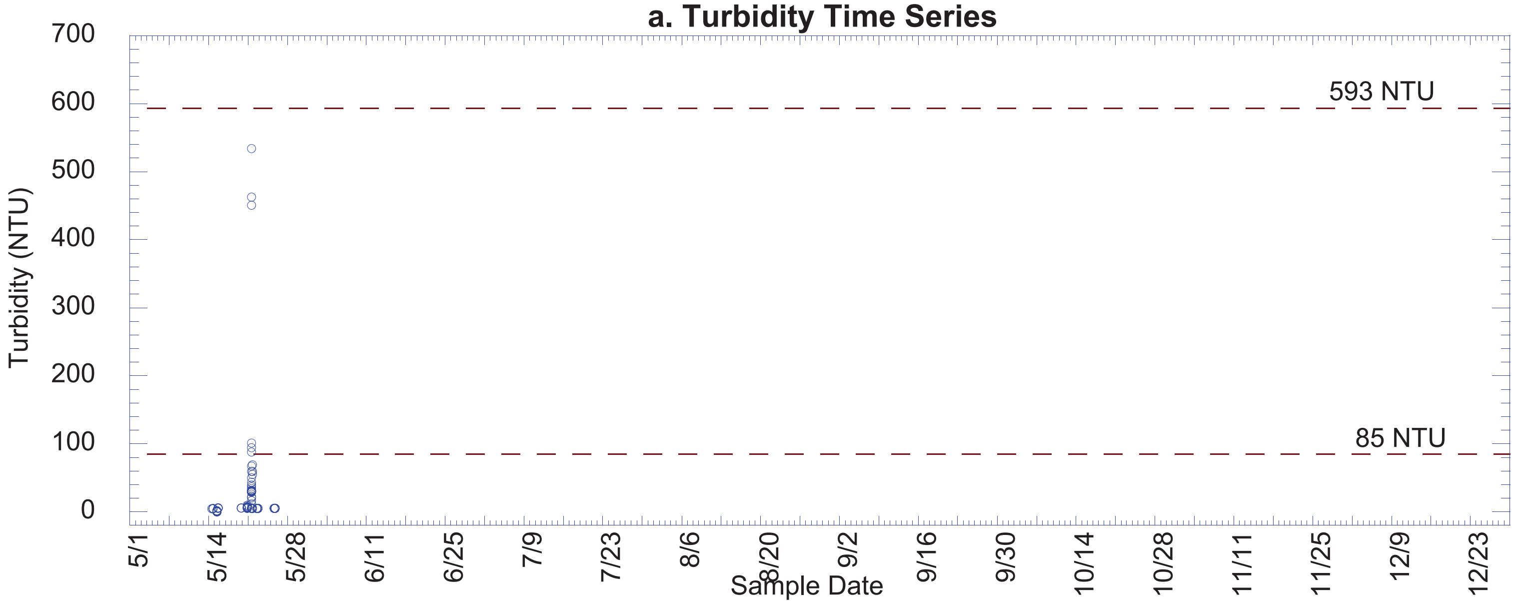
West Rogers Island: Operation #2 - 100m Upstream Transect

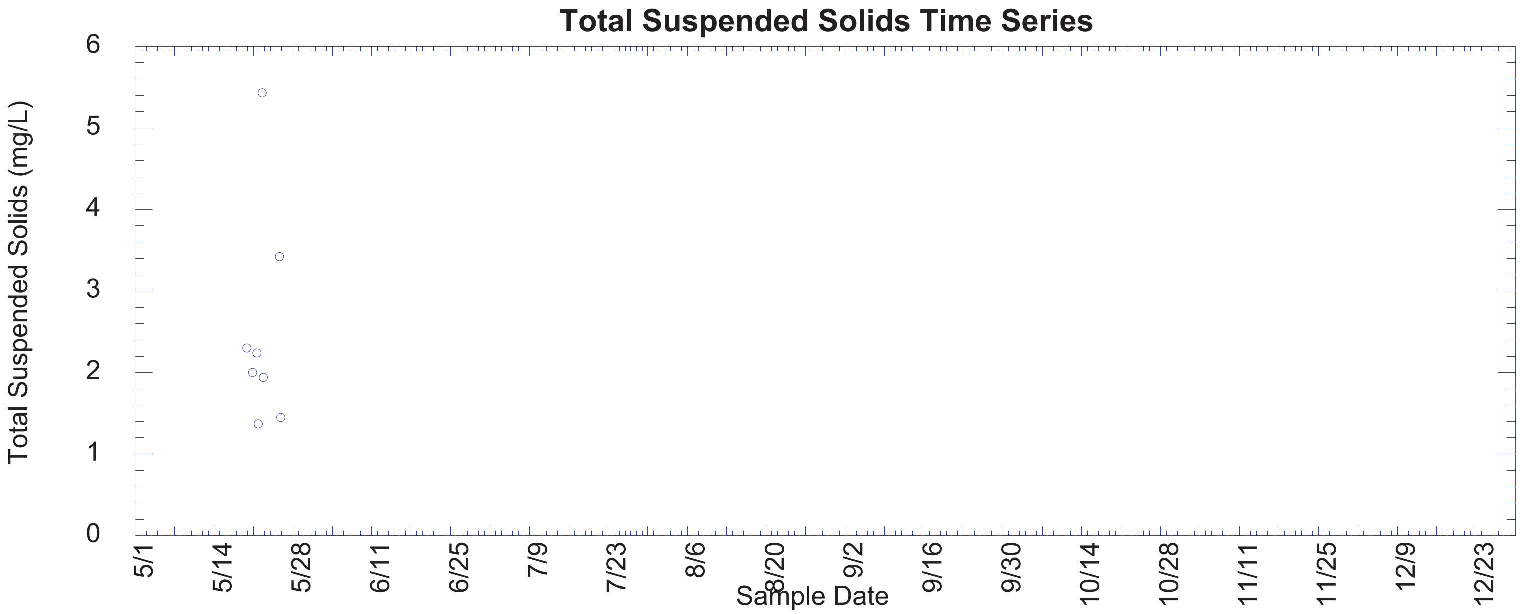


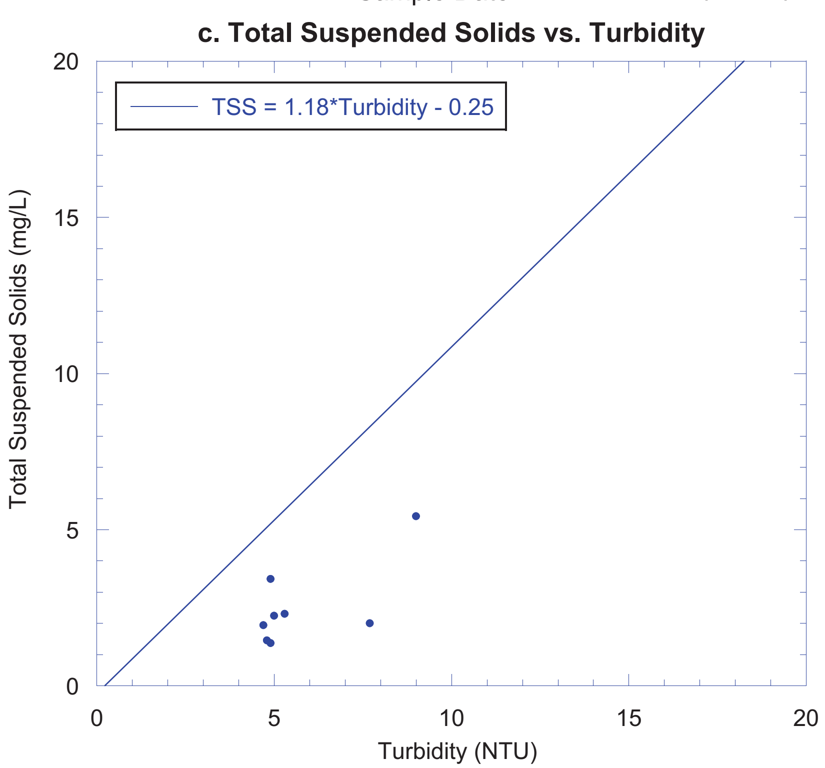




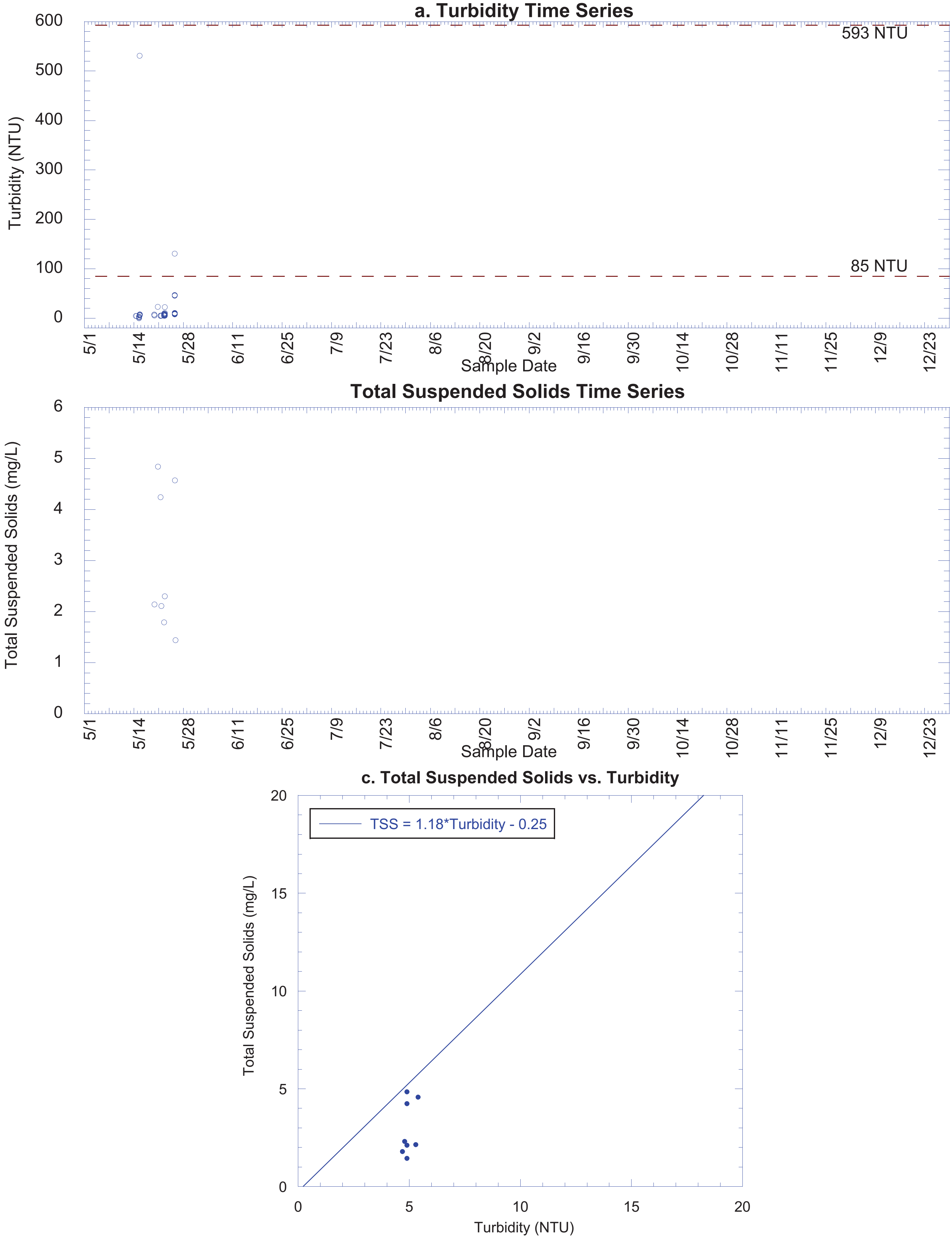
West Rogers Island: Operation #2 - 10m Side Channel Transect





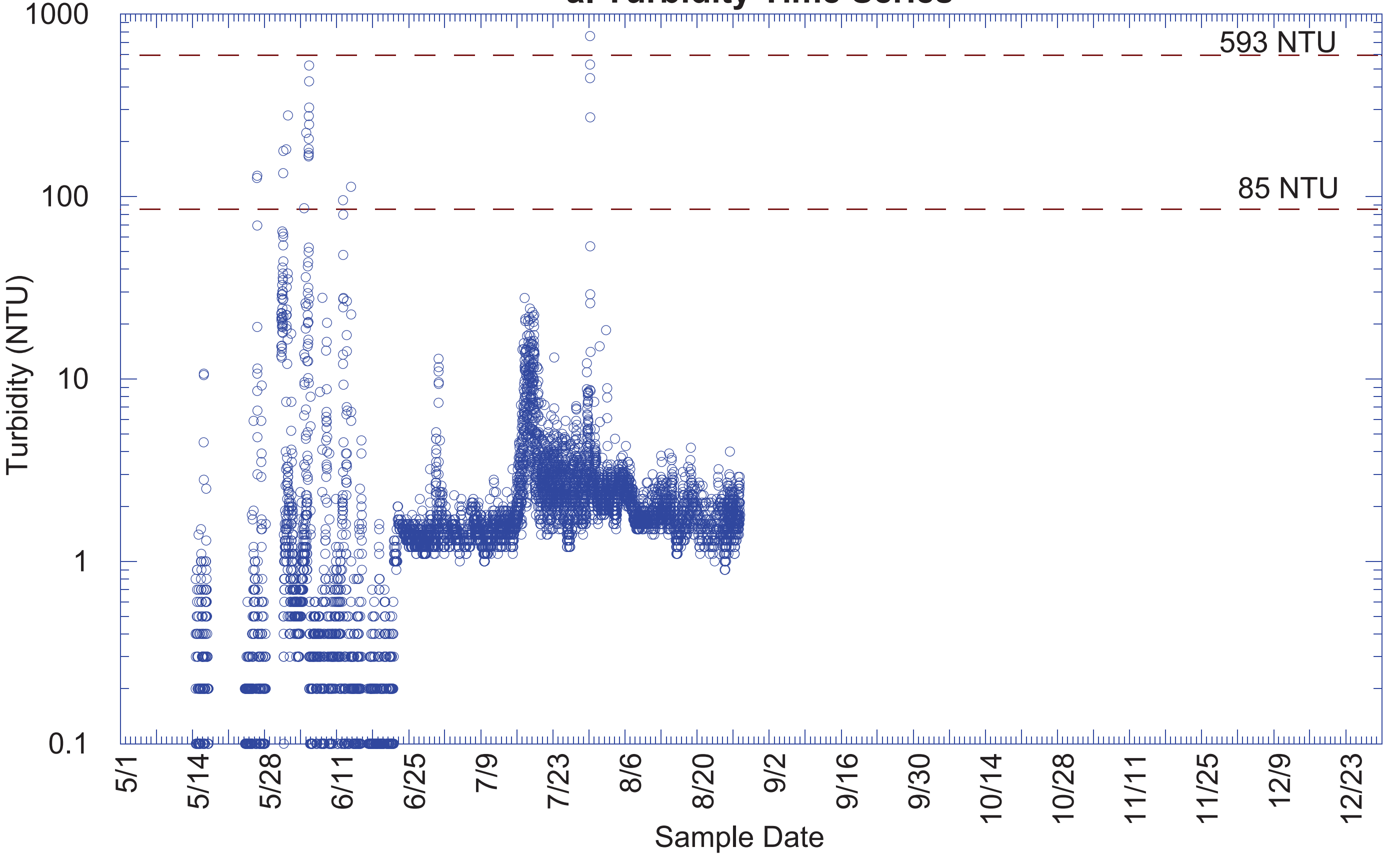


West Rogers Island: Operation #2 - 100m Downstream Transect

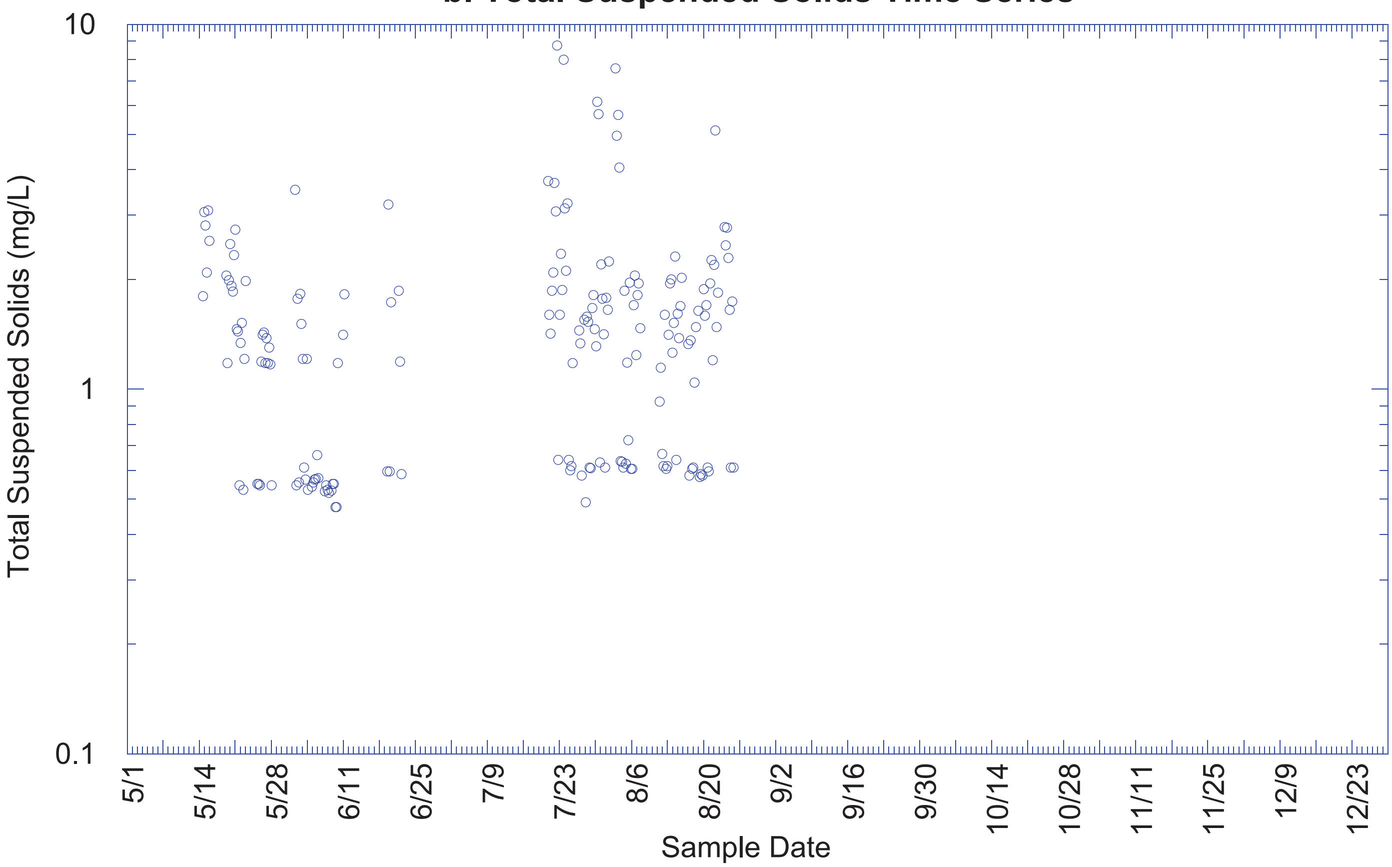


West Rogers Island: Operation #2 - 300m Downstream Buoy

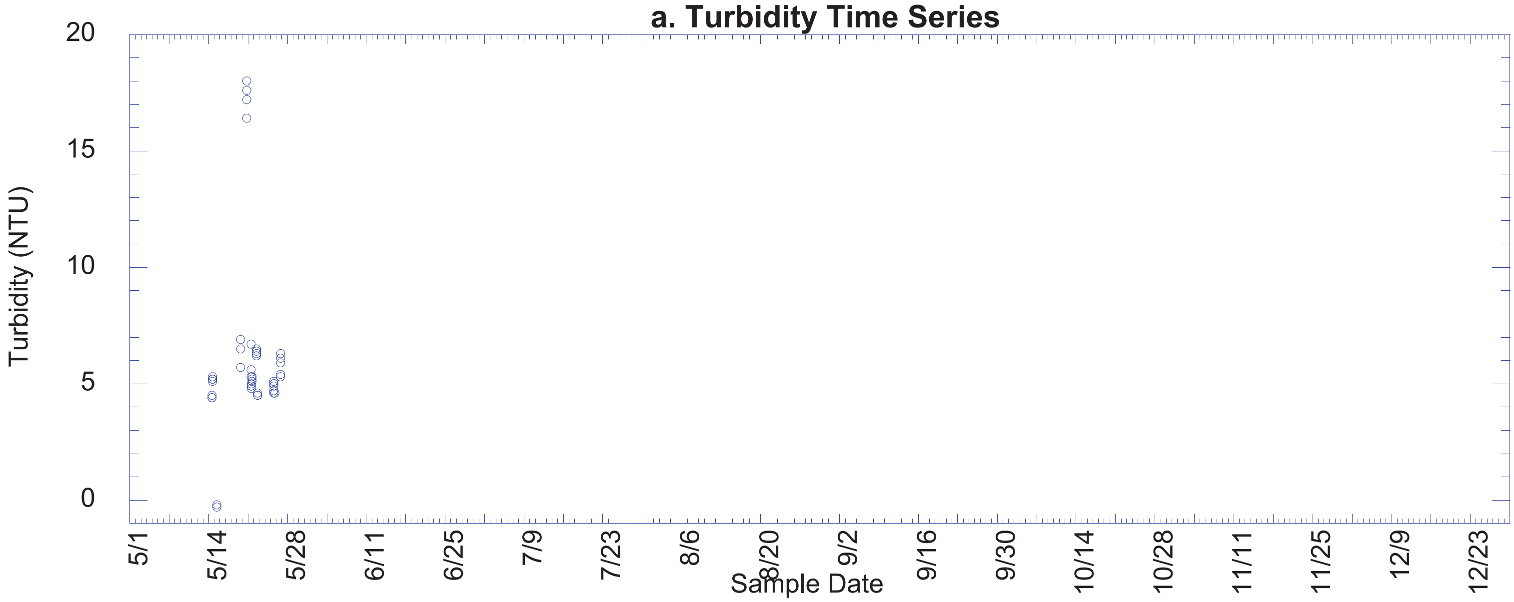
a. Turbidity Time Series

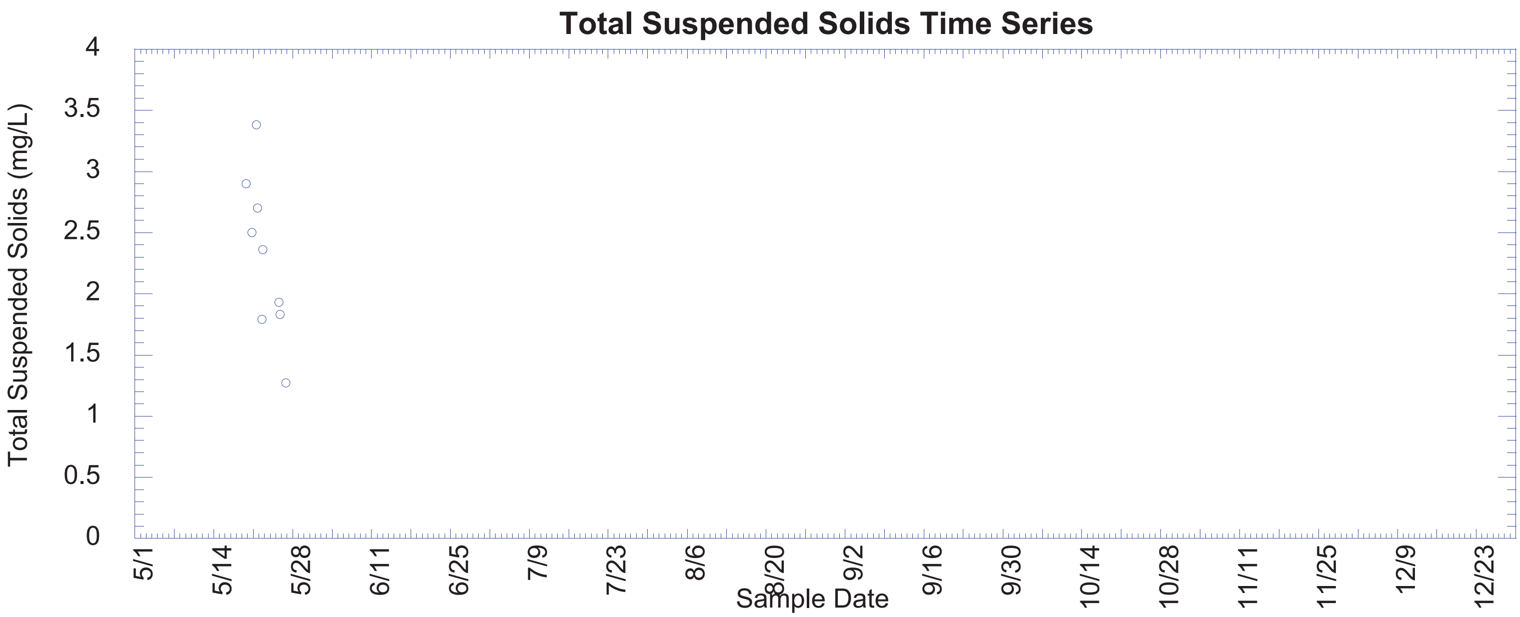


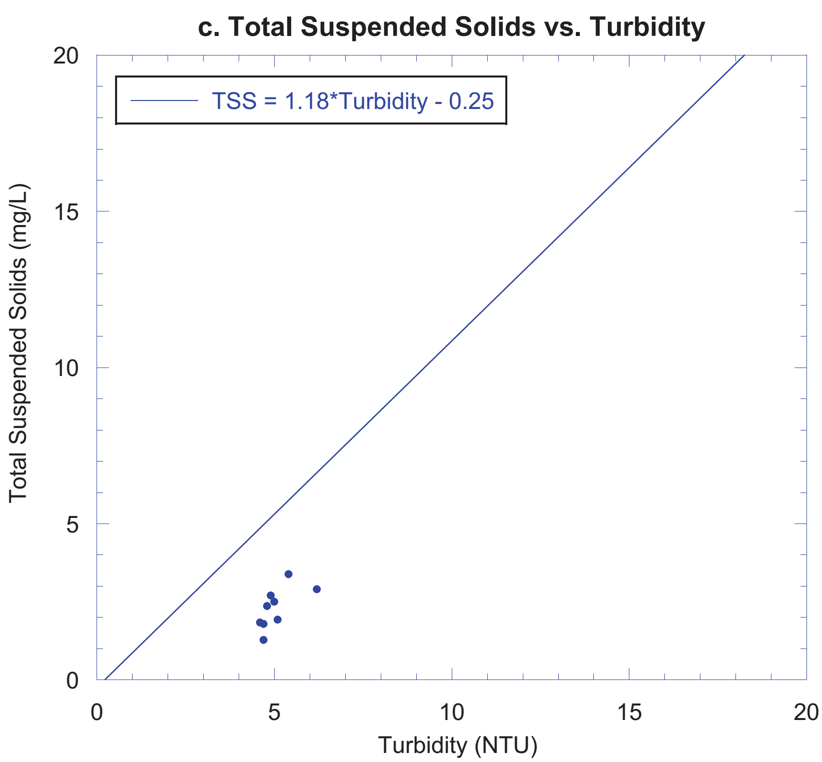
b. Total Suspended Solids Time Series



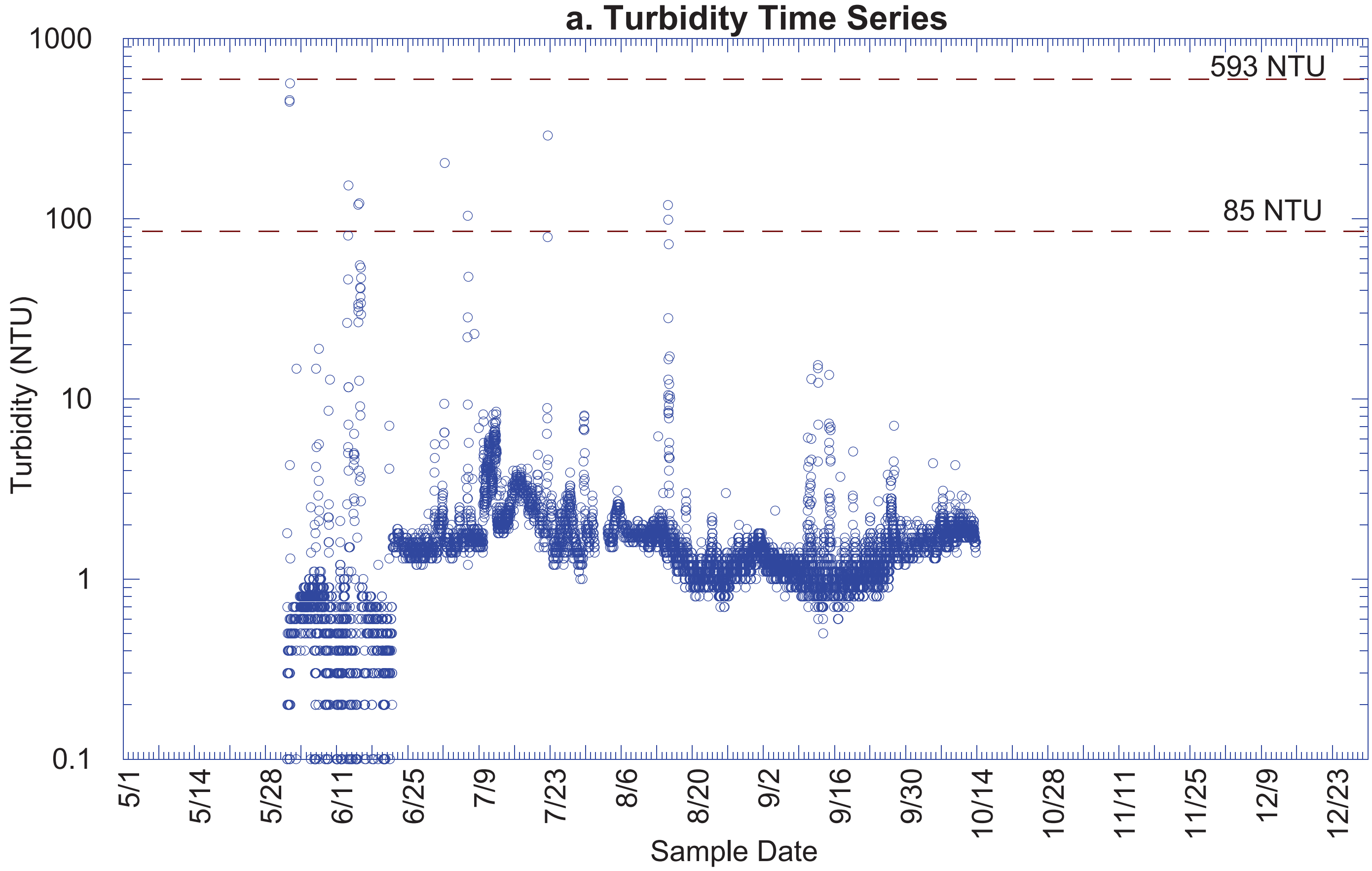
West Rogers Island: Operation #2 - 300m Downstream Transect

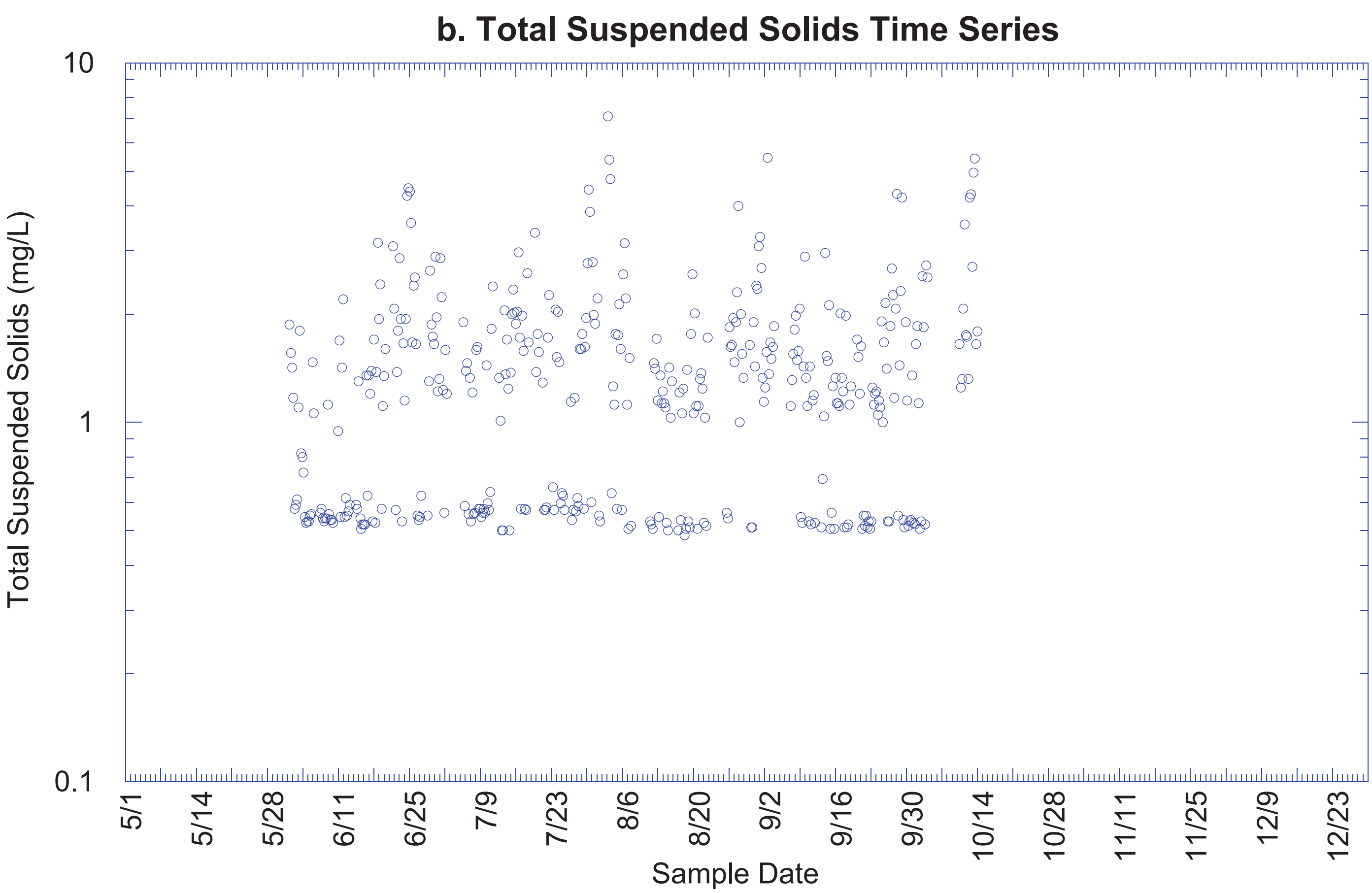




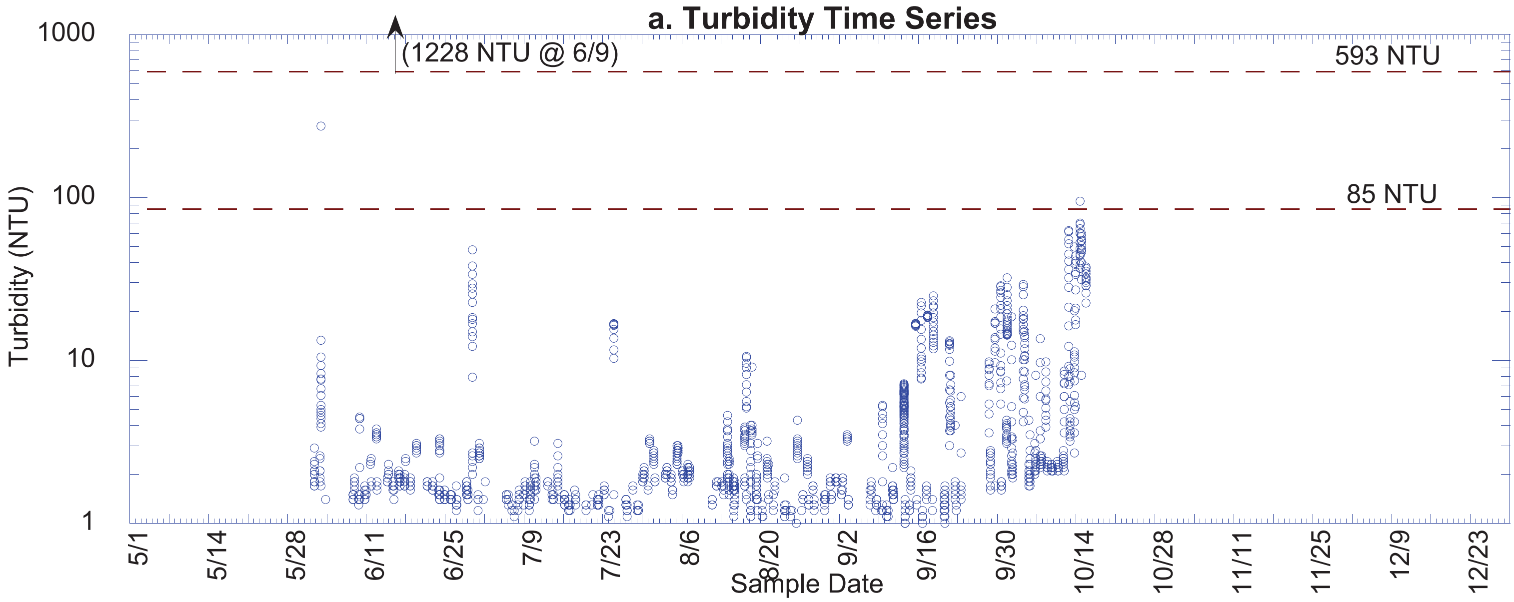


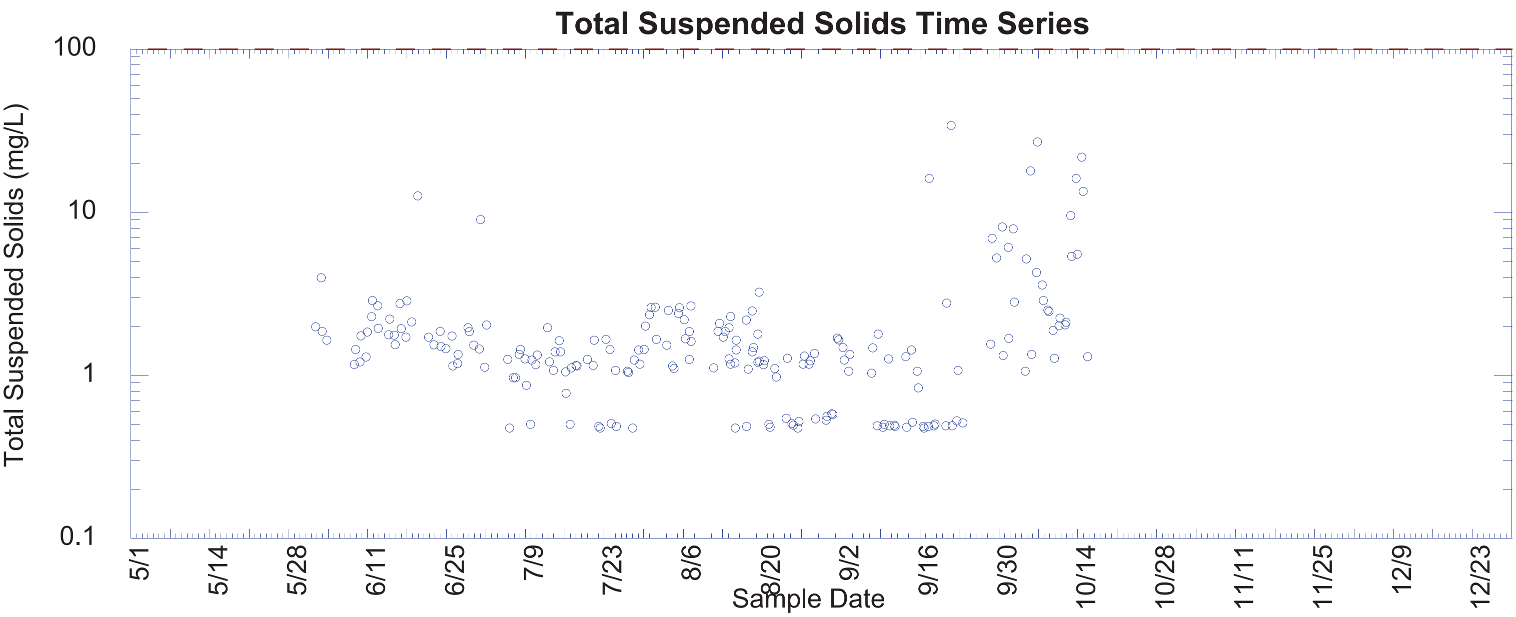
West Rogers Island: Operation #3 - 100m Upstream Buoy

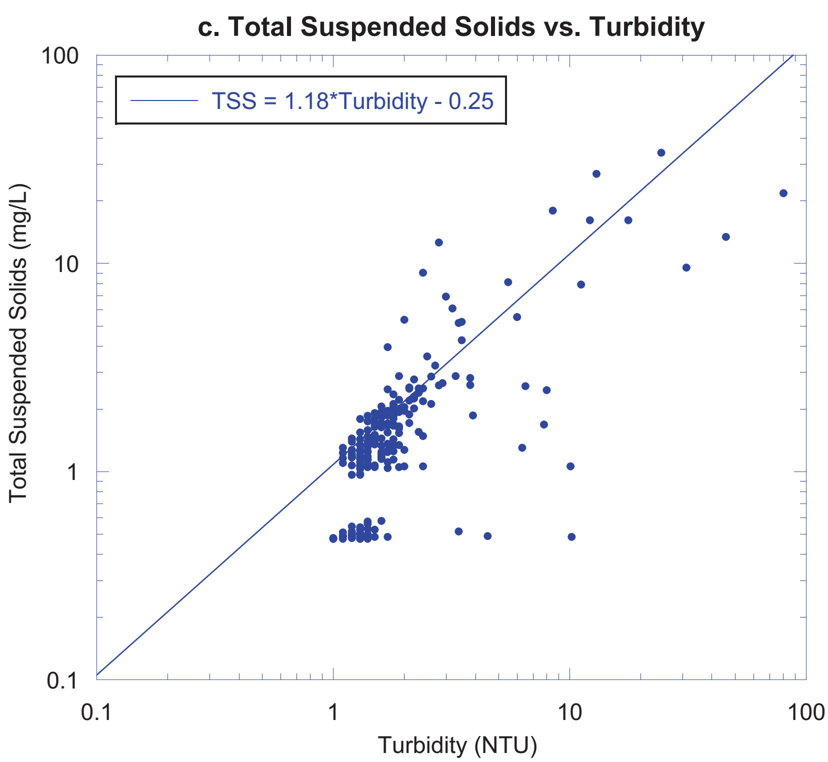




West Rogers Island: Operation #3 - 100m Upstream Transect

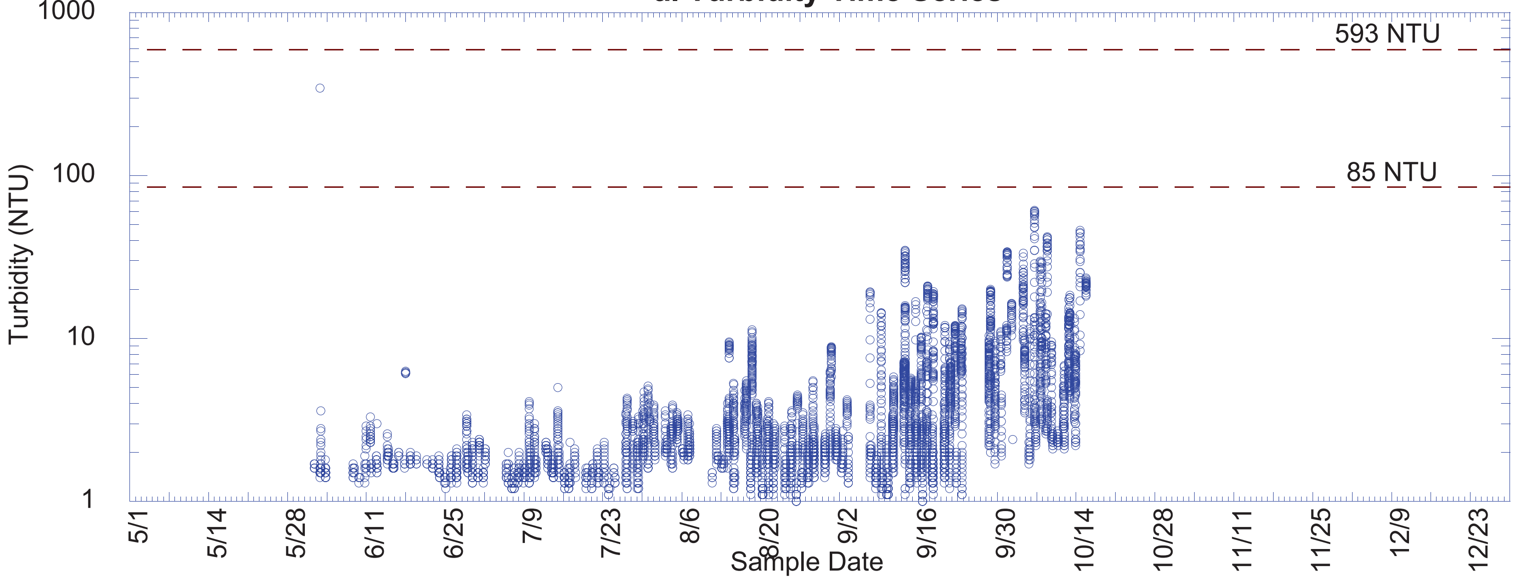




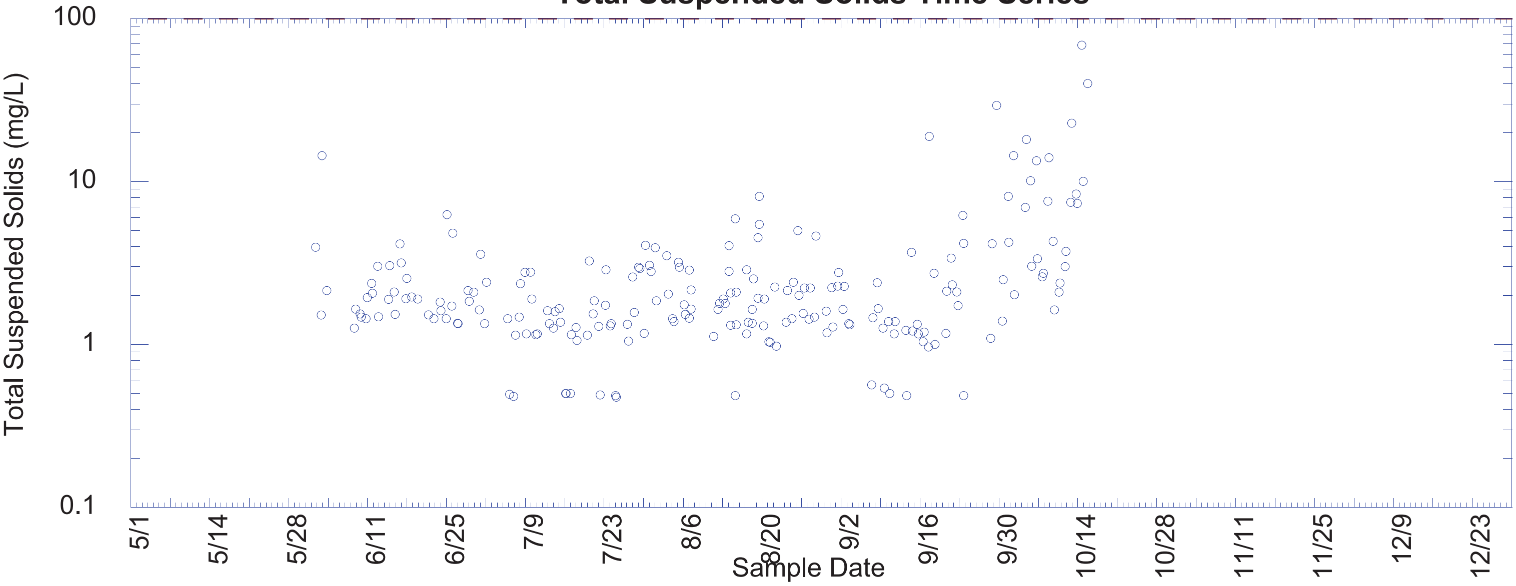


West Rogers Island: Operation #3 - 10m Side Channel Transect

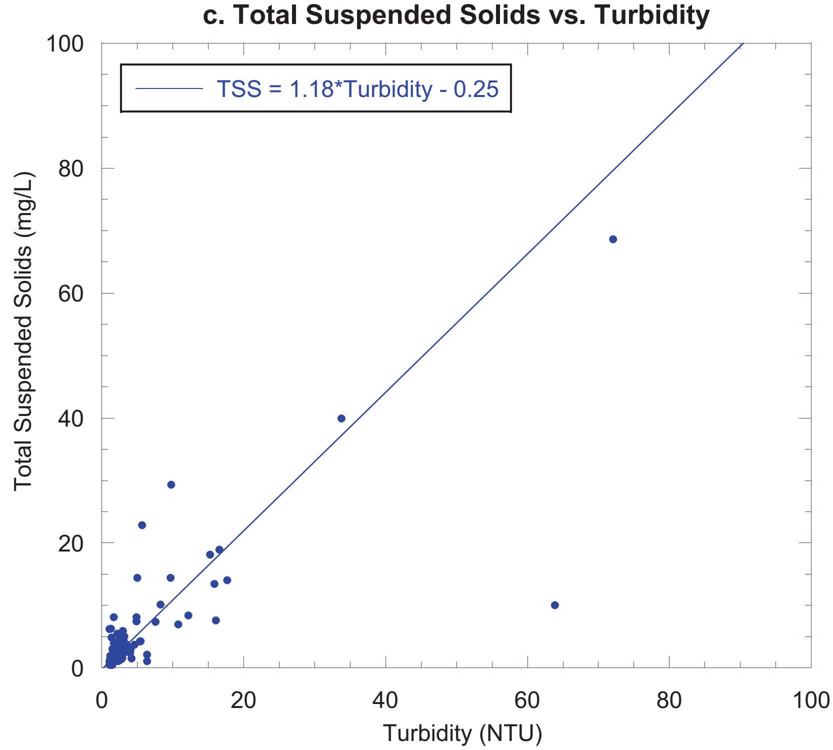
a. Turbidity Time Series



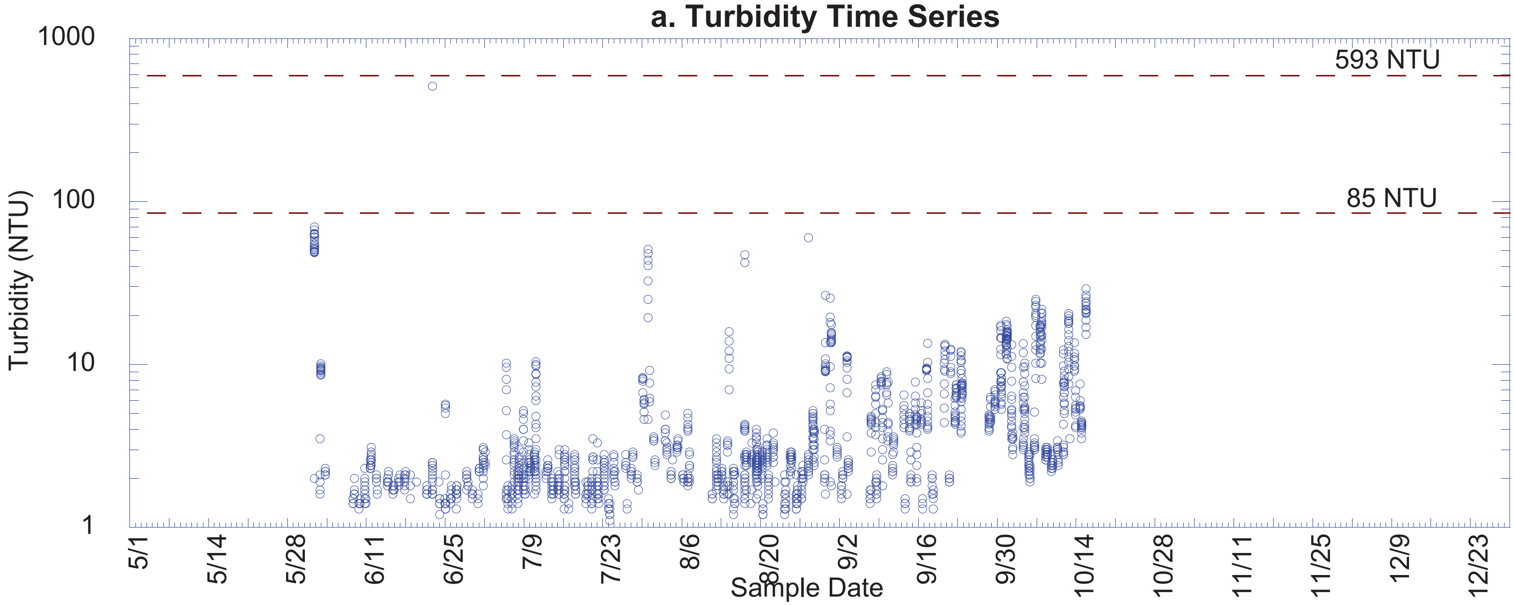
Total Suspended Solids Time Series

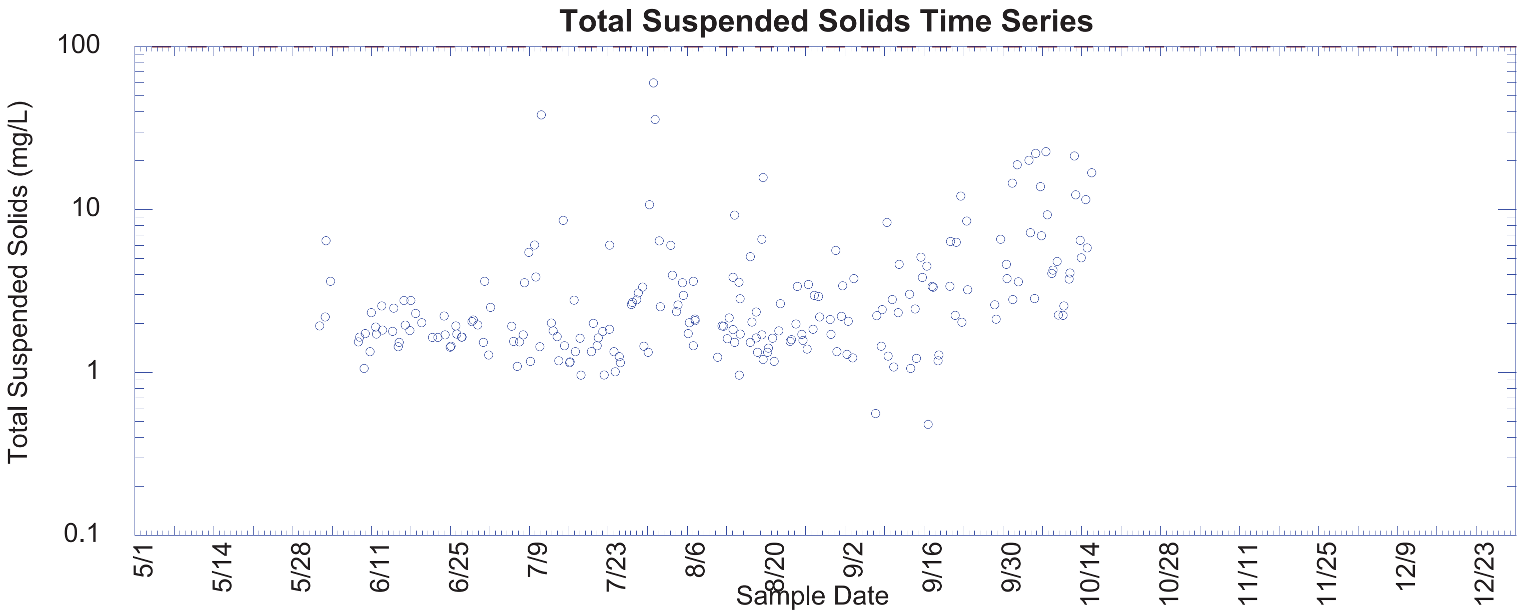


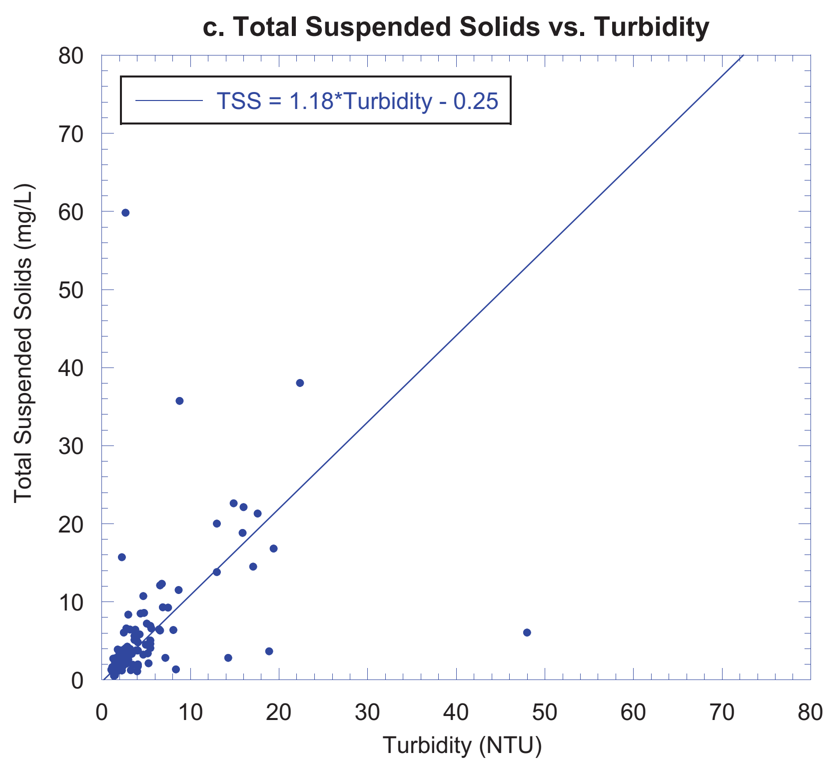
c. Total Suspended Solids vs. Turbidity



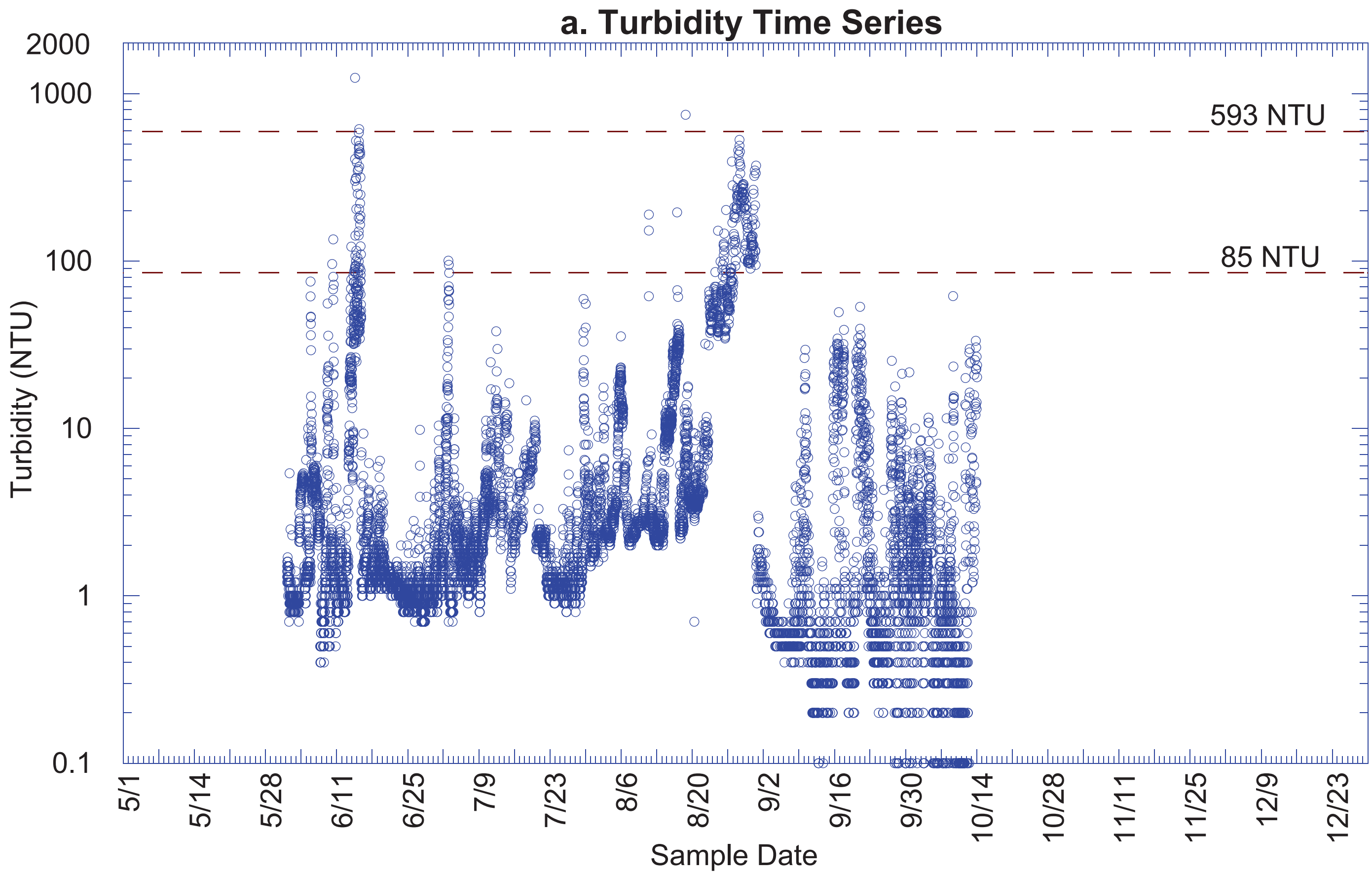
West Rogers Island: Operation #3 - 100m Downstream Transect

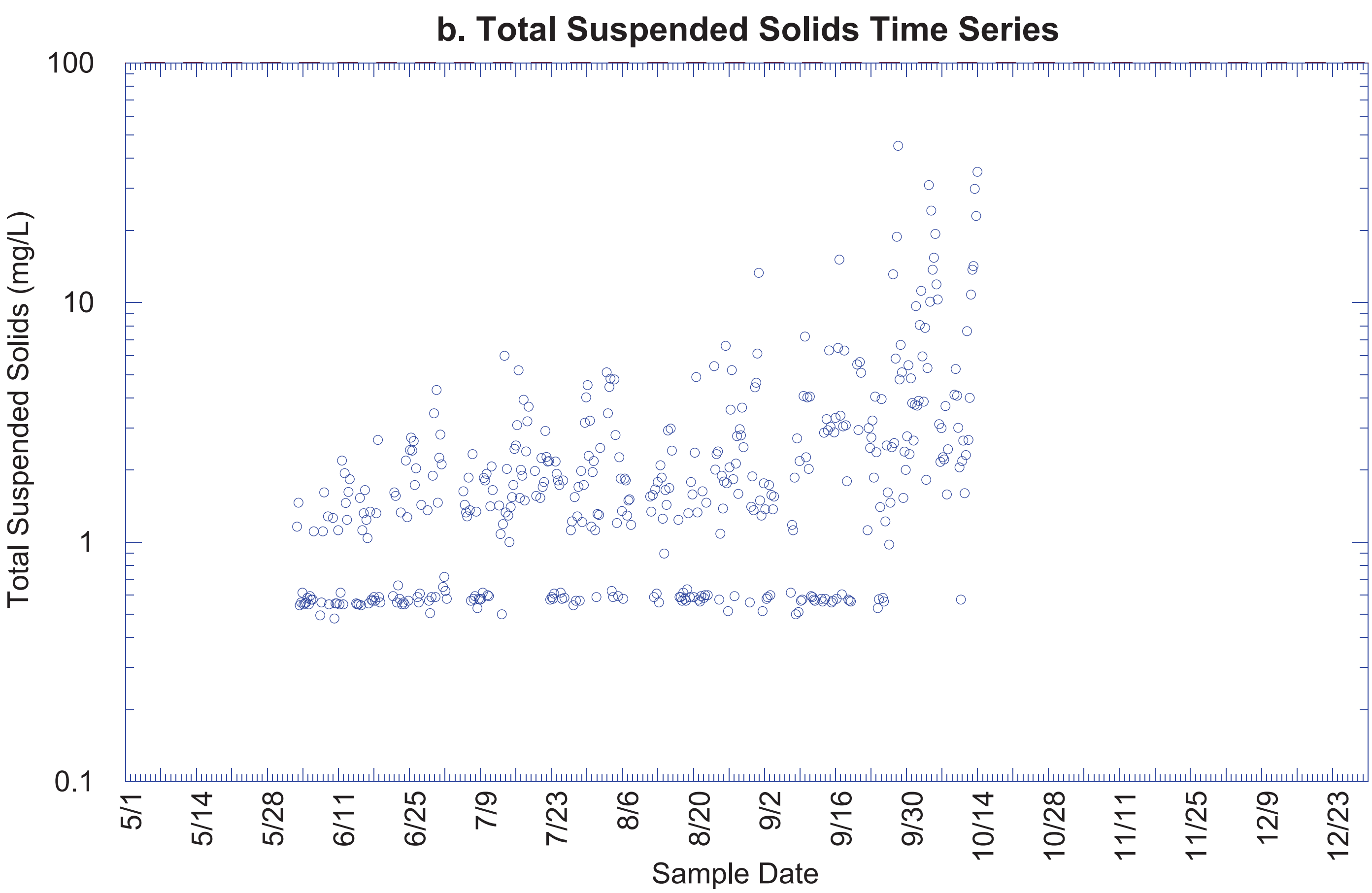




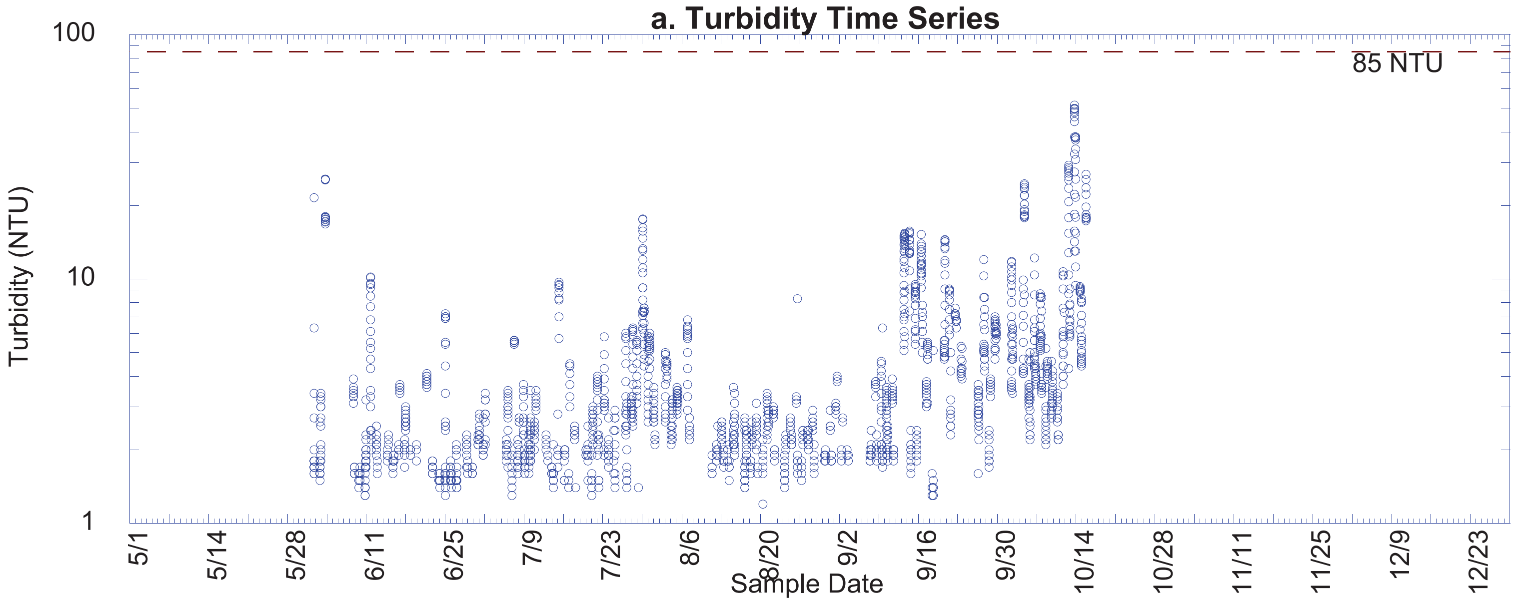


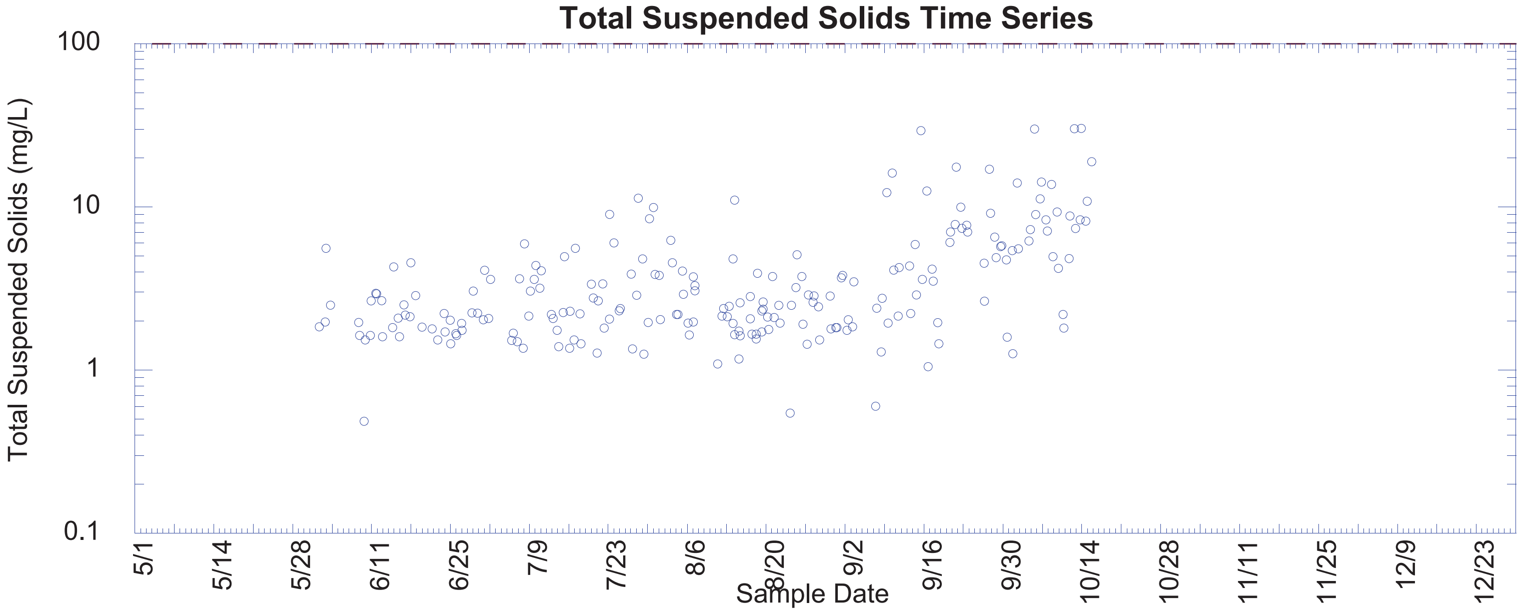
West Rogers Island: Operation #3 - 300m Downstream Buoy

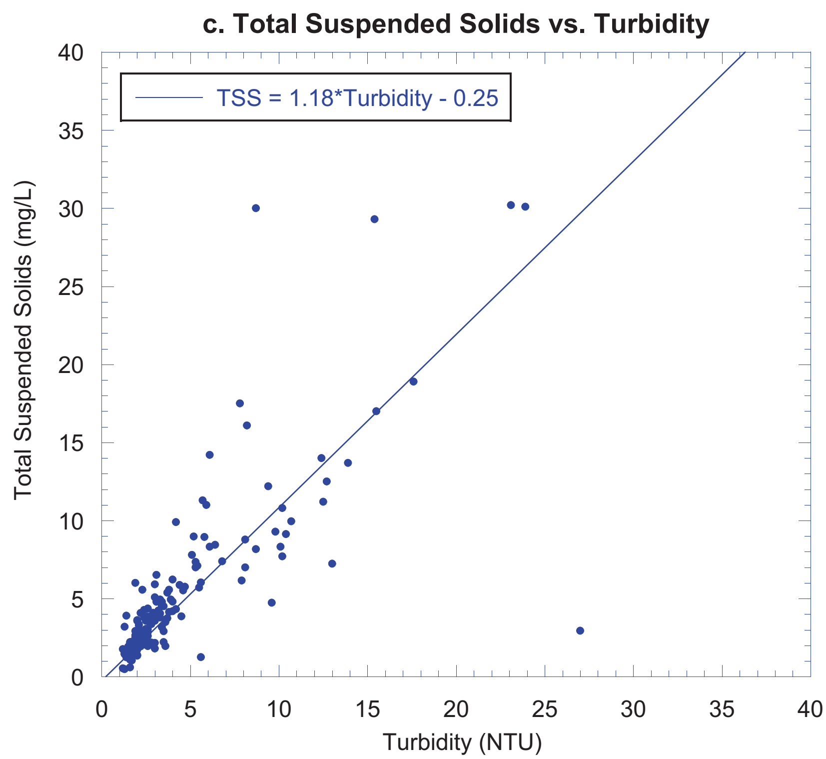




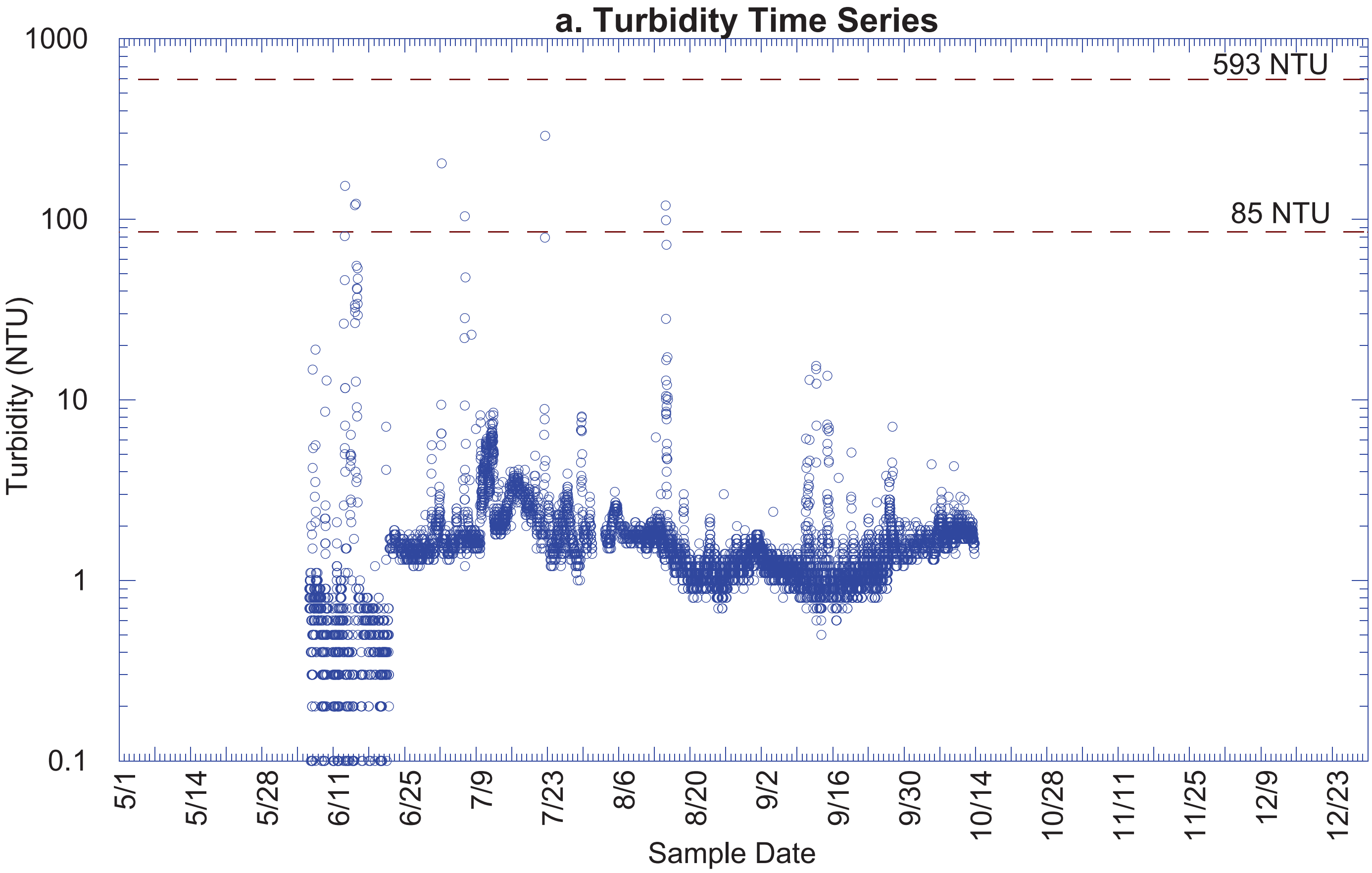
West Rogers Island: Operation #3 - 300m Downstream Transect

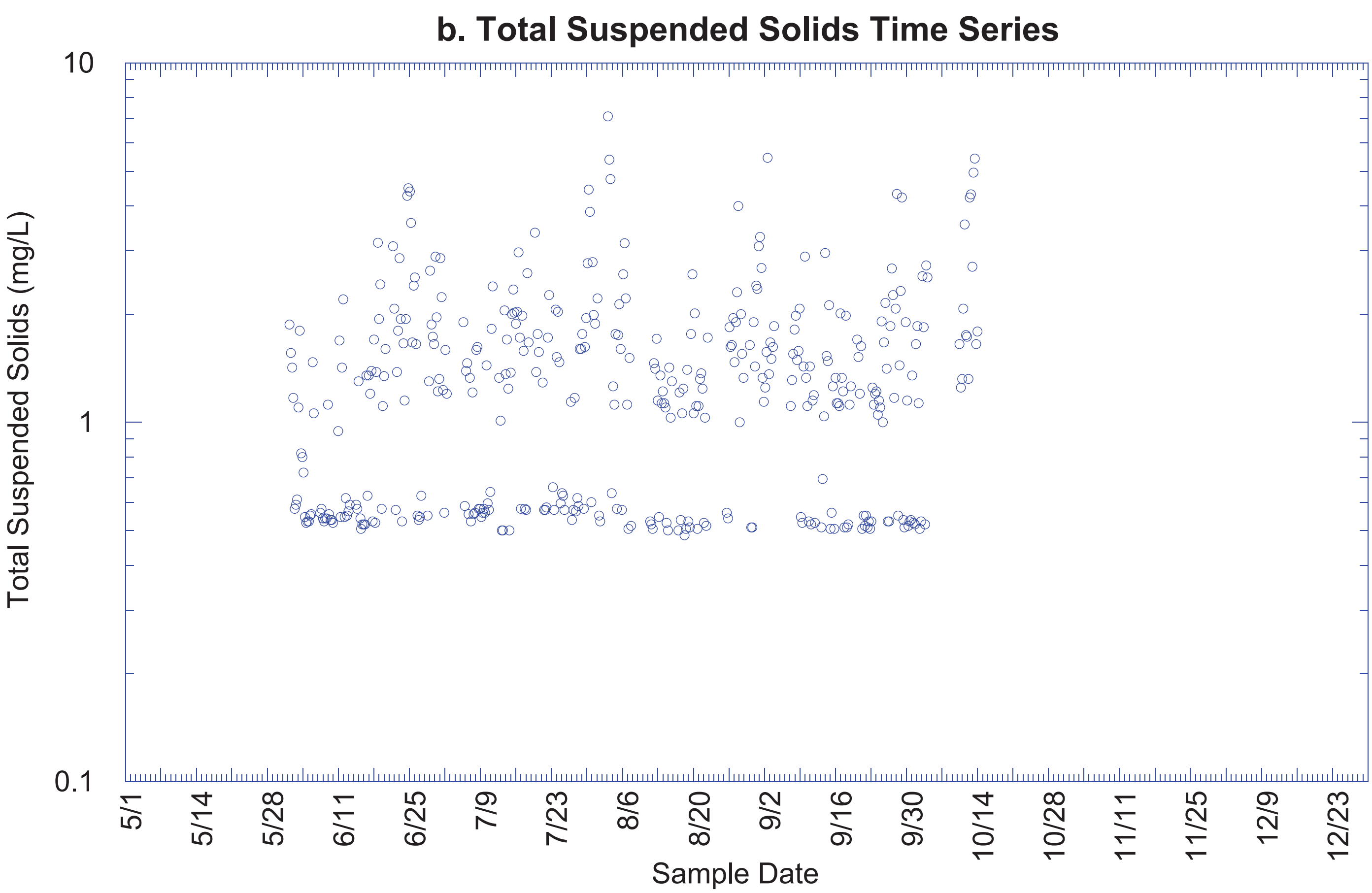




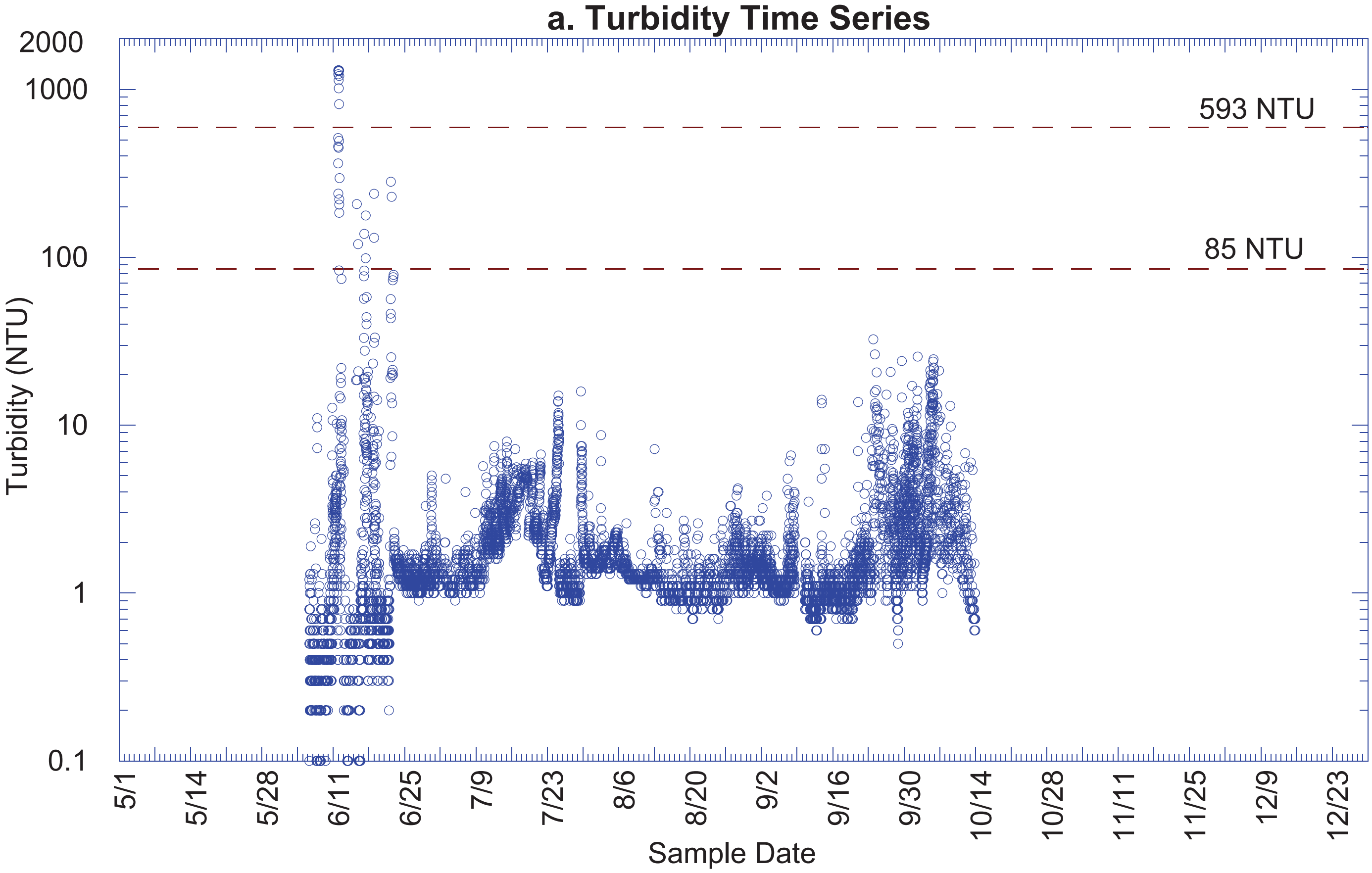


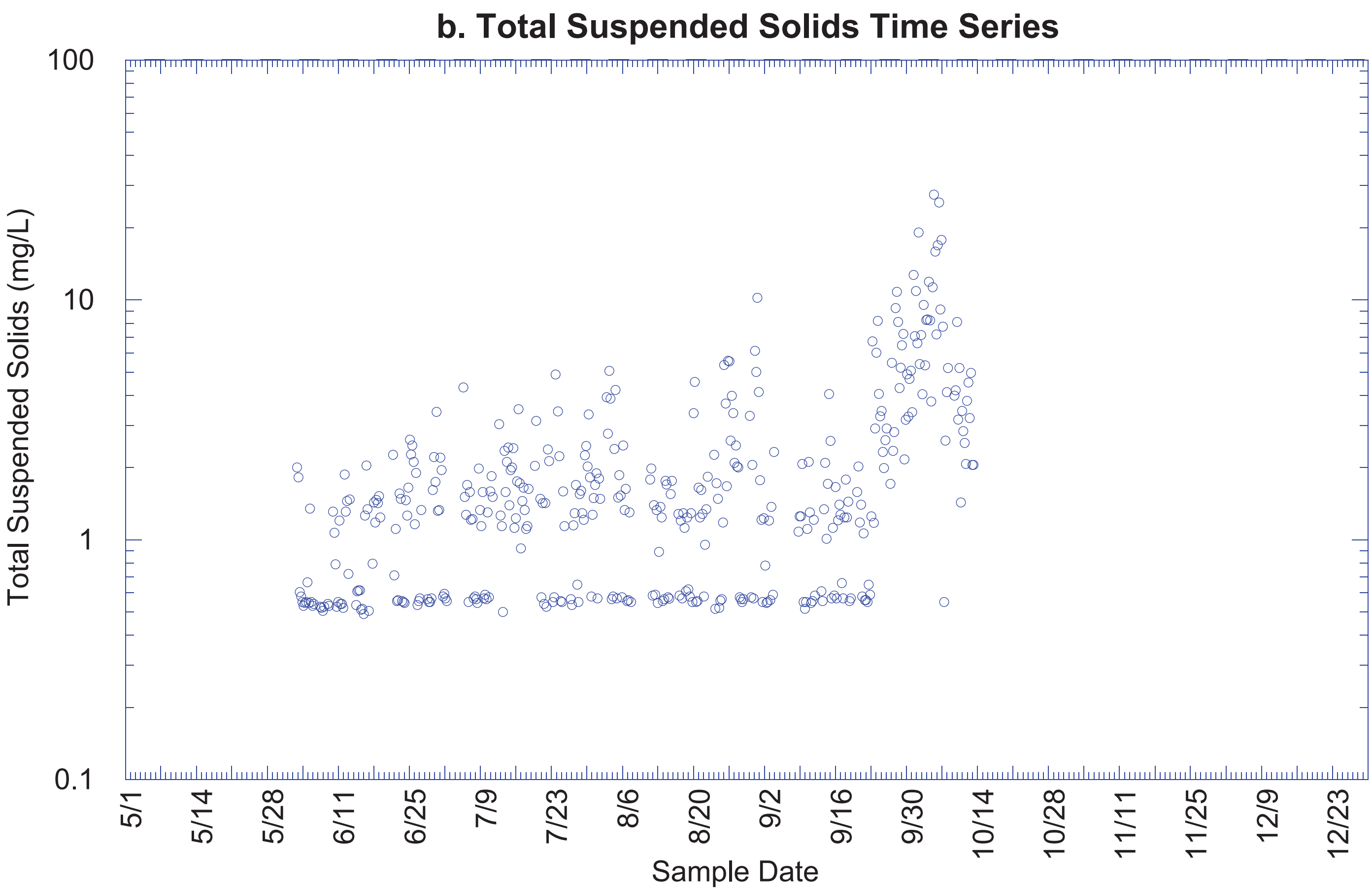
West Rogers Island: Operation #4 - 100m Upstream Buoy



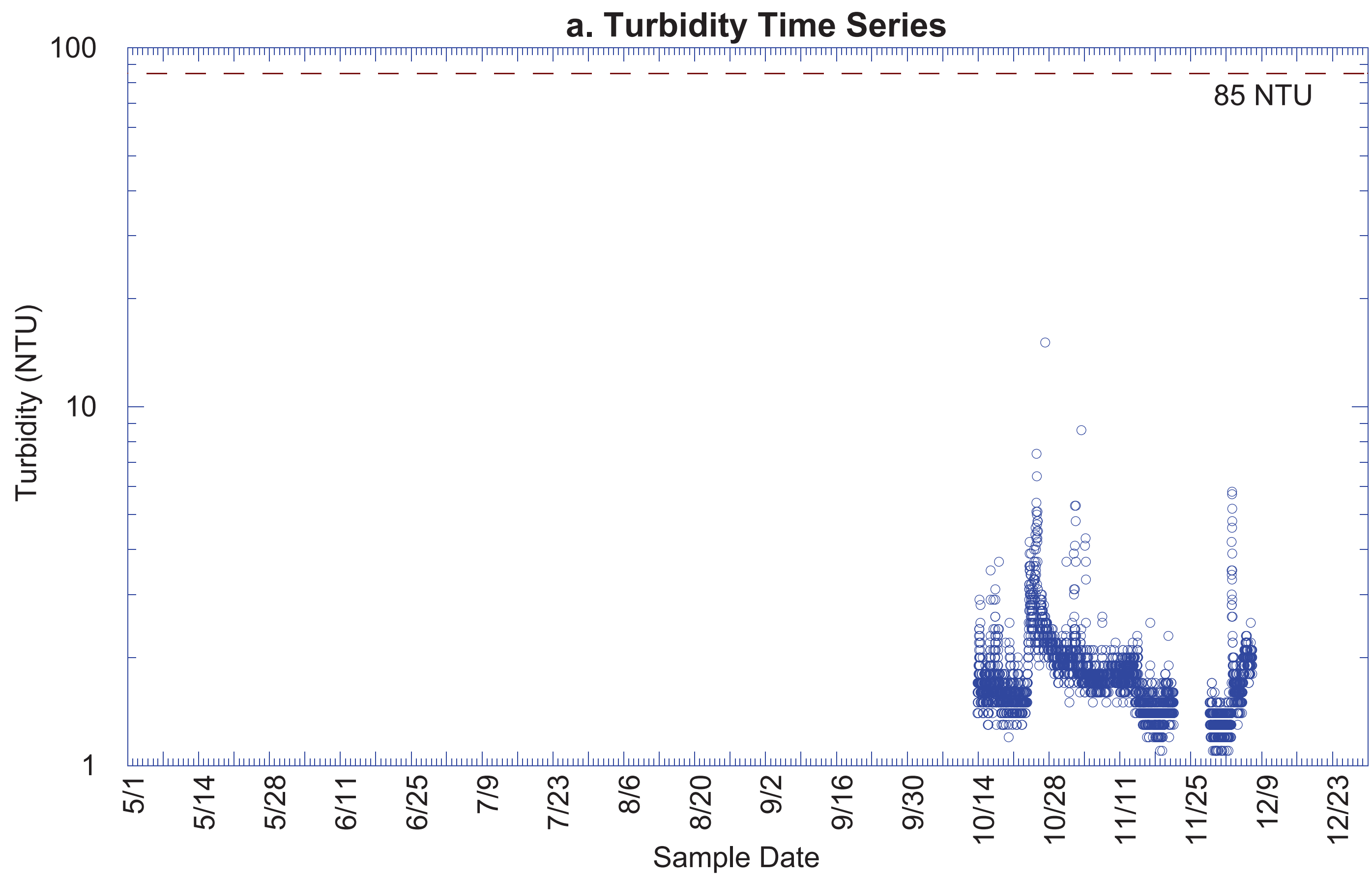


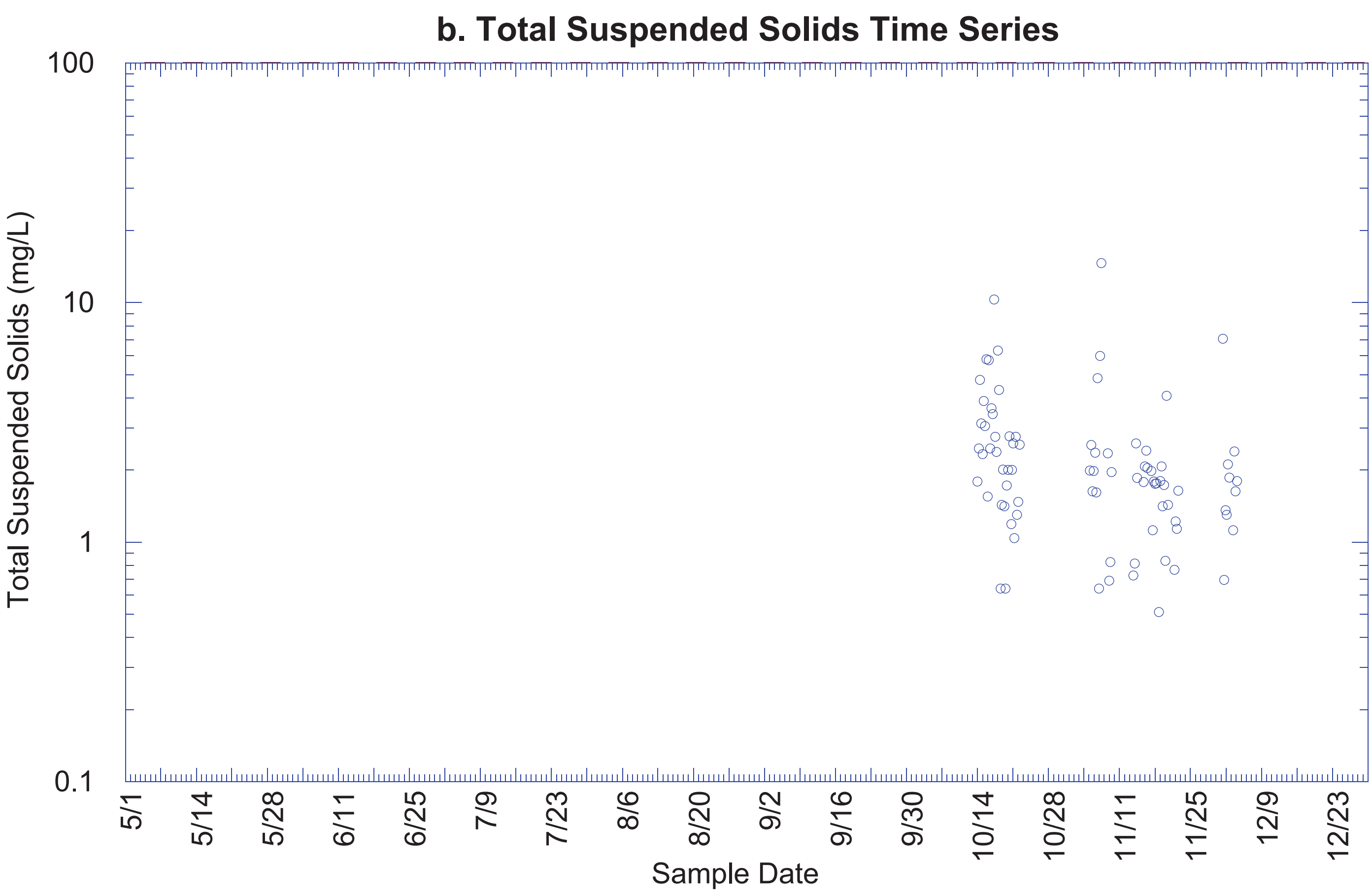
West Rogers Island: Operation #4 - 300m Downstream Buoy



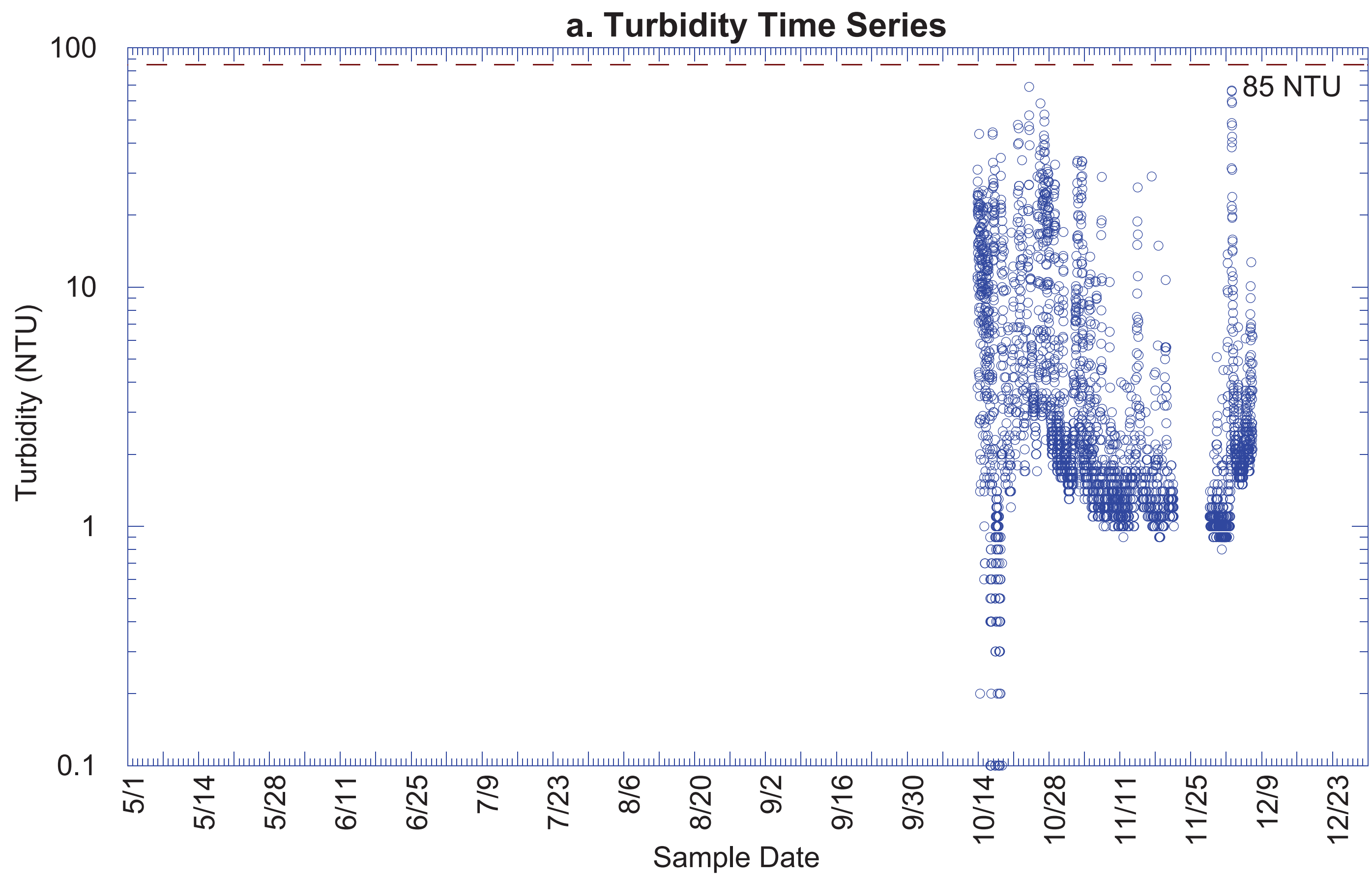


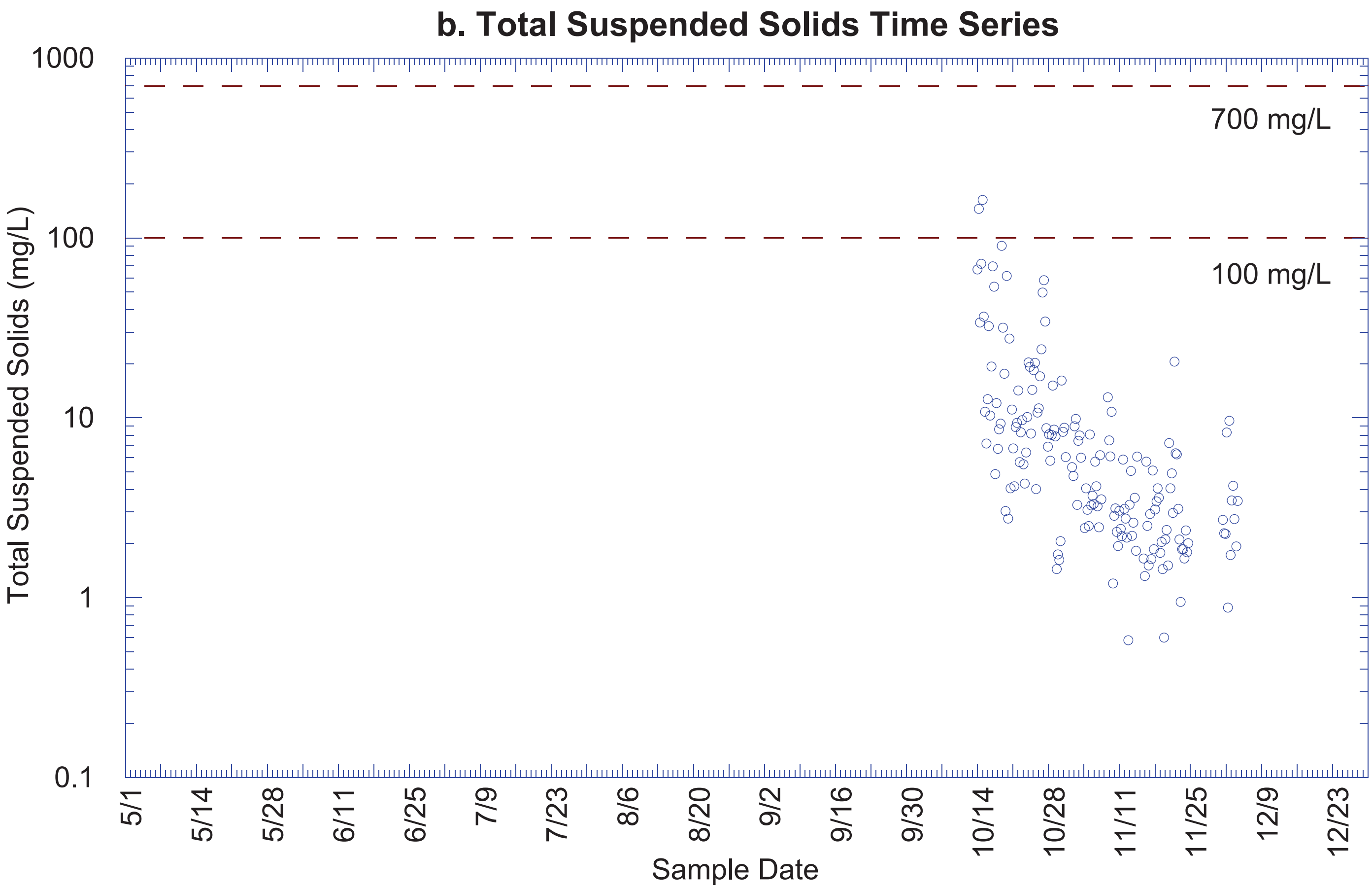
West Rogers Island: Operation #5 - 100m Upstream Buoy





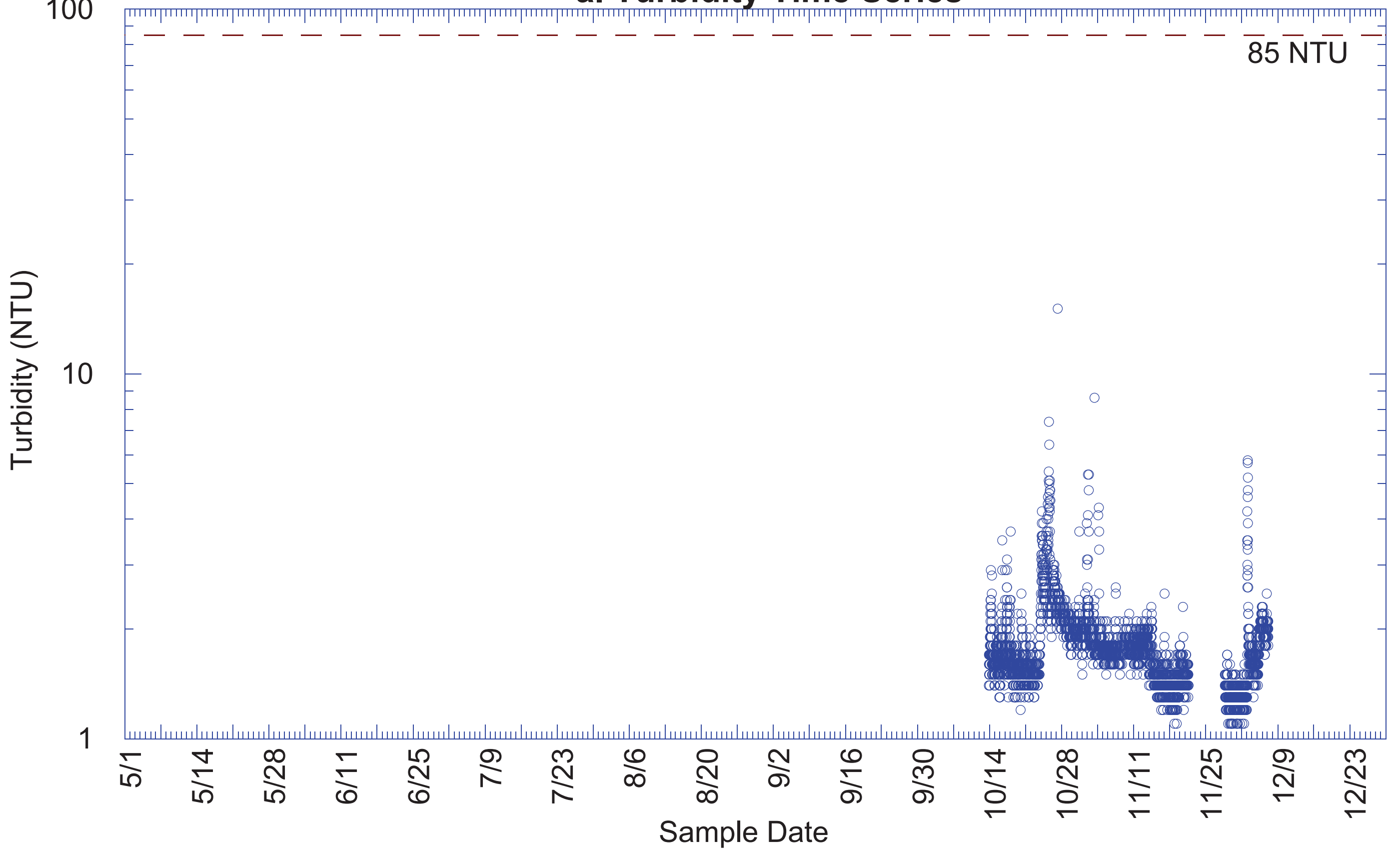
West Rogers Island: Operation #5 - 300m Downstream Buoy



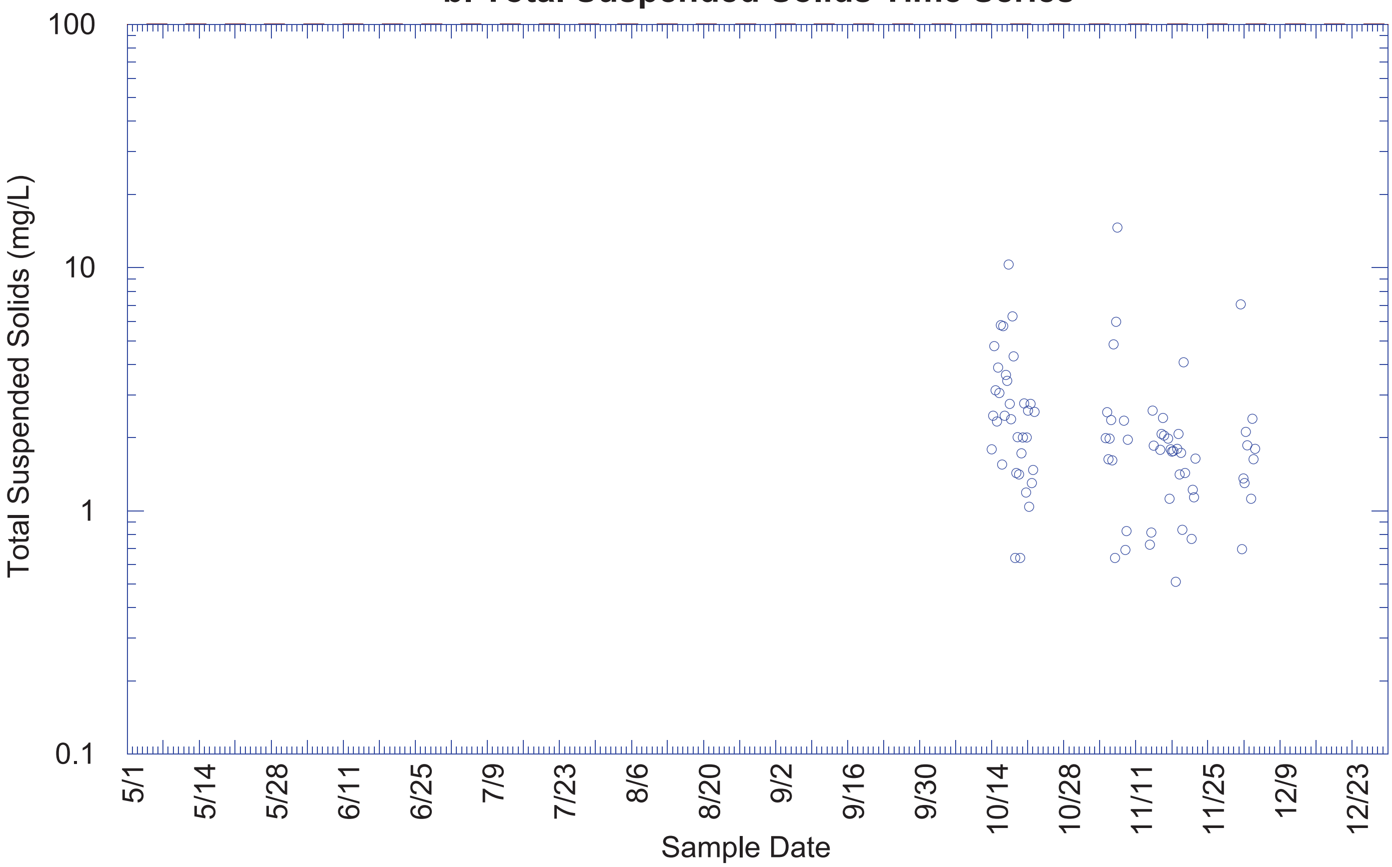


West Rogers Island: Operation #6 - 100m Upstream Buoy

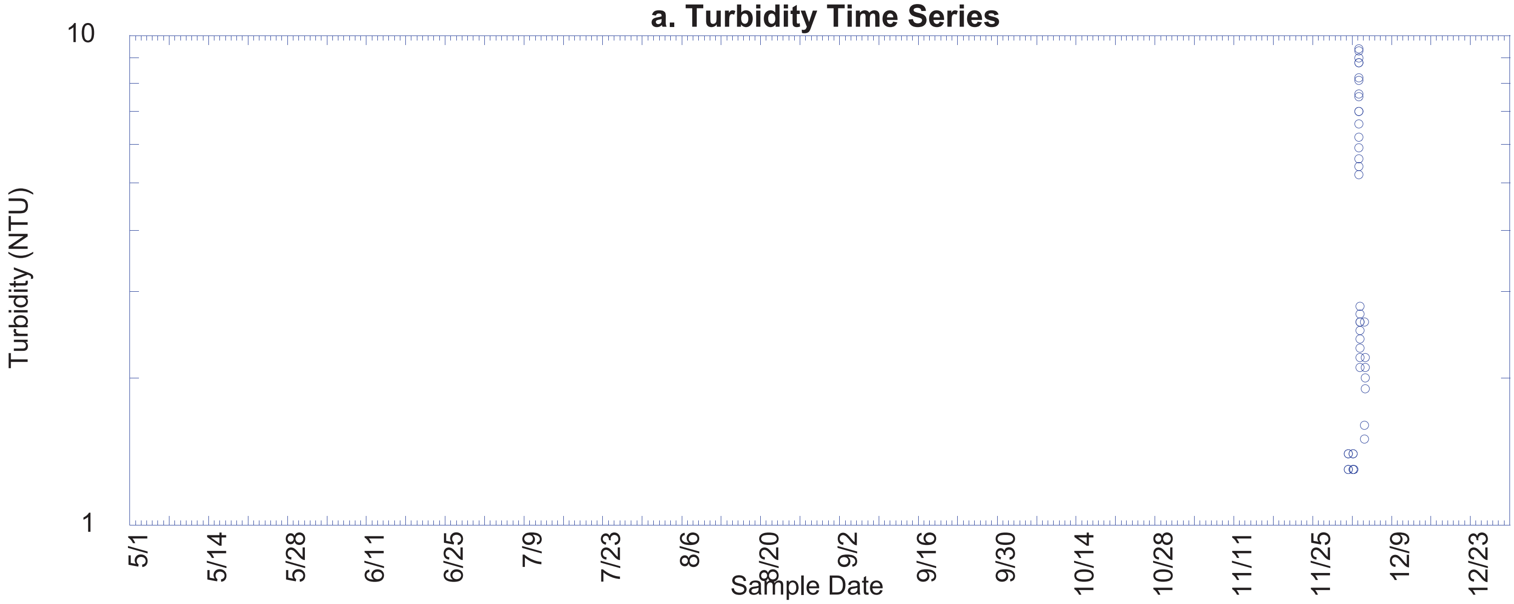
a. Turbidity Time Series

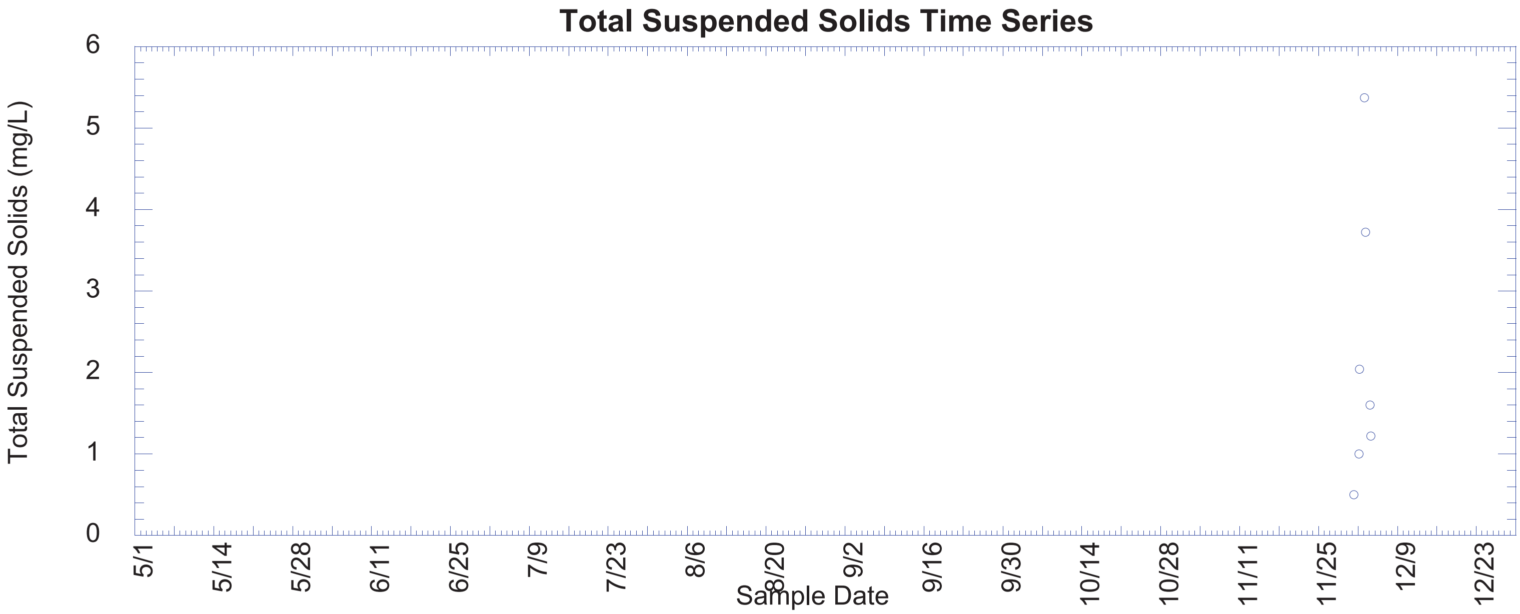


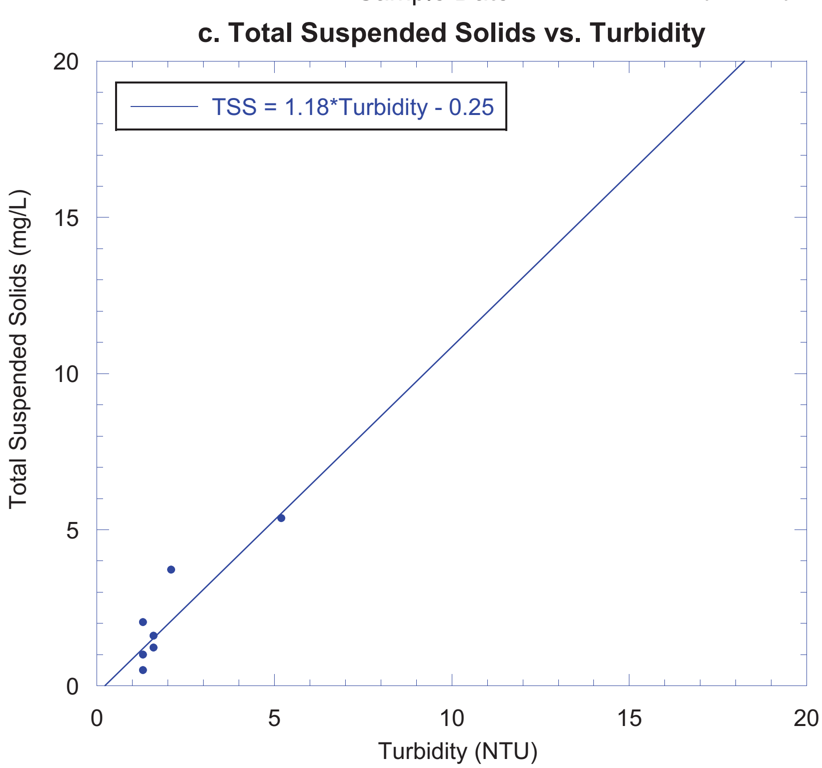
b. Total Suspended Solids Time Series



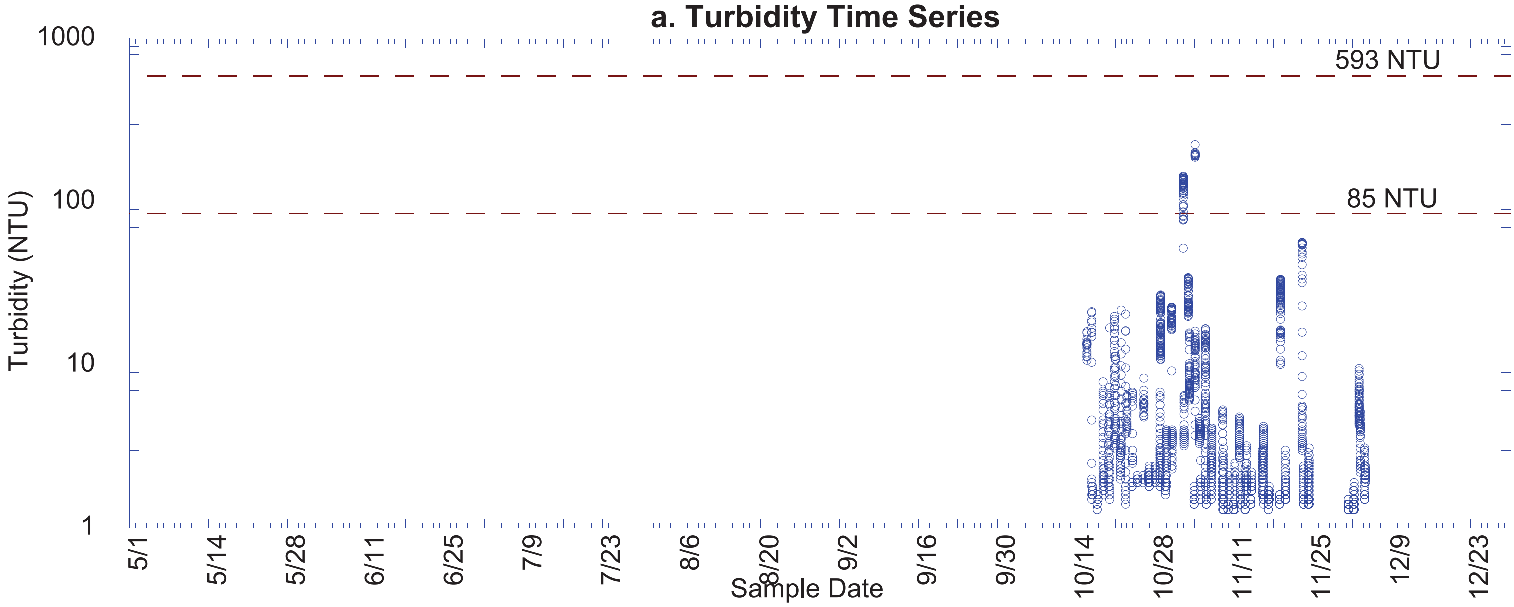
West Rogers Island: Operation #6 - 100m Upstream Transect

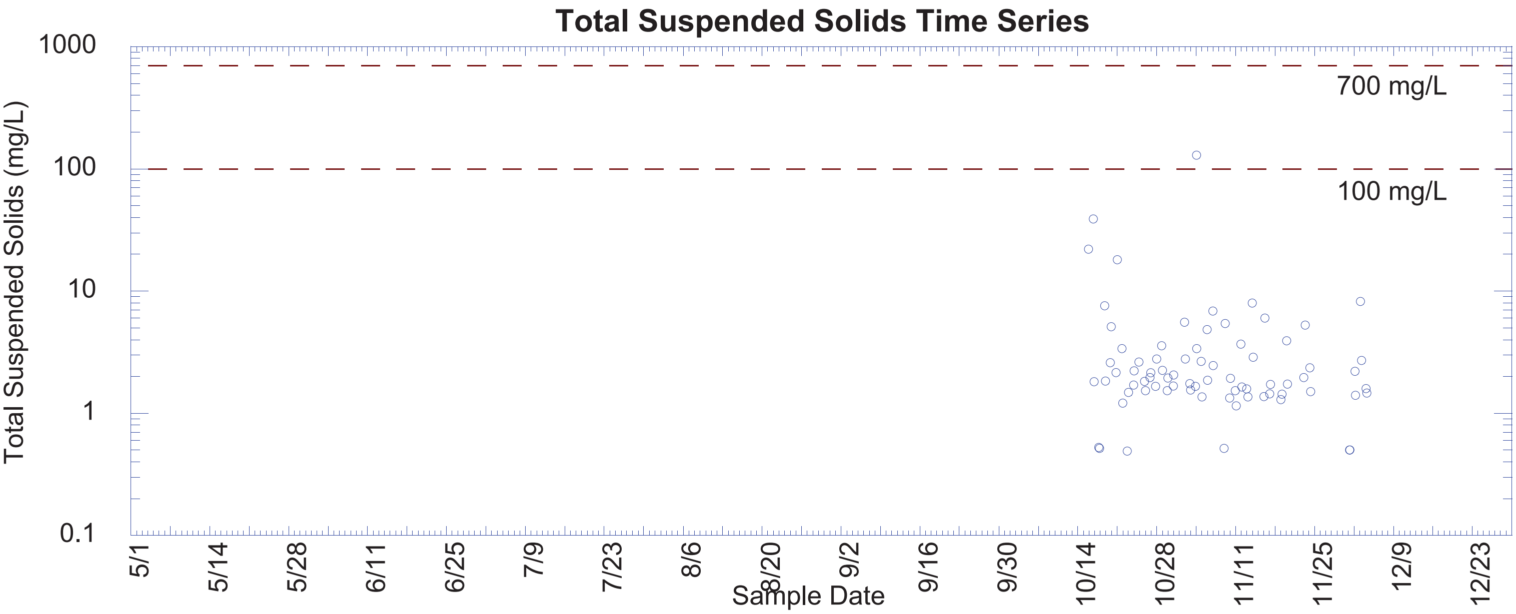


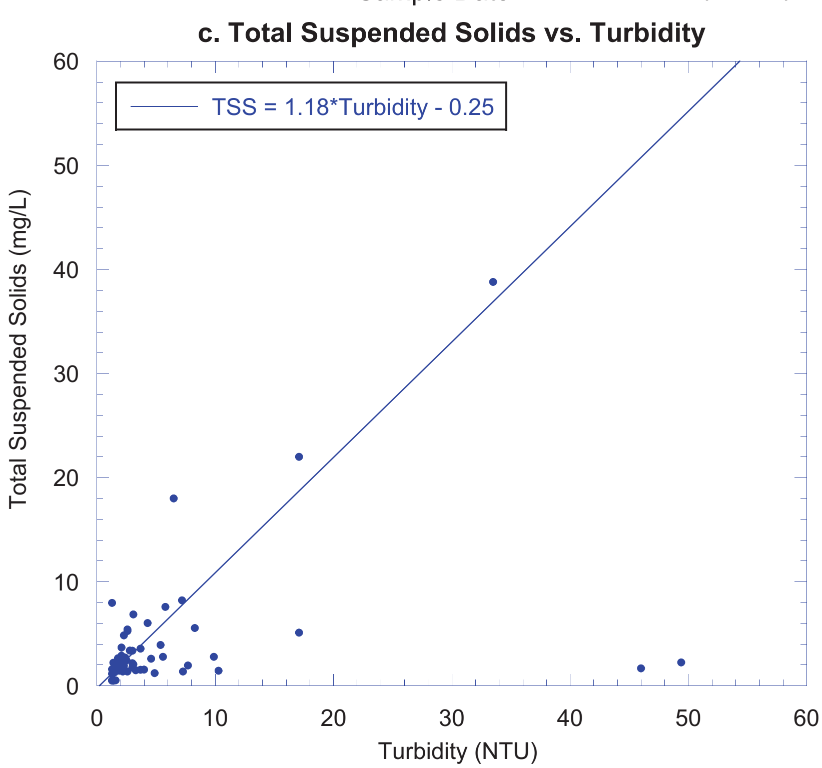




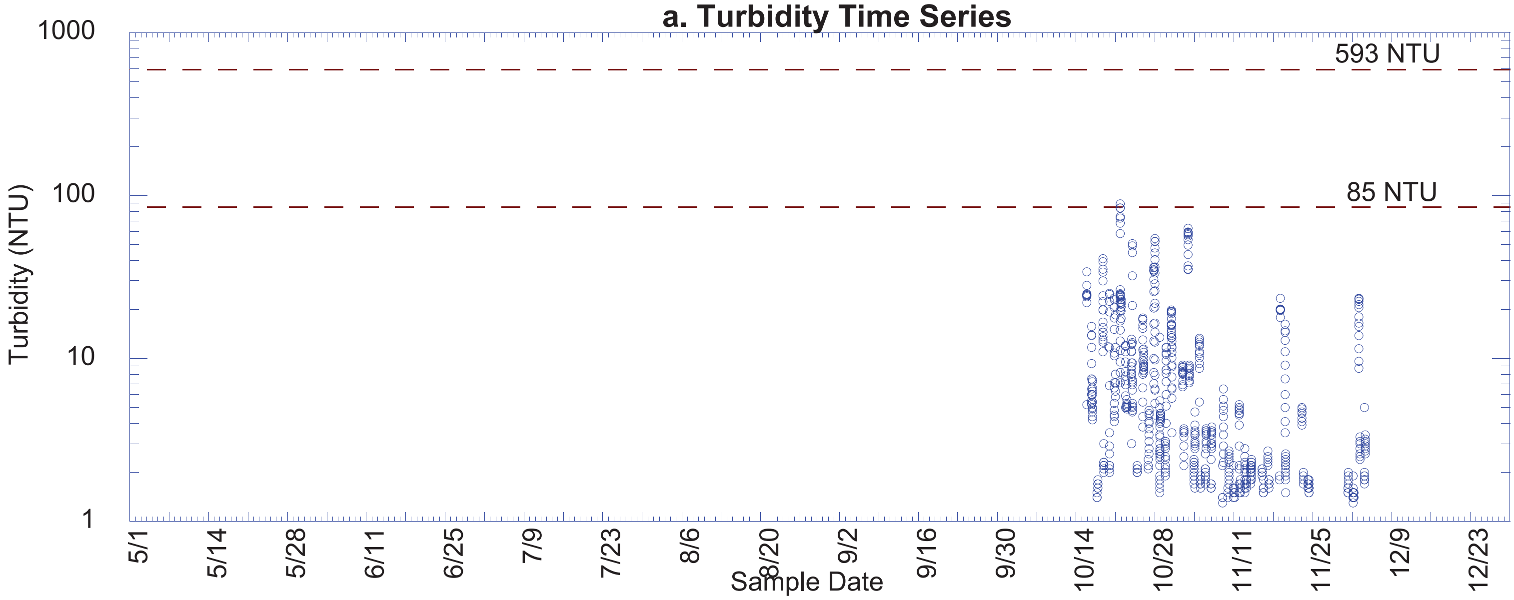
West Rogers Island: Operation #6 - 10m Side Channel Transect

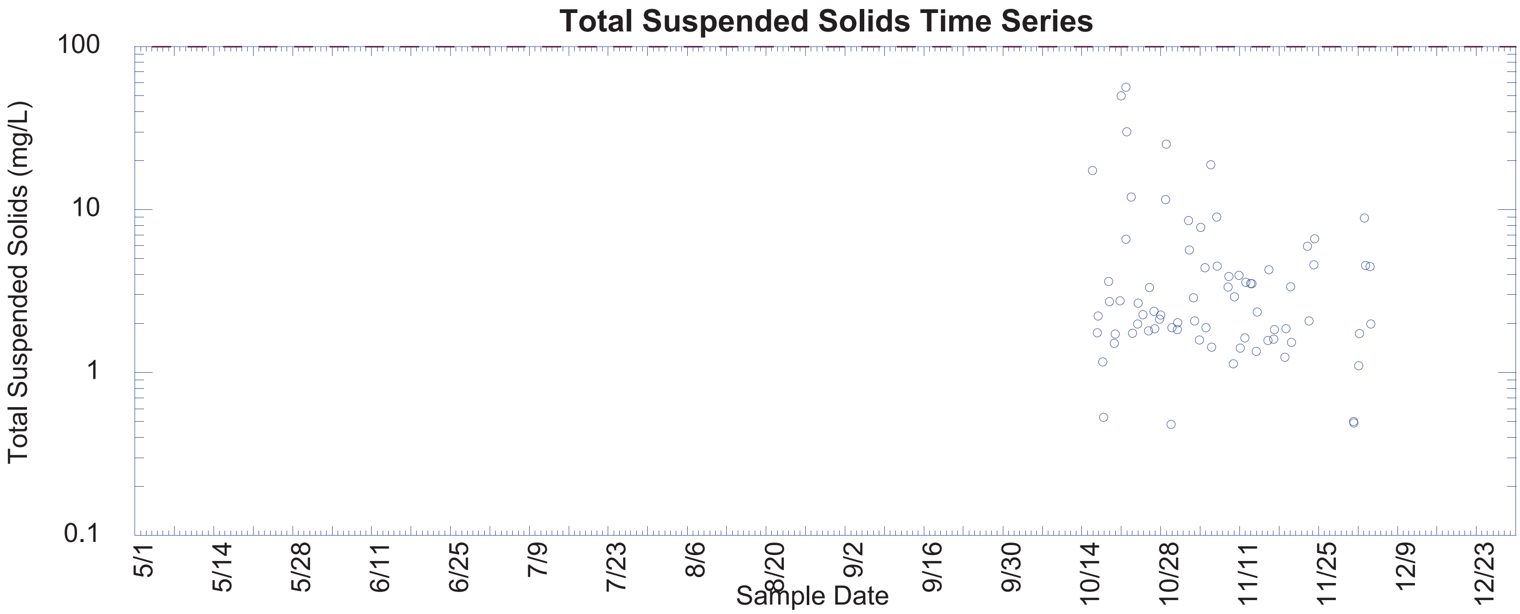


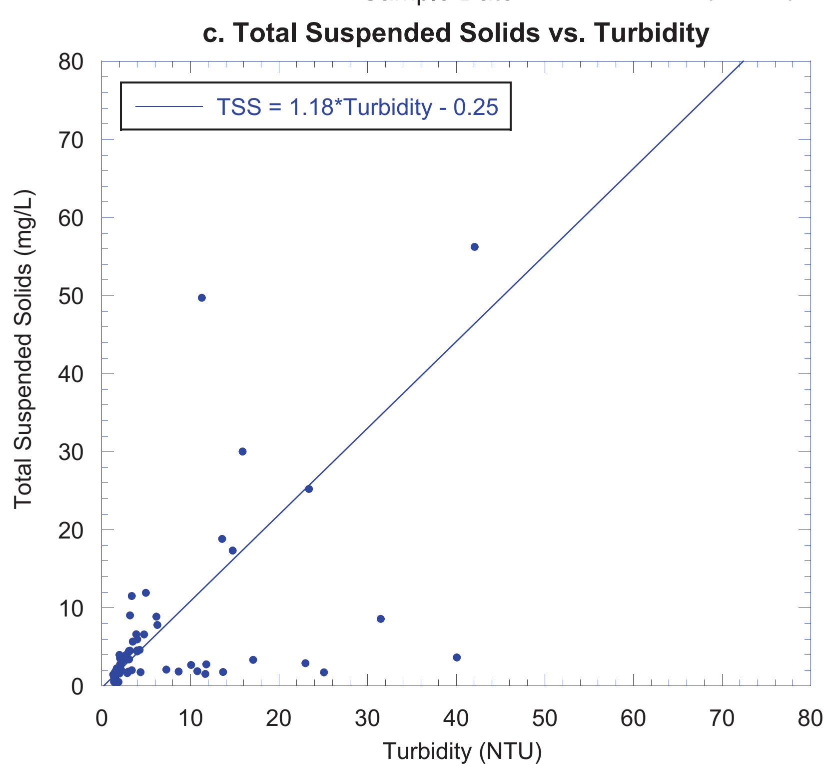




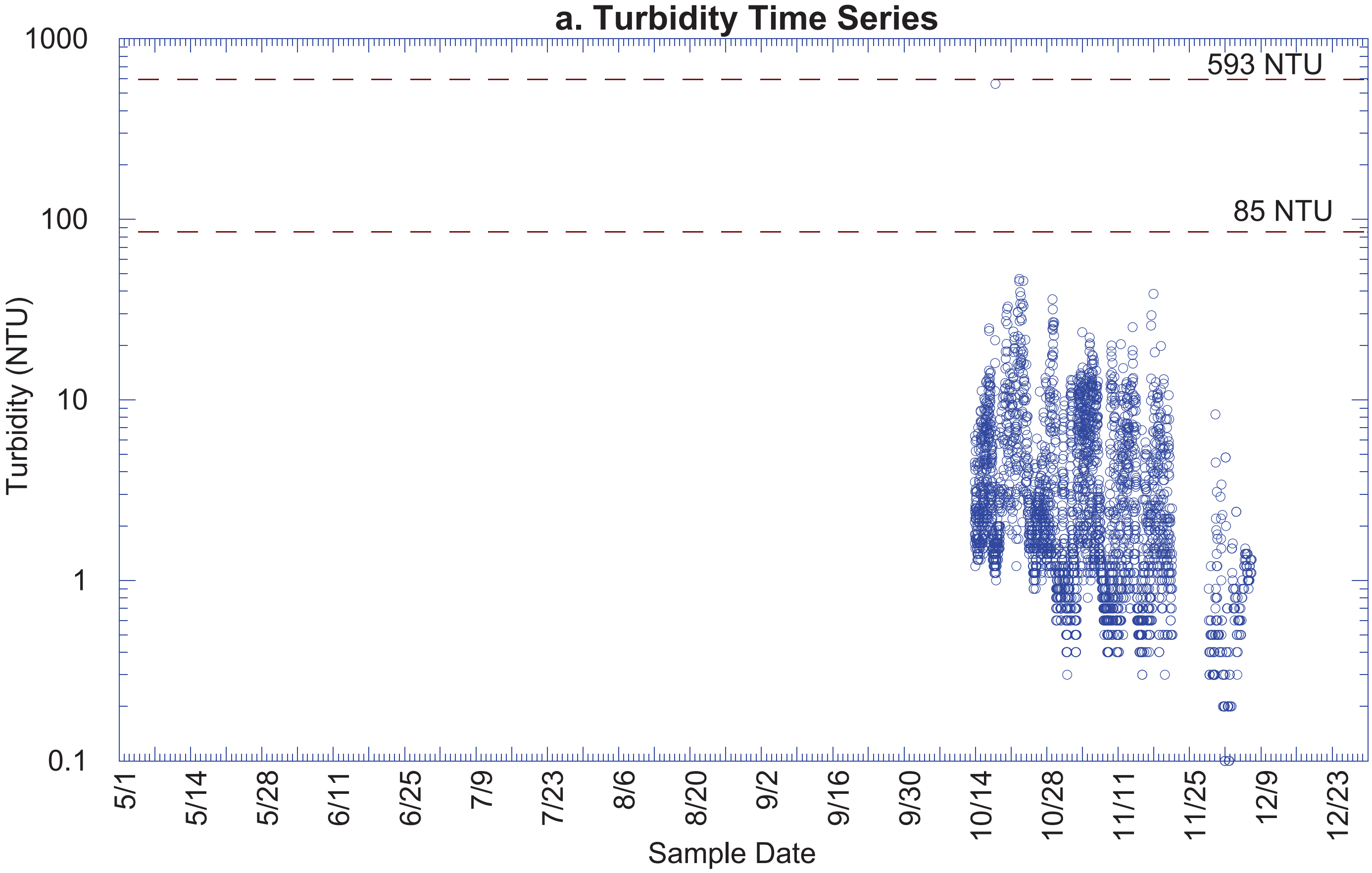
West Rogers Island: Operation #6 - 100m Downstream Transect

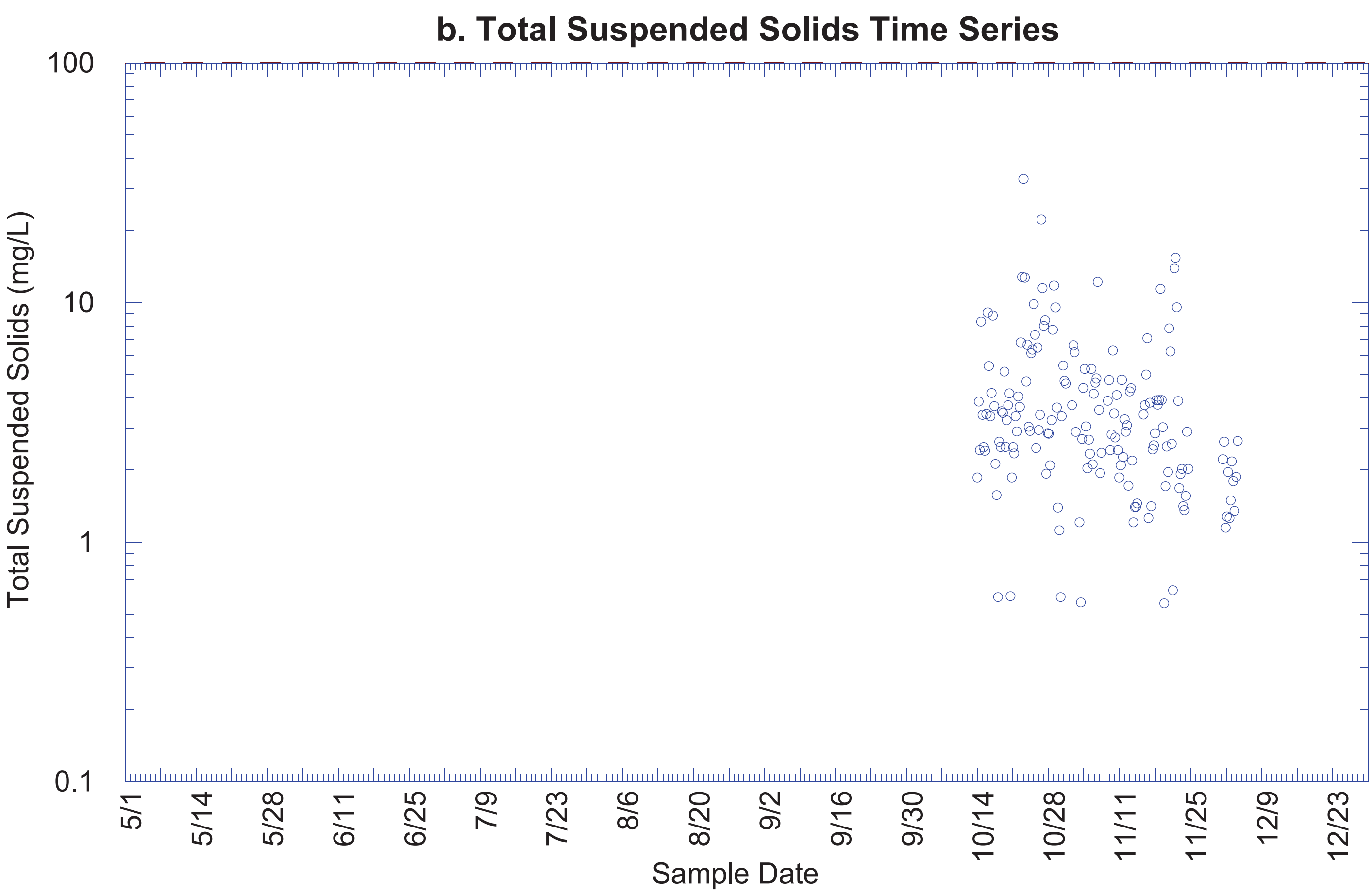




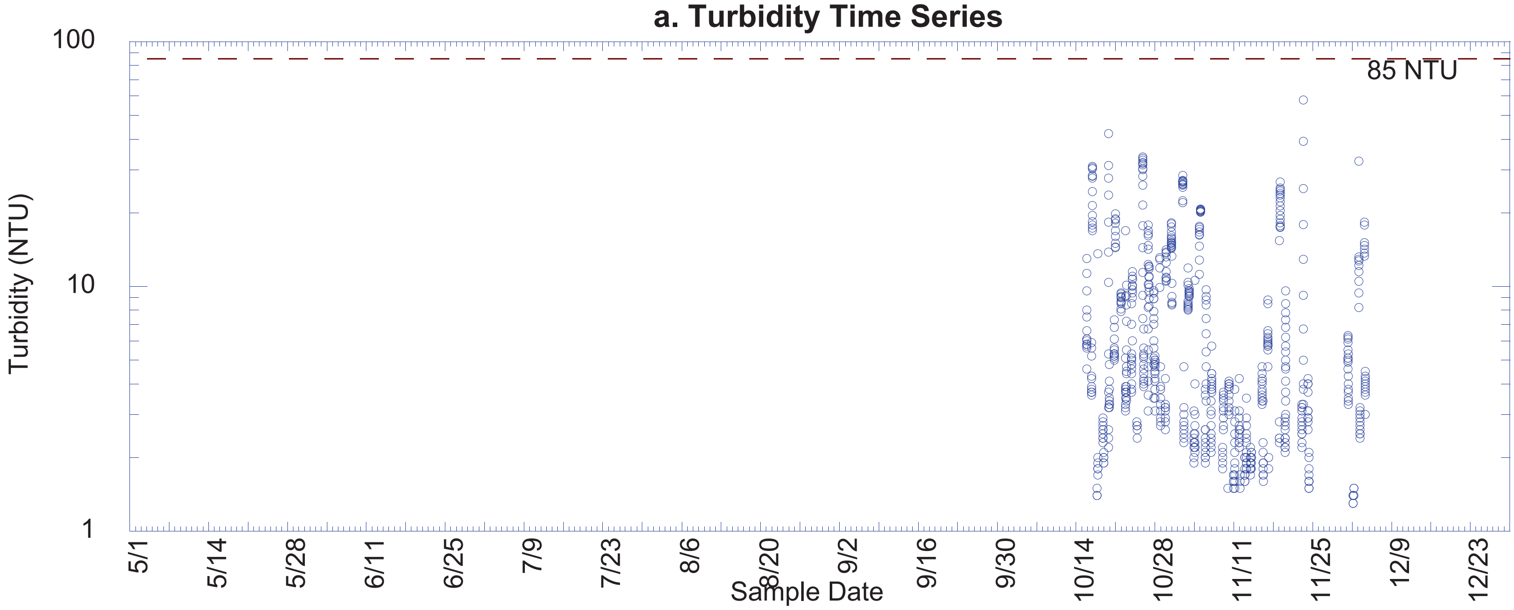


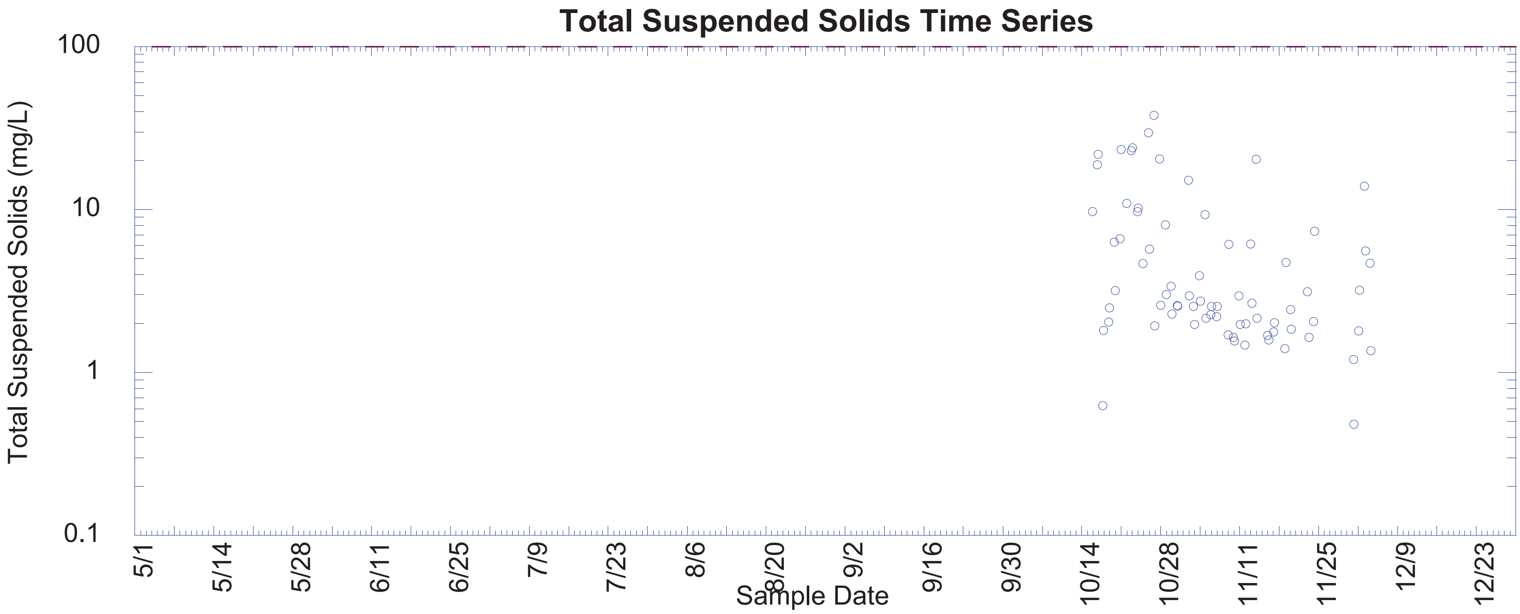
West Rogers Island: Operation #6 - 300m Downstream Buoy

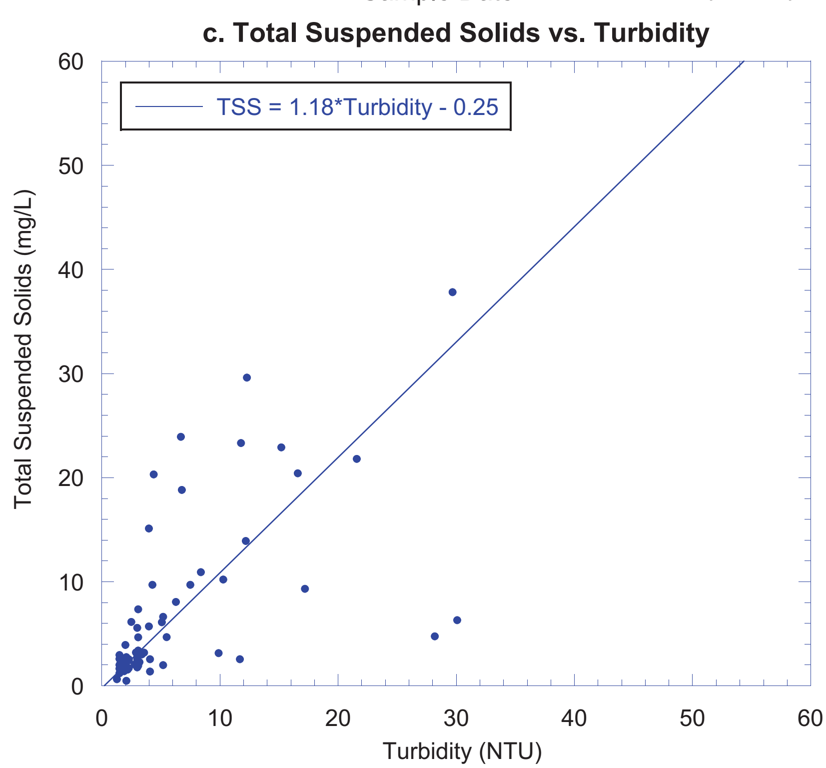




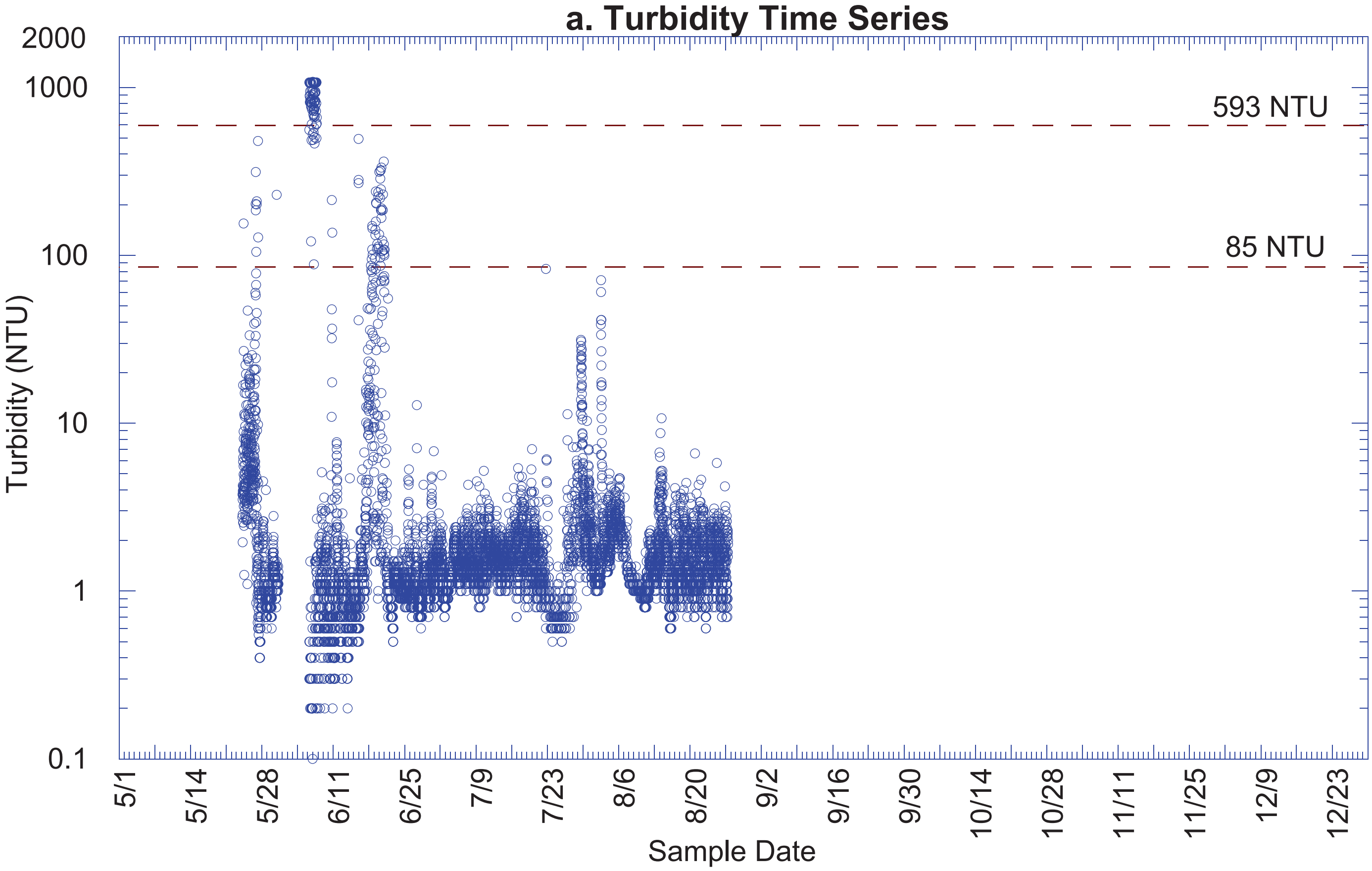
West Rogers Island: Operation #6 - 300m Downstream Transect

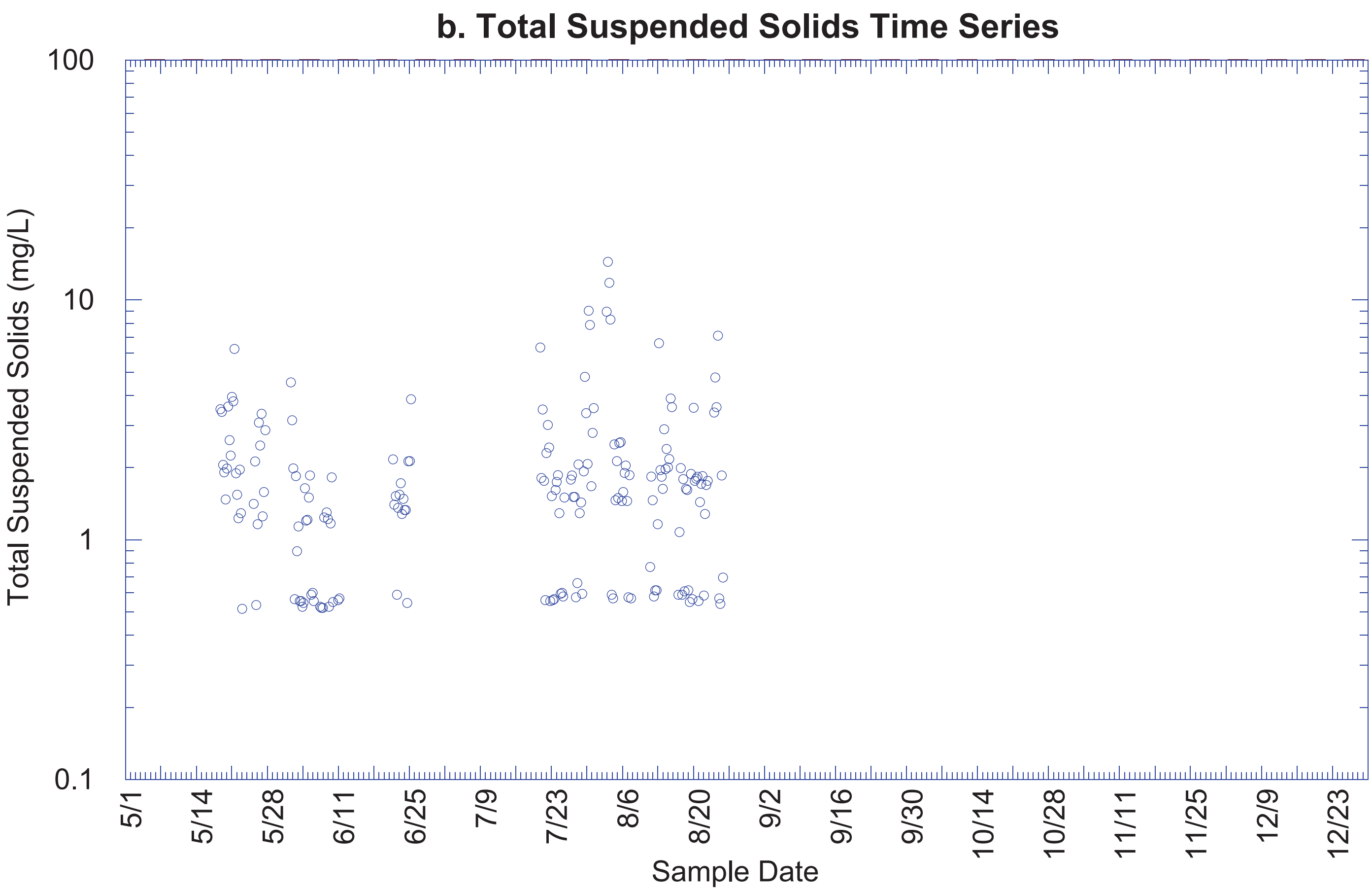






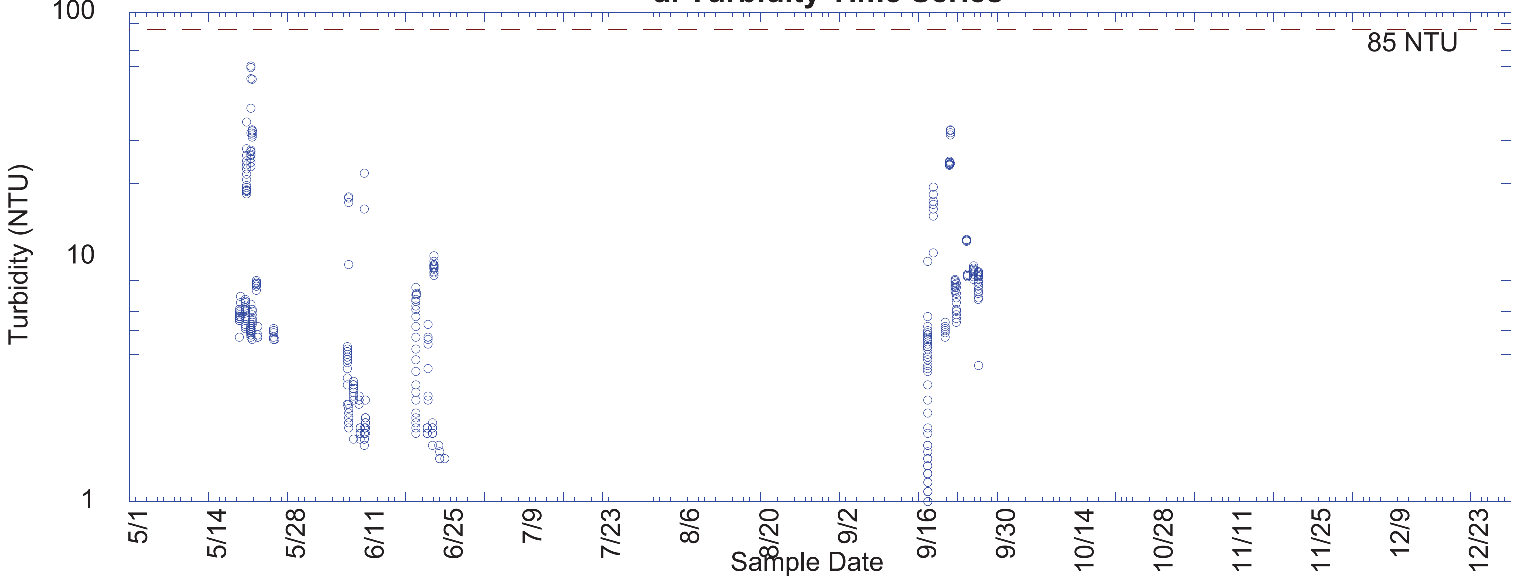
Lock 7: Operation #1 - 100m Upstream Buoy



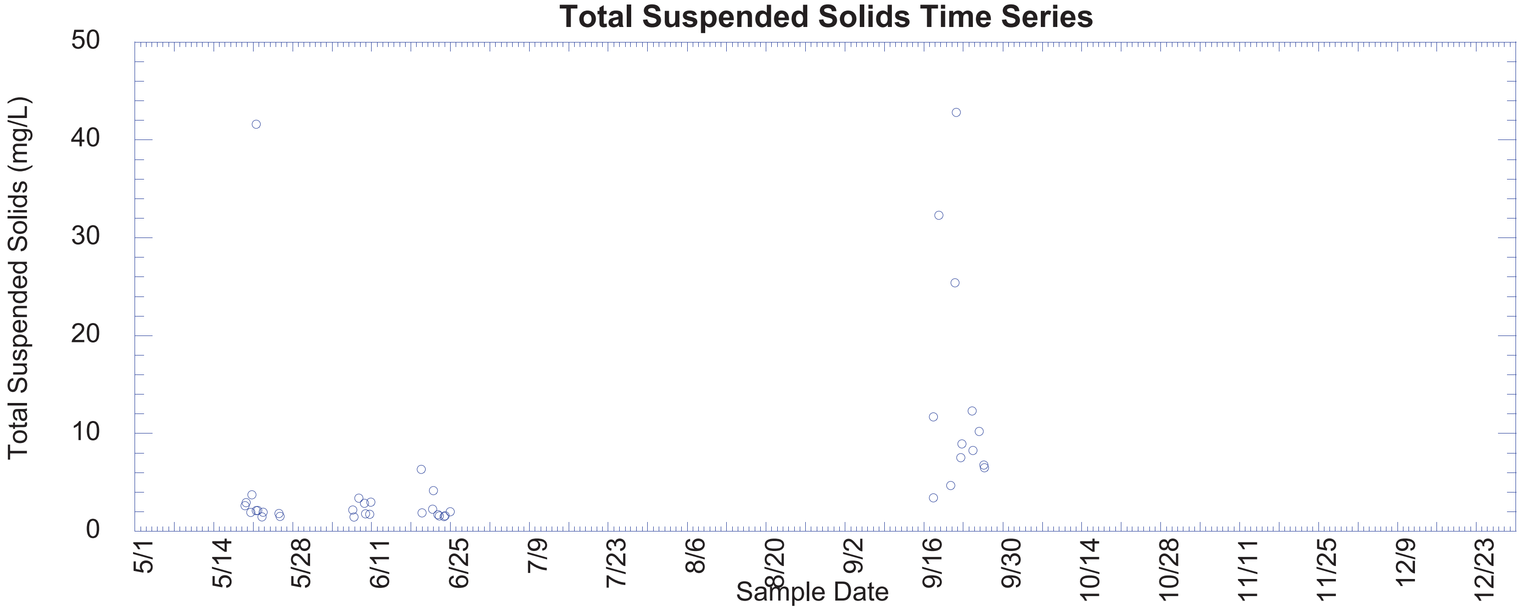


Lock 7: Operation #1 - 100m Upstream Transect

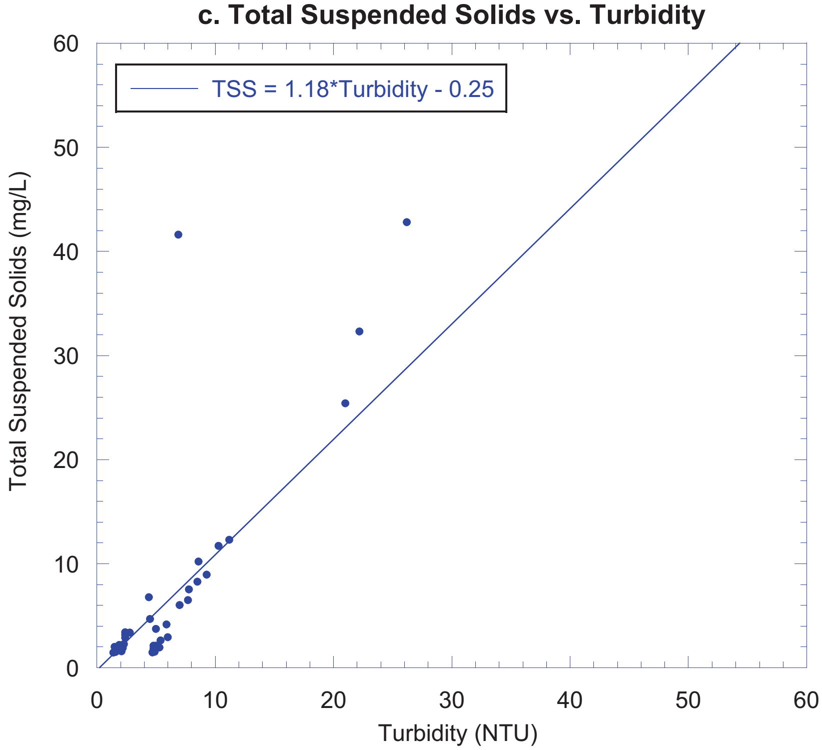
a. Turbidity Time Series



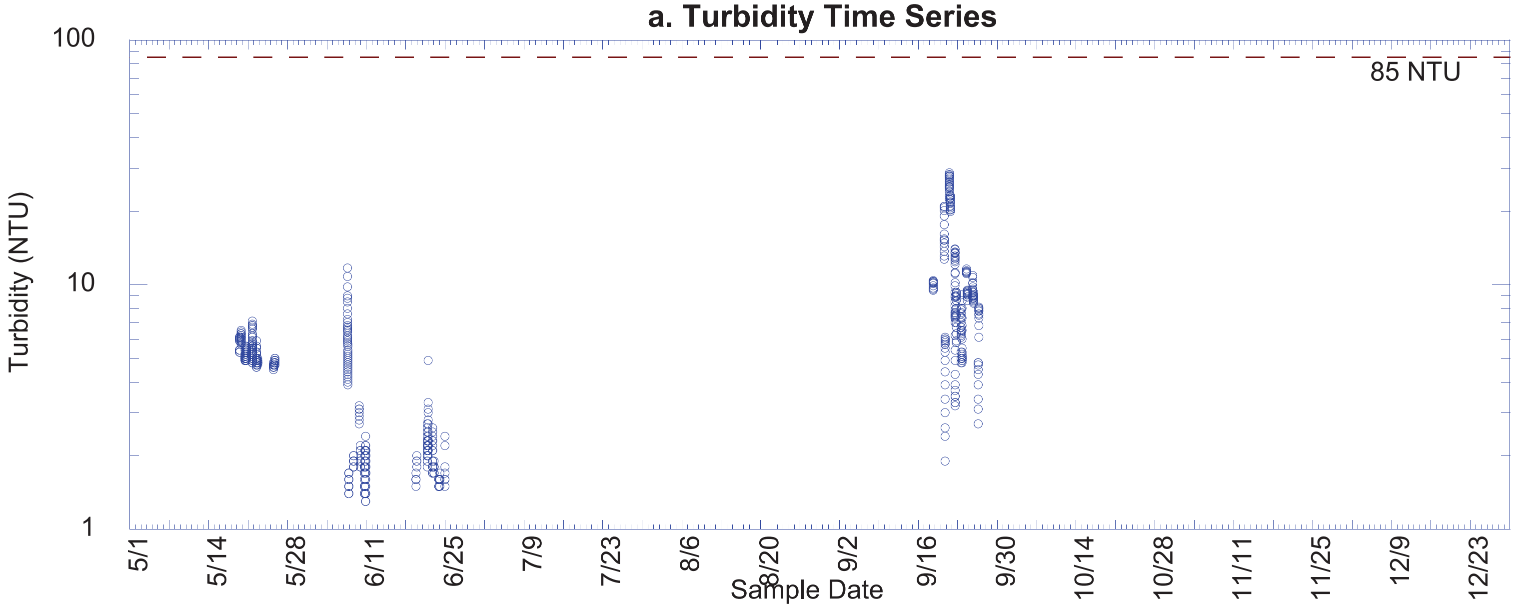
Total Suspended Solids Time Series

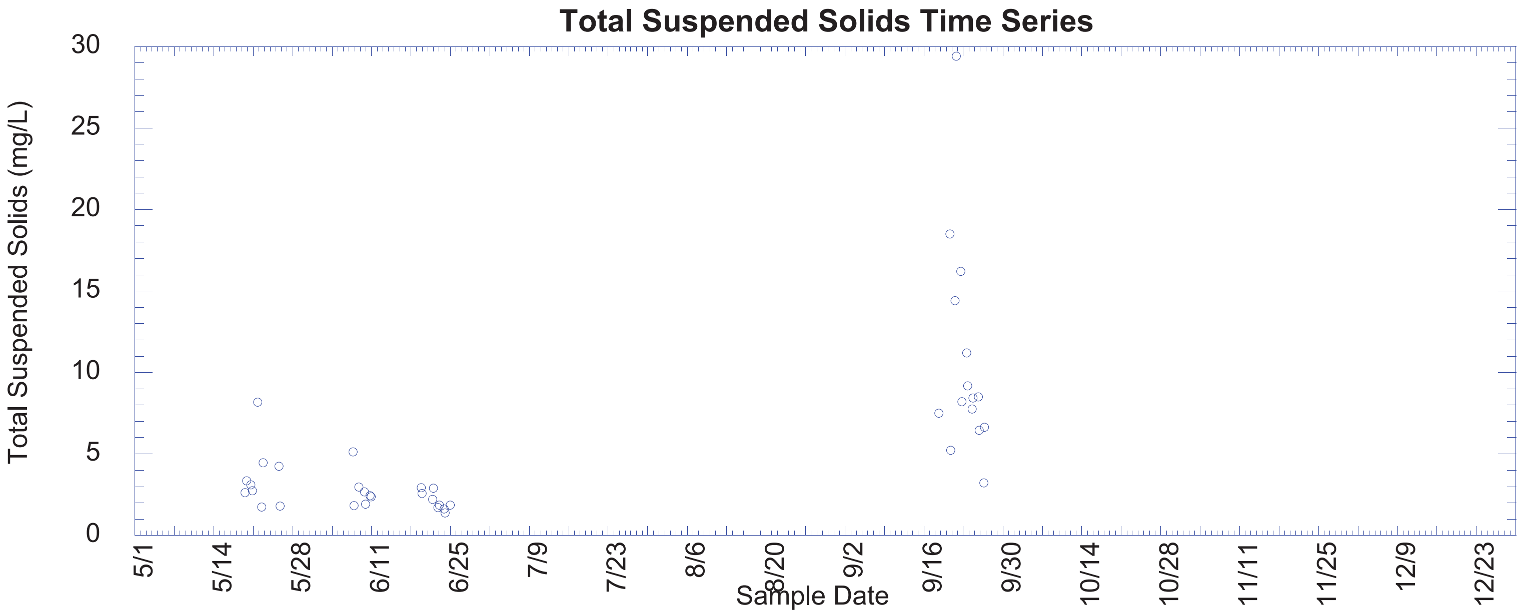


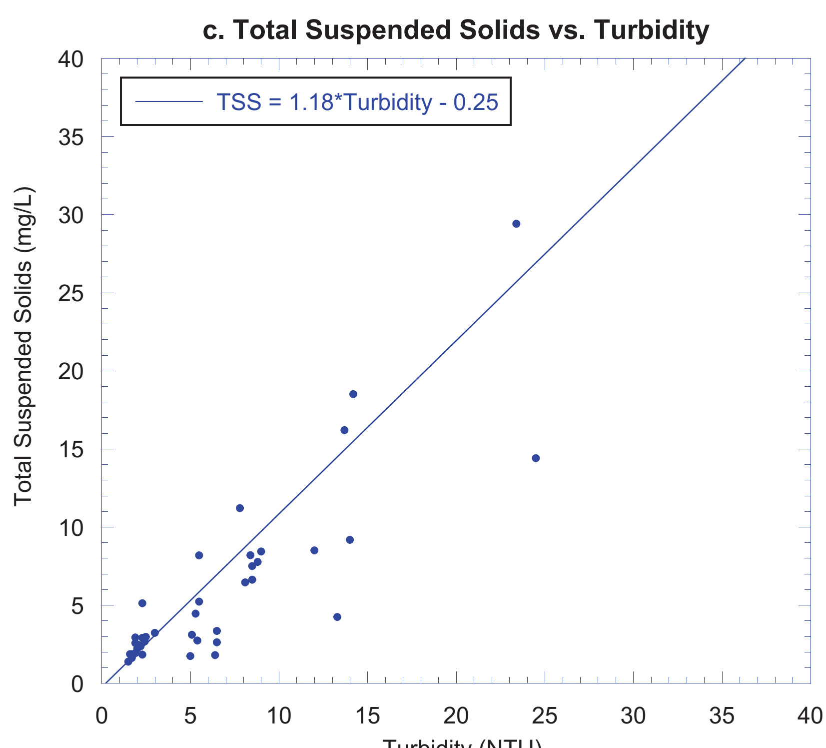
c. Total Suspended Solids vs. Turbidity



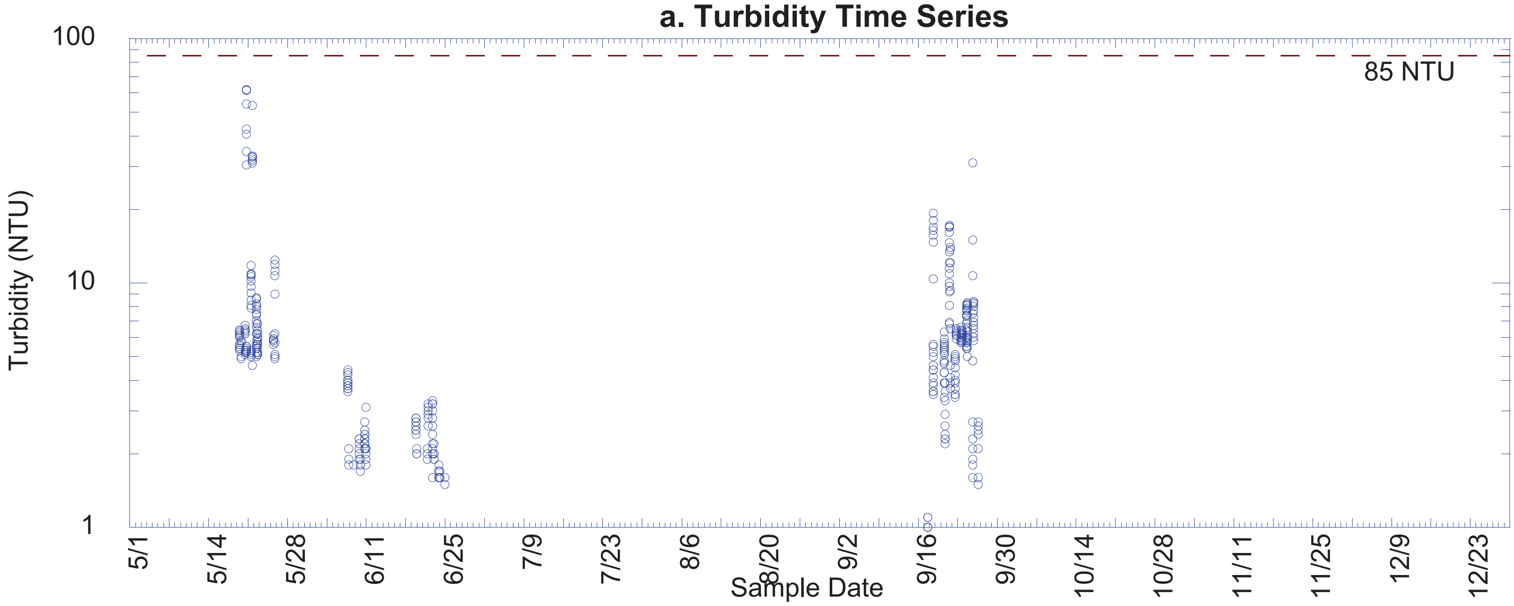
Lock 7: Operation #1 - 10m Side Channel Transect

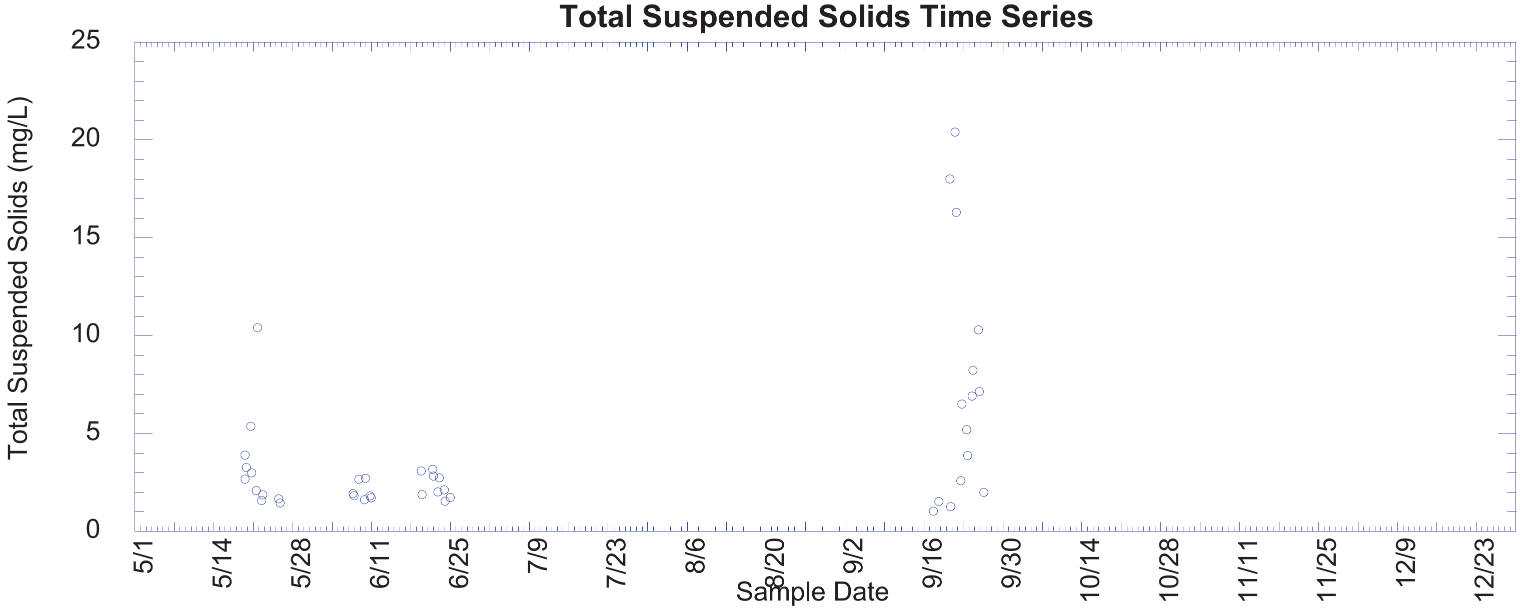


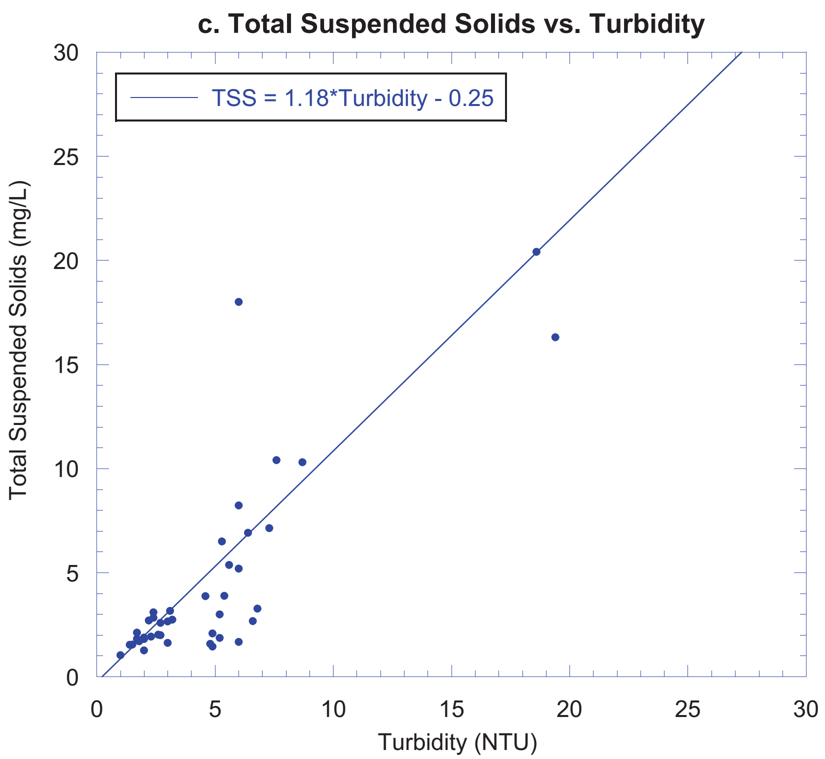




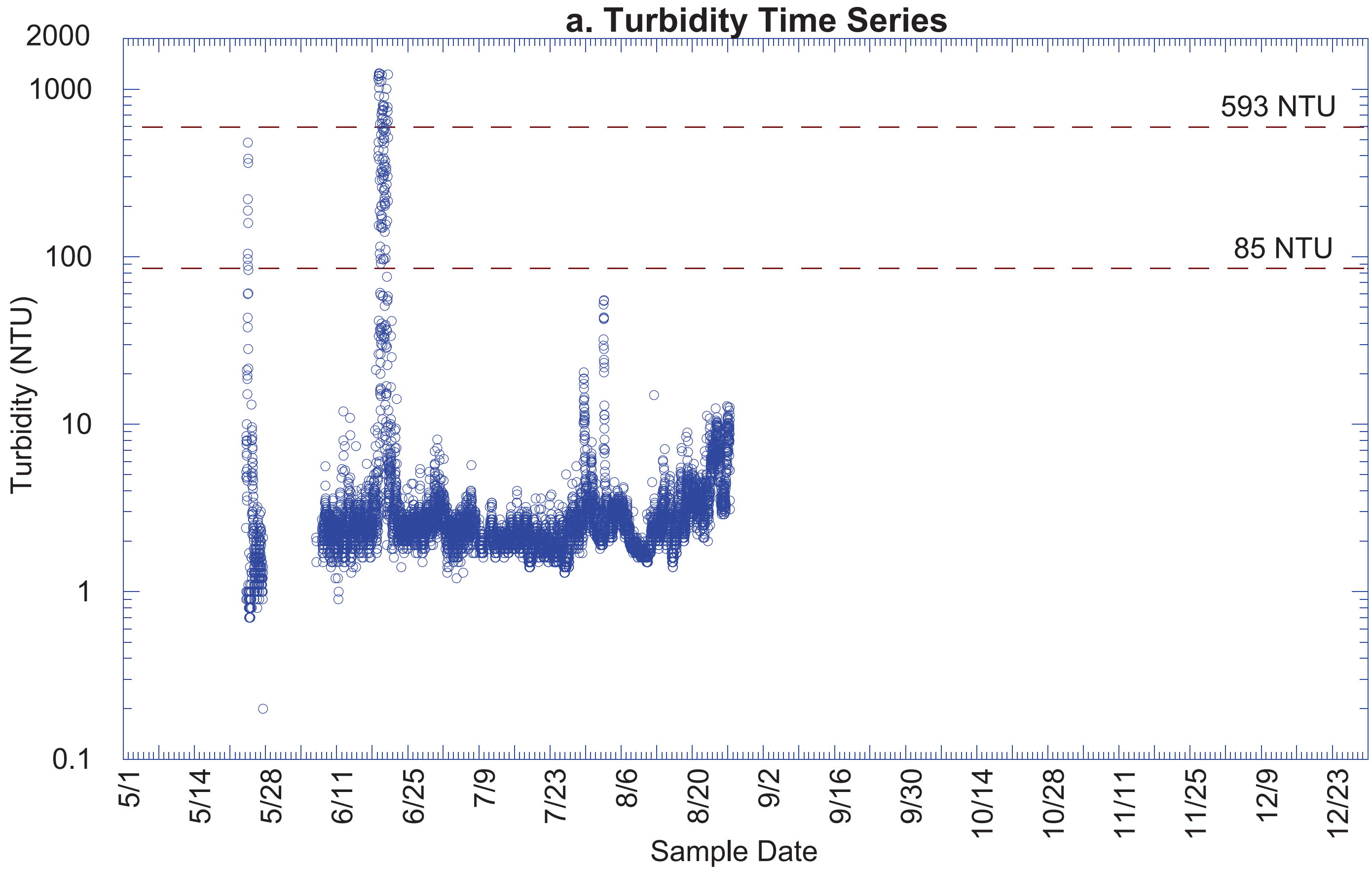
Lock 7: Operation #1 - 100m Downstream Transect

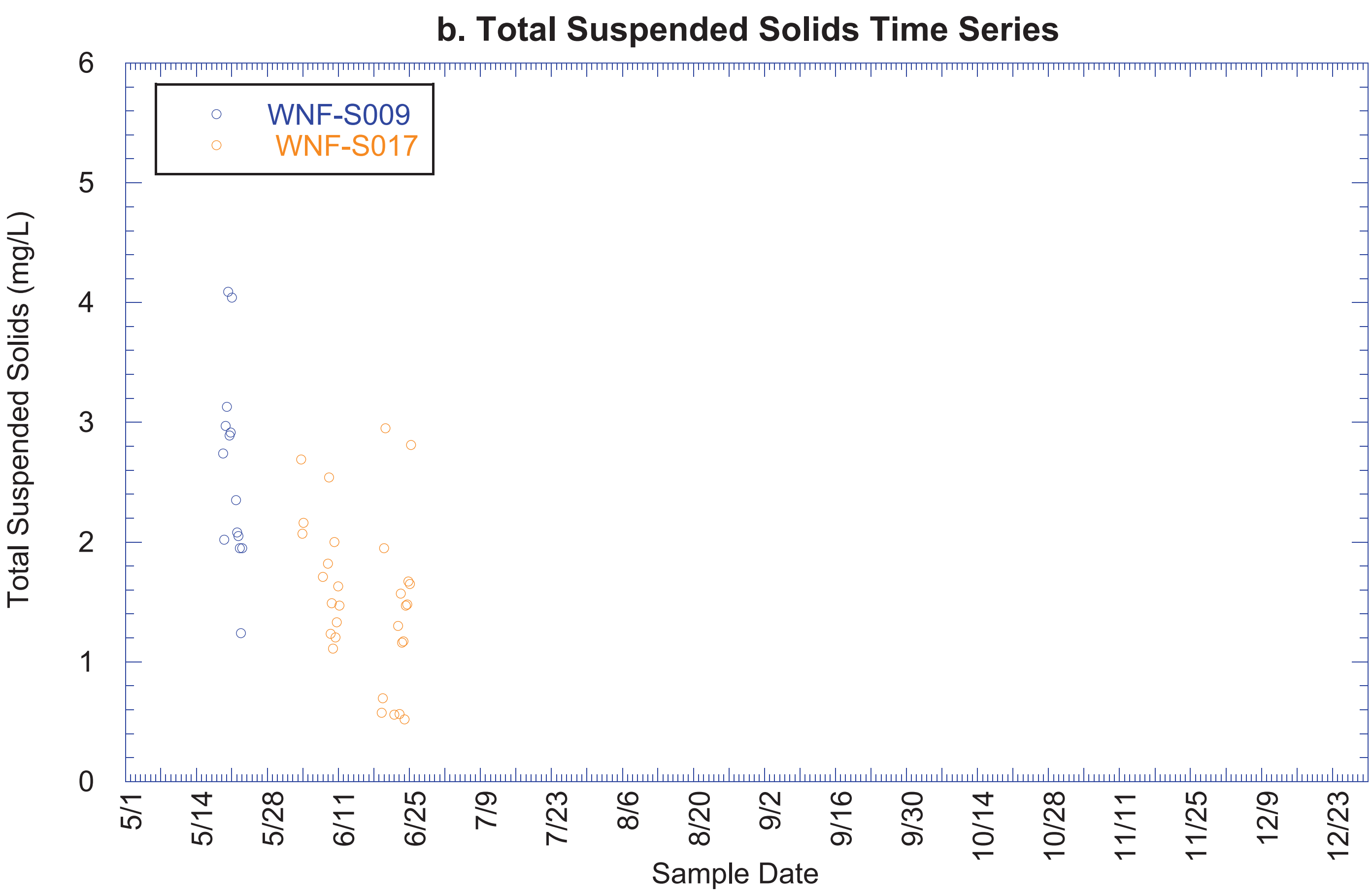




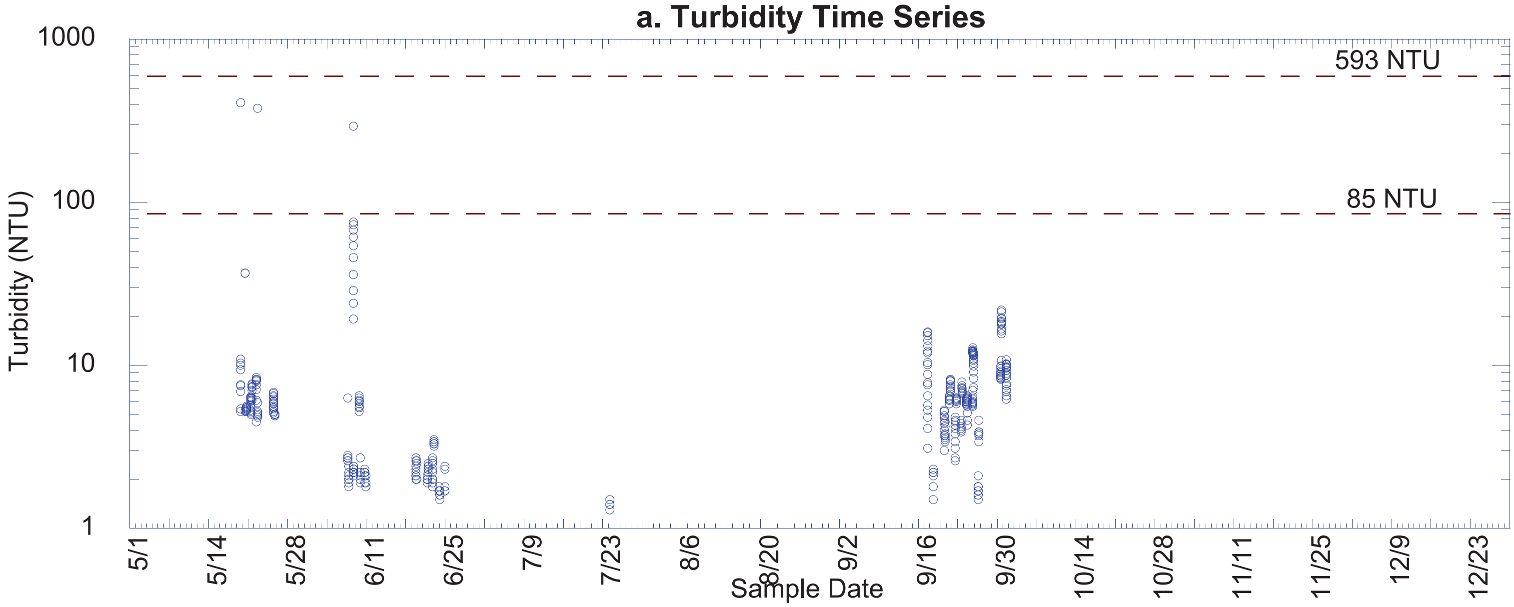


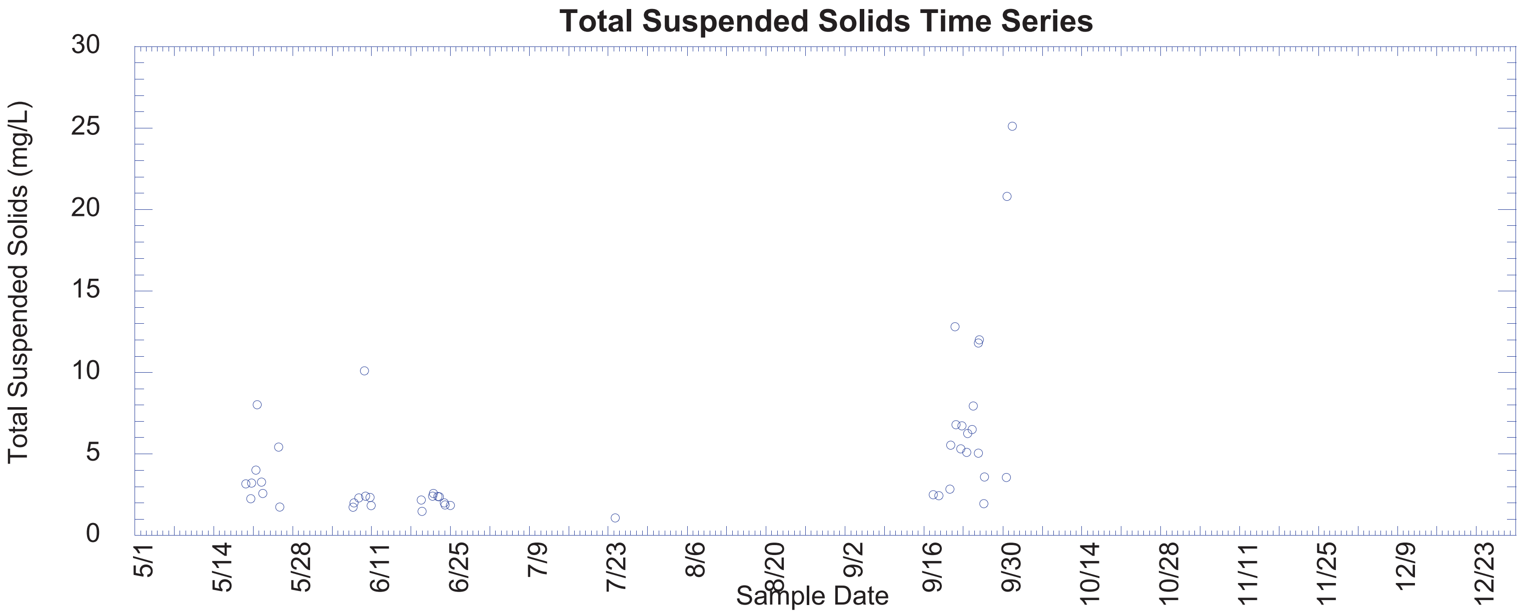
Lock 7: Operation #1 - 300m Downstream Buoy

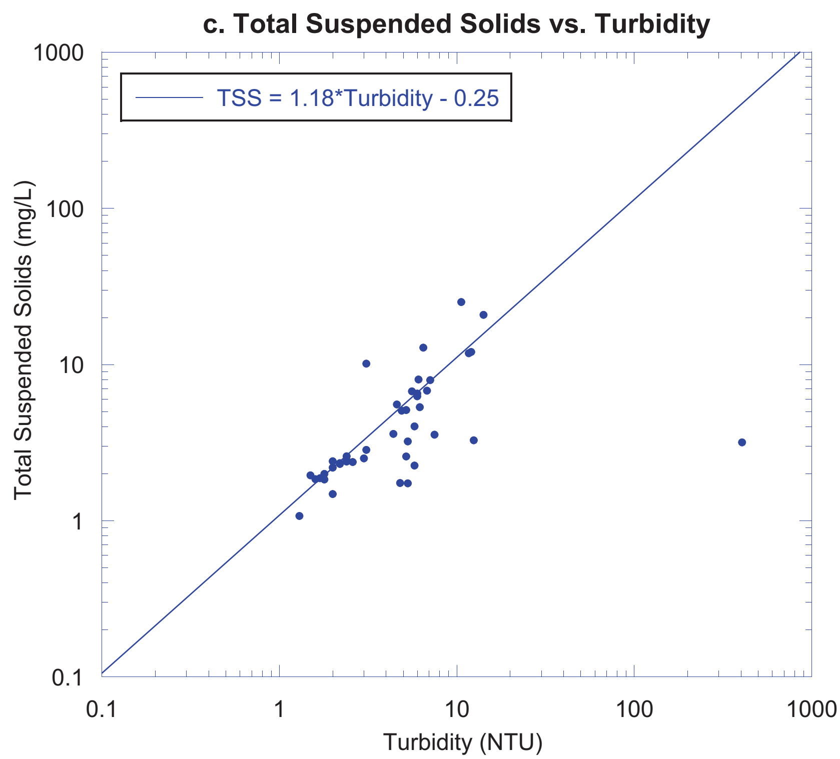




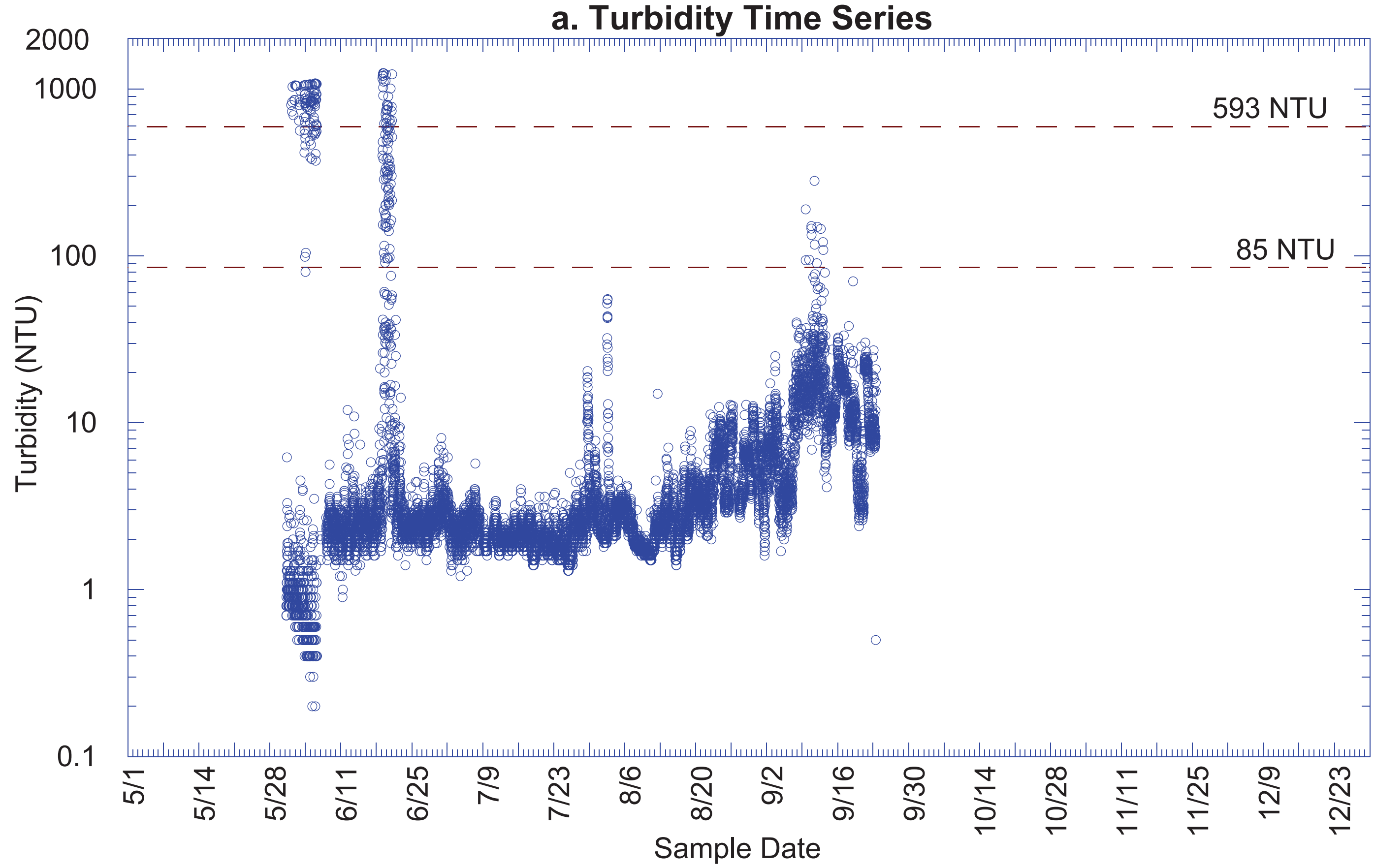
Lock 7: Operation #1 - 300m Downstream Transect

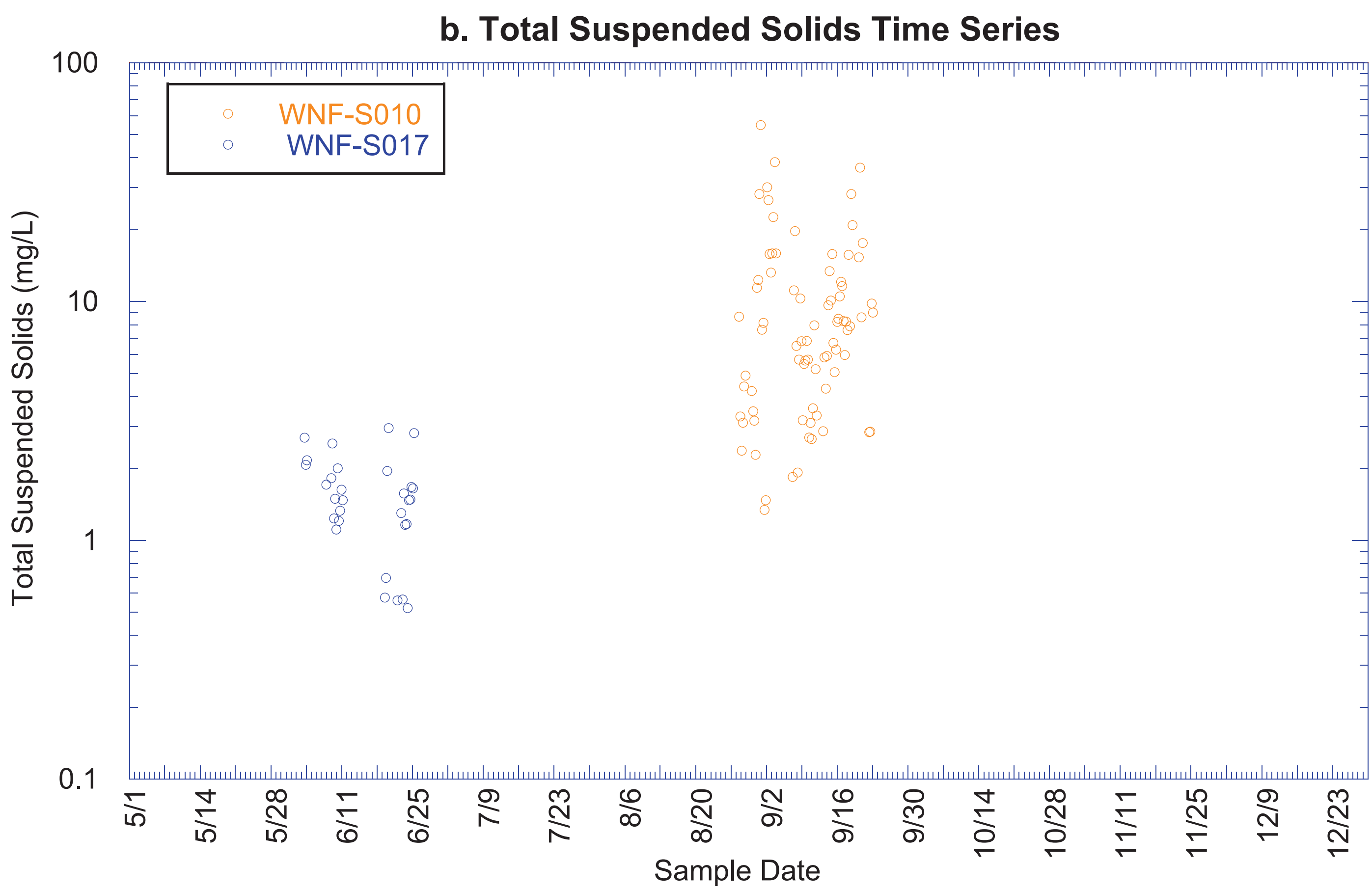




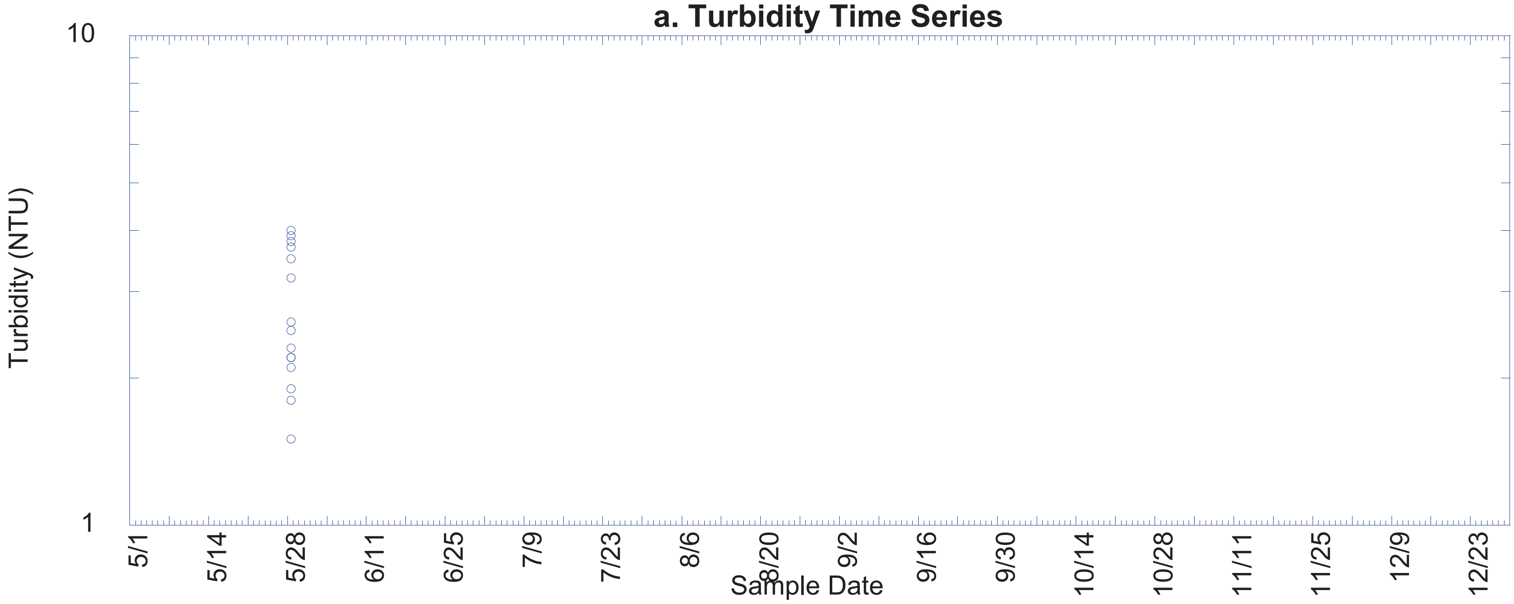


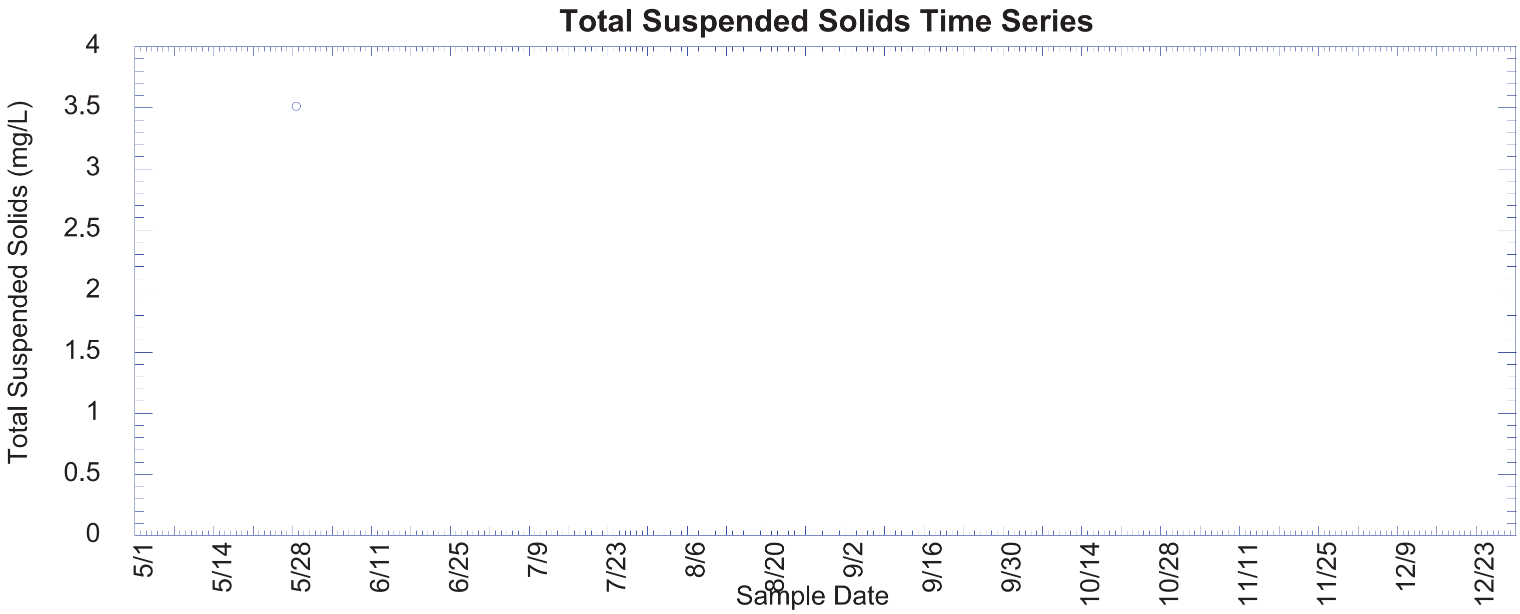
Lock 7: Operation #2 - 100m Upstream Buoy

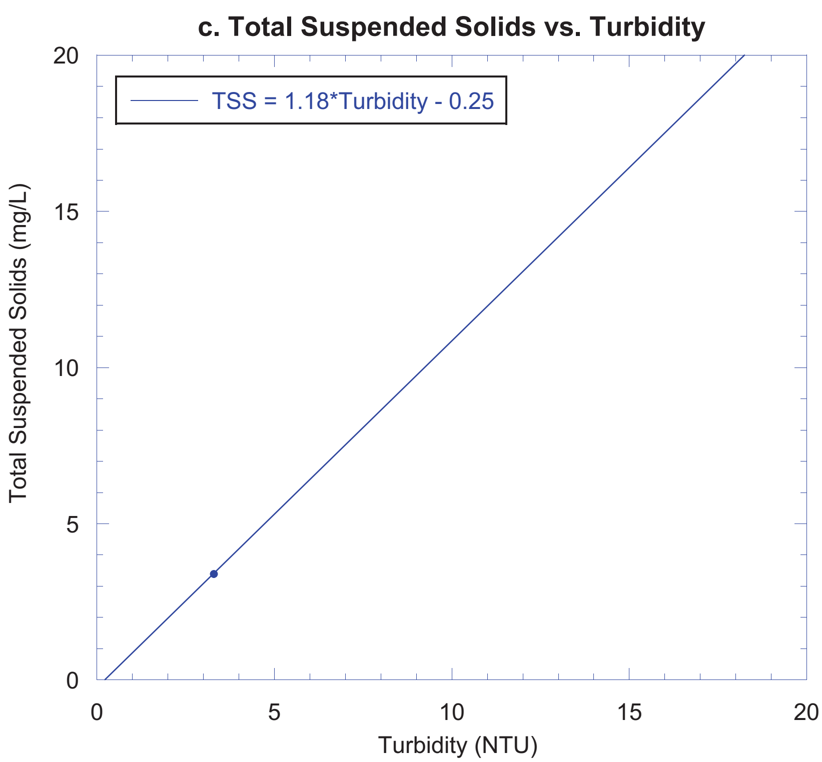




Lock 7: Operation #2 - 100m Upstream Transect

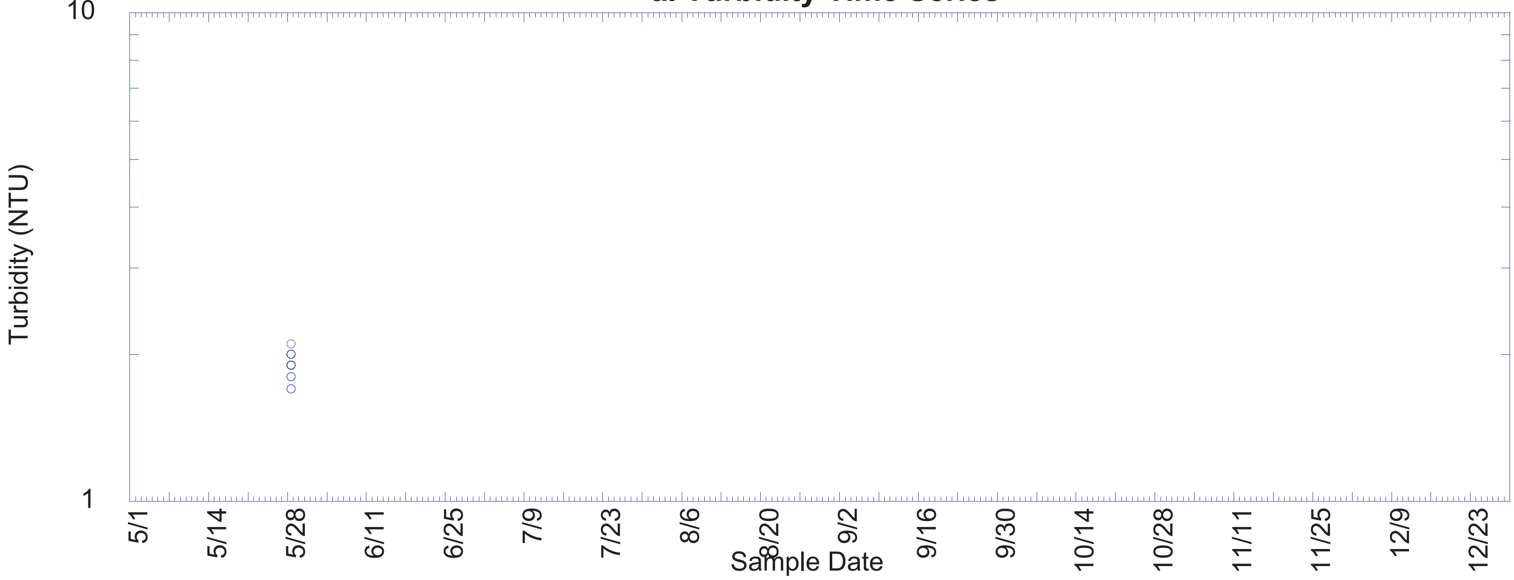




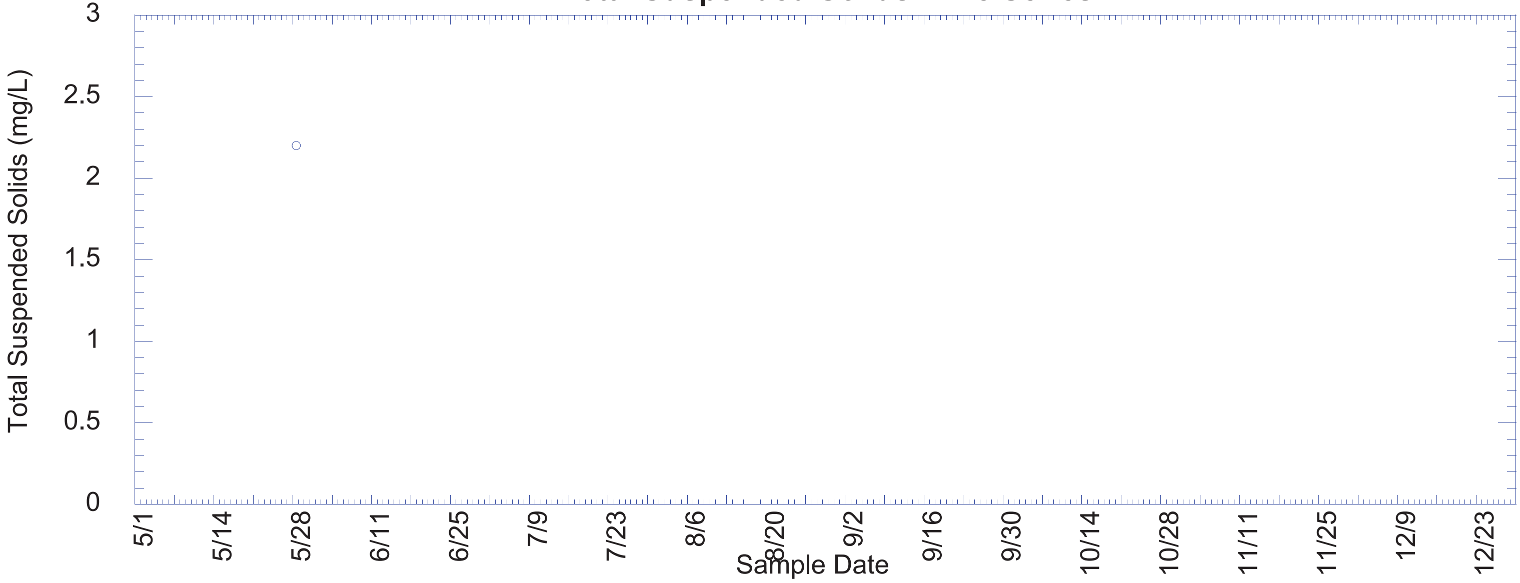


Lock 7: Operation #2 - 10m Side Channel Transect

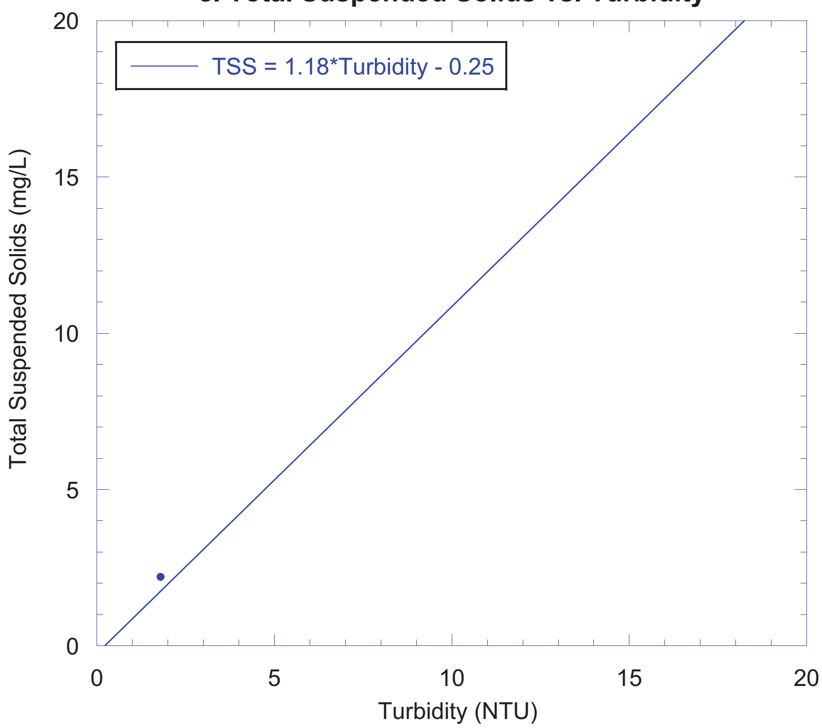
a. Turbidity Time Series



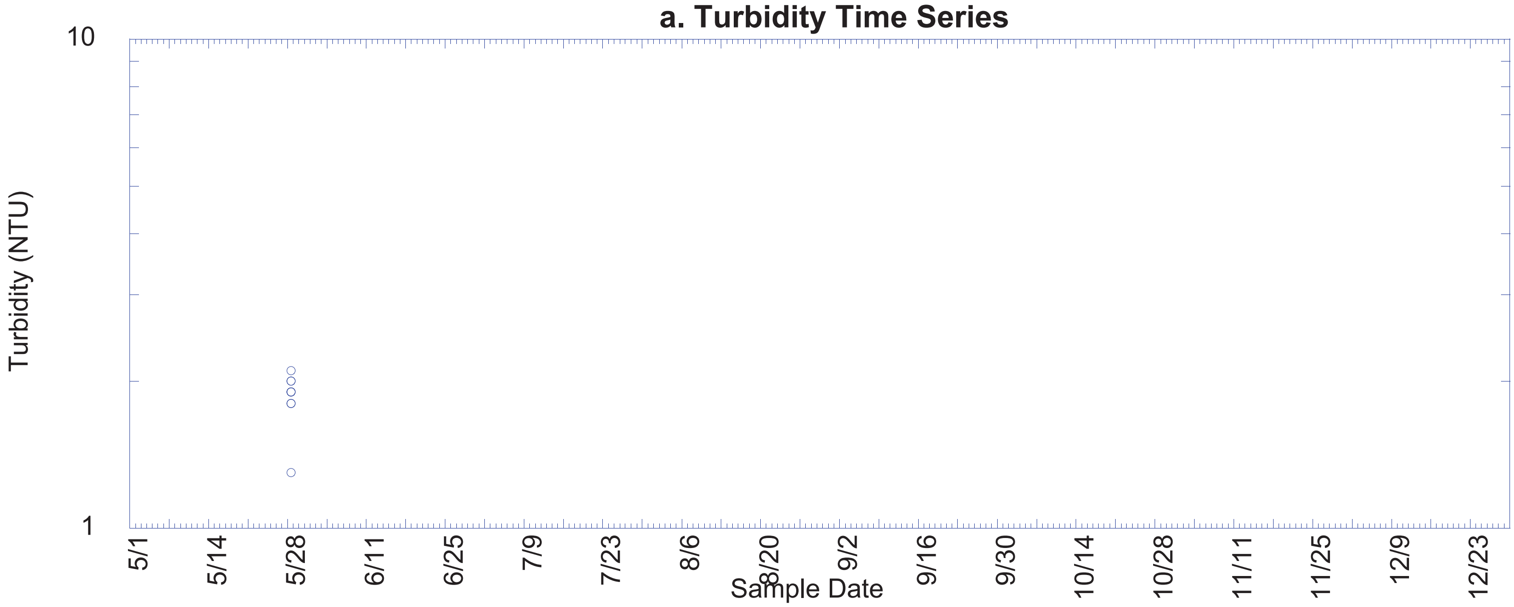
Total Suspended Solids Time Series

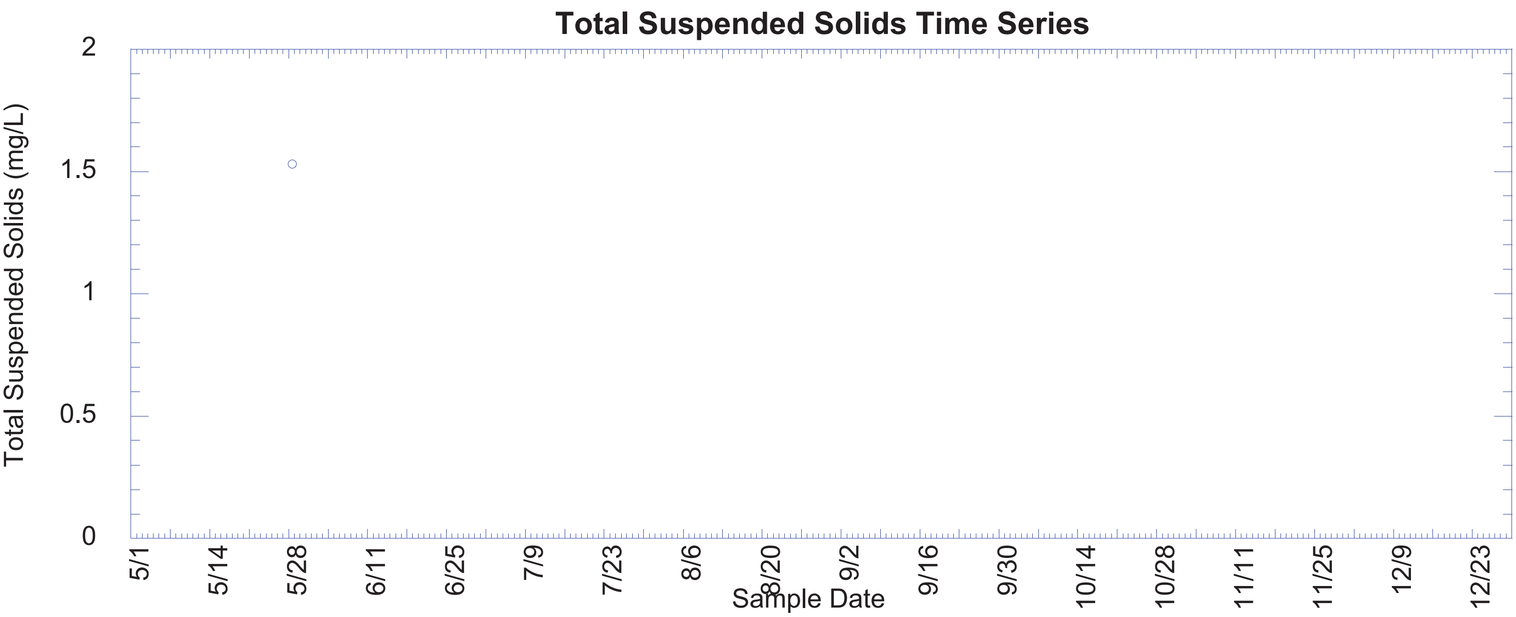


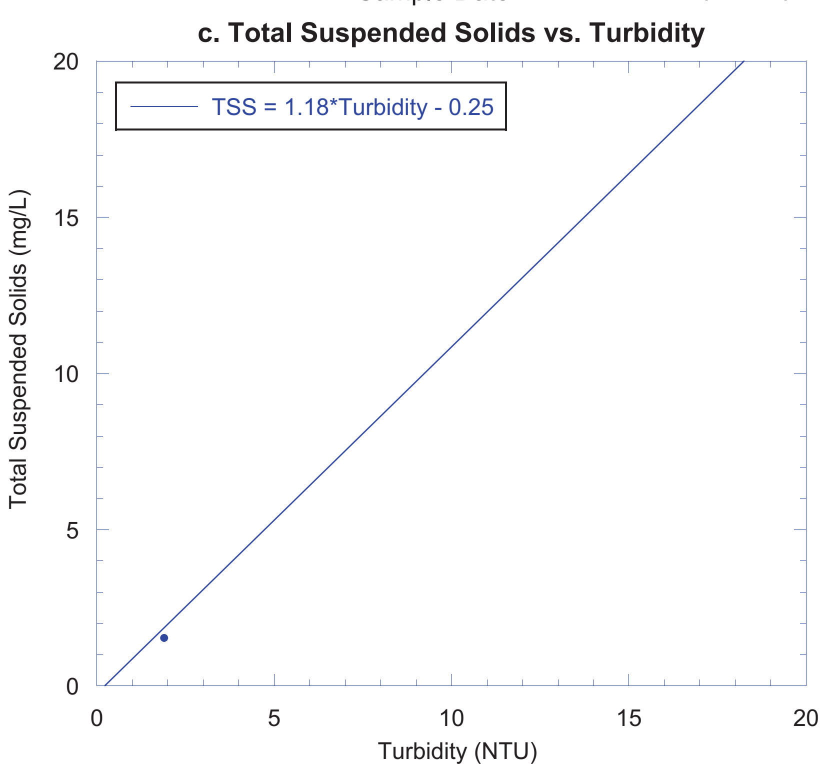
c. Total Suspended Solids vs. Turbidity



Lock 7: Operation #2 - 100m Downstream Transect

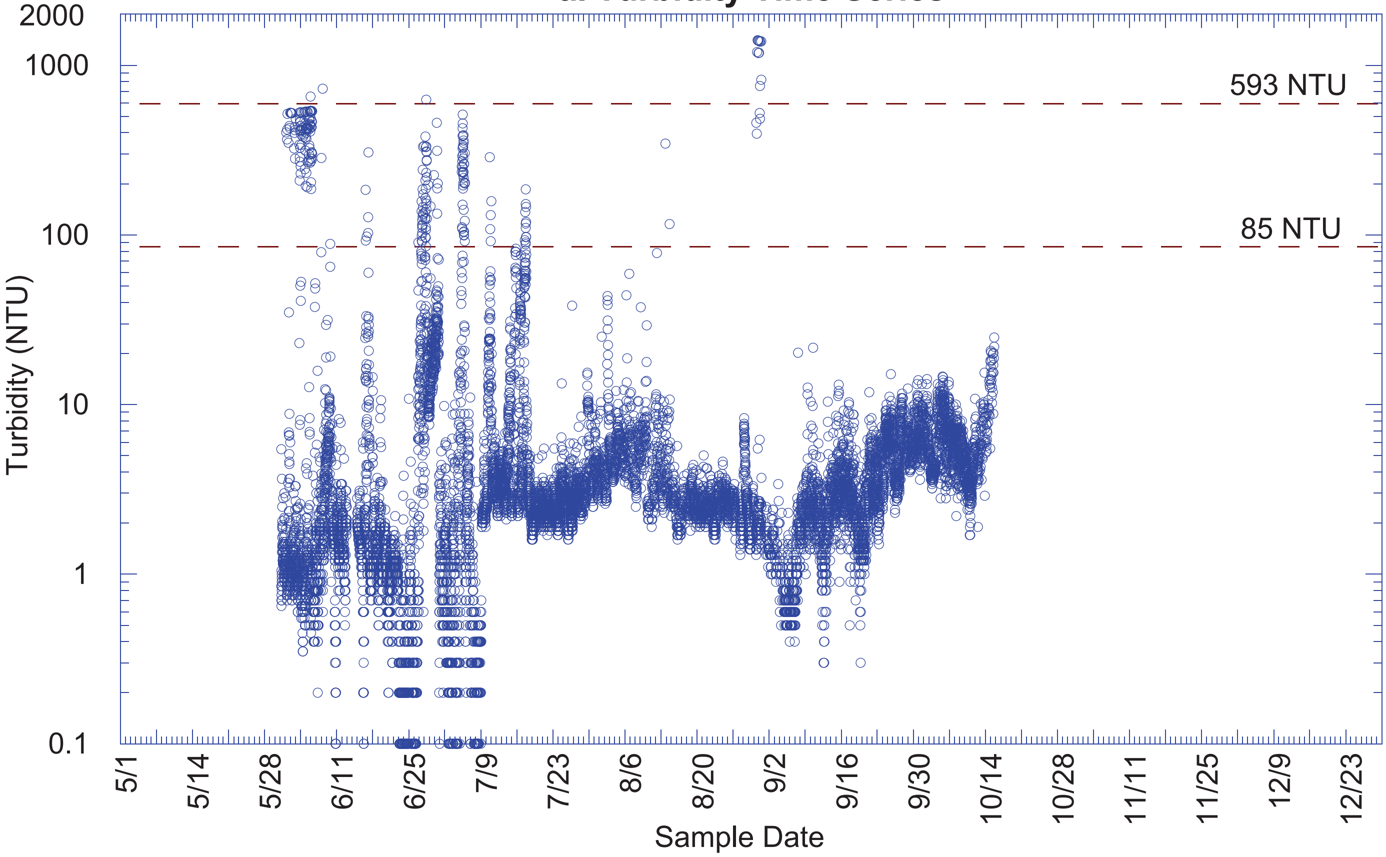




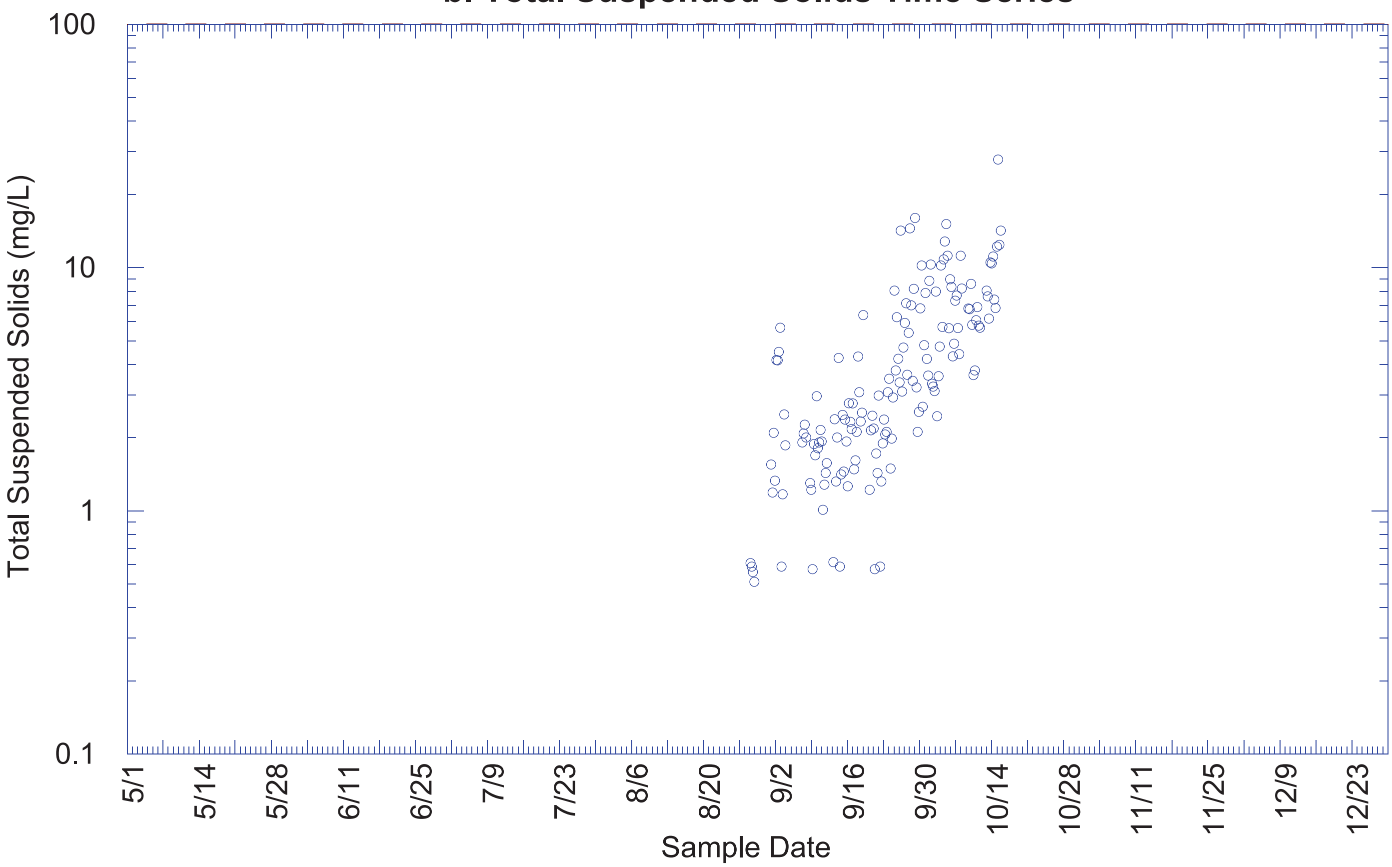


Lock 7: Operation #2 - 300m Downstream Buoy

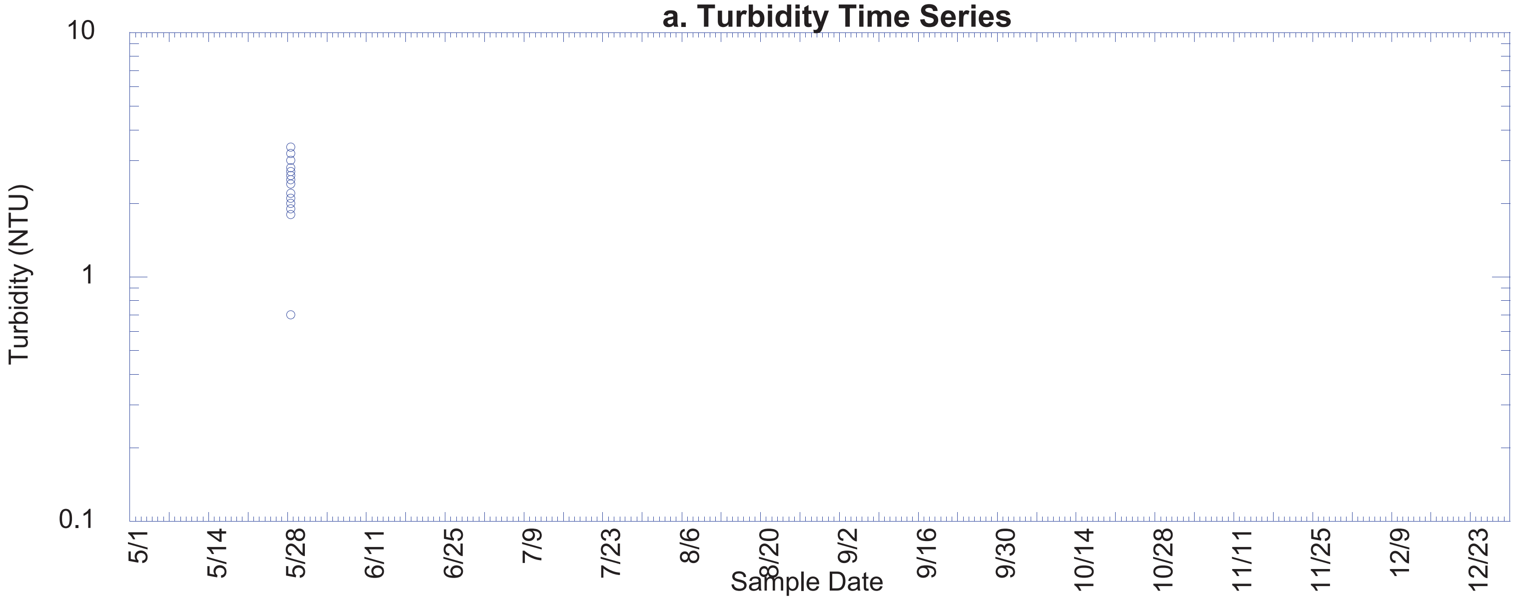
a. Turbidity Time Series

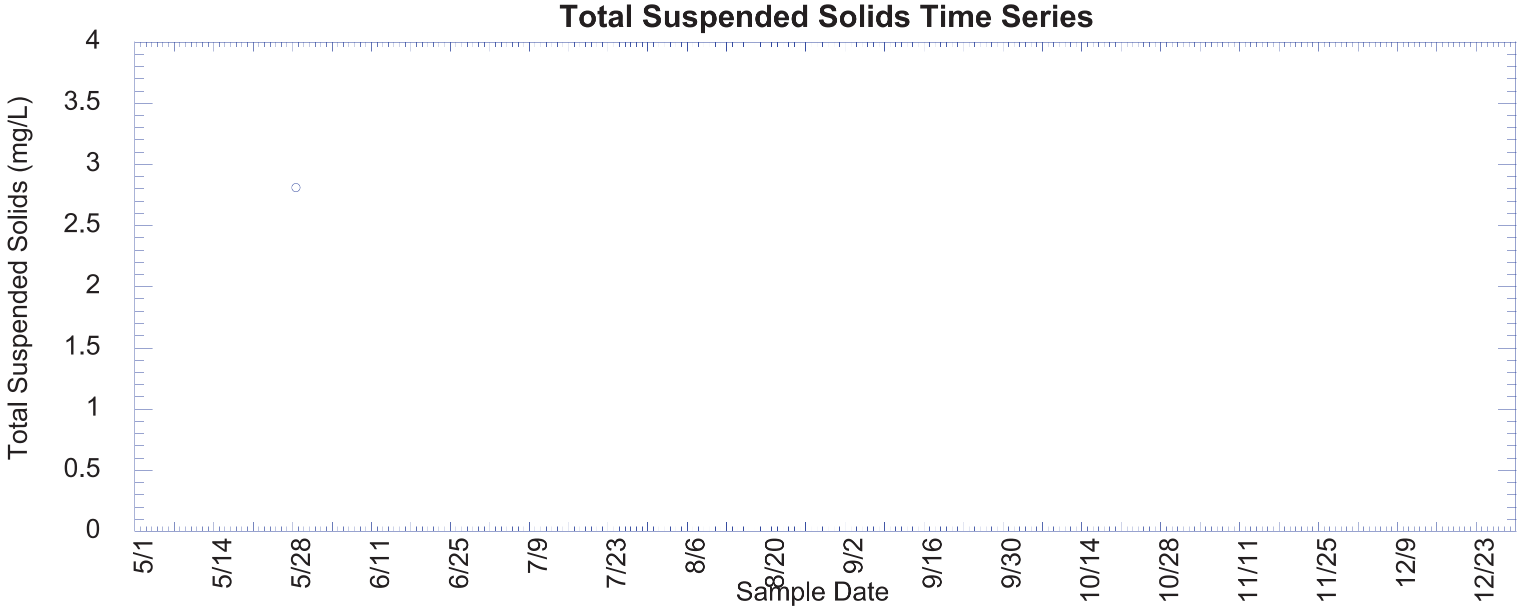


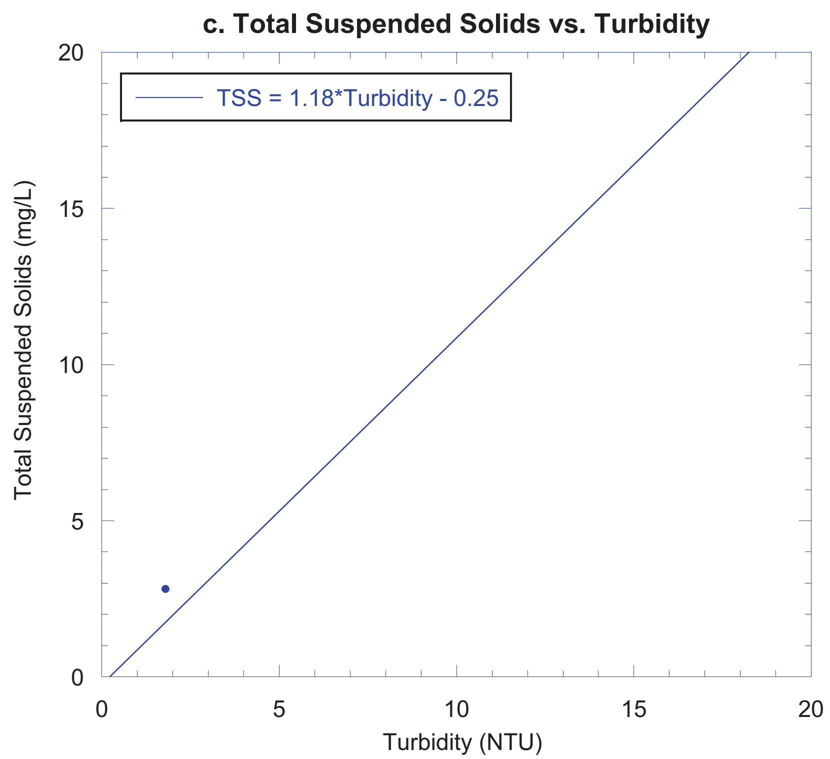
b. Total Suspended Solids Time Series



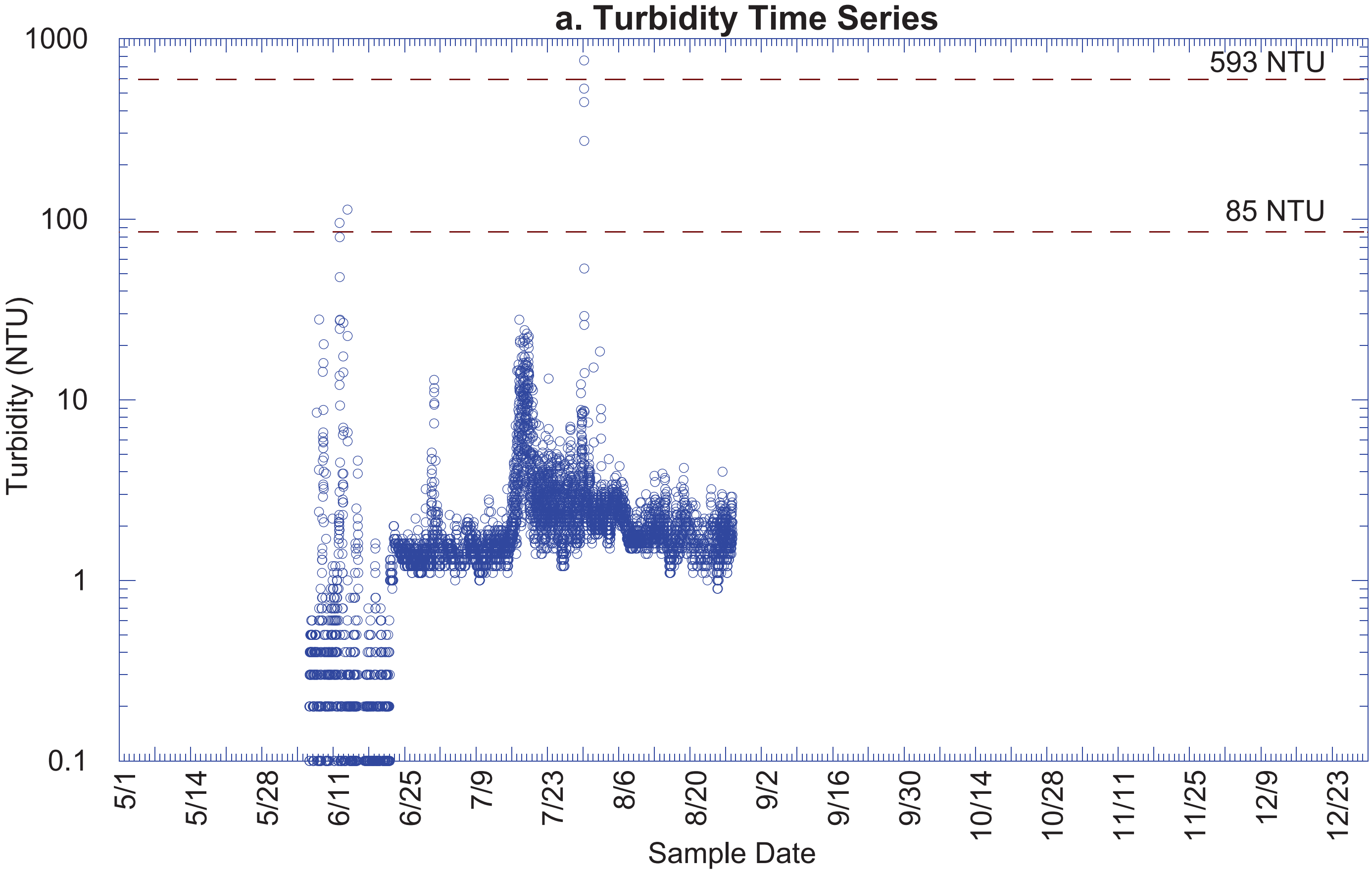
Lock 7: Operation #2 - 300m Downstream Transect

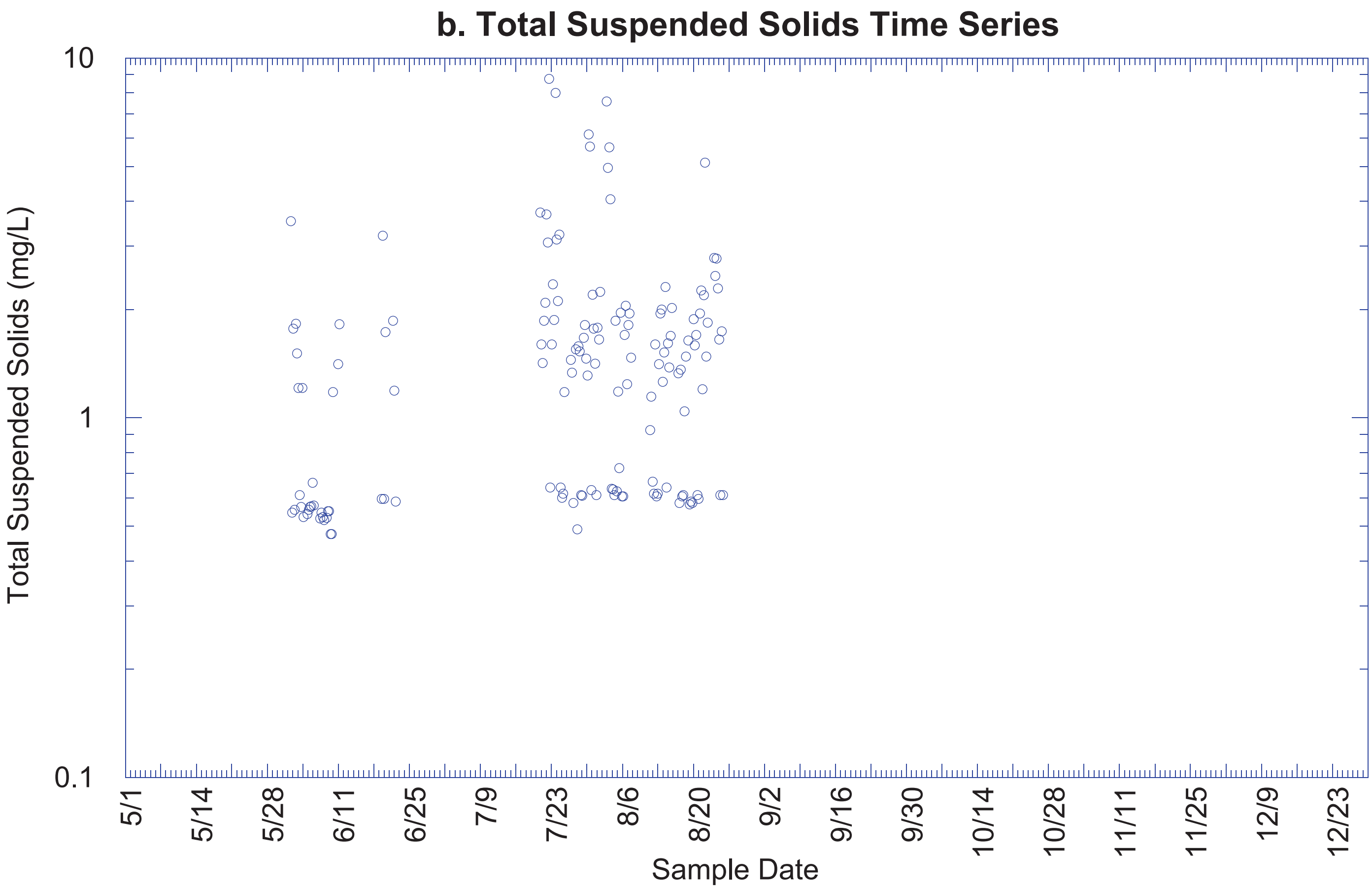




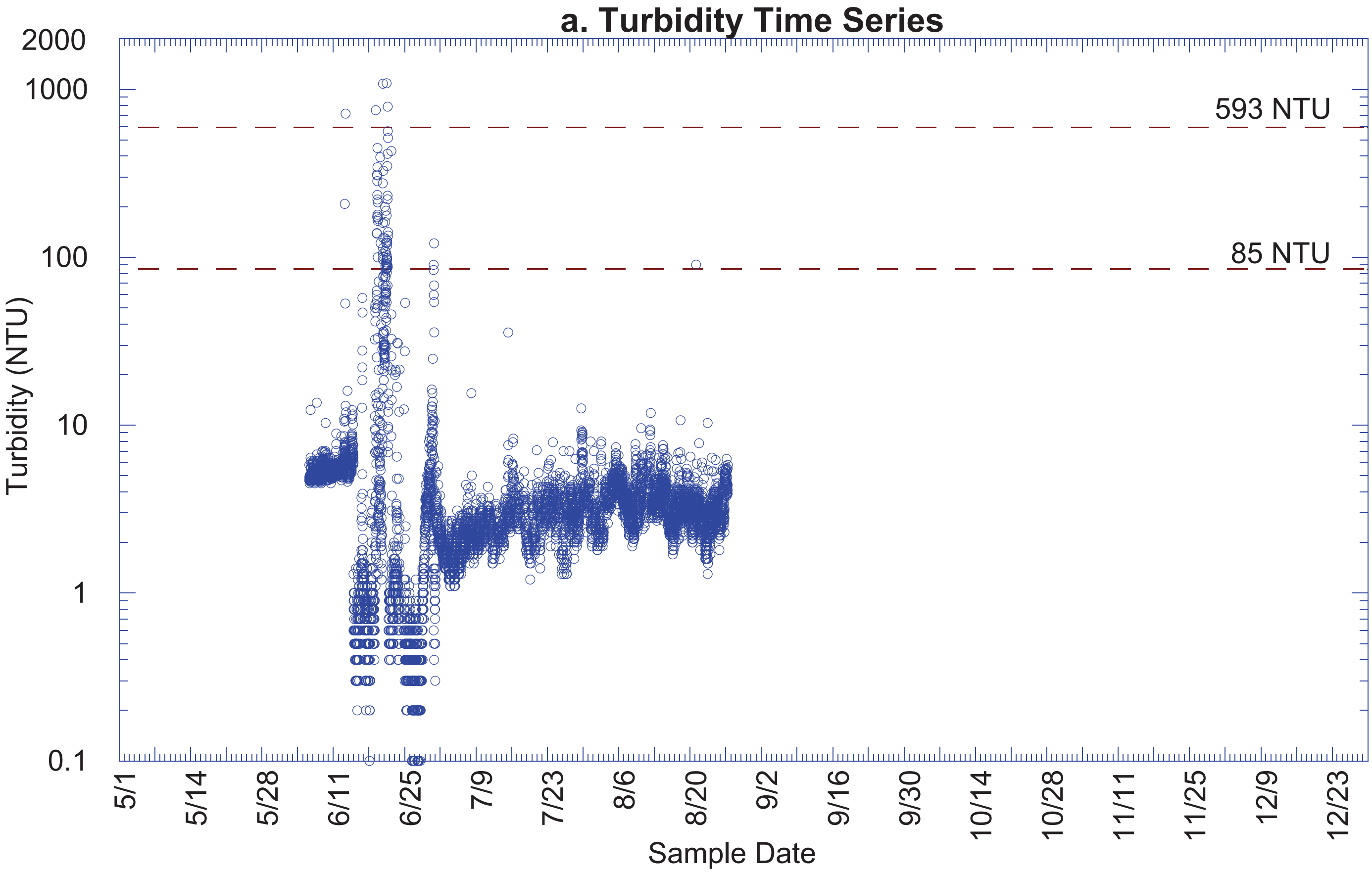


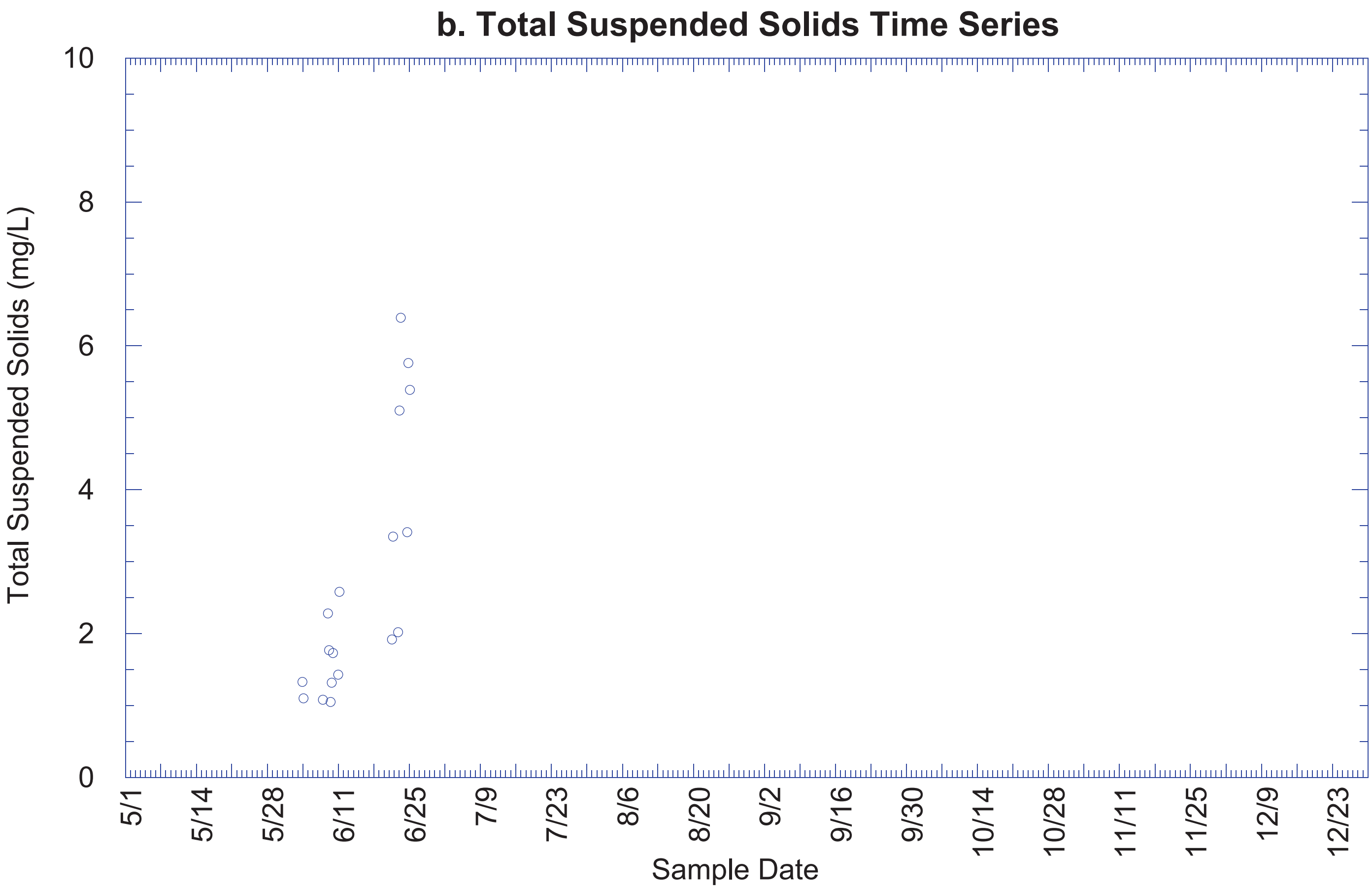
Lock 7: Operation #3 - 100m Upstream Buoy





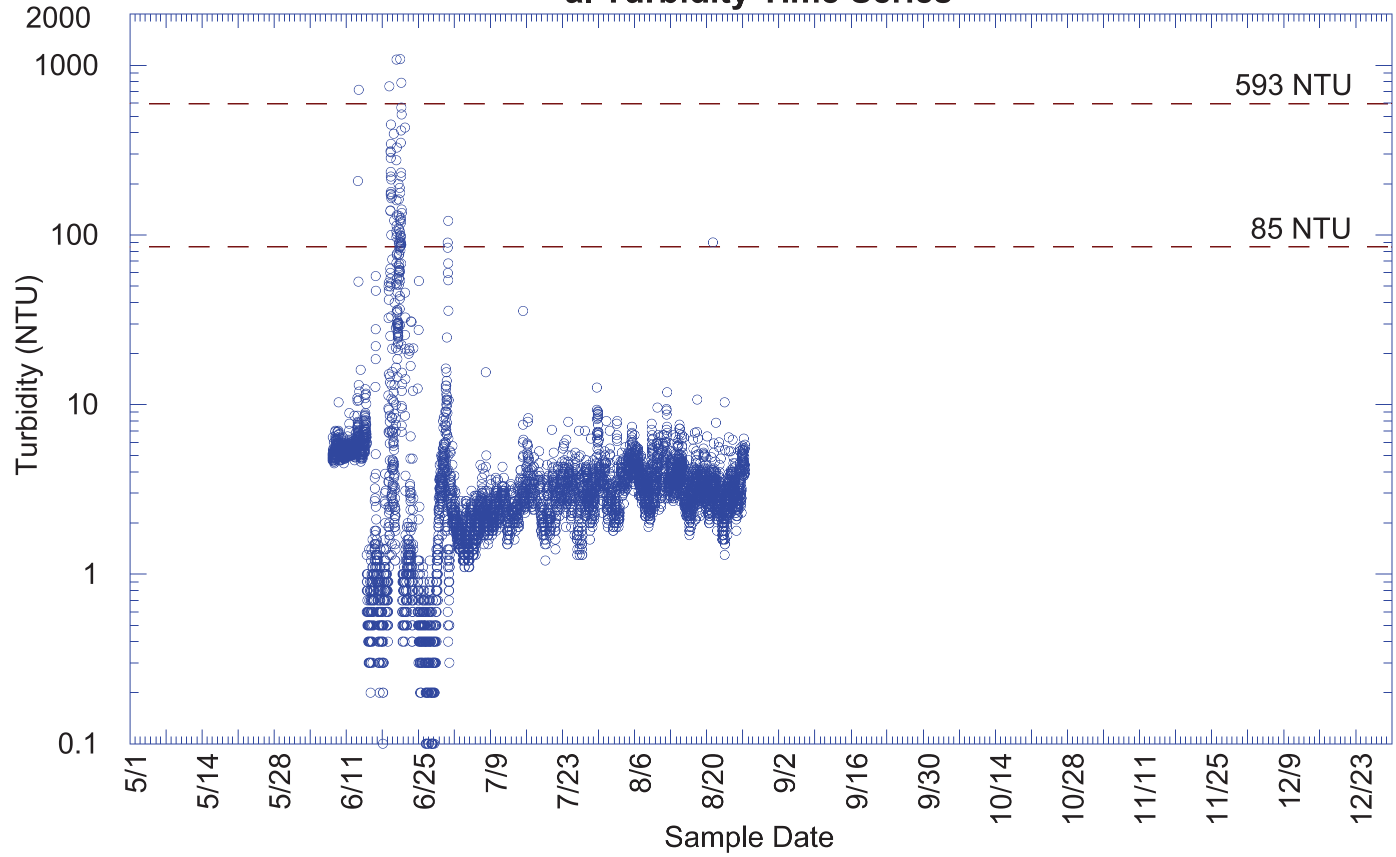
Lock 7: Operation #3 - 300m Downstream Buoy



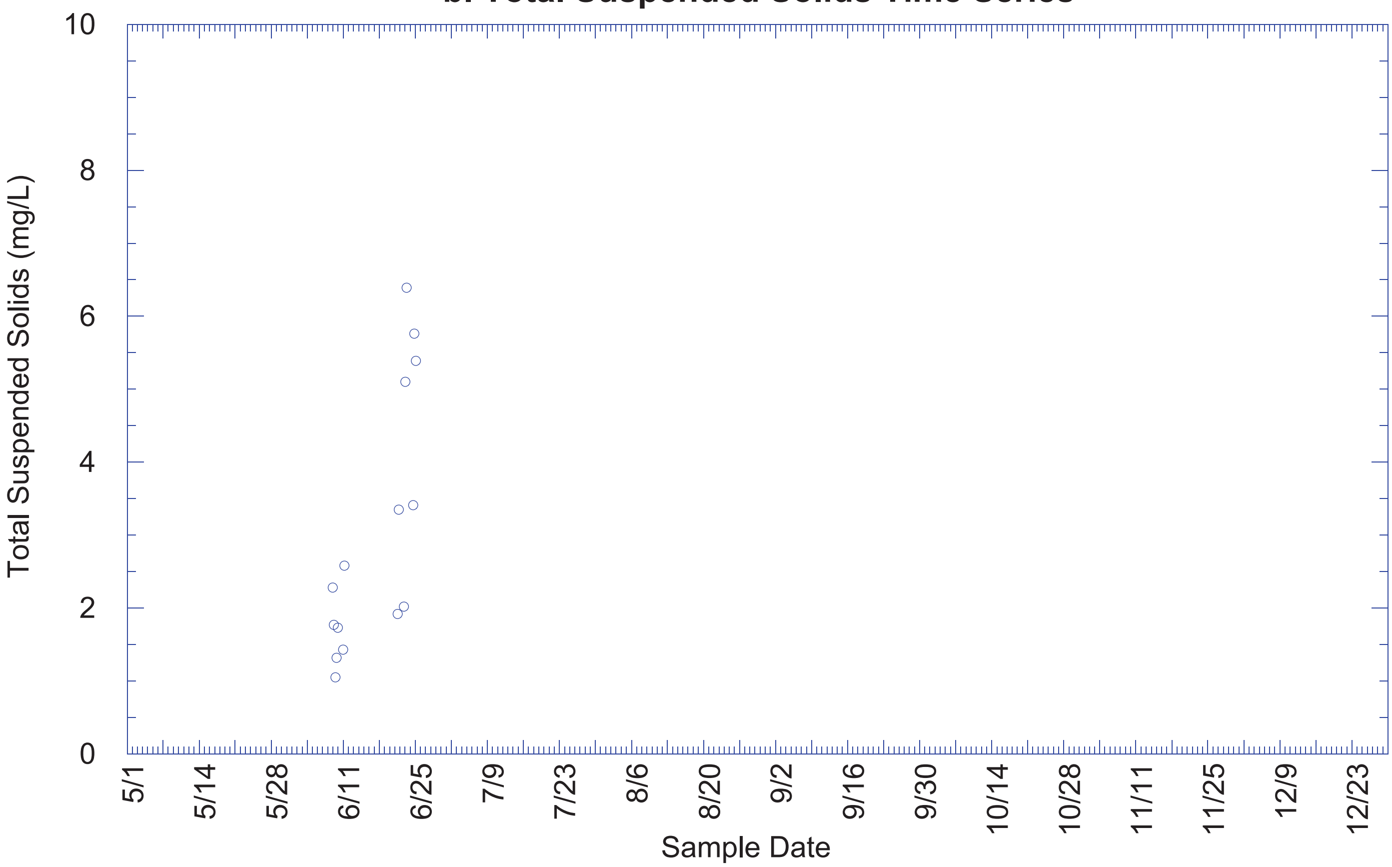


Lock 7: Operation #4 - 100m Upstream Buoy

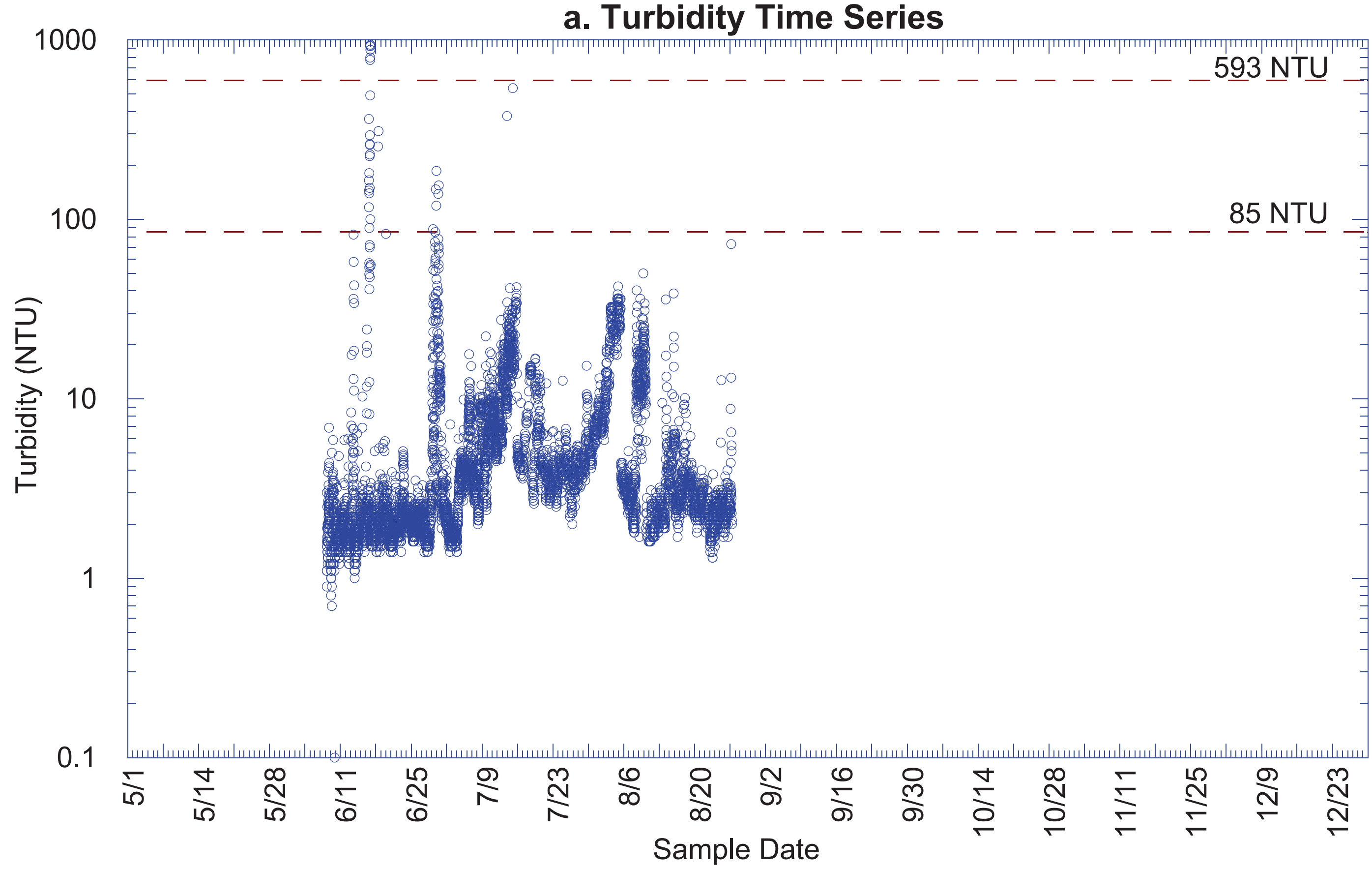
a. Turbidity Time Series

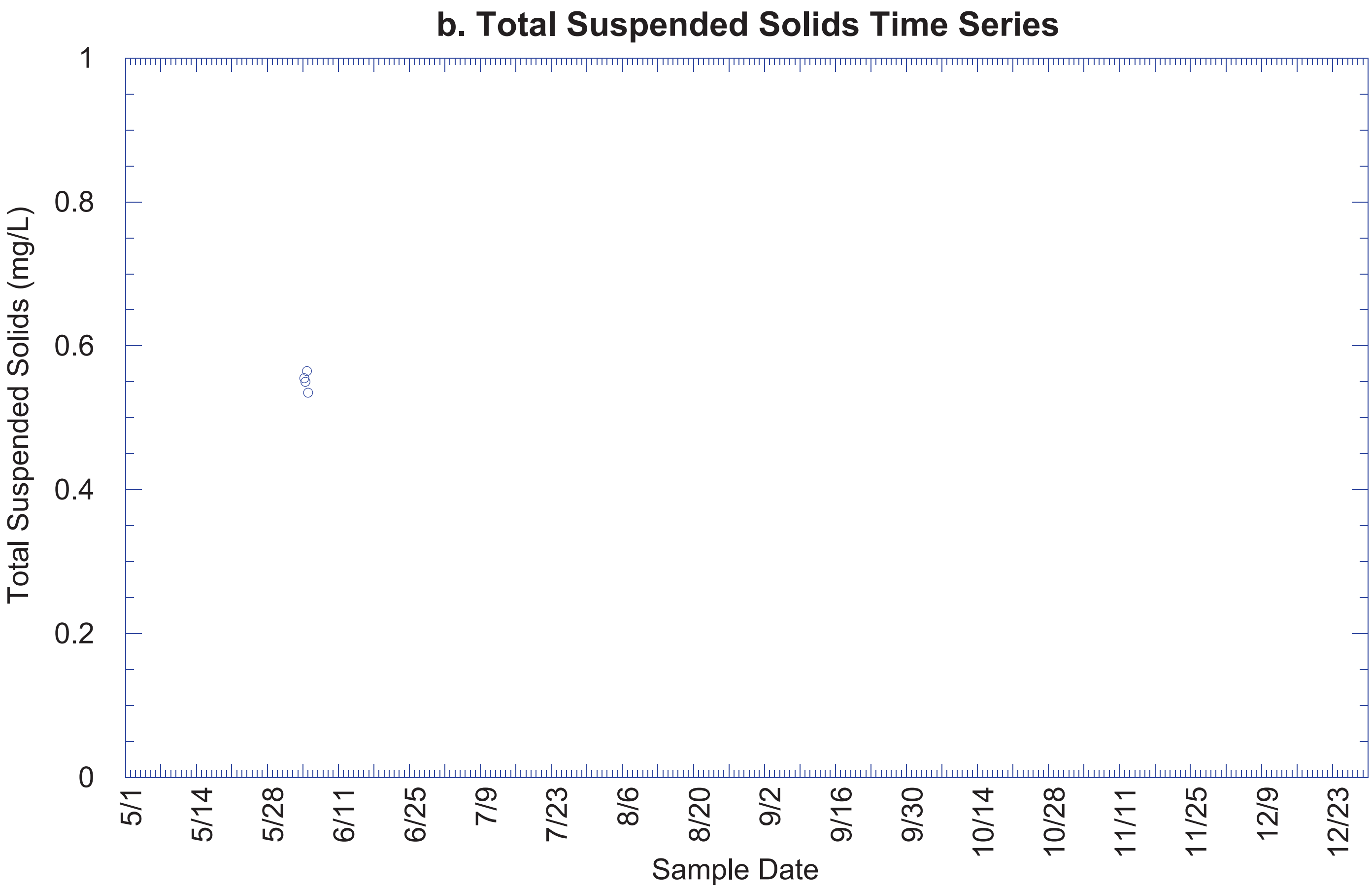


b. Total Suspended Solids Time Series

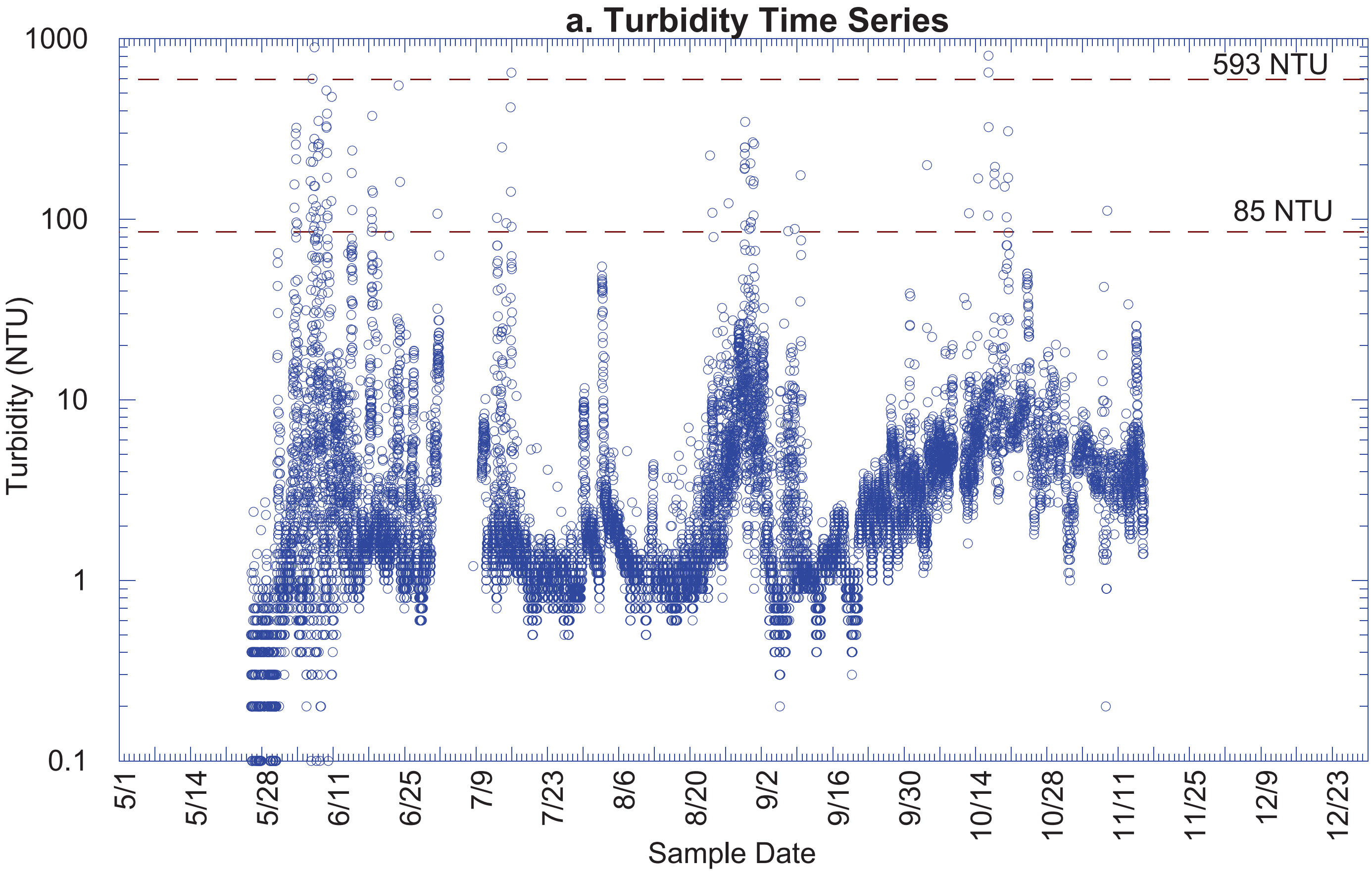


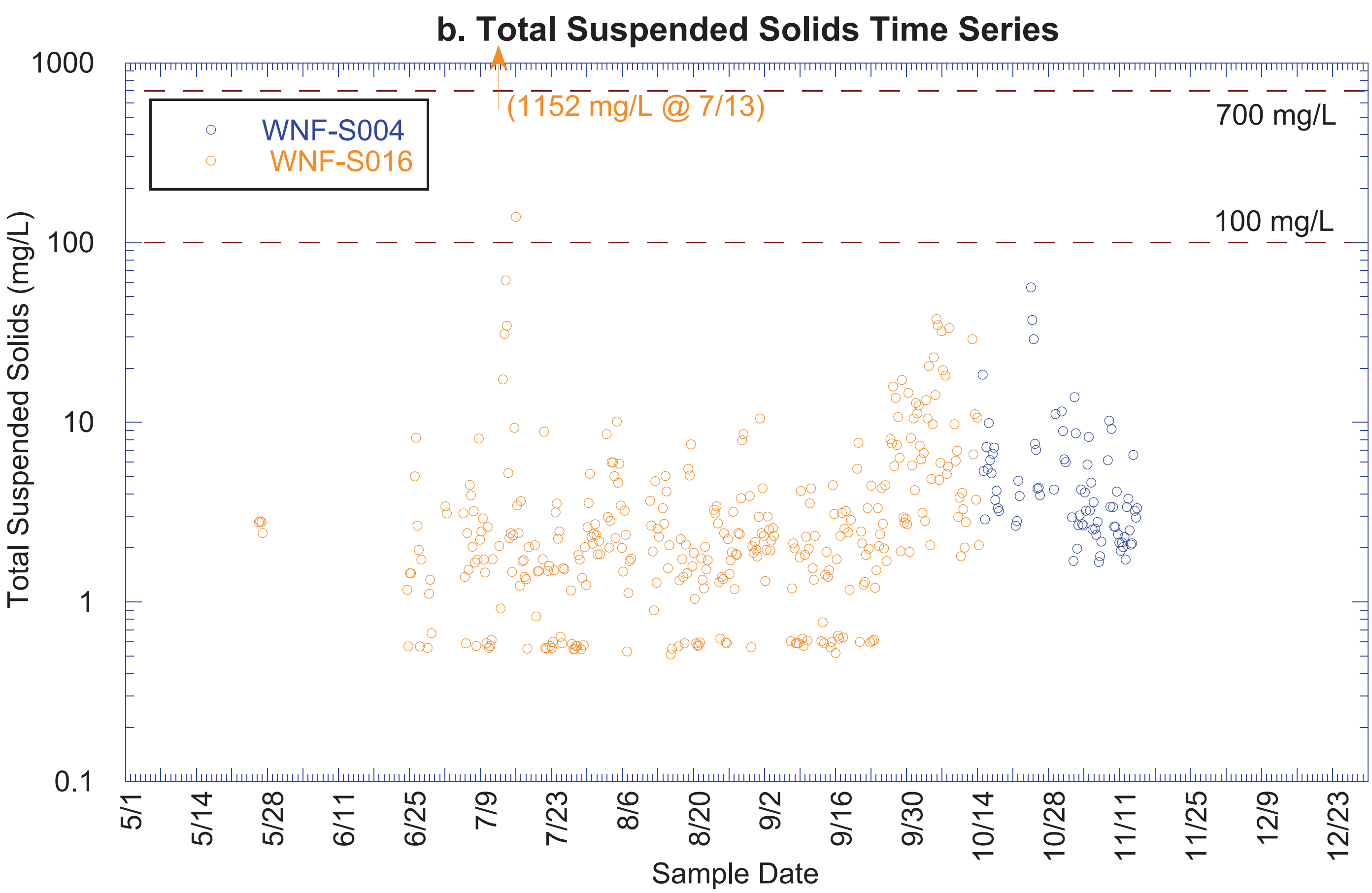
Lock 7: Operation #4 - 300m Downstream Buoy



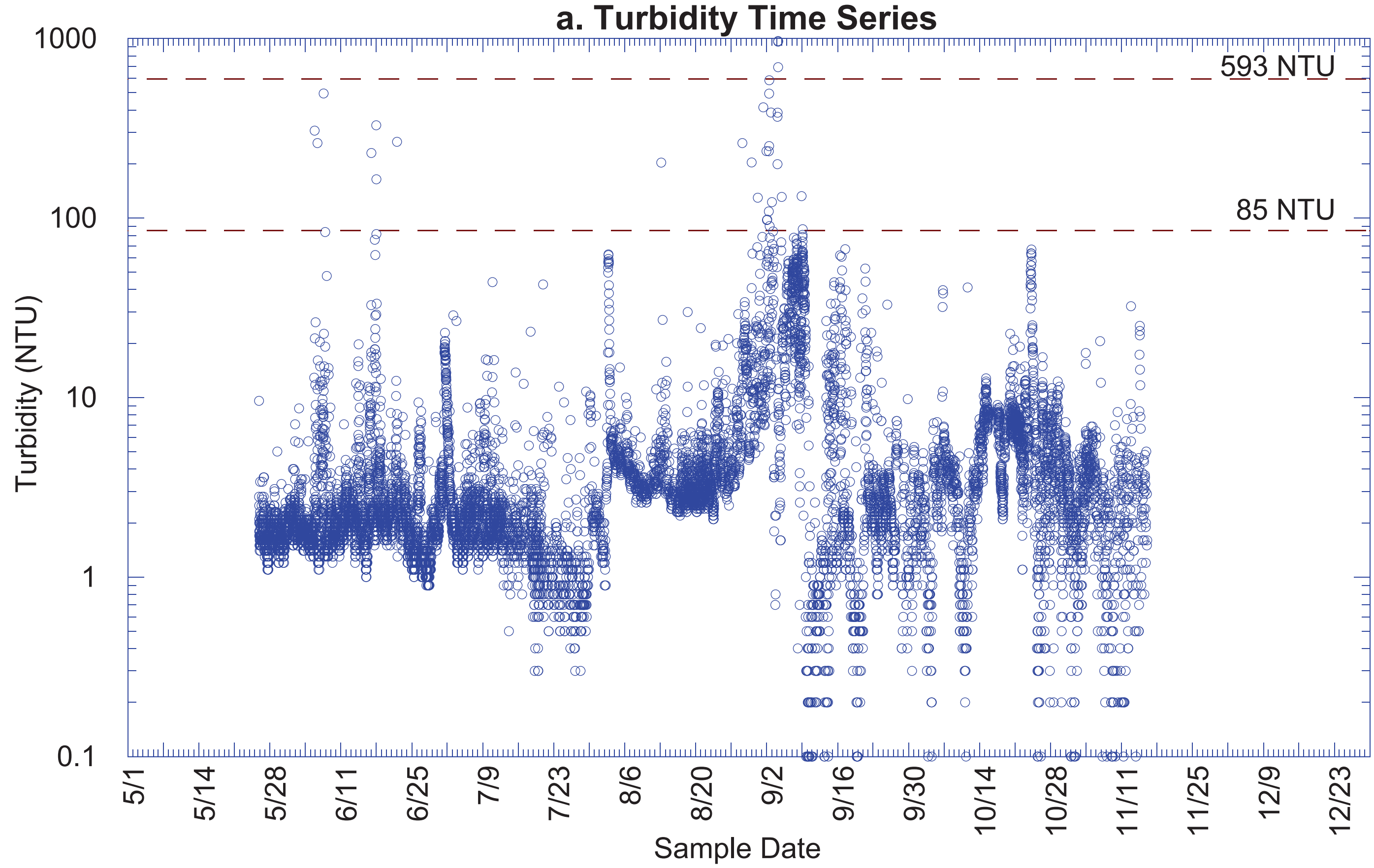


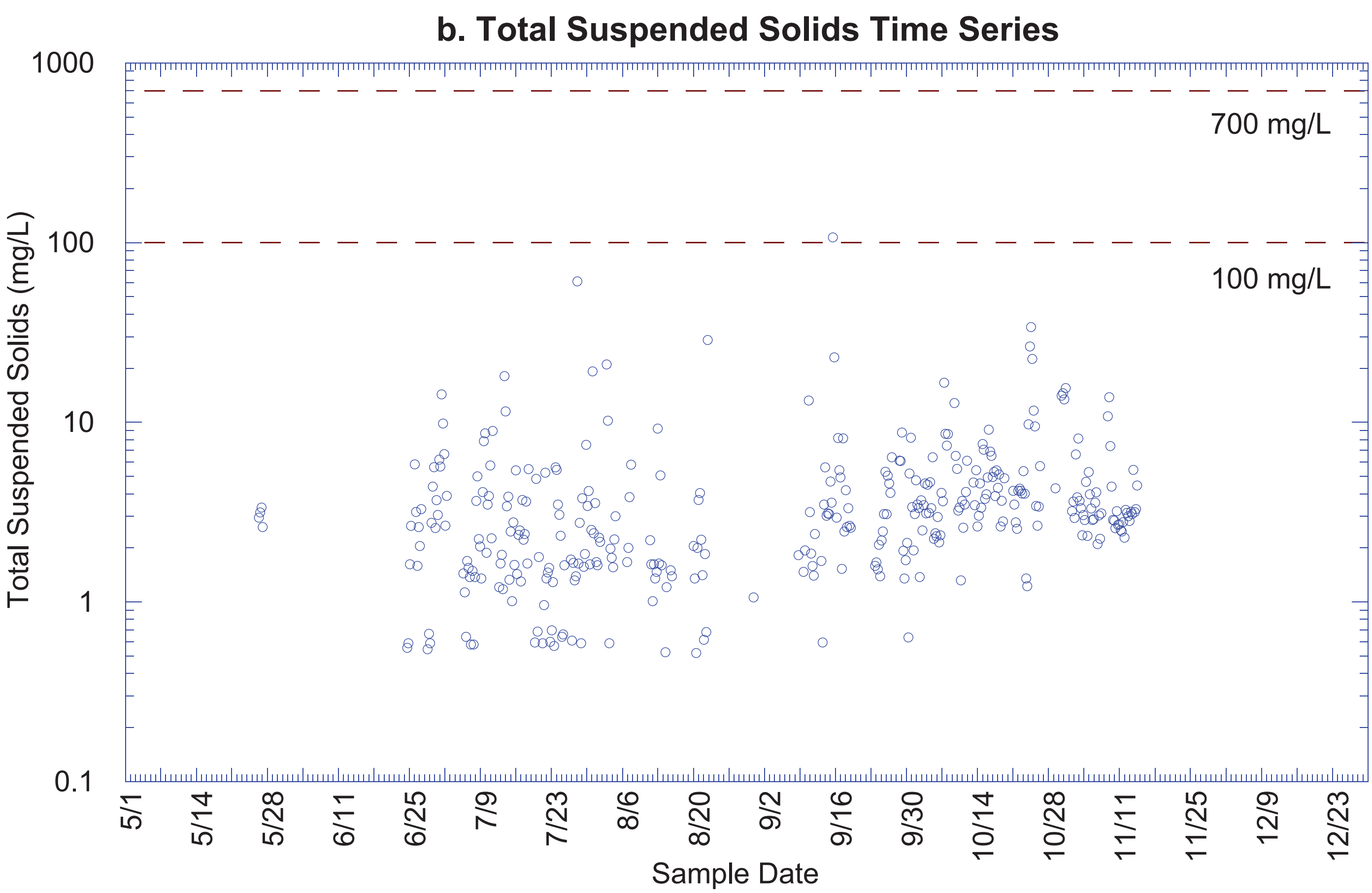
East Griffin Island Area Upstream



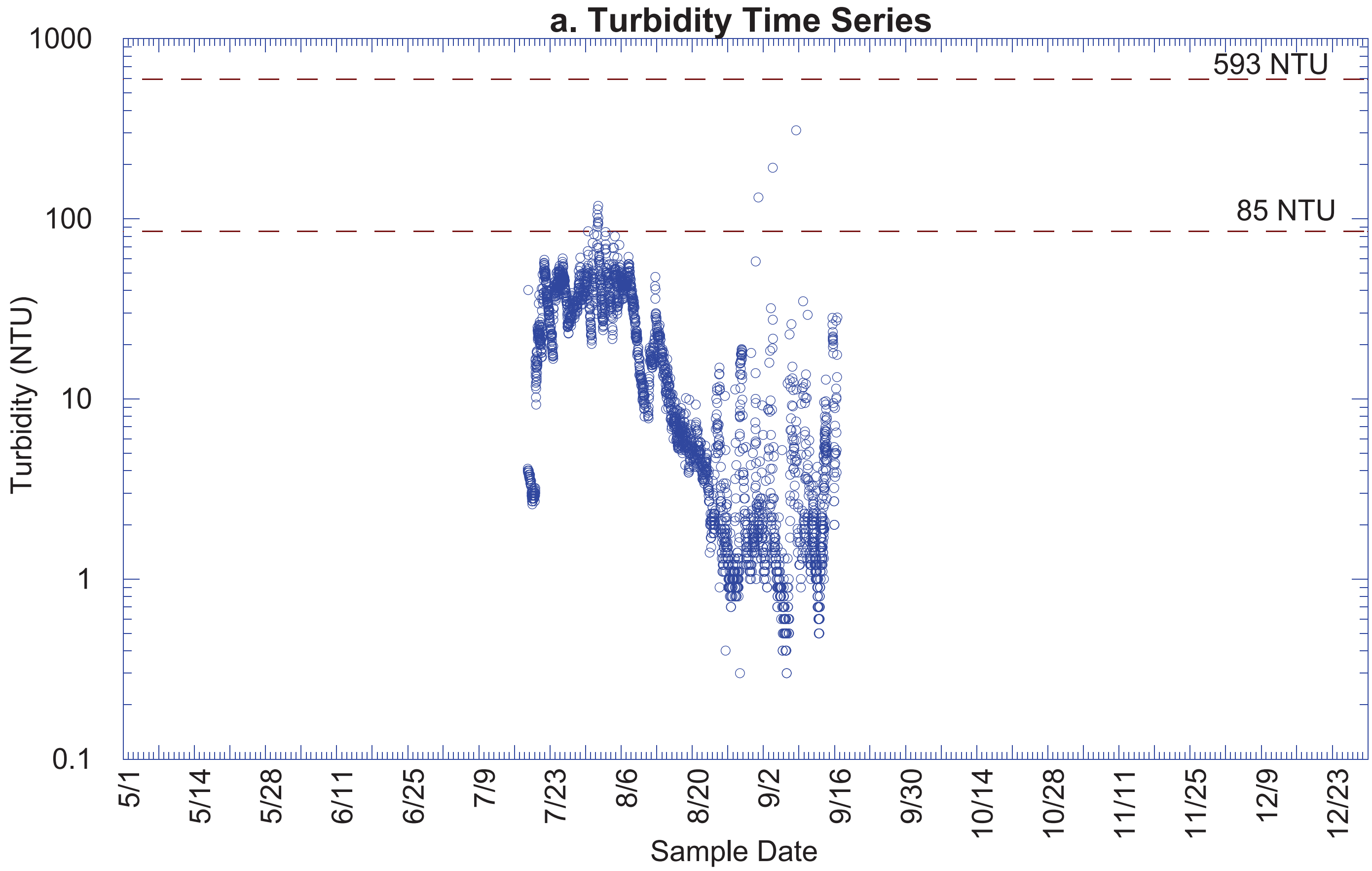


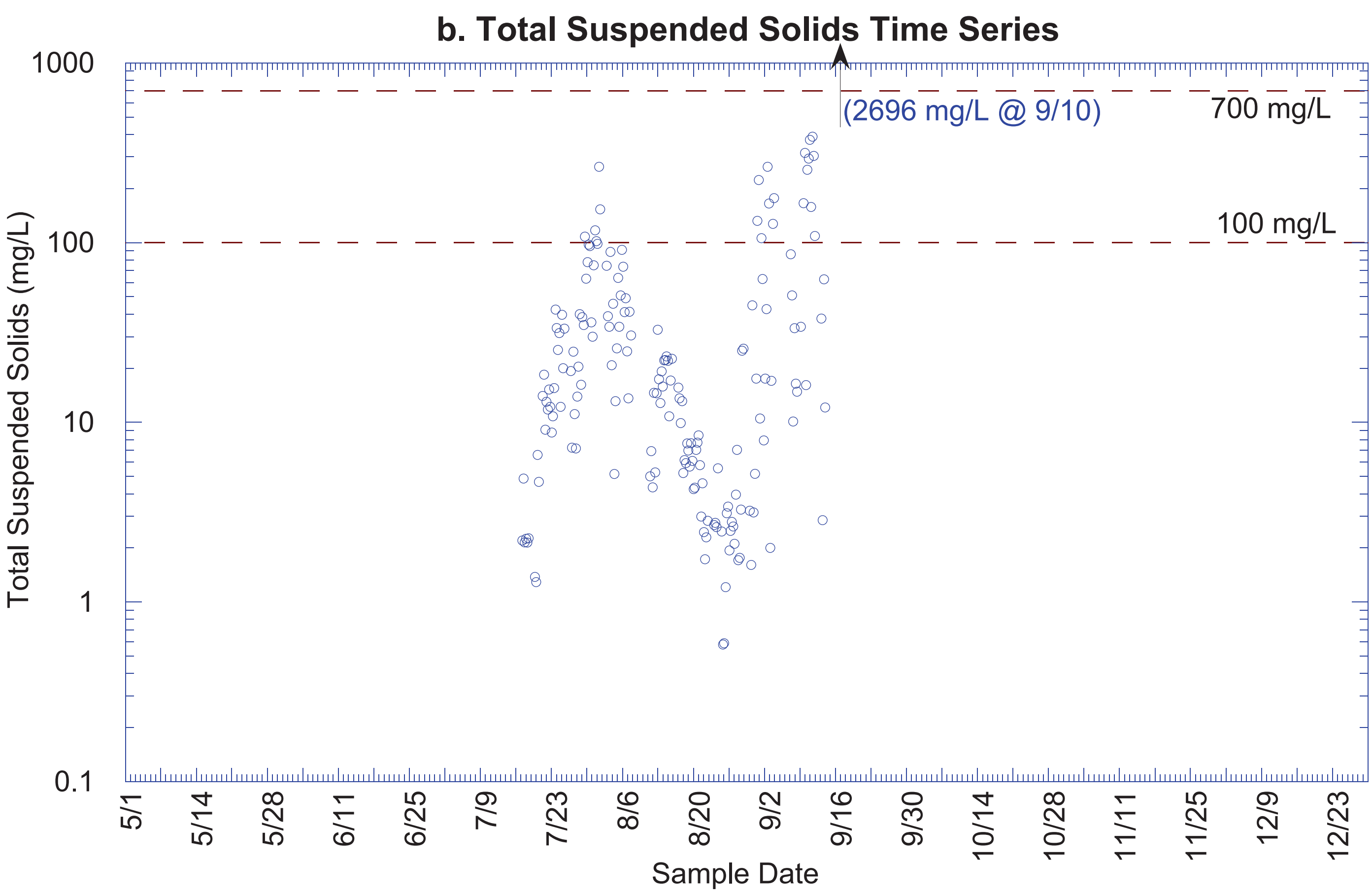
East Griffin Island Side Channel





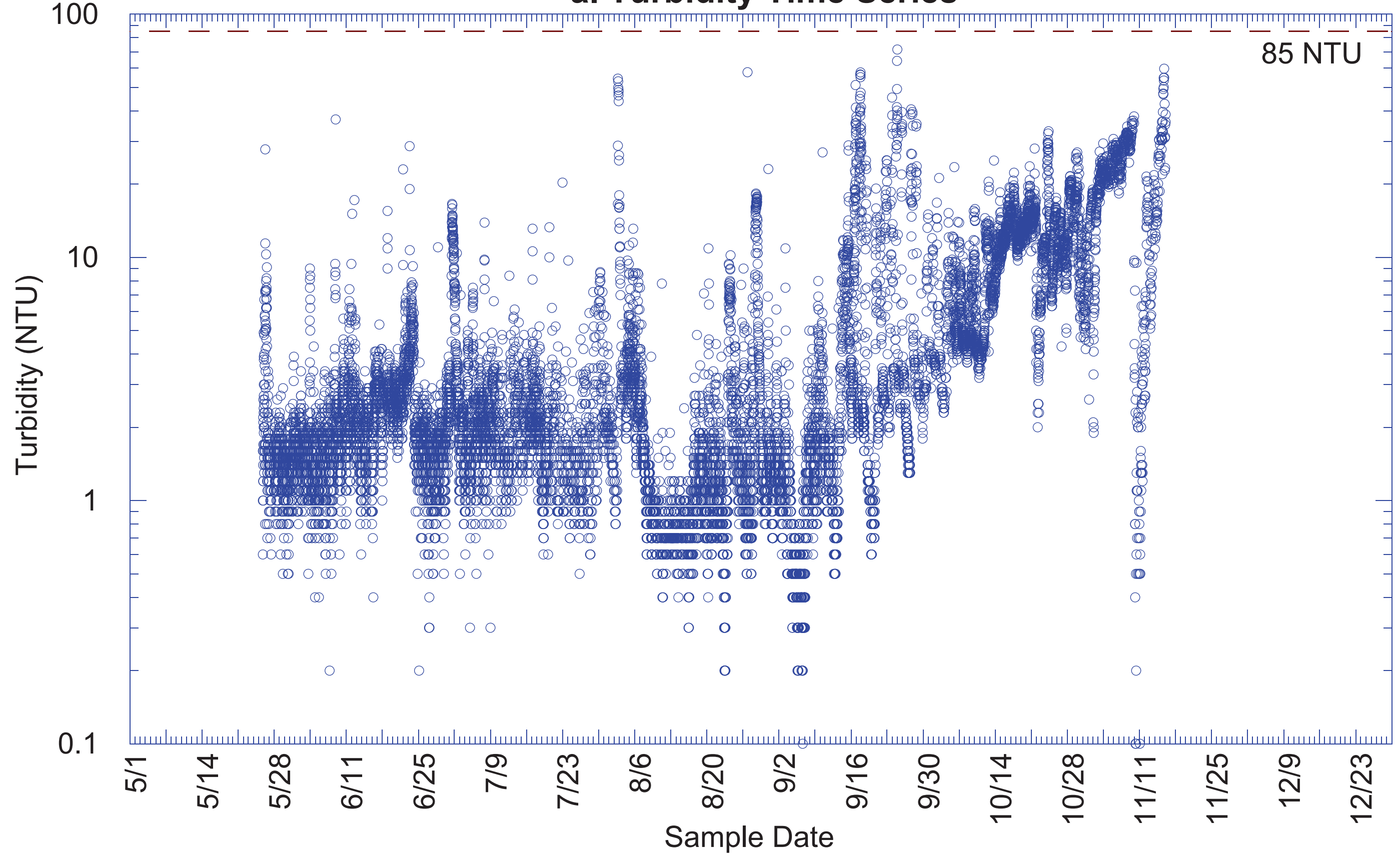
East Griffin Island Inside Containment



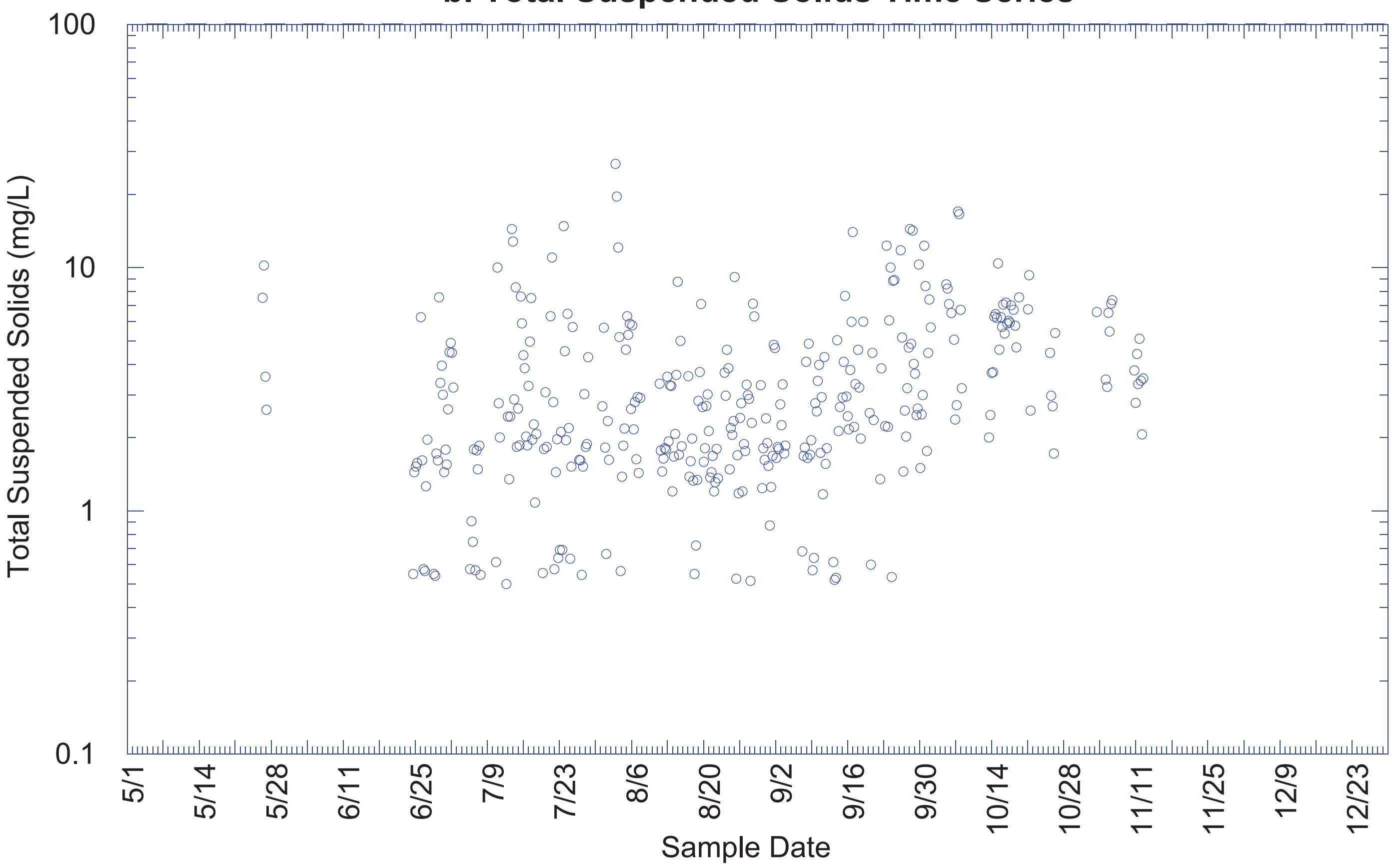


East Griffin Island Area 100m Downstream

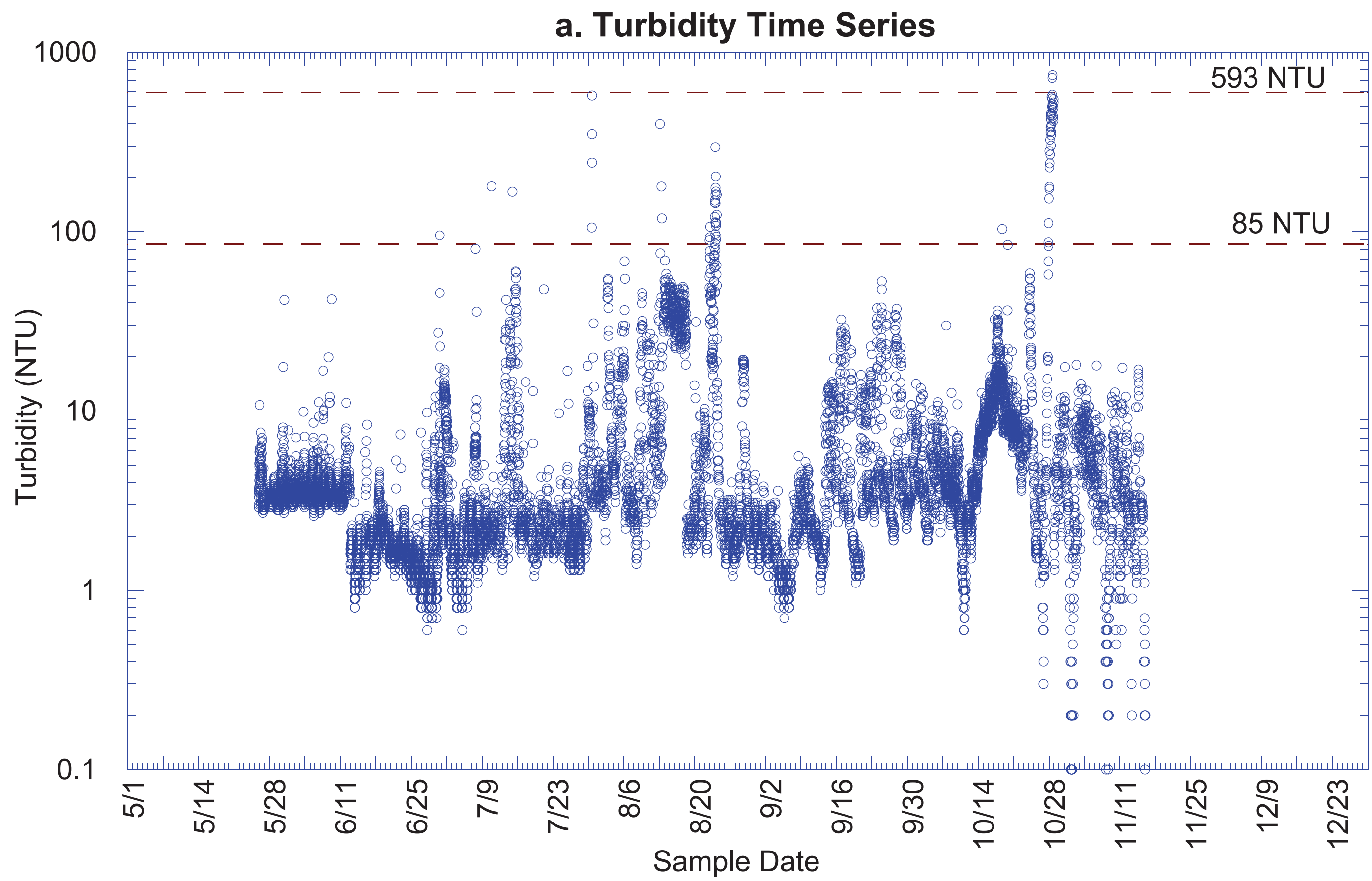
a. Turbidity Time Series

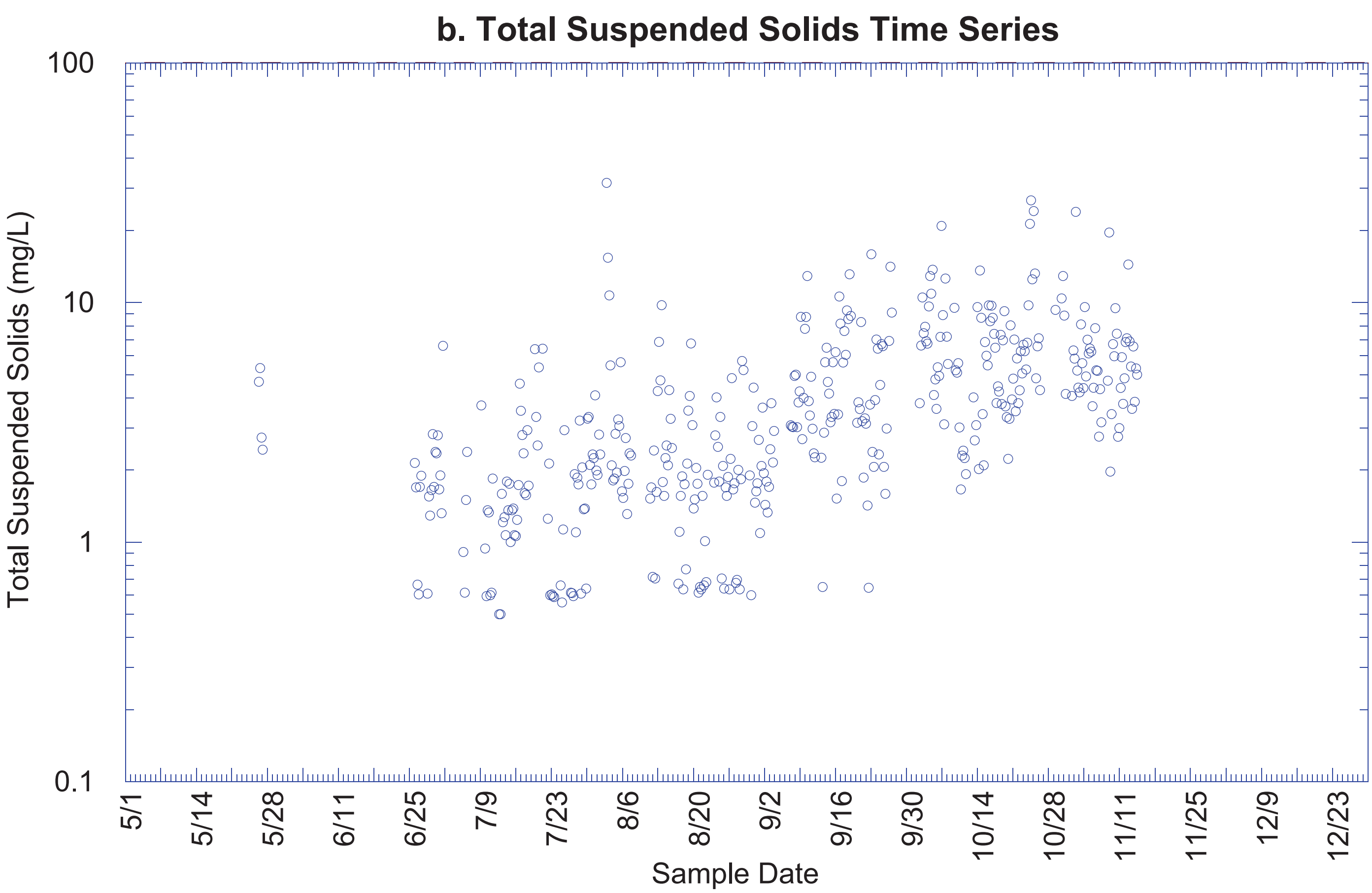


b. Total Suspended Solids Time Series



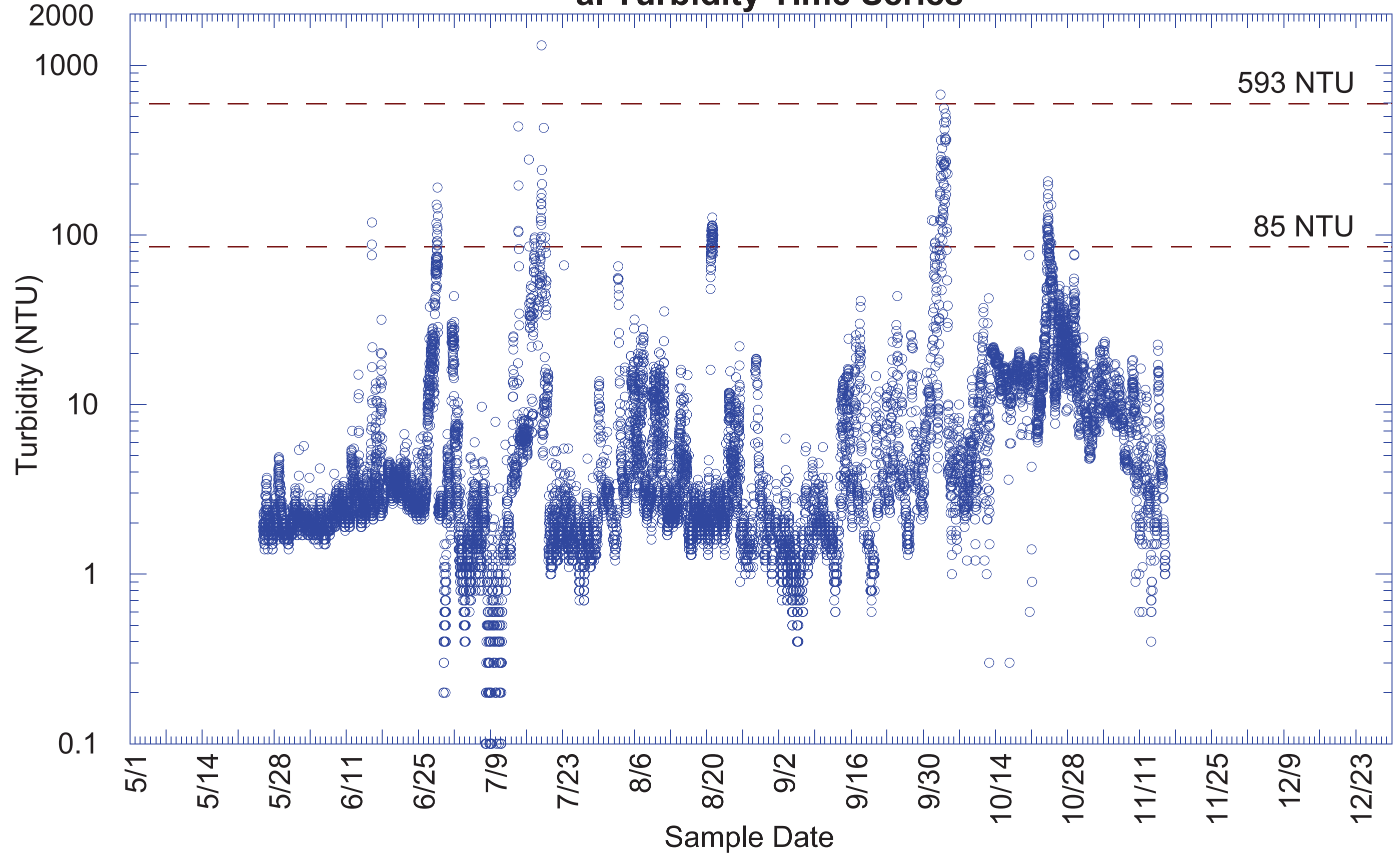
East Griffin Island 300m Downstream East



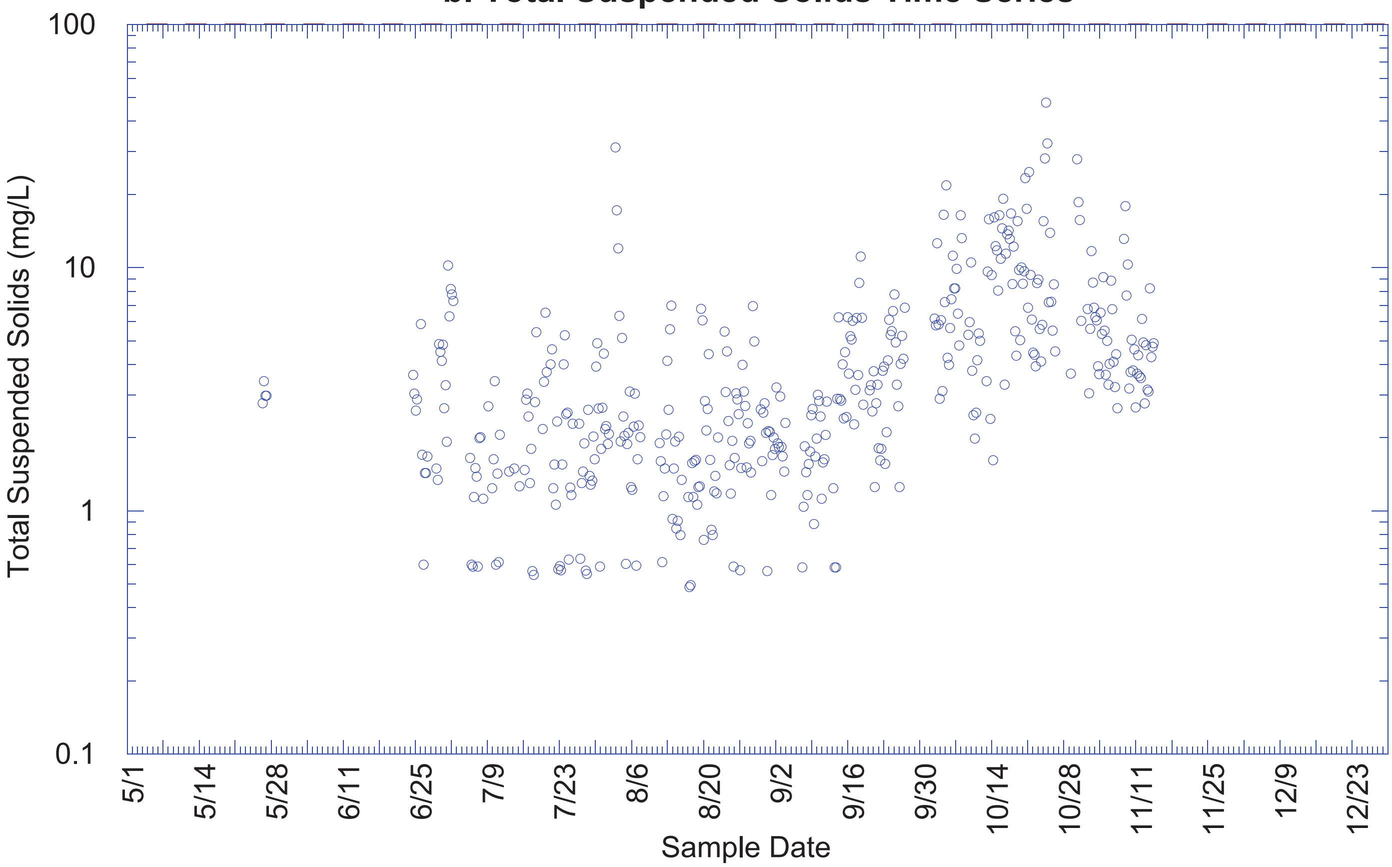


East Griffin Island 300m Downstream West

a. Turbidity Time Series



b. Total Suspended Solids Time Series



Appendix I-C

Fish Analysis Methods

Appendix I-C: Analysis of Resident Fish Annual Monitoring Data

Introduction and Key Findings

The data from the 2004-2008 Baseline Monitoring Program (BMP) (QEA and ESI, 2004) supplemented by data from the New York State Department of Environmental Conservation (NYSDEC, 2009) resident fish annual monitoring program (1997-2003), and the 2009 remedial action monitoring data were used in this analysis. Temporal trends were evaluated using a regression modeling approach (Field et al., 2007) that accounted for the factors of lipid, size (length), and sex (for black bass), for each station and for available data from each species-station combination from 1997-2008. The potential effects of dredging on tissue concentrations in species collected in September of 2009 (pumpkinseed and forage fish) were evaluated by comparing the baseline monitoring average concentrations at each station for the 2004-2008 period with the results from samples collected during the 2009 dredging. Similar analyses were also conducted on the other species that were sampled during or prior to the onset of full scale dredging to provide an understanding of the potential uncertainties associated with apparent dredging effects that might be inferred from pumpkinseed and forage fish analyses. The statistical evaluation of the potential effects of dredging on fish PCB concentrations in the Upper Hudson River was conducted on both River Section (e.g., River Sections 1-3; or Thompson Island, Northumberland/Ft. Miller, and Stillwater pools) and individual monitoring station bases. There are as many as five monitoring stations within each of the River Sections, and multiple samples are taken from each station. Therefore, EPA's analysis considered both large and small spatial scales within the river to improve our understanding of what the monitoring data indicate regarding PCBs in fish. The results also include comparisons of temporal trends among species and sampling locations, and estimates of trends for data at varying scales of aggregation.

Key Findings:

- Some increases in fish tissue PCB levels were seen in 2009 within the Upper Hudson River when compared to baseline data. The increases in fish tissue PCB levels were predominantly focused to the Thompson Island Pool (i.e., the section of the river where the Phase 1 dredging occurred), with limited evidence of responses downstream.

- There were no statistically significant increases in fish tissue PCBs at the Albany/Troy lower river monitoring station below the Federal Dam at Troy.

- The concentrations of PCBs in Hudson River fish are naturally fluctuating, and this needs to be considered as an uncertainty when evaluating the data from the Phase 1 and downstream areas. The importance of this uncertainty is clearly demonstrated by the fact that the mean concentrations of PCBs in forage fish (minnows) and yellow perch in the Feeder Dam Pool reference site (located upstream of the Phase 1 dredging in Glens Falls) were higher in 2009 compared to the baseline period (2004-2008).

- Variability in fish PCB concentrations was often high (*i.e.,* approximately one order of magnitude range of concentrations within each year) within and among stations, and within reach/section;

- We observed apparent downward trends in the BMP data (2004-2008). The regression statistics on a monitoring station basis indicated that these apparent trends, *over this period*, are weak relative to the interannual variability observed for PCB concentrations in fish tissue (*i.e.,* annual variation was about an order of magnitude). Because these series are of relative short duration, these apparent trends should be interpreted tentatively conditional on future monitoring.

- On a River Section (RS) basis fall collected yearling pumpkinseed were significantly increased in 2009 in the Thompson Island (RS-1) and Northumberland/Fort Miller (RS-2) Pools, and forage fish (minnows) were significantly increased in 2009 only in the Thompson Island Pool. There were only significant statistical decreases shown for the spring-collected resident sport fish (black bass, yellow perch, and bullhead) in 2009 compared to the baseline data.

- On an individual monitoring station basis, tissue PCBs in pumpkinseed were significantly elevated at three out of five monitoring stations in the Thompson Island Pool. Two of these locations were within dredging areas (one each in Rogers Island and Griffin Island river locations), and one was approximately one mile below the dredging near Rodgers Island. In the Northumberland/Fort Miller Pool, the statistical comparisons indicated that the northernmost station within this pool was marginally higher in 2009 than during the baseline period (2004-2008). All other monitoring stations in this pool showed no changes. There were no changes from the baseline levels of PCBs in pumpkinseed collected at any of the five monitoring stations in the Stillwater Pool in 2009 or the Albany/Troy station.

- Overall, the monitoring data indicated that resuspension of PCBs from sediments during dredging affected fish locally, with greatest impact in the immediate vicinity of the dredging activity, but the current data do not support the notion that dredging had an effect on PCB levels in fish more than 2-3 miles downstream of the Thompson Island Pool.

Data Source

The fish data used in these summaries and analyses include 3 resident adult species/species groups collected in late spring as individual fillet samples: black bass (largemouth/smallmouth bass), brown bullhead (with a few yellow bullhead), and yellow perch. Whole body yearling pumpkinseed and forage fish (spottail shiner and other species) were collected in late summer. Yearling pumpkinseed were analyzed as individuals, whereas forage fish were analyzed as composites. The source of the data used here is NOAA (2009). This database includes data compiled from the NYSDEC Hudson Basin Biota Contaminant Database (12/2009) and GE EPA

Export databases for the Baseline Monitoring Program (3/2009) and Remedial Action Monitoring Program (11/2009).

Fish collected as part of General Electric's baseline (BMP; 2004-2008) and similar remedial action (2009) monitoring program were supplemented with samples collected under the NYSDEC monitoring programs from 1997-2007 from the same locations.

The baseline and remedial monitoring programs targeted sampling in 5 areas of the Hudson River. Assembled from upstream to downstream these are:

1. The upstream reference site at the Feeder Dam pool in Glens Falls (River Mile [RM] 201.1). There is one fish monitoring station here;
2. River Section 1 (RS-1) comprised of an approximately 6-mile stretch of the river (RM 188.5-195), and containing the Thompson Island Pool (TIP). There are five fish monitoring stations here;
3. River Section 2 (RS-2) comprised of an approximately 6-mile stretch of the river (RM 183.4-188.5), and containing the Northumberland and Fort Miller Pools. There are four monitoring stations here;
4. River Section 3 (RS-3) comprised of an approximately 27-mile stretch of the river, and containing the Stillwater Pool. The sampling stations occur between RM 168.2 and 183.2. There are five monitoring stations within this river section; and,
5. The Albany/Troy monitoring station in the lower Hudson River below the Federal Dam at Troy (RM 153.2 and 142).

Sample sizes for the BMP (2004-2008) and remedial action monitoring program (2009) are generally as described below for the species groups collected as individual whole bodies (pumpkinseed) or fillets (black bass, perch, bullhead). Note that forage fish are collected as annual composites (n=10) per river area (roughly 2 composite samples per sampling station in RS-1, -2, and -3).

Summary of sample sizes for annual fillet (black bass, perch, bullhead) and whole body (yearling pumpkinseed) samples collected in the Hudson River remedial project area. Note that forage fish (minnows) are composited annually; n=10 per river area.

River Area	No. Spp. Groups	No. Indiv/Spp Groups	Total Samples
Feeder Dam	4	20	80
RS-1	4	30	120
RS-2	4	25	100
RS-3	4	30	120
Albany/Troy	4	20	80

Data from 1997 through 2009, for 3 spring-collected resident adult species and fall-collected yearling pumpkinseed, were available from four stations. These were in the upstream reference station in the Feeder Dam Pool (FD1), Thompson Island Pool (TD5), Stillwater Pool of RS- 3 (SW3 for spring-collected fish and SW5 for summer/fall-collected fish), and Albany/Troy (AT1) in the lower river.

The summarized data are provided in Attachment 1a-d. Box plots of the data are shown in Attachments 2-5.

Statistical Methods

Longitudinal Data (1997 through 2009)

Data used in these analyses were from annual spring collections of black bass (largemouth bass and smallmouth bass), yellow perch and bullhead (mostly brown bullhead) from longterm monitoring stations FD1, TD5, SW3, and AT1 from 1997 through 2009. Bullheads were not collected at the Albany/Troy station (the ictalurid species here was white catfish). Yearling pumpkinseed were collected annually, during the fall, from stations FD1, TD5, SW5, and AT1 over the same period of time. Data beginning in 1997 were considered to be no longer affected by the Allen Mill gate failure and release of PCBs from 1991-3. By the standards of statistical time series analysis, these would be considered short time series, although, for an environmental monitoring program at a remedial site, they would qualify as relatively long term studies. These environmental time series data over approximately 12 years are thus referred to as longitudinal studies. These longitudinal data provide a basis from which to understand temporal trends over the most recent decade. Additionally, these data provide an understanding of the amplitude of relatively short term (3-5 year) fluctuations that might be expected at other sampling stations monitored during the BMP for shorter periods of time.

These longitudinal data were used to estimate temporal trends in total PCB concentration at FD1, TD5, SW3, and AT1 for black bass, yellow perch and bullhead (except at AT1) fillets and at FD1, TD5, SW5, AT1 for whole body pumpkinseed. Trends were estimated using standard multiple regression methods that have also been applied to PCB data in fish from Hudson River fish collected from the Sherman Island Pool (Field et al. 2007).

Temporal trends were estimated simultaneously for each species using the following log linear model for time, adjusted for covariation between PCB concentration and fish length, fraction-lipid, and gender.

$$\begin{aligned} Log(C_f) = \beta_0 + \beta_1 Log(f_l) + \beta_2 Year + \beta_3(Sex) + \beta_4(Sex \times Year) \\ + \sum_{k=5}^{8} \beta_k (Species_{k-4}) + \sum_{k=9}^{12} \beta_k (year \times Species_{k-4}) + \varepsilon \end{aligned} \quad \text{Model (1)}$$

Table 1. Mathematical symbols for Model 1.	
C_f	Concentration in fish tissue
f_l	Fraction Lipid in fish
Length	Fish Length
Year	Sampling year represented as years since 1997
Sex	Indicator variable for the sex of sample fish
$Species_i$	Indicator variable identifying the i^{th} species
ε	Normally distributed mean-zero random error

Differences in trends are investigated by testing for interactions between time and species indicator variables. Interspecies differences in decay rates are indicated when at least one of the regression coefficients for species-time interactions is nonzero $(i.e.\, \beta_k \neq 0;\ for\ one\ or\ more,\ k = 9, 10, 11, 12)$. When natural log transformed PCB concentrations are plotted against time for each species, interactions are indicated graphically by lines that are not parallel. Neter (1996) discusses tests of the null hypothesis of parallel lines (i.e. equal decay rates).

Baseline Data (2003 – 2008)

Spatial Variation

Fish samples were collected from several of the baseline monitoring stations by the State of New York prior to 2004, and annually from 2004 by GE as part of their baseline monitoring program. These latter data consist of 3 to 5 years of monitoring data for each of 13 stations. Data from these stations were analyzed for temporal trends in PCB concentration for black bass, yellow perch, bullhead and pumpkinseed using a similar model to that described above for longitudinal data (Model 2). The data were analyzed separately for each species and were tested for differences in decay rates among stations.

$$\begin{aligned} Log(C_f) = \beta_0 + \beta_1 Log(f_l) + \beta_2 Year + \beta_3(Sex) + \beta_4(Sex \times Year) \\ + \sum_{k=5}^{18} \beta_k (Station_{k-4}) + \sum_{k=19}^{32} \beta_k (Year \times Station_{k-4}) + \varepsilon \end{aligned} \qquad \text{Model (2)}$$

Table 2. Mathematical symbols for Model 2.	
C_f	Concentration in fish tissue
f_l	Fraction Lipid in fish
Length	Fish Length
Year	Sampling year represented as years since 1997
Sex	Indicator variable for the sex of sample fish
$Station_i$	Indicator variable identifying the i^{th} sampling station
ε	Normally distributed mean-zero random error

Apparent Effects of Dredging

Analyses discussed in the previous sections have excluded samples collected in 2009. Black bass, yellow perch and bullhead samples were collected in June 2009, prior to initiation of full-scale dredging, and pumpkinseed and forage fish samples were collected late in the dredging season. These data were compared with earlier collections by comparing:

1. Forecasted concentrations with observed 2009 concentrations at stations where longitudinal data are available,
2. Geometric mean baseline (2004-2008) concentrations with geometric mean 2009 concentrations each of 13 stations, and
3. Geometric mean baseline (2004-2008) concentrations with geometric mean 2009 concentrations averaged over each River Section.

For comparisons 2 and 3, the statistical test is parametric and based on the analysis of covariance used to adjust for length and lipid, and follows the the conditional test procedure described by Neter et al (1996). This is a "Type 3" test in SAS (Statistical Analysis Software, Cary, NC) and the test statistic is an F statistic.

Pumpkinseed and forage fish samples were collected in September 2009, during Phase 1 dredging in the Thompson Island Pool. A comparison of 2009 with baseline data represents the combined short-term change (increase) in fish PCB concentrations related to the dredging and other temporal fluctuations that might influence fish tissue concentrations. As such these comparisons should be termed apparent dredging effects. Because only pumpkinseed and forage fish samples represent post-dredging concentrations, samples from the spring-collected resident fish species do not directly inform estimates of the apparent effects of dredging. However, comparison of sample data for black bass, yellow perch and bullhead, particularly for the longitudinal stations, provide a means to evaluate the relative quality of the longitudinal time series models for prediction of near-future fish tissue concentrations.

Results and Discussion

Spatial and Inter-species Variation

Models (1) and (2) used to test for differences in estimated decay rates among species and among stations within species by testing for interactions between year and species and year and sampling station. Decay rates varied among species and among locations ($p < 0.05$), so most subsequent analyses were conducted separately for each species and location (i.e. sampling station) combination. Because some performance metrics are expected to be tested on a per river section basis, some results are reported for data sets pooled within species-river section combinations (*e.g.,* portions of the Pre- and Post-Dredging Comparison section below).

Description of Temporal Trends—Regression Models

Expected natural log-PCB concentrations in fish tissues were regressed against, log-fraction lipid and log-length resulting in a log-log relationship between time that also adjusts the estimated temporal decay rate for covariation with length and lipid. This is often referred to as the analysis of covariance approach to lipid normalization (Hebert and Keenleyside 1994). Effectively this approach allows standardization of all fish to selected levels of the covariates (e.g. lipid and length) so that relationships to other variables, such as time, can be estimated more precisely than otherwise possible. Figures 1 through 17 show adjusted PCB concentrations in fish tissue plotted against time. In addition, the estimated regression model and confidence and prediction intervals are also plotted. Fish were adjusted to the geometric mean of the lipid and length values based on the entire data set (Table 3). This allowed standardized comparisons of results across time and space. The adjusted coefficient of determination (R-square) values of the model fits are summarized in Table 4.

The models were fit to the pre-2009 data only and adjusted tissue concentrations from 2009 collections were plotted on the figures for comparison with the upper and lower prediction limits. If 2009 and 2008 exposures were similar, one would expect 95% of the 2009 values to fall within the prediction limits. Conversely, failure to capture substantial numbers of 2009 samples within the prediction limits would be an indicator of an apparent change in exposures. For species collected during or after onset of dredging this could be considered an apparent dredging effect, although, these data are observational in nature, so cause and effect cannot be inferred.

Forage fish were not analyzed in this way due to the low sample sizes collected in the baseline monitoring studies (typically n=2 per station). Future analysis could incorporate these collections as the number of monitoring periods increases.

Thompson Island Pool (River Section 1, RM 188.5-195)

Fitted regression models are overlaid on adjusted PCB concentrations in fish tissues for pumpkinseed (Figure 1) yellow perch (Figure 2) bullhead (Figure 3) male black bass (Figure 4) and female black bass (Figure 5).

<u>Pumpkinseed</u>**:** Trends in pumpkinseed tissue concentrations varied among locations within Thompson Island Pool, with apparently declining trends at TD1, and TD3 and nearly neutral trends at TD2, TD4 and TD5. Of particular note is the relatively flat temporal trajectory observed at TD5 where collections date back to 1997. Using only the concentrations from 2004 onward (i.e. during the baseline monitoring period) would result in much steeper trend estimates, similar to those calculated at TD1 and TD3.

A closer examination of the longitudinal data at TD5, indicates that interannual variability overall is high (see also Attachments 2-5), and upon examination of shorter time spans within the 12-year period for which data are available, there appears to be an observable oscillation. For example, if one looked at 1998-2002 there is an apparent decrease. Contrast this to an apparent increase from 2002-2005/6, followed by another apparent decrease from 2005/6-2008. These findings demonstrate that the concentrations of PCBs in Hudson River fish are fluctuating, and this needs to be considered as an uncertainty when evaluating the data from the Phase 1 dredging and downstream areas, and drawing conclusions on the apparent effects of dredging on fish PCB levels.

Pumpkinseed tissue PCB concentrations in 2009 were higher than expected, exceeding 95% prediction limits for most samples at TD1, TD3 and TD5. However tissue levels at TD2 were within the 95% prediction limits, albeit more toward the upper limit, while those at TD4 were apparently unimpacted by dredging with all 2009 samples well within the 95% prediction limits.

Bullhead-Black Bass-Yellow Perch**:** Adjusted PCB concentrations in bullhead, black bass, and yellow perch were within 95% prediction limits with only occasional exceptions. It can be seen in Figures 2 through 5 that average concentrations in 2009 at times appear to be outside expected confidence limits (green lines). The significance of these differences between expected and observed averages are tested in subsequent sections based on the ratio of the geometric mean of observed concentrations to the expected geometric mean based on the temporal trend model described in this section.

Thompson Island Dam to Northumberland Dam (River Section 2, RM 183.4-188.5)
Fitted regression models are overlaid on adjusted PCB concentrations in fish tissues for pumpkinseed (Figure 6) yellow perch (Figure 7) bullhead (Figure 8) male black bass (Figure 9) and female black bass (Figure 10).

Pumpkinseed: In River Section 2, pumpkinseed collections were marginally adequate to estimate temporal trends at only locations ND3 and ND5. In both instances, the 95% prediction limits captured nearly all observed values in 2009. These limited data do not show that dredging releases in the Thompson Island Pool impacted pumpkinseed downstream of Thompson Island Dam (~1-5 mi downstream), although the observations in 2009 are clustered at the upper end of the 95% prediction limits for ND5. Of note, the apparent temporal decay rate at ND5 was greater than those estimated at TD5 in Thompson Island Pool. It is not known if these apparent declines are due to improving conditions, or if these estimates may be adversely impacted by the lack of longer term sample collections needed to improve interpretation of apparent trends.

Bullhead, Black Bass, Yellow Perch: The 95% prediction limits captured nearly all observed values in 2009 at all locations with sufficient data, suggesting that dredging did not impact the resident sport fish concentrations downstream of Thompson Island Pool.

Stillwater Pool (River Section 3, RM 168.2-183.2)
Fitted regression models are overlaid on adjusted PCB concentrations in fish tissues for pumpkinseed (Figure 11) yellow perch (Figure 12) bullhead (Figure 13) male black bass (Figure 14) and female black bass (Figure 15).

Nearly all tissue concentrations for all species were within the 95% prediction limits. The lack of response from pumpkinseed samples that were collected in Fall 2009 indicated that dredging-related releases of PCBs in the Thompson Island Pool did not impact fish further downstream (> 20 mi) at the Stillwater Pool.

Feeder Dam (upstream reference, RM 201.1)
Fitted regression models are overlaid on adjusted PCB concentrations in fish tissues for pumpkinseed, yellow perch, bullhead, male black bass, and female black bass (Figure 16). Data for these species were available from 1997-2008 at the single Feeder Dam Pool monitoring location. The concentrations of PCBs in fish are generally low (0.01-0.4 mg/kg wet wt). With the exception of yellow perch, tissue concentrations for all species in 2009 were within the 95% prediction limits of the data. In the case of yellow perch, the concentrations of PCBs in a few

fillet samples were above the 95% upper prediction limit, and most of the data were skewed toward the upper end of the 95% prediction interval.

The Feeder Dam Pool sampling location is upstream of the remnant deposits area, GE's Hudson Falls plant, and the Phase 1 dredging project, and is therefore, aside from potential atmospheric deposition, outside of the influence of these potential exposure sources of PCBs. The observations at the upstream reference monitoring station demonstrates that fish tissue samples can be highly variable through time, and that the concentrations of PCBs in Hudson River fish are naturally fluctuating. This again underscores the need to consider such uncertainties when evaluating the data from the Phase 1 and downstream areas and drawing conclusions on the apparent effects of dredging on fish PCB levels.

Albany/Troy (lower river; below the Federal Dam at Troy, RM 153.2 and 142)
Fitted regression models are overlaid on adjusted PCB concentrations in fish tissues for pumpkinseed, yellow perch, bullhead, male black bass, and female black bass (Figure 17). Adequate data for pumpkinseed, yellow perch, and male and female black bass were available back to 1997 for the summer (RM 153.2) and fall (RM 142) monitoring locations. The 95% prediction limits captured nearly all observed values in 2009, with the exceptions of two pumpkinseed samples and one male black bass samples.

General Observations
For most regression models, the upper and lower prediction limits reflected the approximate order of magnitude range of adjusted concentrations observed in most years and for most species. This suggests that any analysis of spatial or temporal trends should incorporate a rigorous statistical analysis of uncertainty in estimates and predictions. This does not suggest that the data are somehow inadequate or of poor quality, but rather reflects that environmental samples of biotic media are often highly variable.

Ratio of Observed to Expected 2009 Concentrations

Adjusted pre-dredging data were used to estimate temporal trends in tissue PCB concentrations (see above). These adjusted temporal trends were used to "forecast" expected log-concentrations in 2009 under the assumption that remedial actions would have no influence on 2009 fish tissue concentrations. The predicted values were compared with observed log-PCB concentrations in pumpkinseed, bullhead, black bass, and yellow perch collected in 2009, and the difference in predicted and observed log-means were calculated. These differences were back transformed (*i.e.,* exponentiated) resulting in estimates of the ratio of observed to predicted post dredging concentrations. Percentiles of the distribution of these differences were estimated through bootstrap resampling. The 5th and 95th percentiles from this analysis represent the approximate confidence intervals for the true ratio (Table 5a-d).

Pumpkinseed
The ratios of observed to expected concentrations were elevated at Thompson Island Pool stations TD1, TD2, TD3 and TD5, but not at station TD4. The 50th percentiles (median) ranging approximately 1:1 (i.e. no change) to as much as 6:1 (Table 5a). At stations TD5 and SW5 where longer time series form the basis for estimation, tended to provide more precise estimates

of the ratio (*i.e.,* narrower range between the 5^{th} and 95^{th} percentiles) than locations with shorter pre-dredge time series.

<u>Bullhead</u>
In 2009 bullhead (and black bass and yellow perch) samples were collected prior to the onset of full-scale dredging and thus are considered to have been under limited influence of the increased water column concentrations that might have been caused by dredging activities. In contrast to the pumpkinseed results, most ratios are close to 1:1 with an occasional instance, such as at Northumberland station ND5 and SW3 where concentrations were lower than expected and at TD3 where bullhead concentrations were higher than expected (Table 5b).

<u>Black Bass</u>
PCB concentrations in black bass in 2009 were similar to expected concentrations at all but stations TD2 and TD3 where the 95^{th} percentiles of the ratios were less than one, indicating lower than forecasted concentrations (Table 5c). At all other locations the median was very close to 1.0 indicating no apparent change from expected levels.

<u>Yellow Perch</u>
PCB concentrations in yellow perch in 2009 were similar to expected levels at all but stations TD1 where concentrations were slightly higher than expected and at TD5, SW2 and SW3 where concentrations were lower than expected (Table 5d).

Pre- and Post-Dredging Comparison

The Phase 1 dredging began on May 15, 2010. Shortly thereafter, in early June 2009, the black bass, yellow perch and bullhead samples were collected, prior to initiation of full-scale dredging. Therefore, exposures of these resident sport fish species to PCBs from dredging-related activities were limited prior to sampling. The yearling pumpkinseed and forage fish (minnows) were sampled in the late summer (September) of 2009 while dredging was taking place in the Thompson Island Pool. A graphical comparison of the mean PCB concentrations from 2009 with mean and confidence interval from data collected from the same station between 2004 and 2008 provides perspective on the potential impacts of dredging on fish concentrations. (Figures 18-22). The factors of change between the 2009 mean tissue PCB concentrations and baseline means for yearling pumpkinseed, forage fish, black bass, bullhead, and yellow perch are listed in Table 6a-b. Relative to the baseline mean concentration, a factor >1.00 indicates a relative increase in 2009, 1.00 indicates no apparent change, and <1.00 indicates a relative decrease in 2009.

<u>Pumpkinseed and forage fish (minnows)</u>

General observations: The mean PCB concentrations in 2009 at several locations for pumpkinseed (Figure 18) and forage fish (Figure 19) exceeded the 95% upper confidence limit for the baseline data, on both a wet weight and lipid-normalized basis. For both species groups, the differences were most evident in the Thompson Island Pool, although not all stations appeared to be affected. The lipid-normalized results for the pumpkinseed collected from station TD4 in 2009 had concentrations similar to the baseline mean (Figure 18, right panel). Further downstream, at monitoring stations within River Sections 2 and 3, there were mixed observations of increases, decreases, or no apparent differences between the 2009 pumpkinseed mean PCB concentrations and baseline.

An interesting observation was that mean concentrations in forage fish at the upstream reference, in the Feeder Dam Pool, were elevated in 2009 compared to the baseline period. Although this difference was observed at nearly two orders of magnitude below the concentrations in forage fish from the Thompson Island Pool, it does indicate the that variability should be expected in these environmental (fish tissue) samples.

Statistical analysis: Statistical comparisons were carried out between the 2009 and baseline (2004-2008) mean concentrations of PCBs in fish tissues adjusted for percent lipid, length, and sex (black bass only). The data were partitioned for analysis at two scales: 1) by river section; and, 2) by individual monitoring station. The results are shown in Table 7.

On a river section basis, pumpkinseed had significantly elevated concentrations in 2009 in the Thompson Island Pool ($p < 0.05$) and River Section 2 ($p < 0.05$). Forage fish only showed a significant difference (an increase) in the Thompson Island Pool ($p < 0.05$).

On an individual station basis, the statistical comparisons showed that pumpkinseed concentrations were significantly elevated in 2009 at three of the five stations in the Thompson Island Pool (TD1, TD2, and TD5; all $p < 0.05$), and marginally elevated in the northern-most station (ND1) in River Section 2 ($0.05 < p < 0.10$) (Table 7). The three Thompson Island Pool stations were located either within Phase 1 certification units (CUs) that were dredged (TD1, TD5), or less than 1 mile downstream of a dredged CU, as in the case of TD2 (Figure 23). There were no significant differences found for monitoring stations TD3 and TD4. These stations in the Thompson Island Pool were approximately 1.5 and 2.5 miles downstream, respectively, of the southern-most dredged CU (CU-4) in the Rogers Island area (Figure 23). The ND1 station in River Section 2 was approximately 3 miles downstream of the dredging in the Griffin Island area of the Thompson Island Pool. There were no significant differences in pumpkinseed PCB concentrations between 2009 and the baseline for any monitoring stations further downstream of ND1 (*i.e.,* in the remainder of River Section 2 through to Albany/Troy).

Overall, these results indicate that—when compared to the previous five years of data—the pumpkinseed were impacted locally by the 2009 dredging in the Thompson Island Pool and in the northern area of River Section 2 (*i.e.,* the portion of Northumberland/Fort Miller Pool immediately downstream of the Thompson Island Pool). However, the data do not support assumptions that dredging had an impact on these fish further downstream.

The statistical results for forage fish, on an individual station basis, were less clear. These results showed marginally significant ($0.05 < p < 0.10$) increases at the upstream reference in the Feeder Dam Pool (FD1) and at TD4 within the Thompson Island Pool, a significant decrease in River Section 2 at ND2 ($p < 0.05$), and a significant increase at in River Section 3 at SW1 ($p < 0.05$) (Table 7). Note that the sampling plans targeted only two forage fish composites per station compared to five pumpkinseed samples, which makes the per station statistical comparisons for forage fish less reliable. Even so, this uncertainty shown between the results of different approaches to analyzing the forage fish data—in that the statistical tests performed on the aggregated data (*i.e.,* River Section basis) compared to analysis at the station level gave different conclusions along the length of the river—highlights the need to collect monitoring data on this species group in future consecutive years to strengthen the conclusions drawn here, immediately following Phase 1.

<u>Black bass, bullhead, and yellow perch</u>:
On a river section basis, there were only significant statistical decreases shown for the spring-collected fish (Table 7). At the station level, these fish showed statistical decreases in 2009 in multiple locations, including at Albany/Troy for yellow perch (Table 7; Figures 20-22). The only exceptions to this general pattern of declines were for yellow perch that showed increases in 2009 in the upstream reference at the Feeder Dam, and in the northernmost Thompson Island Pool station TD1. Therefore, while it was possible that the increase observed for yellow perch was a local impact related to the onset of dredging in the spring, the preponderance of evidence indicates that there were no apparent effects from the dredging for these resident sport fish. Given that black bass, bullhead, and yellow perch were collected only weeks after the dredging season began, it is plausible to expect that increases in tissue PCB concentrations, in response to elevated water column concentrations from resuspension during dredging in 2009, may be observed in fish that will be collected in spring 2010.

Additional Perspectives

The EPA expected that short-term, localized increases in fish PCB levels would occur during Phase 1. In fact, most of these apparent dredging impacts were observed either within or immediately below the Phase 1 dredging areas. Further, EPA anticipates that any dredging-related, localized body burden increases of PCBs in fish that are observed in the short-term will rapidly return to baseline levels, and continue to decline thereafter following remediation. Our reasoning for this latter statement is based on the following:

(1) Dredging will only occur in a given area for a single dredging season, or a portion thereof. This will be on the order of a few weeks to a few months. In other words, any exposures that are related to the dredging are expected to be brief.
(2) Tissue concentrations of PCBs in fish from the Hudson River have been shown to decrease rapidly, within 1-2 years, following exposure events, once the source of PCBs is controlled. A recent example of this within the Hudson River is the Allen Mill gate failure, where sudden releases from the GE Hudson Falls plant site between late 1991 and early 1993 led to increases in water column and fish PCB concentrations, especially in the area immediately downstream of the capacitor plant sites. Once the source of the PCBs from the capacitor plant site was controlled, PCB concentrations in the fish quickly returned to pre-release conditions (Figure 24).
(3) Tissue concentrations of PCBs in fish have been shown to decrease rapidly following spikes related to environmental dredging. An example from EPA Region 2 is the Cumberland Bay Superfund Site, Plattsburg, NY (Figure 25). Spikes in yellow perch tissue PCB concentrations linked to this dredging event from 1999-2000 in the Upper Hudson River were observed to recover by 2001 and generally declined thereafter.

Other Regional examples include the Grasse River, Massena, NY, and, the Niagara-Mohawk Site, Queensbury, NY. Further details of these examples can be provided upon request.

Conclusions

- Some increases in fish tissue PCB levels were seen in 2009 within the Upper Hudson River when compared to baseline data. The increases in fish tissue PCB levels were predominantly focused to the Thompson Island Pool (i.e., the section of the river where the Phase 1 dredging occurred), with limited evidence of responses downstream. Furthermore, there were no statistically significant increases in fish tissue PCBs at the Albany/Troy lower river monitoring station below the Federal Dam at Troy.

- The concentrations of PCBs in Hudson River fish are naturally fluctuating, and this needs to be considered as an uncertainty when evaluating the data from the Phase 1 and downstream areas. The importance of this uncertainty is clearly demonstrated by the fact that the mean concentrations of PCBs in forage fish (minnows) and yellow perch in the Feeder Dam Pool reference site (located upstream of the Phase 1 dredging in Glens Falls) were higher in 2009 compared to the baseline period (2004-2008).

- Variability in fish PCB concentrations was often high (*i.e.,* approximately one order of magnitude range of concentrations within each year)within and among stations, and within reach/section;

- We observed apparent downward trends in the BMP data (2004-2008). The regression statistics on a monitoring station basis indicated that these apparent trends, *over this period*, are weak relative to the interannual variability observed for PCB concentrations in fish tissue (*i.e.,* annual variation was about an order of magnitude). Because these series are of relative short duration, these apparent trends should be interpreted tentatively conditional on future monitoring. The NYSDEC also obtained similar findings through their statistical analyses of the data (NYSDEC, 2010). Therefore, the concentrations of PCBs in fish tissues can be considered generally stable within this variability during the BMP (2004-2008) such that the data can be pooled for before vs. after statistical comparisons, thus allowing full use of the BMP data set for conducting means comparisons to the 2009 fish monitoring data.

- On a River Section (RS) basis fall collected yearling pumpkinseed were significantly increased in 2009 in the Thompson Island (RS-1) and Northumberland/Fort Miller (RS-2) Pools, and forage fish (minnows) were significantly increased in 2009 only in the Thompson Island Pool. There were only significant statistical decreases shown for the spring-collected resident sport fish (black bass, yellow perch, and bullhead) in 2009 compared to the baseline data.

- On an individual monitoring station basis, tissue PCBs in pumpkinseed were significantly elevated at three out of five monitoring stations in the Thompson Island Pool. The factors of this increase range from 1 to 4.3. Two of these locations were within dredging areas (one each in Rogers Island and Griffin Island river locations), and one was approximately one mile below the dredging near Rodgers Island. The remaining monitoring stations in the Thompson Island Pool, located approximately 2-3 miles downstream of the Rodgers Island dredging area and upstream of the Griffin Island dredging area, showed no changes in pumpkinseed PCB concentrations between 2009 and baseline. In the Northumberland/Fort Miller Pool, the statistical comparisons indicated that the northernmost station within this pool was marginally higher in 2009 than during the baseline period (2004-2008). All other monitoring stations in this pool showed no changes. There were no changes from the baseline levels of PCBs in pumpkinseed collected at any of the five monitoring stations in the Stillwater Pool in 2009 or the Albany/Troy station.

- Overall, the monitoring data indicated that resuspension of PCBs from sediments during dredging affected fish locally, with greatest impact in the immediate vicinity of the dredging activity, but the current data do not support the notion that dredging had an effect on PCB levels in fish more than 2-3 miles downstream of the Thompson Island Pool.

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Table 3. Geometric mean length and percent lipid for representative fish.

Species Group	Length	Percent Lipid
Black Bass	37.0	0.6
Bullhead	32.1	1.6
Forage	8.2	3.6
Pumpkinseed	9.9	2.7
Yellow Perch	22.0	0.7

Table 4. Adjusted R-squared for models of natural log Total PCB regressed on log(length) log(lipid) and sex (Black Bass only) and time.

Station	Pumpkinseed	Black Bass	Bullhead	Yellow Perch
FD1	0.13	0.49	0.54	0.66
TD1	0.46	0.57	0.55	0.01
TD2	-0.03	0.42	0.29	0.56
TD3	0.37	0.45	0.77	0.46
TD4	-0.09	0.45	0.71	0.45
TD5	0.36	0.80	0.74	0.82
ND1	0.05	0.31	0.77	0.25
ND2	0.68	0.22	0.70	0.15
ND3	0.11	0.79	0.51	0.65
ND5	0.54	0.51	0.47	0.80
SW1	0.19	0.35	0.63	0.56
SW2	0.68	0.69	0.91	0.72
SW3	0.26	0.75	0.72	0.66
SW4	0.44	0.46	0.89	0.45
SW5	0.61	0.86	0.63	0.54
AT1	0.77	0.68	0.73	0.45

Table 5-a. Ratio of observed to predicted total PCB concentration in 2009 for whole body pumpkinseed samples based on 2000 replicate bootstrap samples. All comparisons were adjusted for fish length and fraction lipid. Long-term monitoring stations are shown in bold.

Station	Years Monitored	Total Samples	5%	50% (Median)	95%
FD1	**13**	**214**	**1.2**	**1.4**	**1.6**
TD1	7	31	2.4	5.6	11.9
TD2	6	30	1.7	2.5	3.8
TD3	6	34	1.8	4.5	10.0
TD4	6	30	0.8	1.1	1.6
TD5	**12**	**155**	**3.2**	**3.7**	**4.2**
ND1	3	15	0.1	0.8	4.2
ND2	3	11	0.5	5.7	32.9
ND3	5	37	0.6	0.8	1.2
ND5	6	66	1.7	2.2	3.0
SW1	6	30	1.2	2.1	3.7
SW2	6	30	1.0	1.3	1.7
SW3	6	38	0.7	0.9	1.3
SW4	6	30	1.3	1.7	2.0
SW5	**13**	**219**	**1.1**	**1.2**	**1.3**

Table 5-b. Ratio of observed to predicted total PCB concentration in 2009 for bullhead fillet samples based on 2000 replicate bootstrap samples. All comparisons were adjusted for fish length and fraction lipid. Long-term monitoring stations are shown in bold.

Station	Years Monitored	Total Samples	5%	50% (Median)	95%
FD1	**13**	**234**	**0.70**	**0.96**	**1.38**
TD1	6	30	0.69	1.23	2.14
TD2	7	35	0.75	1.14	1.68
TD3	7	33	1.83	3.36	5.78
TD4	7	30	0.75	1.06	1.55
TD5	**13**	**201**	**0.96**	**1.36**	**1.78**
ND1	5	27	0.91	1.27	1.74
ND2	5	14	0.21	0.63	1.58
ND3	7	51	0.69	1.36	2.51
ND5	7	68	0.55	0.72	0.98
SW1	7	31	0.53	0.88	1.50
SW2	6	30	0.64	1.05	1.79
SW3	**13**	**191**	**0.40**	**0.54**	**0.73**
SW4	6	30	0.61	0.97	1.55
SW5	8	36	0.81	1.01	1.27

Table 5-c. Ratio of observed to predicted total PCB concentration in 2009 for Black Bass fillet samples based on 2000 replicate bootstrap samples. All comparisons were adjusted for fish length and fraction lipid and sex. Long-term monitoring stations are shown in bold.

Station	Years Monitored	Total Samples	5%	50% (Median)	95%
FD1	**13**	**233**	**1.23**	**1.65**	**2.14**
TD1	8	43	0.54	0.78	1.14
TD2	7	32	0.37	0.52	0.77
TD3	7	33	0.26	0.43	0.66
TD4	6	30	0.69	1.18	2.08
TD5	**13**	**195**	**0.38**	**0.58**	**0.89**
ND1	5	25	0.73	1.07	1.50
ND2	6	28	0.78	1.25	2.01
ND3	7	54	0.60	0.95	1.50
ND5	7	58	0.76	1.07	1.52
SW1	7	36	0.64	1.00	1.52
SW2	6	30	0.97	1.37	1.95
SW3	**13**	**195**	**0.58**	**0.94**	**1.65**
SW4	6	29	0.60	0.88	1.27
SW5	8	46	0.52	0.84	1.41

Table 5-d. Ratio of observed to predicted total PCB concentration in 2009 for yellow perch fillet samples based on 2000 replicate bootstrap samples. All comparisons were adjusted for fish length and fraction lipid. Long-term monitoring stations are shown in bold.

Station	Years Monitored	Total Samples	5%	50% (Median)	95%
FD1	**13**	**260**	**0.37**	**0.51**	**0.71**
TD1	7	34	1.05	1.77	3.21
TD2	8	41	0.92	1.36	2.05
TD3	7	38	0.47	0.71	1.12
TD4	6	30	0.29	0.60	1.22
TD5	**13**	**184**	**0.41**	**0.53**	**0.70**
ND1	5	22	0.70	1.44	3.43
ND2	5	22	0.42	1.06	2.47
ND3	7	53	0.87	1.36	2.12
ND5	7	68	0.93	1.33	1.80
SW1	7	35	0.49	1.03	2.13
SW2	6	30	0.23	0.45	0.79
SW3	**13**	**178**	**0.43**	**0.62**	**0.88**
SW4	6	30	0.56	0.79	1.14
SW5	7	32	0.57	0.88	1.34
AT1	**10**	**74**	**2.00**	**2.64**	**3.55**

Table 6-a. Factors of change between mean baseline (2004-2008) and 2009 mean total PCB concentrations; wet weight basis, mg PCBs /kg wet weight. Relative to the baseline mean concentration, a factor >1.0 indicates a relative increase in 2009, 1.0 indicates no apparent change, and <1.0 indicates a relative decrease in 2009.

Station	Pumpkinseed	Forage fish	Black Bass	Yellow Perch	Bullhead
FD1	0.36	2.03	0.32	0.98	0.93
TD1	3.91	2.99	0.50	1.61	0.39
TD2	1.81	1.98	0.21	0.98	0.50
TD3	1.83	1.54	0.24	0.24	1.66
TD4	1.10	2.25	0.42	0.24	0.72
TD5	2.79	0.73	0.31	0.14	0.43
ND1	1.57	2.40	0.75	0.69	0.86
ND2	1.59	1.00	0.71	0.08	0.62
ND3	0.75	1.37	0.53	0.97	1.13
ND5	1.28	1.60	0.53	0.59	0.66
SW1	1.58	1.45	0.48	0.42	0.37
SW2	1.19	1.42	0.23	0.07	1.25
SW3	0.39	0.29	0.68	0.23	0.62
SW4	1.19	1.70	0.46	0.55	0.93
SW5	0.99	0.90	0.77	0.42	0.33

Table 6-b. Factors of change between mean baseline (2004-2008) and 2009 mean total PCB concentrations; lipid-normalized basis, mg PCBs/kg lipid. Relative to the baseline mean concentration, a factor >1.0 indicates a relative increase in 2009, 1.0 indicates no apparent change, and <1.0 indicates a relative decrease in 2009.

Station	Pumpkinseed	Forage fish	Black Bass	Yellow Perch	Bullhead
FD1	0.34	2.25	0.37	1.42	0.96
TD1	4.27	2.30	0.35	1.32	0.40
TD2	1.70	1.71	0.30	0.81	0.67
TD3	1.54	1.14	0.43	0.38	1.89
TD4	0.98	1.49	0.36	0.26	0.56
TD5	2.84	0.94	0.43	0.29	1.02
ND1	1.66	2.26	1.81	0.55	0.74
ND2	1.59	0.72	1.54	0.29	0.39
ND3	0.81	0.93	0.96	0.88	1.11
ND5	1.13	1.55	0.56	0.59	0.67
SW1	1.85	1.15	1.03	0.69	0.61
SW2	1.05	1.28	0.92	0.41	1.92
SW3	0.56	0.55	0.98	0.47	0.56
SW4	0.98	1.15	0.72	0.63	0.87
SW5	1.05	0.87	0.58	0.71	0.65

Table 7. Comparison of adjusted geometric mean total PCB concentrations in fish tissues from baseline monitoring (2004-8) with concentrations in 2009.

SECTION	STATION	Approx. River Mile	Black Bass	Bullhead	Yellow Perch	Pumpkin-seed	Forage Fish
1	ALL	188.5-195	-		-	+	+
2	ALL	183.4-188.5	(-)		-	+	
3	ALL	168.2-183.2		-	-		
SECTION	STATION						
--	FD1	201.1			+		(+)
1	TD1	194			+	+	
1	TD2	193	-			+	
1	TD3	192	-		(-)		
1	TD4	190-191			-		(+)
1	TD5	189.3	-		-	+	
2	ND1	187		(-)		(+)	
2	ND2	186.4			-		-
2	ND3	185.5					
2	ND5	183.5	-		-		
3	SW1	181.2					+
3	SW2	178.2					
3	SW3	177.3		-	-		
3	SW4	172.1					
3	SW5	167.8					
--	AT1	153.2 & 142		NA	-		

	Neutral p > 0.10
-	Decrease between 2004-8 and 2009; p<0.05
+	Increase between 2004-8 and 2009; p<0.05
( )	p<0.10

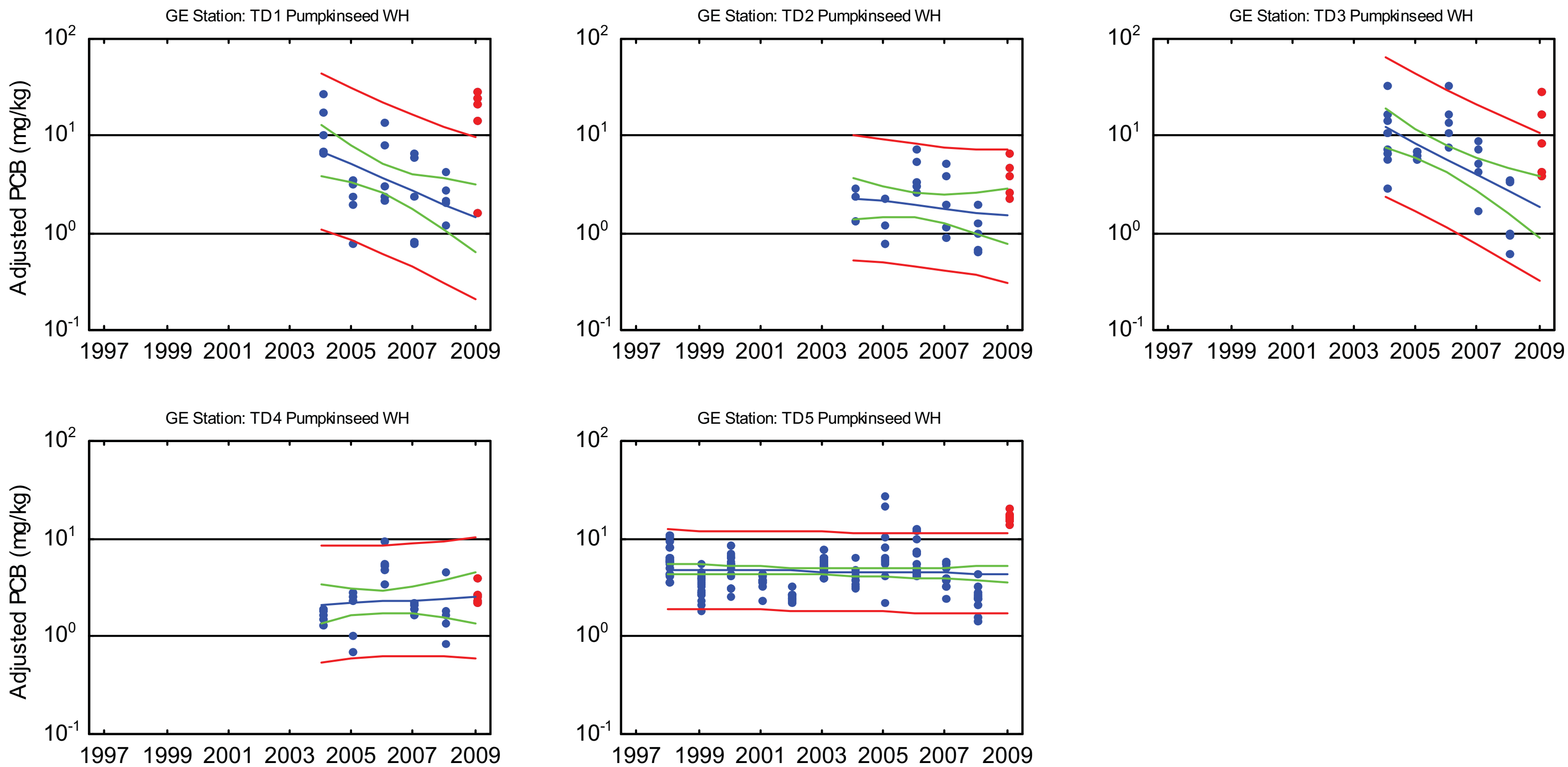


Figure 1. Length and lipid adjusted Total PCB concentrations in whole body Pumpkinseed from the Thompson Island Pool, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

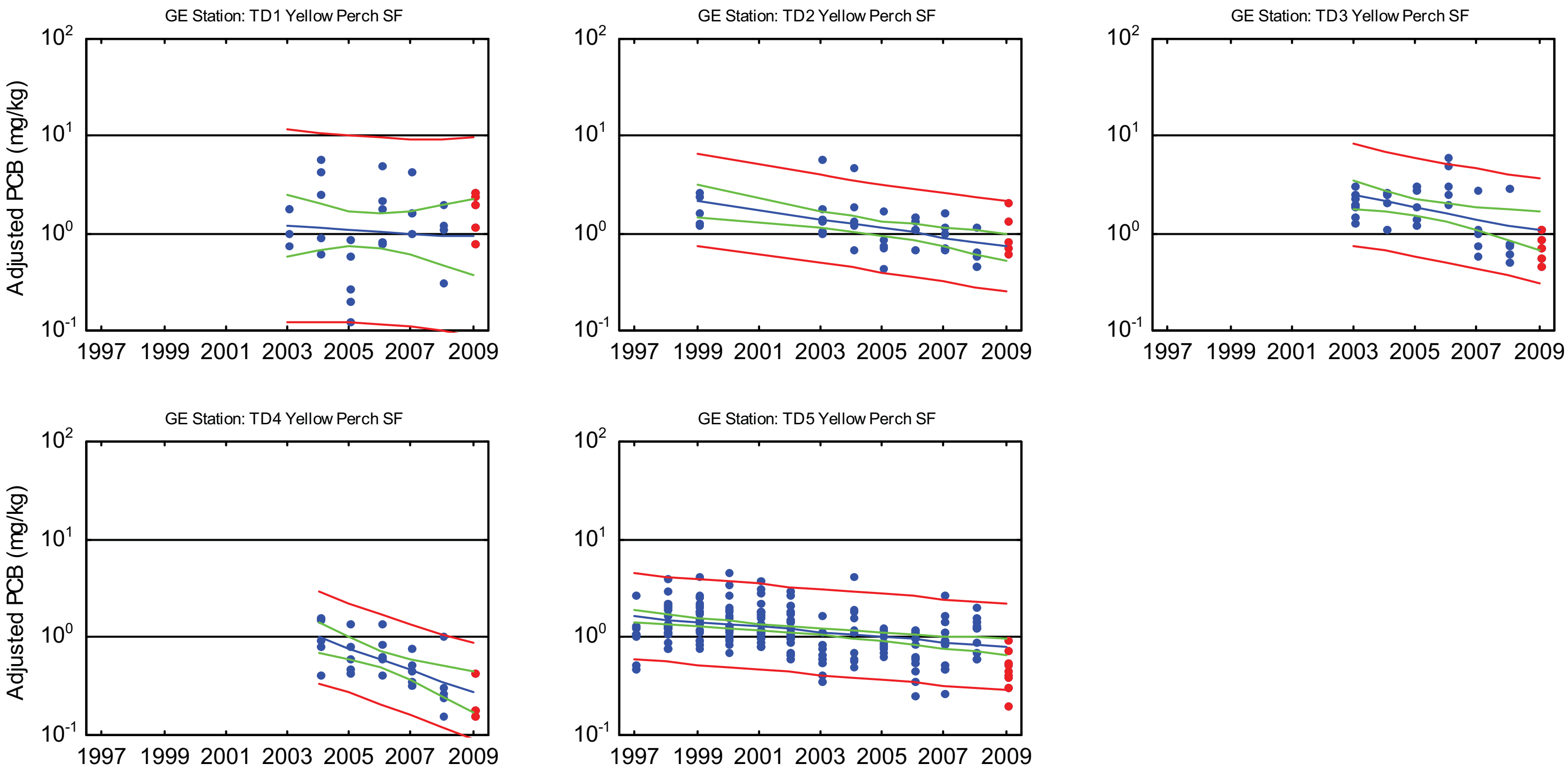


Figure 2. Length and lipid adjusted Total PCB concentrations in whole body Yellow Perch standard fillets from the Thompson Island Pool, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

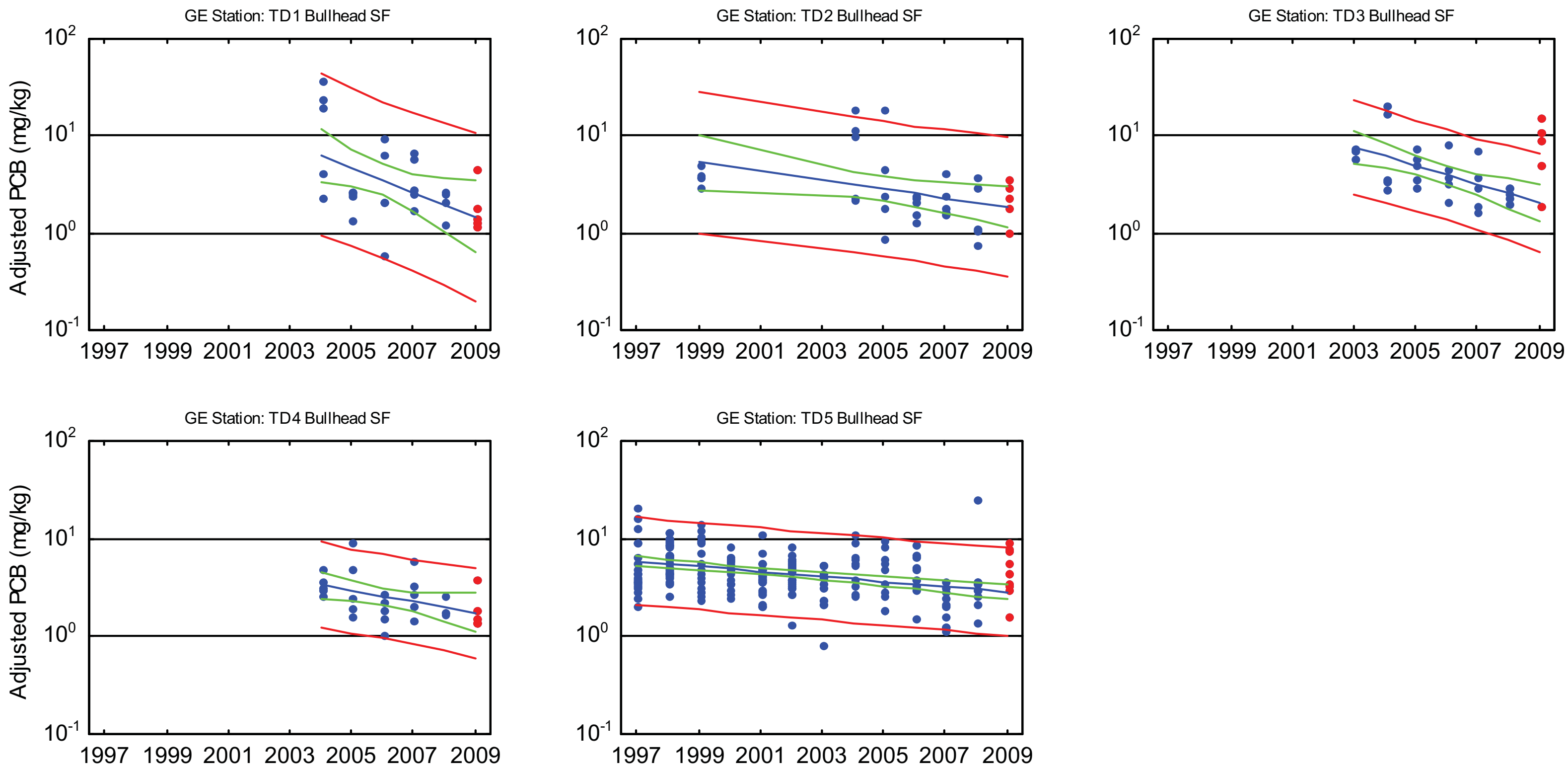


Figure 3. Length and lipid adjusted Total PCB concentrations in Bullhead standard fillets from the Thompson Island Pool, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

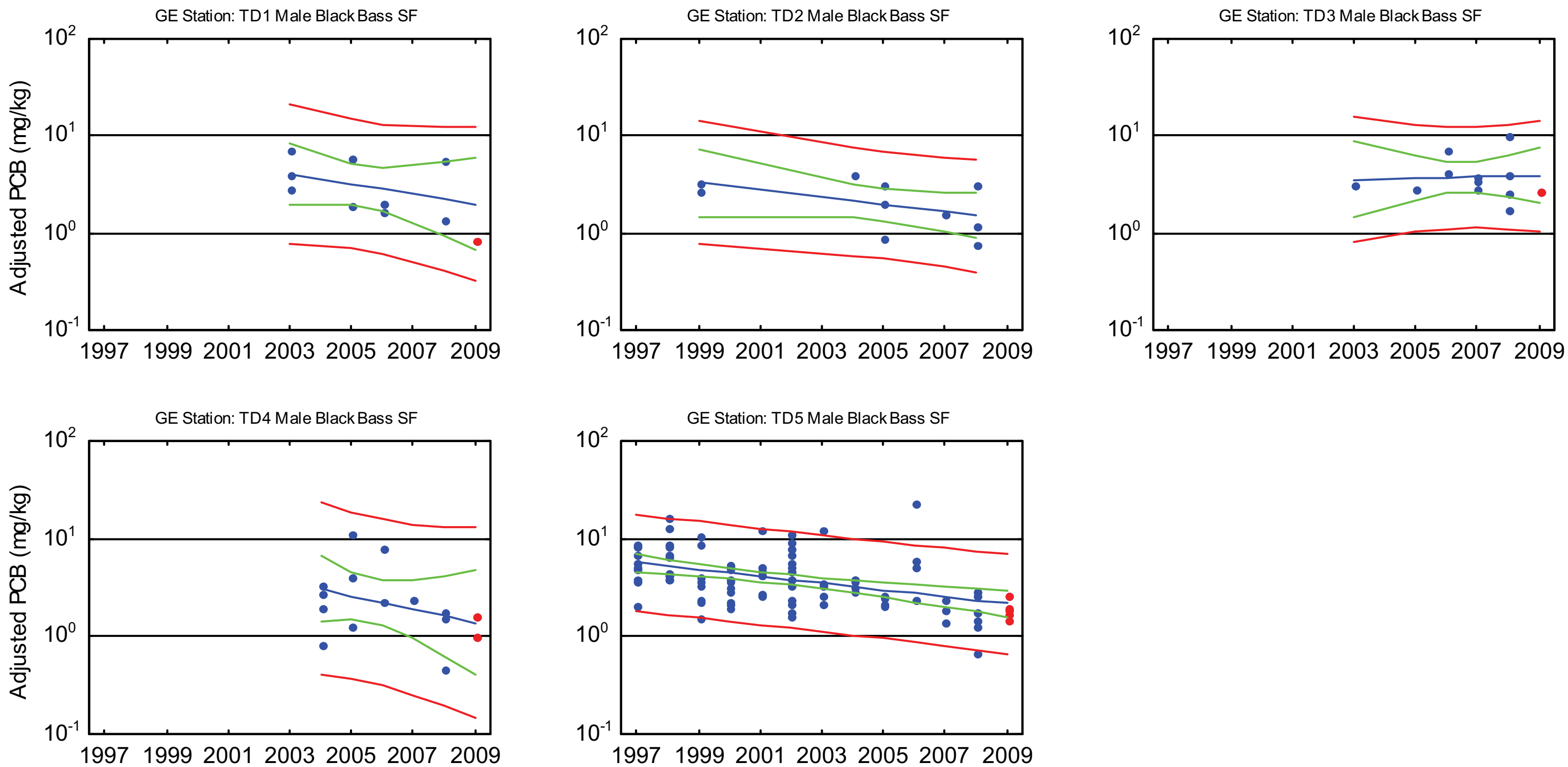


Figure 4. Length and lipid adjusted Total PCB concentrations in Male Black Bass standard fillets from the Thompson Island Pool, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

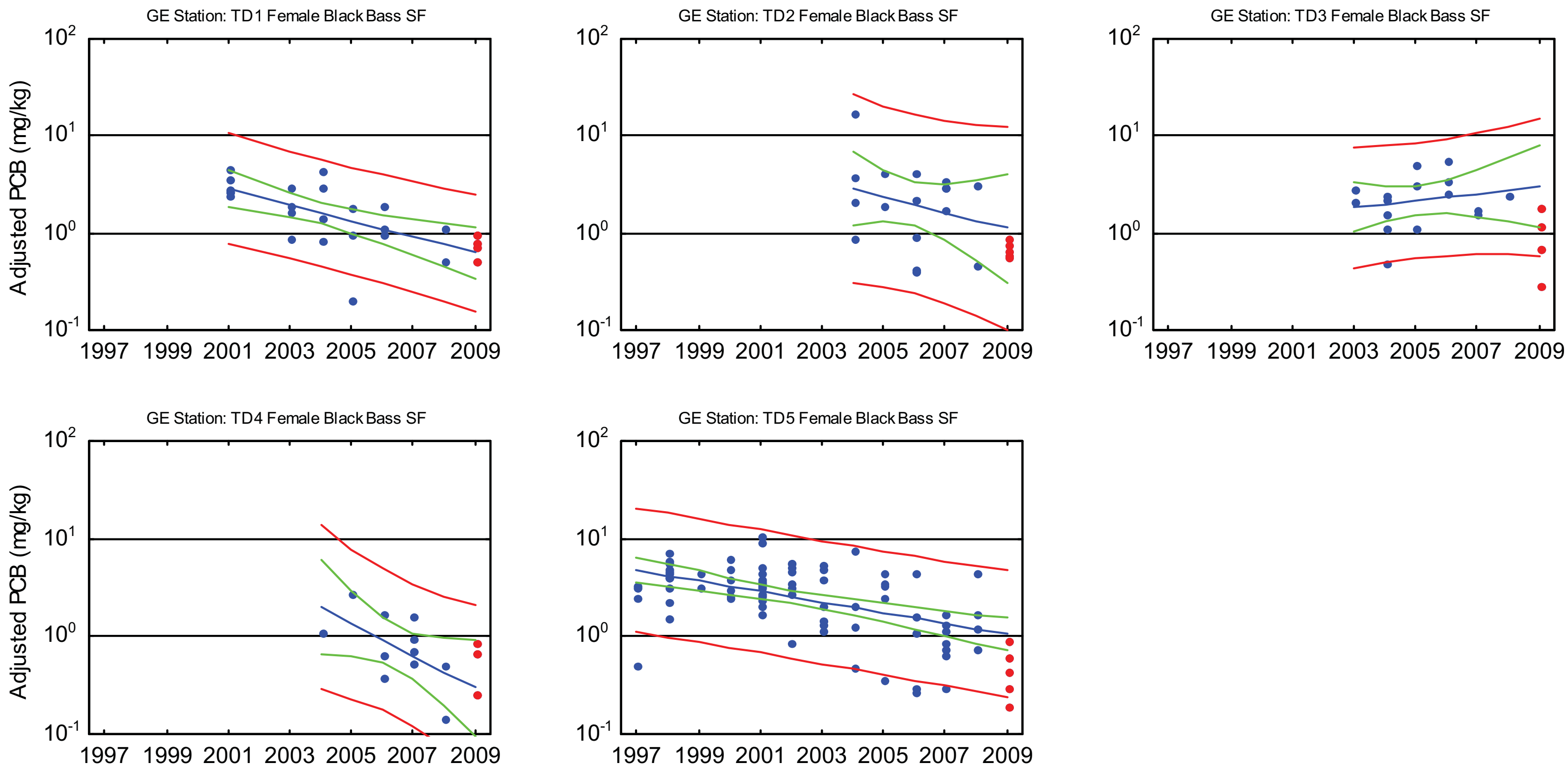


Figure 5. Length and lipid adjusted Total PCB concentrations in female black bass from the Thompson Island Pool, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

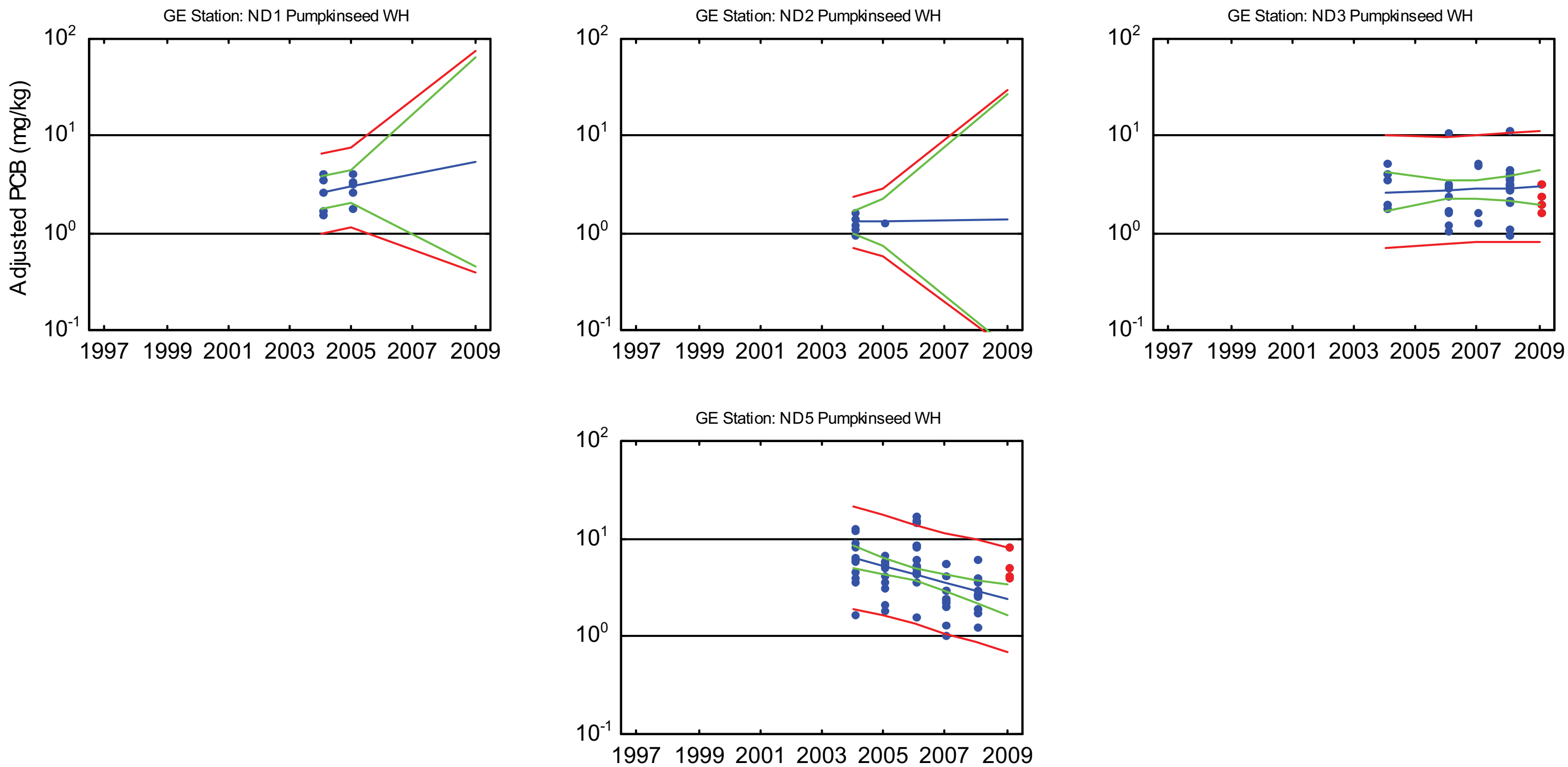


Figure 6. Length and lipid adjusted Total PCB concentrations in whole body Pumpkinseed from the Northumberland area, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

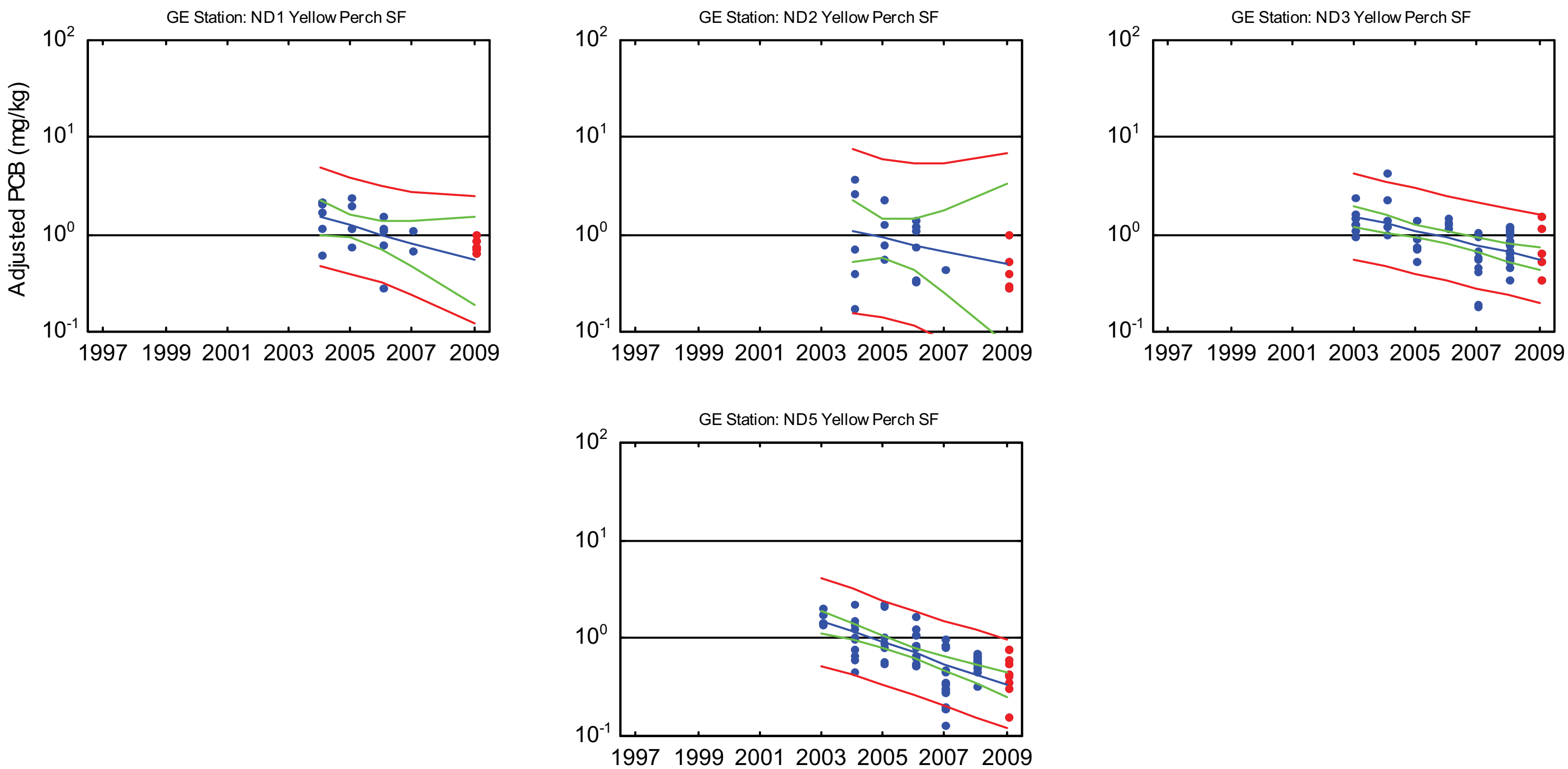


Figure 7. Length and lipid adjusted Total PCB concentrations in yellow perch standard fillets from the Northumberland area, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

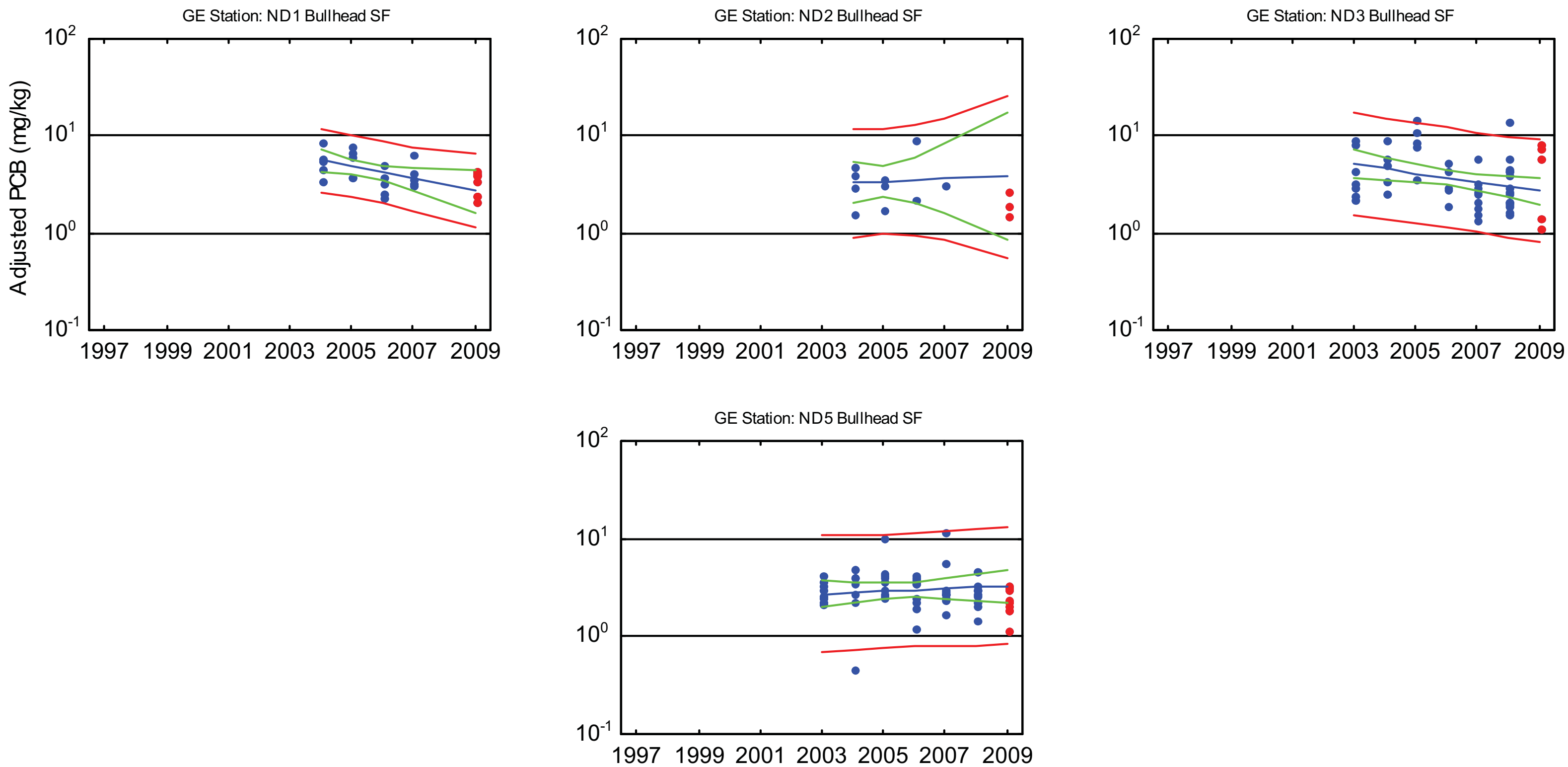


Figure 8. Length and lipid adjusted Total PCB concentrations in Bulhead standard fillets from the Northumberland area, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

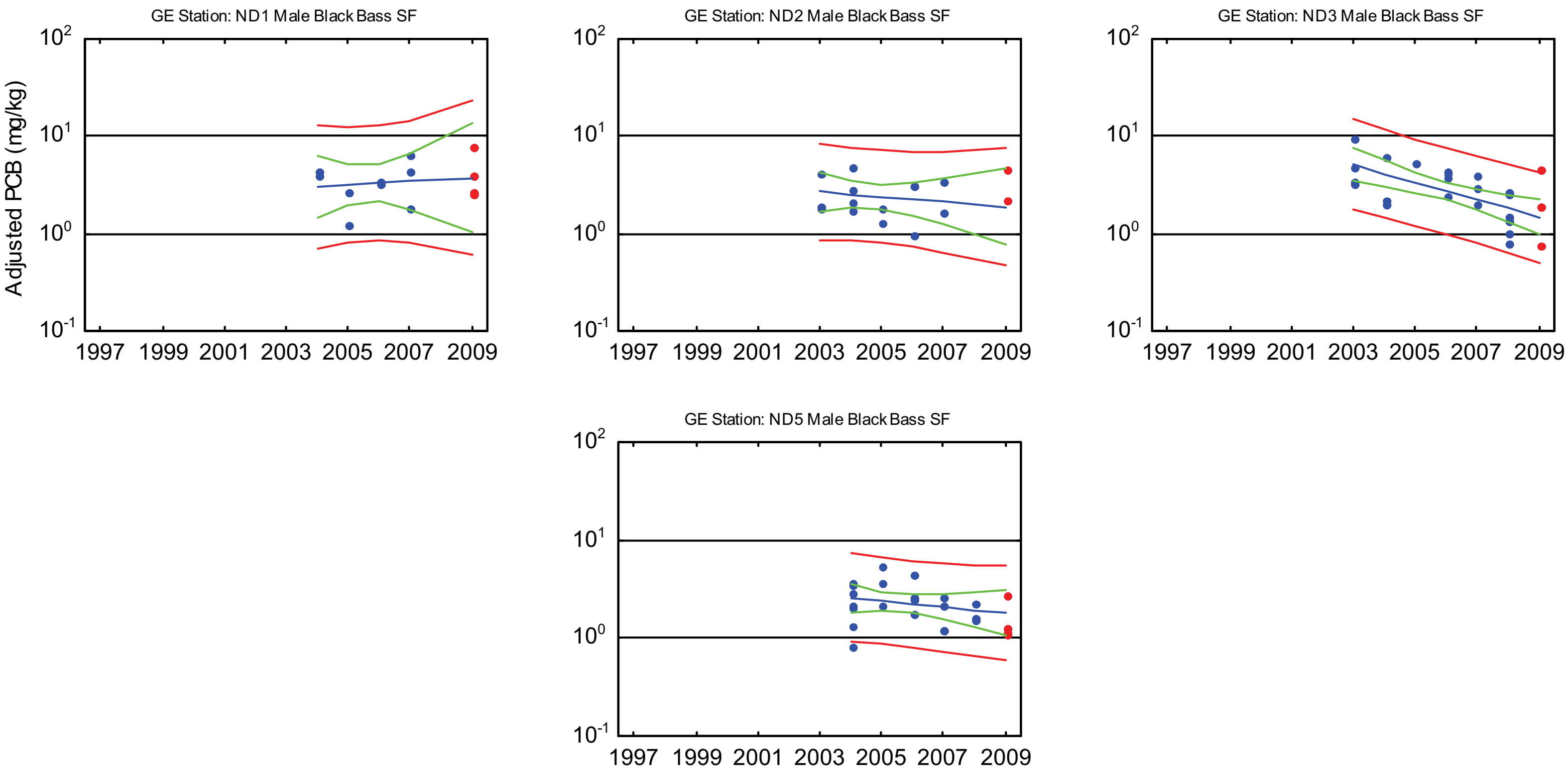


Figure 9. Length and lipid adjusted Total PCB concentrations in male black bass standard fillets from the Northumberland area, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

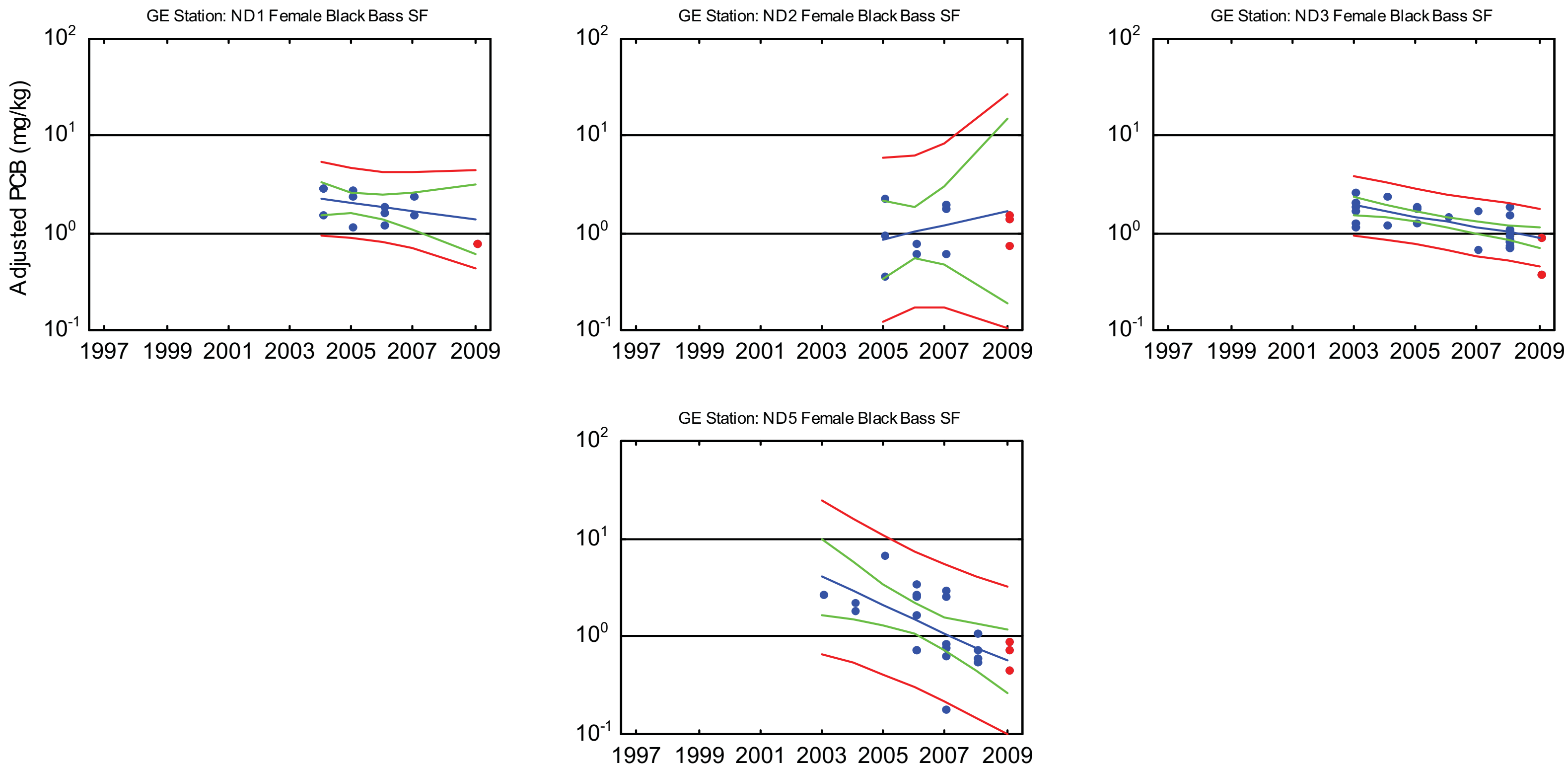


Figure 10. Length and lipid adjusted Total PCB concentrations in female black bass from the Northumberland area, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

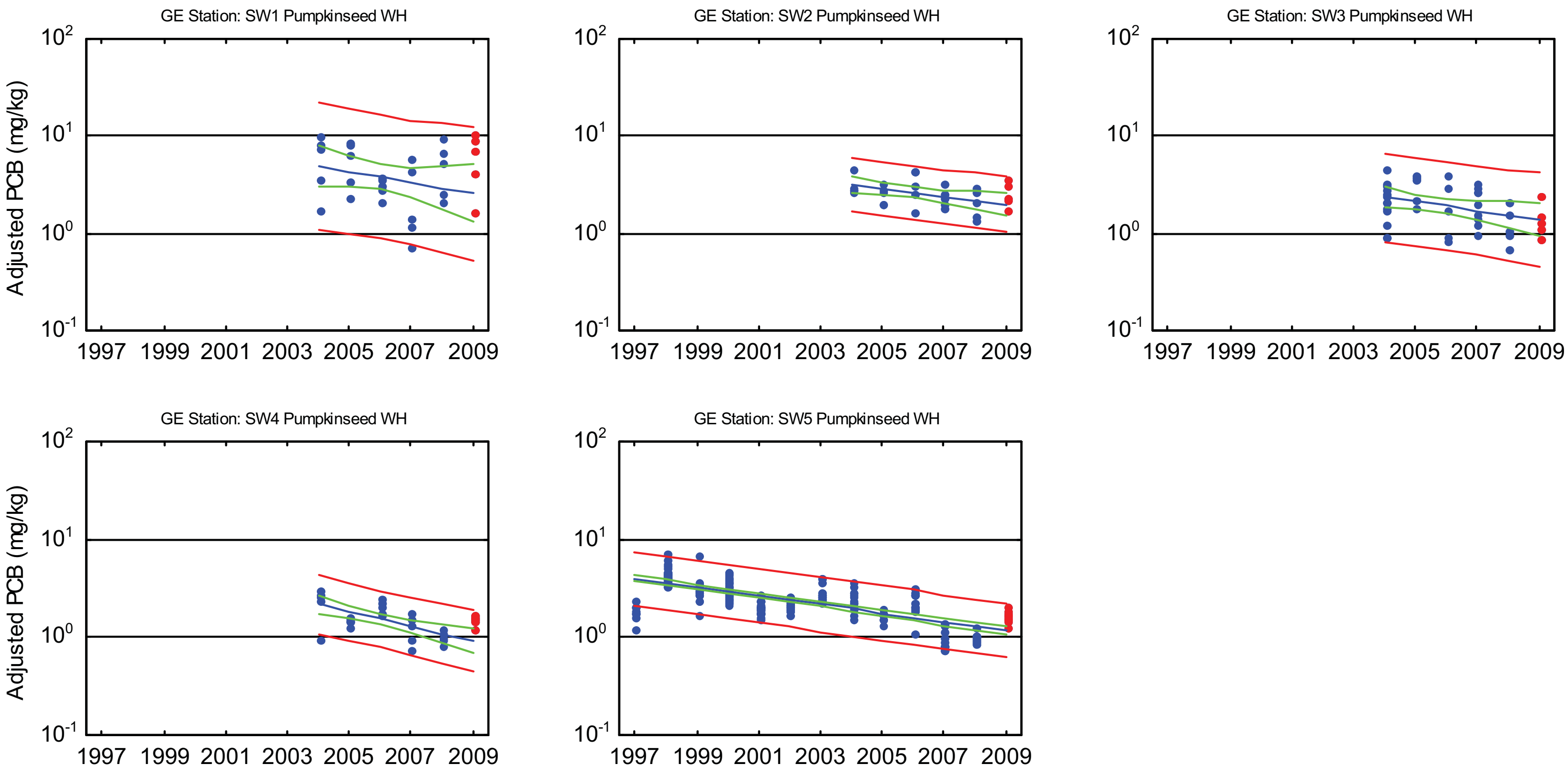


Figure 11. Length and lipid adjusted Total PCB concentrations in whole body Pumpkinseed from the Stillwater area, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

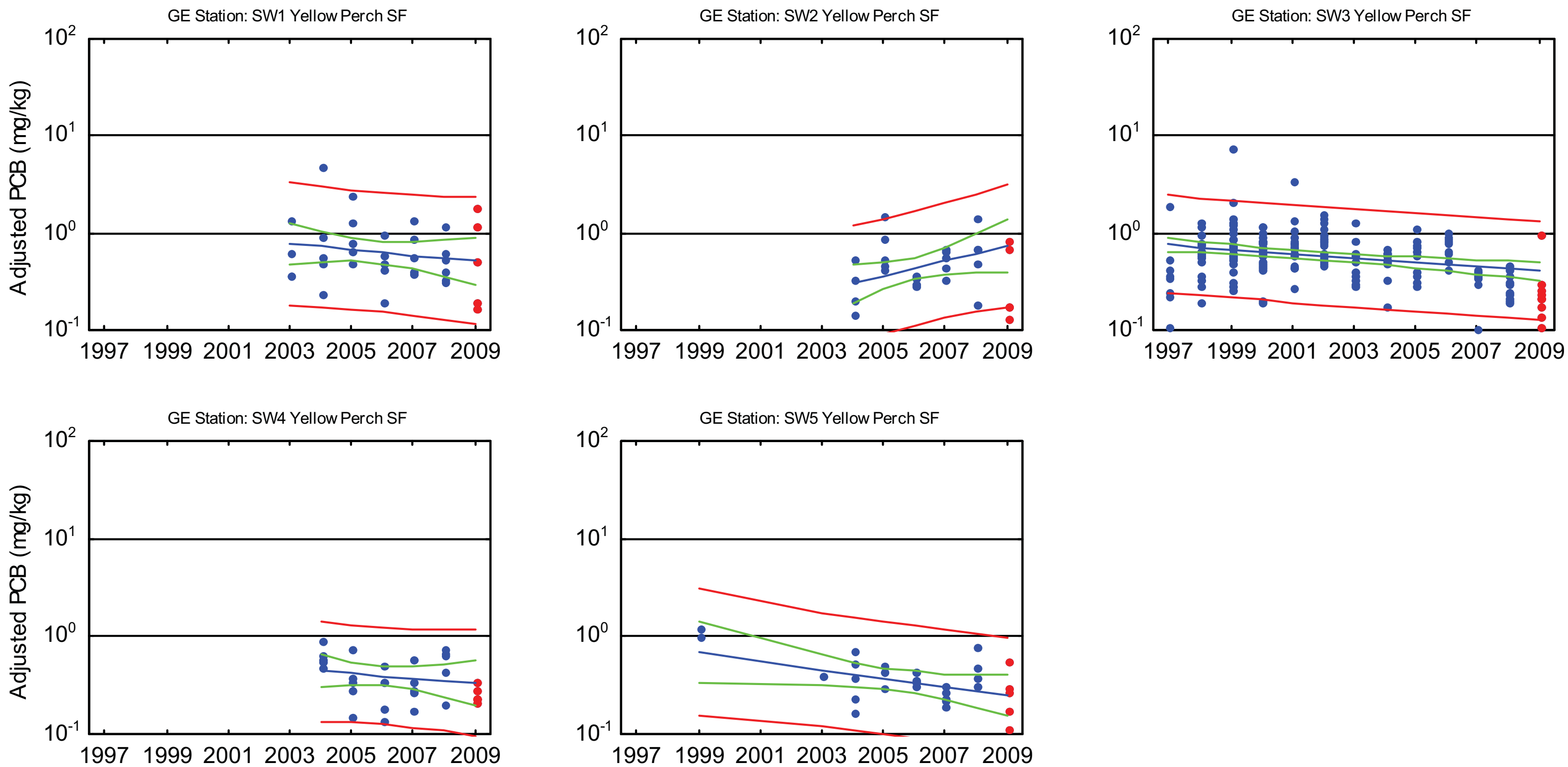


Figure 12. Length and lipid adjusted Total PCB concentrations in yellow perch standard fillets from the Stillwater area, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

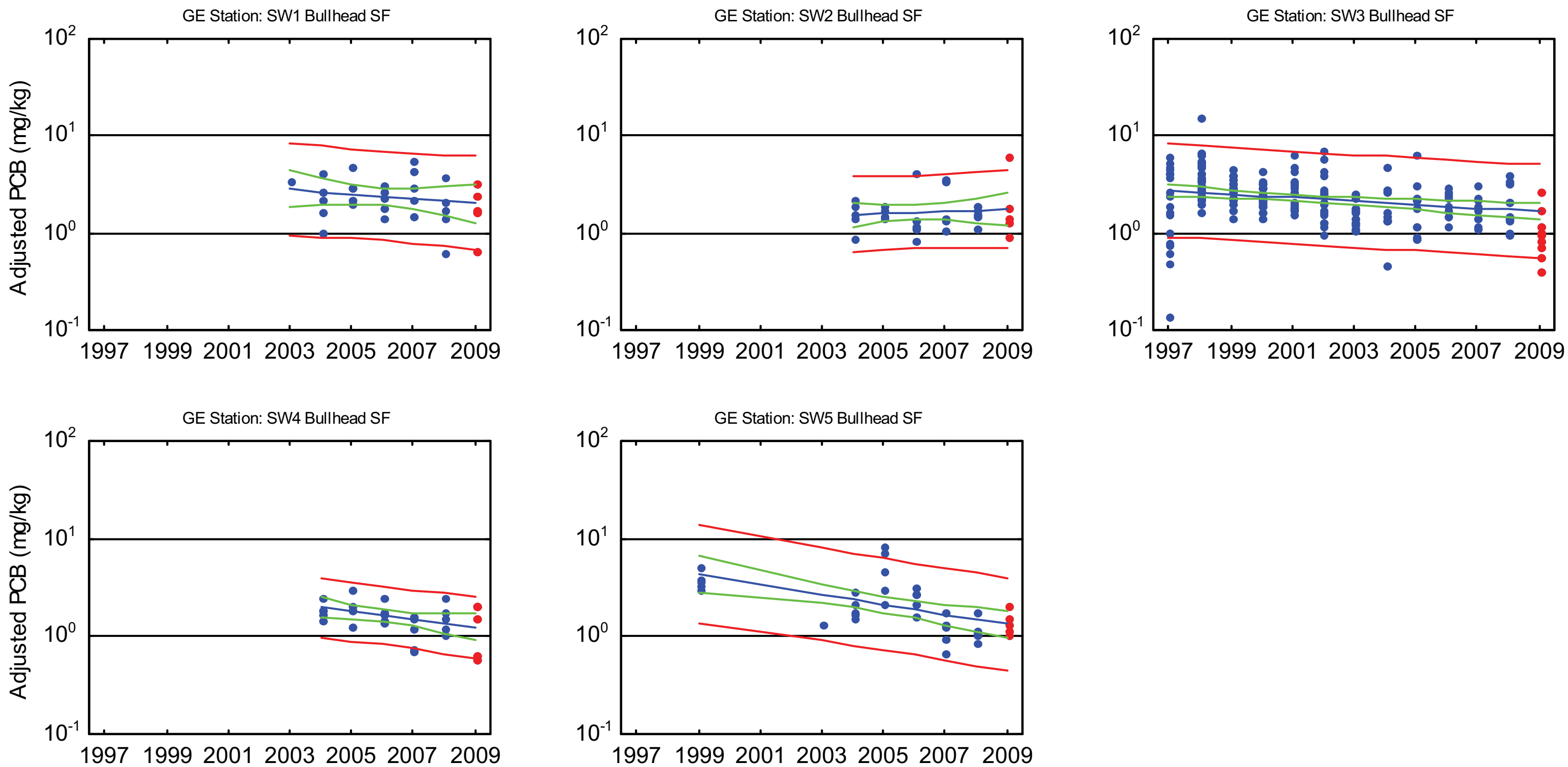


Figure 13. Length and lipid adjusted Total PCB concentrations in bullhead standard fillets from the Stillwater area, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

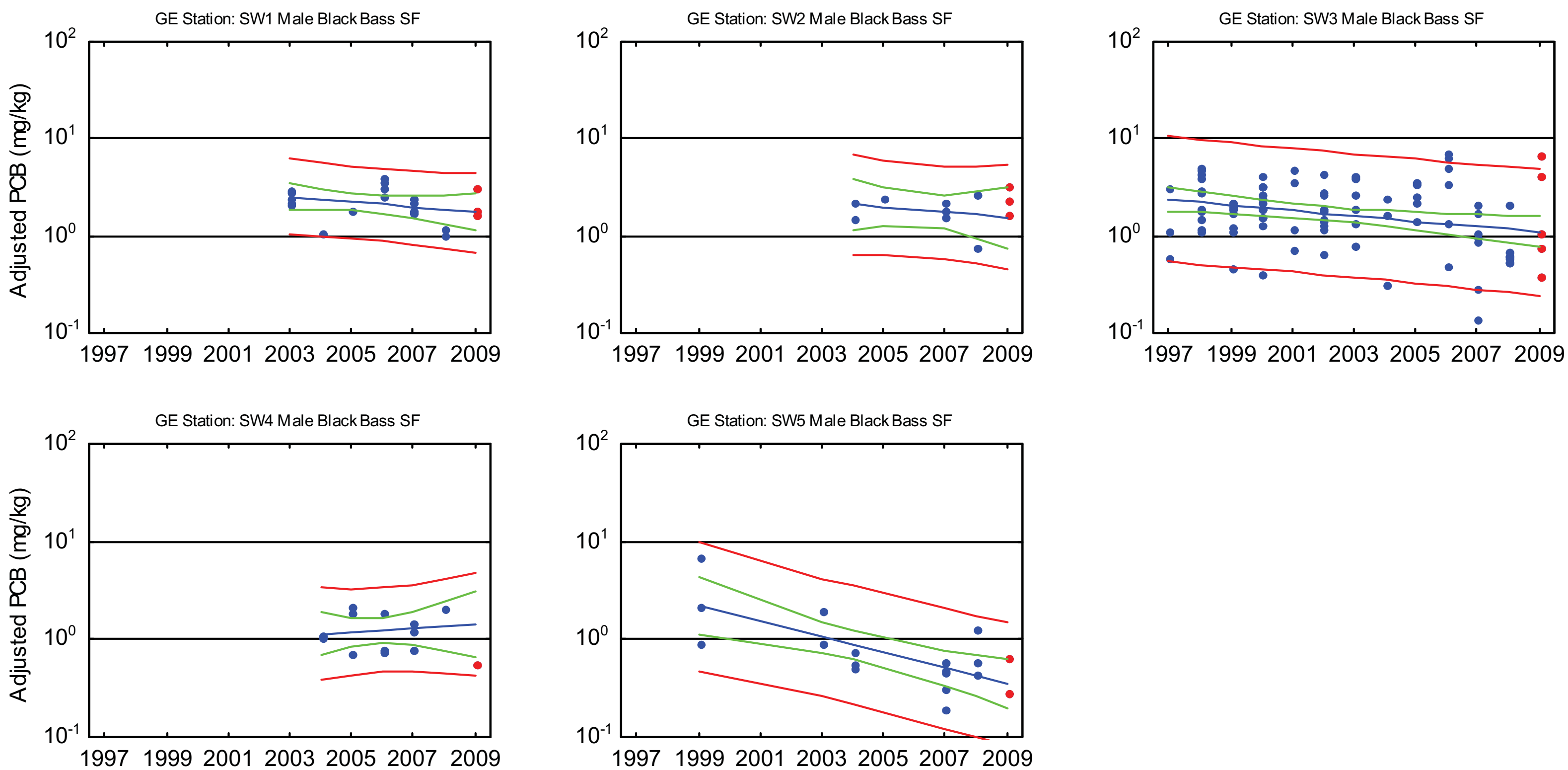


Figure 14. Length and lipid adjusted Total PCB concentrations in male black bass from the Stillwater area, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

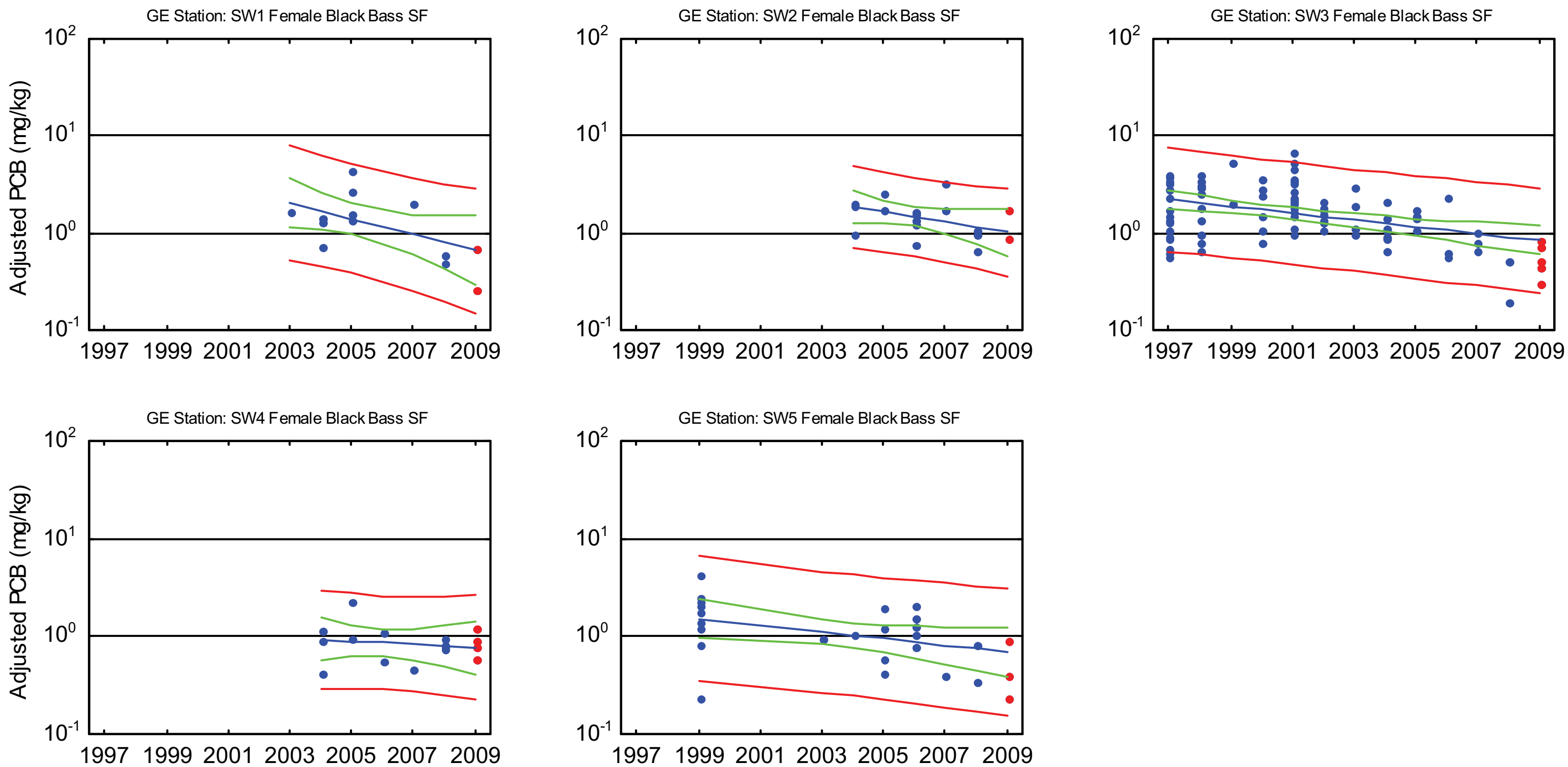


Figure 15. Length and lipid adjusted Total PCB concentrations in female black bass standard fillets from the Stillwater Area, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

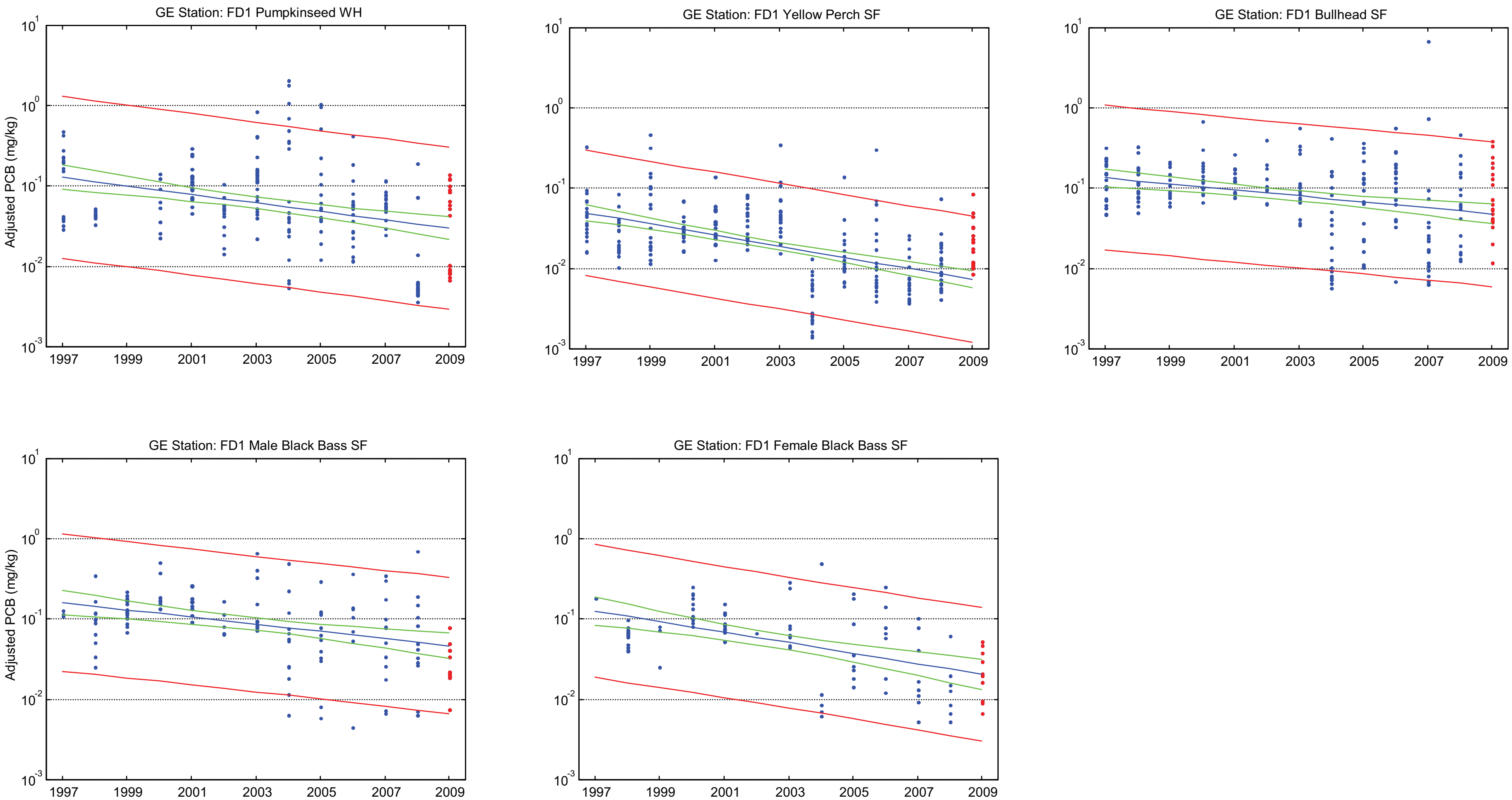


Figure 16. Length and lipid adjusted Total PCB concentrations in whole body pumpkinseed, and bullhead, yellow perch, male and female black bass standard fillets at the Feeder Dam reference site, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

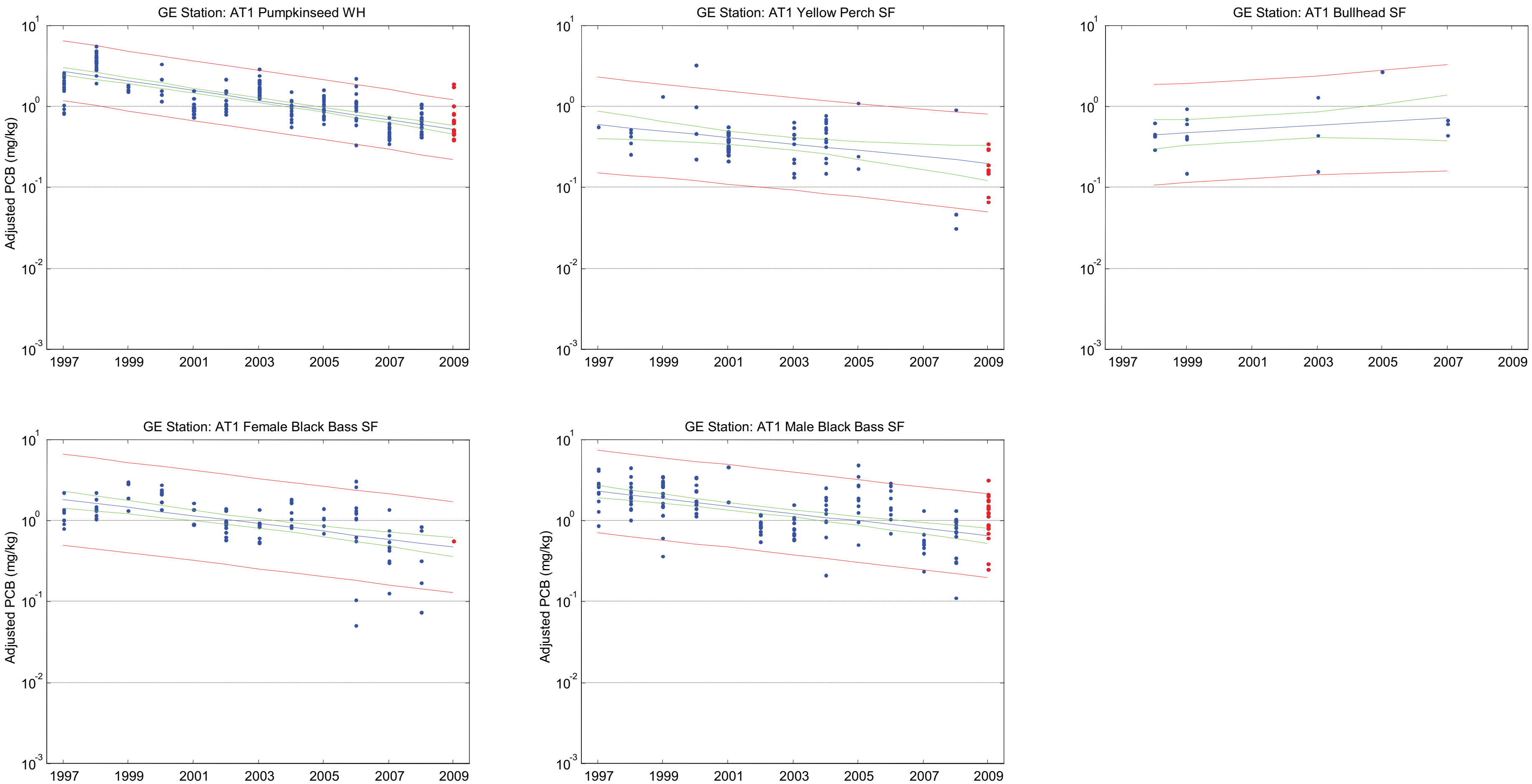


Figure 17. Length and lipid adjusted Total PCB concentrations in whole body pumpkinseed, and bullhead, yellow perch, male and female black bass standard fillets at Albany Troy, Hudson River, New York. Blue lines represent estimated temporal trend, green lines represent confidence limits for the fitted lines and red lines represent 95% prediction limits for individual fish tissue concentrations. Blue dots represent individual sample tissue concentrations of PCBs through 2008, and upon which the regressions were based. Red dots are the 2009 data plotted for comparison.

Pumpkinseed

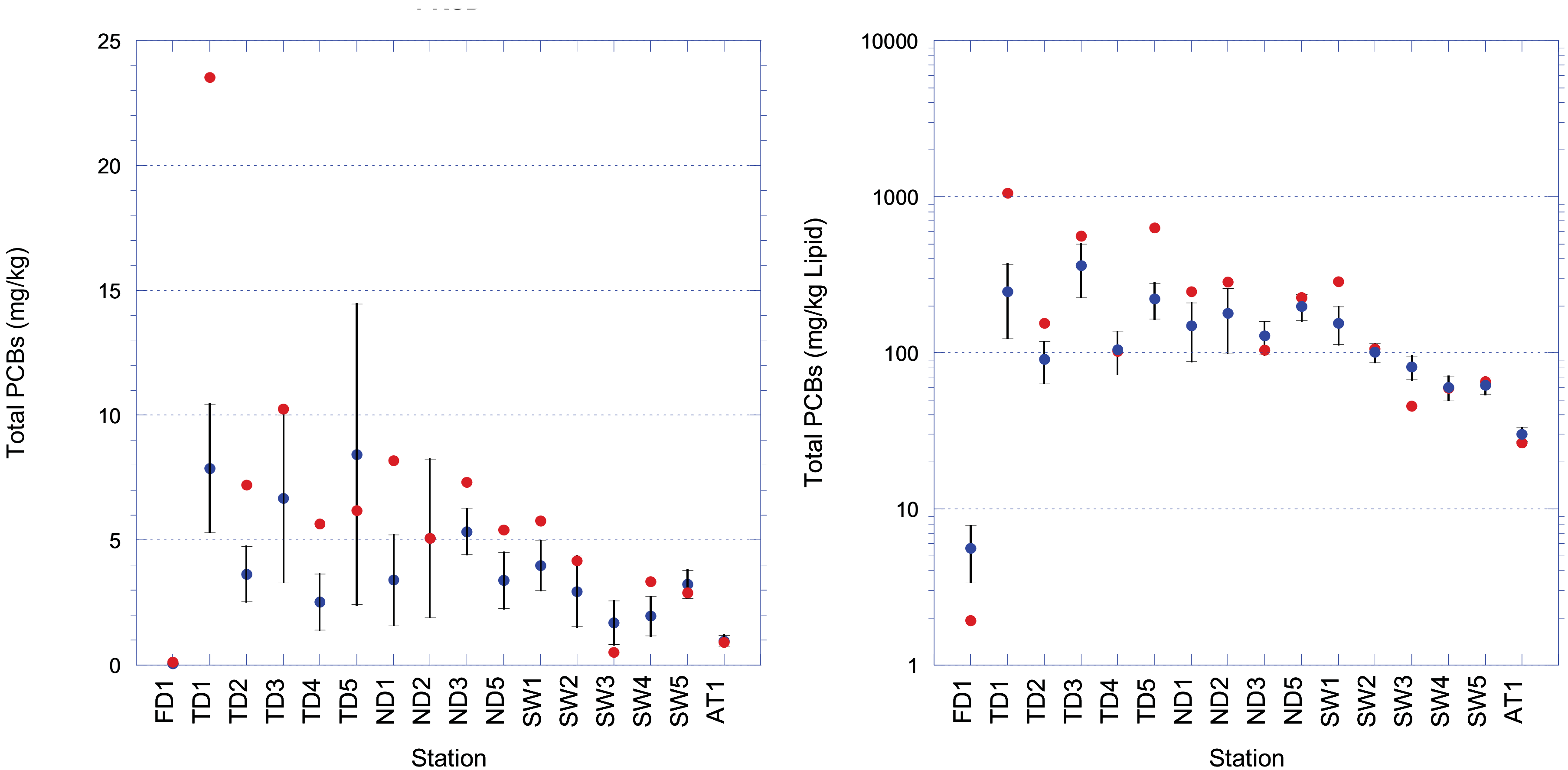


Figure 18. Comparison of pumpkinseed baseline (2004-2008) total PCB concentrations (mg/kg, wet weight) and lipid-normalized PCB concentrations (mg/kg lipid) mean (blue dots)and 95% confidence interval with mean concentrations from 2009 (red dots).

Forage Fish

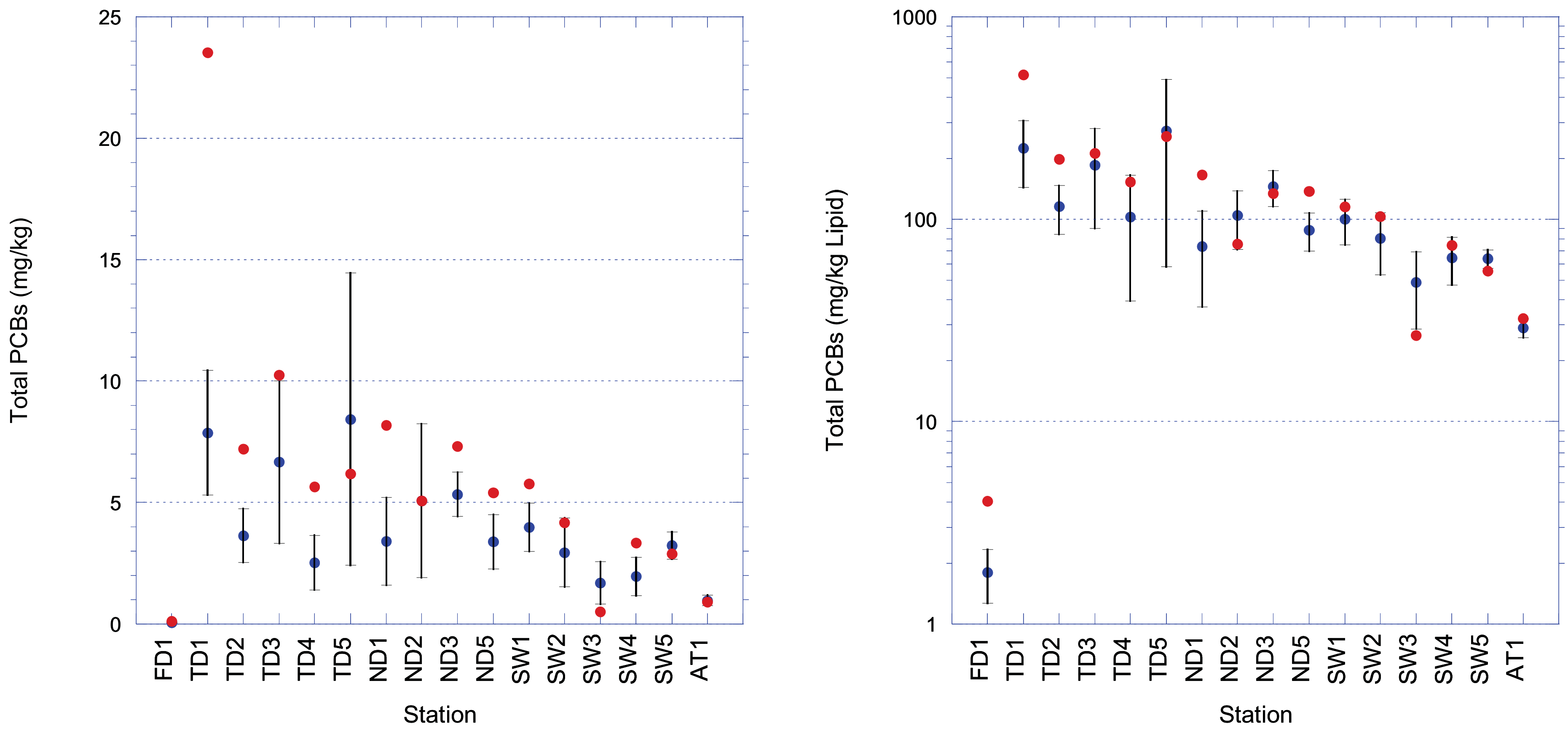
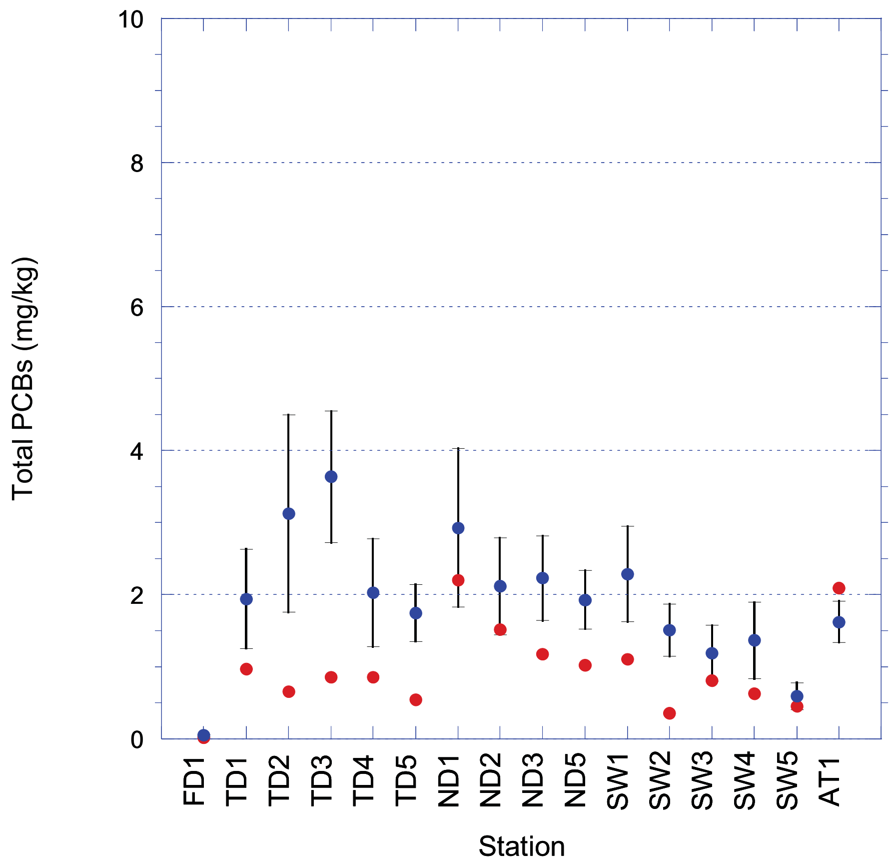


Figure 19. Comparison of forage fish (minnows) baseline (2004-2008) total PCB concentrations (mg/kg, wet weight) and lipid-normalized PCB concentrations (mg/kg lipid) mean (blue dots) and 95% confidence interval with mean concentrations from 2009 (red dots).

Black Bass



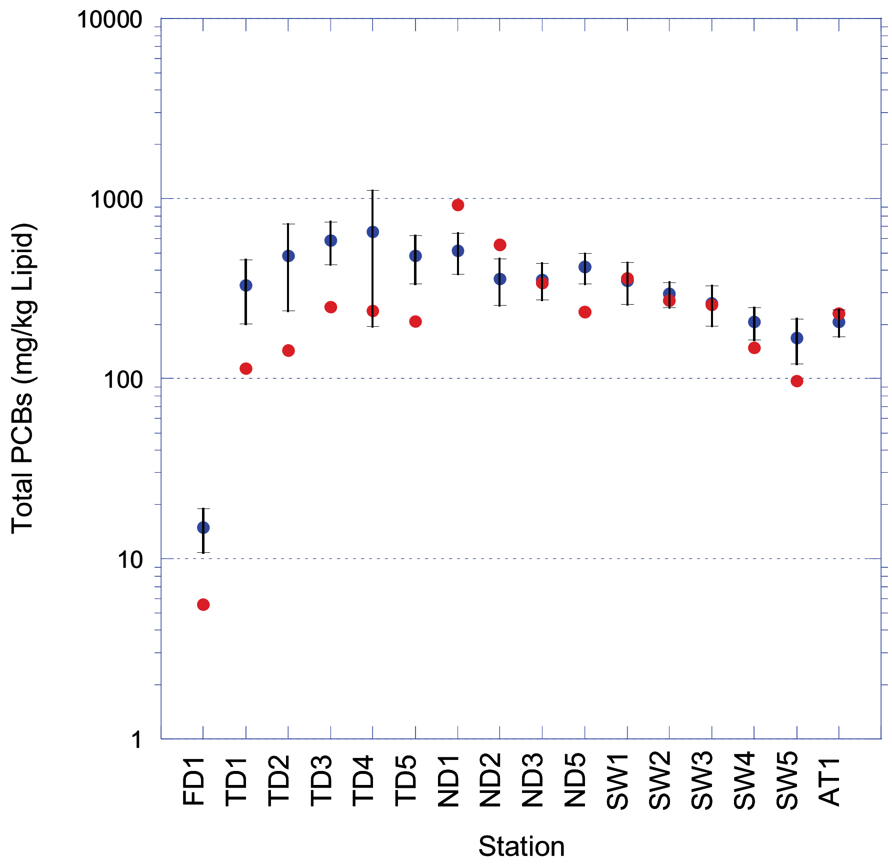


Figure 20. Comparison of black bass baseline (2004-2008) total PCB concentrations (mg/kg, wet weight) and lipid-normalized PCB concentrations (mg/kg lipid) mean (blue dots) and 95% confidence interval with mean concentrations from 2009 (red dots).

Yellow Perch

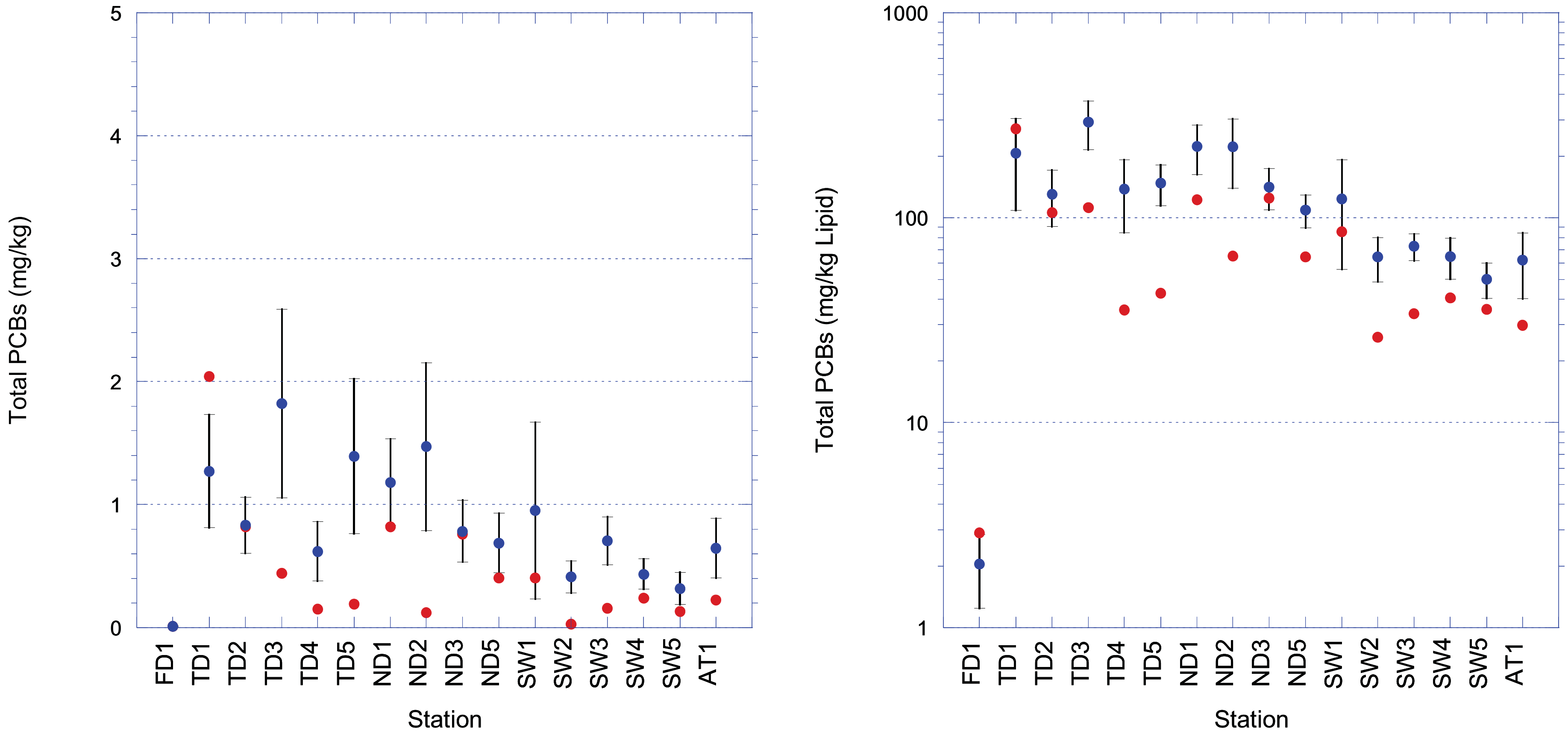


Figure 21. Comparison of yellow perch baseline (2004-2008) total PCB concentrations (mg/kg, wet weight) and lipid-normalized PCB concentrations (mg/kg lipid) mean (blue dots) and 95% confidence interval with mean concentrations from 2009 (red dots).

Bullhead

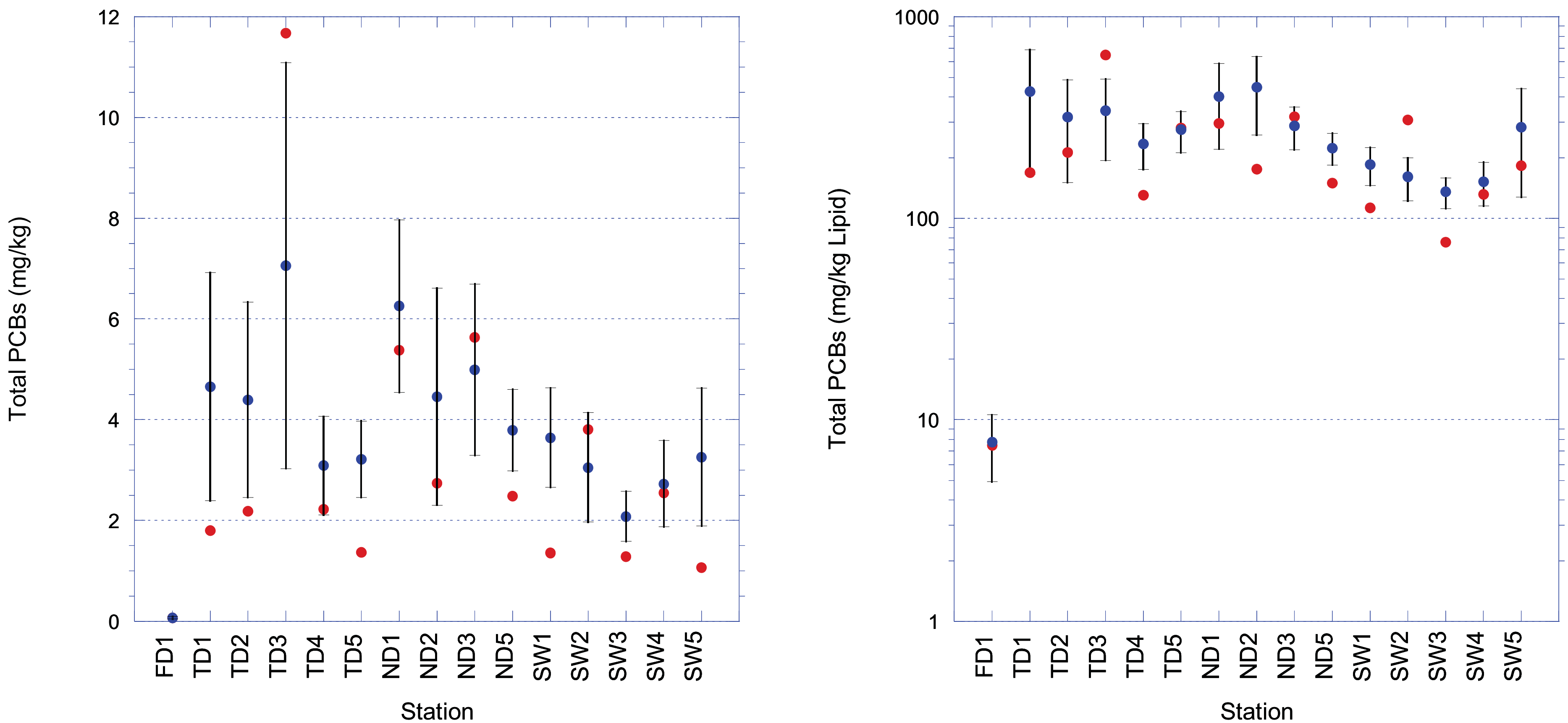


Figure 22. Comparison of bullhead baseline (2004-2008) total PCB concentrations (mg/kg, wet weight) and lipid-normalized PCB concentrations (mg/kg lipid) mean (blue dots) and 95% confidence interval with mean concentrations from 2009 (red dots).

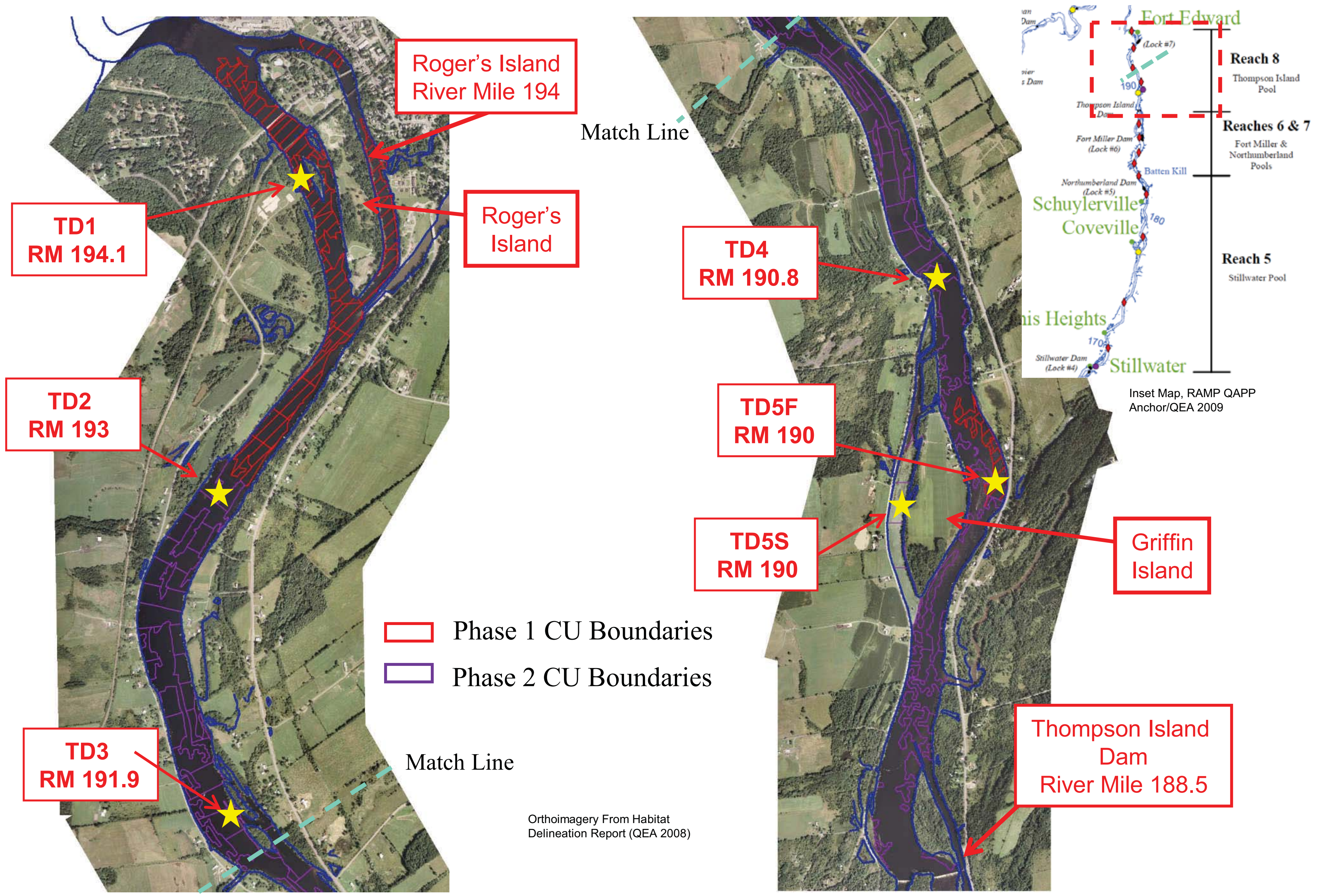


Figure 23. Baseline Monitoring Progam and remedial action fish Sampling Transect Locations. Thompson Island Pool (River Section 1). Inset shows additional fish monitoring locations to the Stillwater Dam in River Section 3 (red dots).

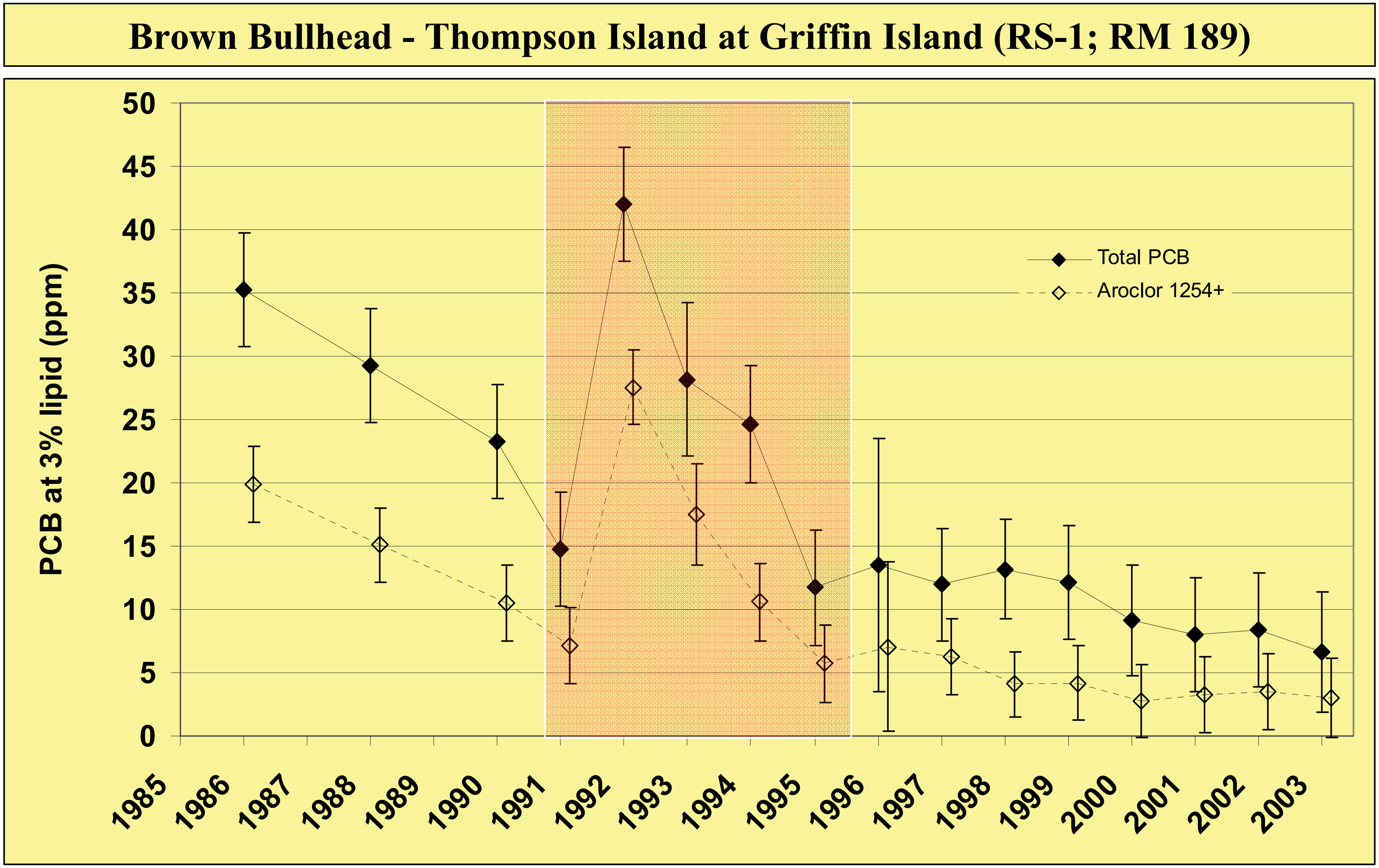


Figure 24. Monitoring data for brown bullhead collected in the Thompson Island Pool. Spikes in tissue concentrations linked to exposures following the Allen Mill gate failure PCBs release from 1991-1993 in the Upper Hudson River were observed to recover by 1995. (Figure courtesy of NYSDEC, 2005).

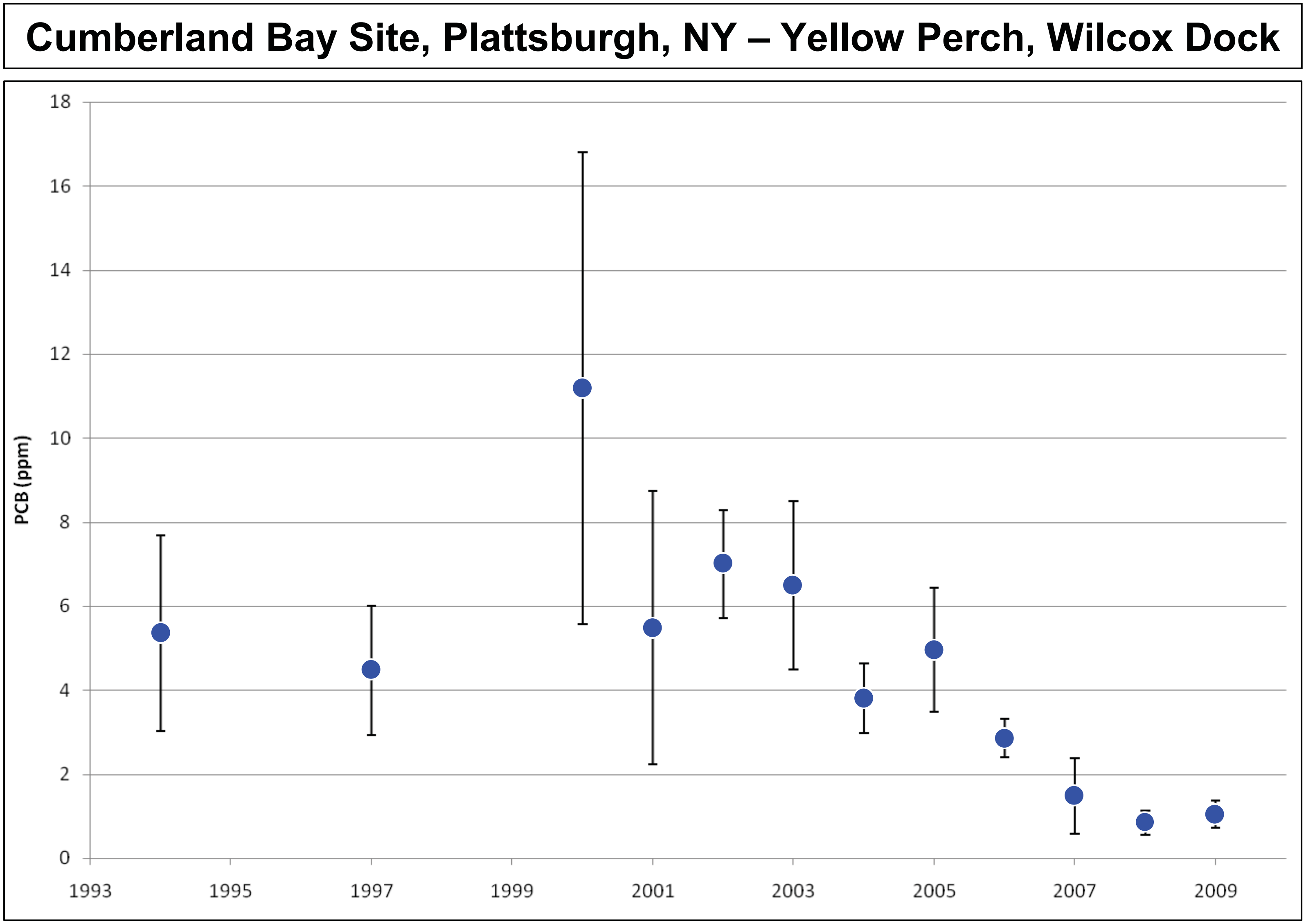


Figure 25. Monitoring data for yellow perch collected at the Cumberland Bay Site, Wilcox Dock location, within the area where approximately 195,000 cy of sediments contaminated with PCBs were removed. Spikes in tissue concentrations linked to this dredging event from 1999-2000 in the Upper Hudson River were observed to recover by 2001 and generally declined thereafter. (Figure courtesy of NYSDEC, 2005).

sp_group	section	reach	station	tiss	total	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bbass	0	9	FD1	SF	233	4	23	20	20	20	6	20	20	20	20	20	20	20
Bbass	1	8	TD1	SF	43					6		7	5	5	5	5	5	5
Bbass	1	8	TD2	SF	32			2					5	5	5	5	5	5
Bbass	1	8	TD3	SF	33							3	5	5	5	5	5	5
Bbass	1	8	TD4	SF	30								5	5	5	5	5	5
Bbass	1	8	TD5	SF	195	13	22	26	21	20	21	12	10	10	10	10	10	10
Bbass	2	7	ND1	SF	25								5	5	5	5		5
Bbass	2	7	ND2	SF	28							3	5	5	5	5		5
Bbass	2	6	ND3	SF	54							11	5	5	5	5	18	5
Bbass	2	6	ND5	SF	58							1	10	10	10	10	7	10
Bbass	3	5	SW1	SF	36							6	5	5	5	5	5	5
Bbass	3	5	SW2	SF	30								5	5	5	5	5	5
Bbass	3	5	SW3	SF	195	20	21	24	20	20	20	10	10	10	10	10	10	10
Bbass	3	5	SW4	SF	29								5	5	5	4	5	5
Bbass	3	5	SW5	SF	46			12				3	5	5	5	6	5	5
Bbass	4	0	AT1	SF	254	19	27	20	20	7	23	20	20	17	21	20	20	20
Bullhead	0	9	FD1	SF	234	20	20	16	20	12	10	16	20	20	20	20	20	20
Bullhead	1	8	TD1	SF	30								5	5	5	5	5	5
Bullhead	1	8	TD2	SF	35			5					5	5	5	5	5	5
Bullhead	1	8	TD3	SF	33							3	5	5	5	5	5	5
Bullhead	1	8	TD4	SF	30								5	5	5	5	5	5
Bullhead	1	8	TD5	SF	201	20	26	20	21	20	20	14	10	10	10	10	10	10
Bullhead	2	7	ND1	SF	27								5	5	5	5		7
Bullhead	2	7	ND2	SF	14								5	3	2	1		3
Bullhead	2	6	ND3	SF	51							7	5	5	5	9	15	5
Bullhead	2	6	ND5	SF	68							8	10	10	10	10	10	10
Bullhead	3	5	SW1	SF	31							1	5	5	5	5	5	5
Bullhead	3	5	SW2	SF	30								5	5	5	5	5	5
Bullhead	3	5	SW3	SF	191	20	21	20	20	20	20	10	10	10	10	10	10	10
Bullhead	3	5	SW4	SF	30								5	5	5	5	5	5
Bullhead	3	5	SW5	SF	36			5				1	5	5	5	5	5	5
Bullhead	4	0	AT1	SF	19		4	8				3		1		3		
YPerch	0	9	FD1	SF	260	20	20	20	20	20	20	20	20	20	20	20	20	20
YPerch	1	8	TD1	SF	34							4	5	5	5	5	5	5
YPerch	1	8	TD2	SF	41			5				6	5	5	5	5	5	5
YPerch	1	8	TD3	SF	38							8	5	5	5	5	5	5
YPerch	1	8	TD4	SF	30								5	5	5	5	5	5
YPerch	1	8	TD5	SF	184	8	20	25	21	20	20	10	10	10	10	10	10	10
YPerch	2	7	ND1	SF	22								5	5	5	2		5
YPerch	2	7	ND2	SF	22								5	5	6	1		5
YPerch	2	6	ND3	SF	53							9	5	5	5	9	15	5
YPerch	2	6	ND5	SF	68							5	10	10	10	13	10	10
YPerch	3	5	SW1	SF	35							4	5	5	5	5	6	5
YPerch	3	5	SW2	SF	30								5	5	5	5	5	5
YPerch	3	5	SW3	SF	178	8	15	25	20	20	20	10	10	10	10	10	10	10
YPerch	3	5	SW4	SF	30								5	5	5	5	5	5
YPerch	3	5	SW5	SF	32			2				1	5	5	5	5	4	5
YPerch	4	0	AT1	SF	74	1	5	1	4	20		10	17	3			3	10
Forage	0	9	FD1	WH	76						8	7	11	10	10	10	10	10
Forage	1	8	TD1	WH	43			16					2	13	6	2	2	2

sp_group	section	reach	station	tiss	total	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Forage	1	8	TD2	WH	20								2	10	2	2	2	2
Forage	1	8	TD3	WH	11								2	2	2	1	2	2
Forage	1	8	TD4	WH	12								2	2	2	2	2	2
Forage	1	8	TD5	WH	30						10	5	2	5	2	2	2	2
Forage	2	7	ND1	WH	6								2	2				2
Forage	2	7	ND2	WH	6								2	2				2
Forage	2	6	ND3	WH	51								17	2	5	20	5	2
Forage	2	6	ND5	WH	27								4	4	5	5	5	4
Forage	3	5	SW1	WH	11								2	2	2	1	2	2
Forage	3	5	SW2	WH	12								2	2	2	2	2	2
Forage	3	5	SW3	WH	14								2	2	2	4	2	2
Forage	3	5	SW4	WH	11								2	2	2	1	2	2
Forage	3	5	SW5	WH	48						10	10	10	2	2	10	2	2
Forage	4	0	AT1	WH	73						10	10	10	10	3	10	10	10
PKSD	0	9	FD1	WH	214	18	11		9	19	13	24	20	20	20	20	20	20
PKSD	1	8	TD1	WH	31			1					5	5	5	5	5	5
PKSD	1	8	TD2	WH	30								5	5	5	5	5	5
PKSD	1	8	TD3	WH	34								9	5	5	5	5	5
PKSD	1	8	TD4	WH	30								5	5	5	5	5	5
PKSD	1	8	TD5	WH	155		19	17	17	10	10	21	10	11	10	10	10	10
PKSD	2	7	ND1	WH	15								5	5				5
PKSD	2	7	ND2	WH	11								5	1				5
PKSD	2	6	ND3	WH	39								5		10	4	15	5
PKSD	2	6	ND5	WH	82								11	11	15	25	10	10
PKSD	3	5	SW1	WH	30								5	5	5	5	5	5
PKSD	3	5	SW2	WH	30								5	5	5	5	5	5
PKSD	3	5	SW3	WH	42								13	5	5	9	5	5
PKSD	3	5	SW4	WH	30								5	5	5	5	5	5
PKSD	3	5	SW5	WH	220	8	27	20	45	26	10	19	14	10	10	11	10	10
PKSD	4	0	AT1	WH	216	20	30	4	5	14	10	20	13	20	20	20	20	20

sp_group	section	reach	station	tiss	total	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bbass	0	9	FD1	SF	233	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0
Bbass	1	8	TD1	SF	43					3.3		3.5	2.8	2.3	1.4	1.4	1.9	1.0
Bbass	1	8	TD2	SF	32			3.6					5.8	2.5	1.8	2.5	3.0	0.7
Bbass	1	8	TD3	SF	33							4.4	2.3	3.1	4.1	4.9	3.8	0.9
Bbass	1	8	TD4	SF	30								3.3	2.6	1.7	2.1	0.5	0.9
Bbass	1	8	TD5	SF	195	12.9	18.7	19.1	7.7	5.4	6.8	5.9	2.0	1.8	2.4	1.5	1.0	0.5
Bbass	2	7	ND1	SF	25								3.1	1.7	1.6	5.3		2.2
Bbass	2	7	ND2	SF	28							2.5	3.4	1.2	1.7	2.2		1.5
Bbass	2	6	ND3	SF	54							2.6	3.6	3.1	2.6	2.3	1.5	1.2
Bbass	2	6	ND5	SF	58							1.6	2.7	1.9	2.2	1.5	1.1	1.0
Bbass	3	5	SW1	SF	36							2.6	1.2	2.2	4.7	2.4	0.9	1.1
Bbass	3	5	SW2	SF	30								1.3	1.8	1.9	1.9	0.6	0.4
Bbass	3	5	SW3	SF	195	3.5	9.6	4.5	3.3	4.0	2.8	0.7	1.6	1.6	2.1	0.3	0.4	0.8
Bbass	3	5	SW4	SF	29								1.1	2.3	1.0	1.5	1.0	0.6
Bbass	3	5	SW5	SF	46			2.7				2.8	0.8	0.6	1.0	0.4	0.2	0.5
Bbass	4	0	AT1	SF	254	4.6	7.2	4.5	2.9	2.4	2.2	1.2	2.7	1.7	1.8	0.8	1.2	2.1
Bullhead	0	9	FD1	SF	234	0.3	0.2	0.2	0.2	0.2	0.3	0.0	0.1	0.1	0.1	0.0	0.0	0.1
Bullhead	1	8	TD1	SF	30								11.4	1.5	3.6	5.2	1.6	1.8
Bullhead	1	8	TD2	SF	35			5.5					9.1	4.5	2.8	3.5	2.2	2.2
Bullhead	1	8	TD3	SF	33							1.8	17.3	4.4	6.6	5.6	1.5	11.7
Bullhead	1	8	TD4	SF	30								4.9	3.1	1.3	4.0	2.1	2.2
Bullhead	1	8	TD5	SF	201	14.1	16.2	11.2	8.7	5.7	6.5	1.9	2.2	3.9	5.2	2.8	2.0	1.4
Bullhead	2	7	ND1	SF	27								8.6	7.8	5.1	3.6		5.4
Bullhead	2	7	ND2	SF	14								4.9	4.3	3.6	4.1		2.7
Bullhead	2	6	ND3	SF	51							1.7	6.2	6.3	4.4	2.6	5.8	5.6
Bullhead	2	6	ND5	SF	68							2.4	3.6	4.0	3.6	3.4	4.3	2.5
Bullhead	3	5	SW1	SF	31							1.1	3.7	6.2	2.7	3.8	1.9	1.4
Bullhead	3	5	SW2	SF	30								2.1	3.2	1.5	5.9	2.6	3.8
Bullhead	3	5	SW3	SF	191	5.5	10.1	5.6	6.3	5.0	2.9	1.1	1.2	2.2	3.5	2.0	1.5	1.3
Bullhead	3	5	SW4	SF	30								1.6	4.5	4.4	2.5	0.7	2.6
Bullhead	3	5	SW5	SF	36			6.2				2.2	3.5	2.5	7.1	2.3	1.0	1.1
Bullhead	4	0	AT1	SF	19		2.1	1.9				0.6		2.6		0.6		
YPerch	0	9	FD1	SF	260	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
YPerch	1	8	TD1	SF	34							2.5	2.2	0.3	1.4	1.4	1.1	2.0
YPerch	1	8	TD2	SF	41			2.5				2.1	1.3	0.7	0.9	0.6	0.7	0.8
YPerch	1	8	TD3	SF	38							3.1	1.1	1.4	4.6	1.2	0.7	0.4
YPerch	1	8	TD4	SF	30								1.4	0.4	0.5	0.5	0.3	0.2
YPerch	1	8	TD5	SF	184	6.0	10.4	3.5	3.2	3.2	3.2	2.8	4.2	0.6	1.2	0.6	0.4	0.2
YPerch	2	7	ND1	SF	22								1.4	1.2	1.1	0.8		0.8
YPerch	2	7	ND2	SF	22								2.0	0.6	1.8	0.8		0.1
YPerch	2	6	ND3	SF	53							2.6	1.8	0.7	1.2	0.5	0.5	0.8
YPerch	2	6	ND5	SF	68							2.2	1.5	0.3	1.1	0.3	0.4	0.4
YPerch	3	5	SW1	SF	35							1.7	2.7	0.9	0.5	0.4	0.4	0.4
YPerch	3	5	SW2	SF	30								0.2	0.5	0.7	0.4	0.3	0.0
YPerch	3	5	SW3	SF	178	1.5	1.8	1.3	1.8	1.1	1.4	1.6	1.5	0.2	1.1	0.5	0.2	0.2
YPerch	3	5	SW4	SF	30								0.9	0.2	0.4	0.4	0.4	0.2
YPerch	3	5	SW5	SF	32			2.0				0.5	0.7	0.1	0.2	0.3	0.3	0.1
YPerch	4	0	AT1	SF	74	1.3	0.8	3.7	0.8	0.7		0.4	0.8	0.7			0.1	0.2
Forage	0	9	FD1	WH	76						0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
Forage	1	8	TD1	WH	43			3.7					10.2	9.4	8.1	2.3	0.7	23.5

sp_group	section	reach	station	tiss	total	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Forage	1	8	TD2	WH	20								4.0	4.2	5.7	0.9	1.3	7.2
Forage	1	8	TD3	WH	11								5.7	10.3	10.6	1.2	2.8	10.3
Forage	1	8	TD4	WH	12								2.4	3.8	4.0	0.5	1.9	5.7
Forage	1	8	TD5	WH	30						3.4	6.3	1.3	15.9	9.9	1.3	2.6	6.2
Forage	2	7	ND1	WH	6								2.5	4.3				8.2
Forage	2	7	ND2	WH	6								4.0	6.1				5.1
Forage	2	6	ND3	WH	51								7.3	5.4	8.4	3.8	2.0	7.3
Forage	2	6	ND5	WH	27								8.2	4.1	4.0	1.4	1.3	5.4
Forage	3	5	SW1	WH	11								4.3	5.0	4.5	2.2	3.0	5.8
Forage	3	5	SW2	WH	12								5.4	4.6	2.5	0.9	1.3	4.2
Forage	3	5	SW3	WH	14								1.0	1.2	2.5	2.4	0.6	0.5
Forage	3	5	SW4	WH	11								3.0	2.4	1.2	0.3	2.1	3.3
Forage	3	5	SW5	WH	48						2.4	4.7	4.1	3.7	4.5	2.8	1.9	2.9
Forage	4	0	AT1	WH	73						1.4	1.1	2.1	0.6	1.2	0.5	0.6	0.9
PKSD	0	9	FD1	WH	214	0.3	0.1		0.1	0.1	0.1	0.2	0.4	0.2	0.1	0.1	0.0	0.1
PKSD	1	8	TD1	WH	31			3.4					21.8	2.4	4.8	3.5	2.3	27.2
PKSD	1	8	TD2	WH	30								2.3	1.7	4.7	2.4	1.1	4.4
PKSD	1	8	TD3	WH	34								16.5	5.6	22.0	4.7	2.5	20.3
PKSD	1	8	TD4	WH	30								1.7	2.0	5.6	2.2	1.9	3.0
PKSD	1	8	TD5	WH	155		10.3	3.1	4.7	4.2	3.1	5.5	4.5	11.6	7.3	4.0	2.6	17.0
PKSD	2	7	ND1	WH	15								6.4	5.4				9.2
PKSD	2	7	ND2	WH	11								7.4	6.2				11.4
PKSD	2	6	ND3	WH	39								5.4		3.3	3.6	3.8	2.9
PKSD	2	6	ND5	WH	82								8.8	5.7	9.2	1.6	3.2	7.8
PKSD	3	5	SW1	WH	30								8.1	6.2	4.5	2.0	4.6	8.0
PKSD	3	5	SW2	WH	30								3.4	3.6	2.7	2.2	1.5	3.2
PKSD	3	5	SW3	WH	42								2.6	3.3	2.0	1.6	1.2	0.9
PKSD	3	5	SW4	WH	30								2.2	1.6	2.1	1.0	1.1	1.9
PKSD	3	5	SW5	WH	220	1.3	5.5	3.4	2.9	1.8	1.9	2.3	2.2	1.7	2.5	1.0	1.1	1.7
PKSD	4	0	AT1	WH	216	2.8	5.2	1.6	1.6	1.1	1.3	1.5	1.1	1.1	0.8	0.6	0.6	0.8

sp_group	section	reach	station	tiss	total	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bbass	0	9	FD1	SF	233	21.7	15.1	25.0	35.9	25.5	19.3	27.5	17.4	13.4	15.1	12.6	15.9	5.6
Bbass	1	8	TD1	SF	43					551.5		472.4	359.7	394.9	335.8	153.7	400.3	113.8
Bbass	1	8	TD2	SF	32			463.8					998.6	437.2	281.6	496.2	185.9	143.0
Bbass	1	8	TD3	SF	33							498.1	279.9	573.4	838.6	470.8	766.1	249.1
Bbass	1	8	TD4	SF	30								333.2	1159.3	1274.6	205.5	286.5	237.0
Bbass	1	8	TD5	SF	195	868.9	1256.1	1091.7	714.2	875.7	881.5	741.7	591.3	479.0	784.4	235.3	304.5	207.8
Bbass	2	7	ND1	SF	25								577.4	447.8	312.1	702.5		921.0
Bbass	2	7	ND2	SF	28							565.8	539.2	294.5	260.9	335.3		551.5
Bbass	2	6	ND3	SF	54							573.6	432.3	399.4	659.2	443.5	210.2	340.1
Bbass	2	6	ND5	SF	58							533.3	476.0	579.2	444.6	289.7	234.9	234.6
Bbass	3	5	SW1	SF	36							442.6	224.6	456.0	583.9	341.0	139.3	360.1
Bbass	3	5	SW2	SF	30								307.0	351.4	246.2	372.6	198.1	272.4
Bbass	3	5	SW3	SF	195	382.0	576.0	483.6	397.8	503.5	335.8	314.2	252.3	358.2	455.4	130.9	109.0	256.6
Bbass	3	5	SW4	SF	29								170.6	289.3	189.0	179.4	195.9	148.5
Bbass	3	5	SW5	SF	46			456.1				226.9	102.7	201.7	293.9	74.9	183.3	96.9
Bbass	4	0	AT1	SF	254	317.6	277.4	392.2	267.0	275.6	124.4	161.3	251.4	321.7	263.1	92.9	118.1	230.3
Bullhead	0	9	FD1	SF	234	9.8	8.4	7.6	11.7	9.4	10.9	6.9	5.4	8.5	11.1	8.0	5.9	7.5
Bullhead	1	8	TD1	SF	30								1231.5	129.6	333.7	298.1	136.7	169.0
Bullhead	1	8	TD2	SF	35			223.1					796.9	340.4	136.8	179.4	137.3	212.6
Bullhead	1	8	TD3	SF	33							228.1	723.7	295.9	288.0	262.2	138.5	646.2
Bullhead	1	8	TD4	SF	30								345.2	292.1	124.2	215.6	195.1	130.2
Bullhead	1	8	TD5	SF	201	398.3	438.9	403.8	305.0	265.8	278.5	223.2	341.4	298.8	297.6	136.5	300.5	281.0
Bullhead	2	7	ND1	SF	27								542.3	583.3	300.8	180.9		296.1
Bullhead	2	7	ND2	SF	14								442.0	648.1	296.7	171.6		175.7
Bullhead	2	6	ND3	SF	51							352.5	376.8	508.1	257.2	174.1	263.3	320.1
Bullhead	2	6	ND5	SF	68							204.1	201.5	256.4	198.5	266.4	194.1	149.9
Bullhead	3	5	SW1	SF	31							311.8	140.0	234.8	173.3	249.0	126.4	112.9
Bullhead	3	5	SW2	SF	30								129.4	182.8	118.6	199.1	173.5	308.0
Bullhead	3	5	SW3	SF	191	154.1	282.0	177.6	203.2	183.3	174.5	96.6	121.6	138.7	136.1	129.7	149.0	75.9
Bullhead	3	5	SW4	SF	30								129.0	145.8	144.1	77.1	264.1	131.9
Bullhead	3	5	SW5	SF	36			282.4				96.0	130.0	871.3	165.8	107.7	139.8	182.8
Bullhead	4	0	AT1	SF	19		41.7	44.6				28.5		144.9		35.0		
YPerch	0	9	FD1	SF	260	9.7	4.9	12.3	5.3	6.3	6.2	8.8	0.7	2.4	4.2	1.1	1.8	2.9
YPerch	1	8	TD1	SF	34							289.6	364.9	64.0	335.5	169.6	98.9	271.8
YPerch	1	8	TD2	SF	41			264.2				296.6	169.5	175.8	127.0	117.7	62.1	106.2
YPerch	1	8	TD3	SF	38							310.4	319.6	293.8	511.9	174.0	162.6	112.4
YPerch	1	8	TD4	SF	30								121.7	189.0	244.3	74.8	59.2	35.6
YPerch	1	8	TD5	SF	184	334.5	511.3	325.7	306.2	302.1	265.9	181.2	294.6	111.3	122.5	108.4	101.7	42.8
YPerch	2	7	ND1	SF	22								260.8	259.5	166.6	177.0		122.4
YPerch	2	7	ND2	SF	22								193.3	313.1	187.1	112.9		65.1
YPerch	2	6	ND3	SF	53							211.3	294.5	130.5	187.7	84.0	112.7	124.9
YPerch	2	6	ND5	SF	68							244.3	162.2	148.6	124.4	58.2	66.9	64.3
YPerch	3	5	SW1	SF	35							168.5	252.7	138.9	72.0	88.0	76.1	85.2
YPerch	3	5	SW2	SF	30								29.1	95.6	56.2	71.2	69.2	26.2
YPerch	3	5	SW3	SF	178	96.0	116.3	146.3	120.8	122.2	135.2	88.8	93.1	68.6	116.6	48.1	36.0	34.0
YPerch	3	5	SW4	SF	30								80.3	66.9	37.1	43.8	96.2	40.7
YPerch	3	5	SW5	SF	32			173.3				59.6	62.9	41.3	51.0	35.6	62.9	35.7
YPerch	4	0	AT1	SF	74	67.4	54.5	206.2	194.2	56.6		49.7	56.5	75.3			80.9	29.9
Forage	0	9	FD1	WH	76						4.4	3.8	1.4	3.1	3.3	1.0	0.2	4.1
Forage	1	8	TD1	WH	43			175.4					203.1	293.2	205.3	54.3	26.0	516.4

sp_group	section	reach	station	tiss	total	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Forage	1	8	TD2	WH	20								76.2	153.2	126.5	47.9	24.1	197.8
Forage	1	8	TD3	WH	11								206.6	272.7	247.3	69.1	72.3	211.5
Forage	1	8	TD4	WH	12								74.4	166.0	187.0	30.5	53.8	153.0
Forage	1	8	TD5	WH	30						96.8	175.8	48.7	555.3	195.6	67.9	75.8	256.8
Forage	2	7	ND1	WH	6								54.8	91.8				165.4
Forage	2	7	ND2	WH	6								94.5	114.6				75.5
Forage	2	6	ND3	WH	51								216.7	114.4	168.9	107.2	38.5	134.0
Forage	2	6	ND5	WH	27								138.8	105.2	115.8	42.6	67.8	137.2
Forage	3	5	SW1	WH	11								82.7	154.4	85.5	84.6	84.8	115.3
Forage	3	5	SW2	WH	12								121.0	76.9	69.6	42.6	90.6	103.0
Forage	3	5	SW3	WH	14								42.0	28.6	78.6	61.1	21.1	26.6
Forage	3	5	SW4	WH	11								82.1	60.0	56.2	28.8	77.2	74.3
Forage	3	5	SW5	WH	48						47.3	97.8	77.5	59.6	73.0	50.9	73.0	55.6
Forage	4	0	AT1	WH	73						42.1	57.2	33.2	34.2	37.6	26.5	19.6	32.3
PKSD	0	9	FD1	WH	214	8.1	1.5		2.6	4.9	2.2	6.0	12.8	8.5	3.1	3.0	0.8	1.9
PKSD	1	8	TD1	WH	31			76.7					697.8	101.9	234.1	107.6	89.0	1051.2
PKSD	1	8	TD2	WH	30								93.4	69.6	174.4	85.3	32.9	154.9
PKSD	1	8	TD3	WH	34								506.6	228.7	692.5	195.4	75.2	558.3
PKSD	1	8	TD4	WH	30								63.8	65.5	221.9	82.9	88.5	102.2
PKSD	1	8	TD5	WH	155		302.4	142.4	223.3	125.2	87.8	231.6	154.8	405.4	264.1	156.5	111.1	629.5
PKSD	2	7	ND1	WH	15								171.2	126.2				246.7
PKSD	2	7	ND2	WH	11								187.5	136.4				284.4
PKSD	2	6	ND3	WH	39								136.0		105.5	113.6	144.6	104.1
PKSD	2	6	ND5	WH	82								270.4	161.0	305.3	70.6	108.5	224.9
PKSD	3	5	SW1	WH	30								234.1	183.9	125.8	62.0	169.5	286.2
PKSD	3	5	SW2	WH	30								128.1	102.9	115.1	90.9	67.0	106.2
PKSD	3	5	SW3	WH	42								88.2	117.8	75.5	72.4	46.7	45.6
PKSD	3	5	SW4	WH	30								82.5	46.4	79.7	51.7	40.8	59.3
PKSD	3	5	SW5	WH	220	77.6	142.8	111.4	129.9	83.8	79.2	128.5	93.6	53.1	85.6	30.9	37.5	65.1
PKSD	4	0	AT1	WH	216	90.8	152.6	51.5	72.1	53.8	44.9	59.3	38.3	39.0	37.3	15.8	22.6	26.4

sp_group	section	reach	station	tiss	total	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bbass	0	9	FD1	SF	233	1.02	1.26	0.59	0.49	0.37	0.48	0.32	0.40	0.35	0.32	0.42	0.29	0.33
Bbass	1	8	TD1	SF	43					0.60		0.86	0.79	0.87	0.44	0.89	0.57	0.87
Bbass	1	8	TD2	SF	32			0.82					0.97	0.55	0.63	0.51	1.51	0.55
Bbass	1	8	TD3	SF	33							0.89	0.87	0.55	0.50	1.03	0.46	0.37
Bbass	1	8	TD4	SF	30								1.04	0.25	0.32	0.93	0.23	0.40
Bbass	1	8	TD5	SF	195	1.49	1.53	1.63	1.09	0.71	0.80	1.06	0.40	0.39	0.42	0.70	0.37	0.33
Bbass	2	7	ND1	SF	25								0.58	0.41	0.51	0.75		0.28
Bbass	2	7	ND2	SF	28							0.47	0.64	0.40	0.63	0.71		0.31
Bbass	2	6	ND3	SF	54							0.50	0.76	0.75	0.41	0.52	0.71	0.40
Bbass	2	6	ND5	SF	58							0.30	0.60	0.34	0.47	0.51	0.50	0.46
Bbass	3	5	SW1	SF	36							0.69	0.60	0.58	0.90	0.70	0.67	0.36
Bbass	3	5	SW2	SF	30								0.40	0.51	0.74	0.53	0.31	0.15
Bbass	3	5	SW3	SF	195	0.98	1.76	0.93	0.83	0.86	0.87	0.25	0.59	0.45	0.47	0.17	0.42	0.34
Bbass	3	5	SW4	SF	29								0.72	0.68	0.54	0.78	0.53	0.43
Bbass	3	5	SW5	SF	46			0.72				1.90	0.84	0.34	0.31	0.56	0.13	0.48
Bbass	4	0	AT1	SF	254	1.16	2.72	1.30	1.10	1.02	1.81	0.76	1.05	0.67	0.73	0.85	1.19	0.91
Bullhead	0	9	FD1	SF	234	3.55	2.55	2.71	2.32	1.98	2.92	0.70	1.32	0.97	0.97	0.95	0.57	0.89
Bullhead	1	8	TD1	SF	30								1.16	1.15	1.20	2.03	1.02	0.91
Bullhead	1	8	TD2	SF	35			2.44					1.08	1.37	2.00	1.86	1.71	1.01
Bullhead	1	8	TD3	SF	33							0.79	2.16	1.33	2.14	2.26	0.95	2.07
Bullhead	1	8	TD4	SF	30								1.38	1.08	1.06	1.92	1.14	1.89
Bullhead	1	8	TD5	SF	201	3.32	3.82	2.98	3.13	2.37	2.51	0.97	0.67	1.13	1.74	2.15	1.07	0.46
Bullhead	2	7	ND1	SF	27								1.61	2.34	1.91	1.80		1.86
Bullhead	2	7	ND2	SF	14								1.30	0.89	1.80	2.39		1.59
Bullhead	2	6	ND3	SF	51							0.50	1.73	1.29	1.85	1.61	1.92	1.43
Bullhead	2	6	ND5	SF	68							1.27	1.64	1.58	1.76	1.97	1.92	1.74
Bullhead	3	5	SW1	SF	31							0.34	2.68	2.89	1.79	1.82	1.40	1.04
Bullhead	3	5	SW2	SF	30								1.35	1.67	1.39	3.38	1.27	1.81
Bullhead	3	5	SW3	SF	191	3.80	3.84	3.11	3.18	3.10	2.06	1.04	1.04	1.83	2.44	1.56	1.21	1.85
Bullhead	3	5	SW4	SF	30								1.19	3.19	3.29	3.10	0.33	1.79
Bullhead	3	5	SW5	SF	36			2.34				2.25	2.61	0.33	4.49	2.12	0.84	0.69
Bullhead	4	0	AT1	SF	19		4.82	3.86				1.60		1.78		1.48		
YPerch	0	9	FD1	SF	260	1.76	1.90	1.06	1.28	1.19	1.03	0.81	1.30	0.36	0.67	0.61	0.48	0.44
YPerch	1	8	TD1	SF	34							0.92	0.61	0.51	0.60	1.01	1.10	0.76
YPerch	1	8	TD2	SF	41			0.97				0.79	0.96	0.39	0.82	0.54	1.15	0.71
YPerch	1	8	TD3	SF	38							1.03	0.37	0.50	0.93	0.72	0.65	0.50
YPerch	1	8	TD4	SF	30								1.13	0.27	0.33	0.76	0.59	0.41
YPerch	1	8	TD5	SF	184	1.70	1.99	1.06	1.04	1.03	1.21	1.63	1.37	0.53	0.97	0.56	0.39	0.40
YPerch	2	7	ND1	SF	22								0.62	0.46	0.68	0.53		0.71
YPerch	2	7	ND2	SF	22								0.93	0.27	1.04	0.66		0.20
YPerch	2	6	ND3	SF	53							1.28	0.60	0.51	0.66	0.67	0.47	0.61
YPerch	2	6	ND5	SF	68							0.92	0.78	0.20	0.89	0.54	0.56	0.58
YPerch	3	5	SW1	SF	35							1.19	0.98	0.76	0.56	0.39	0.55	0.49
YPerch	3	5	SW2	SF	30								0.39	0.46	1.10	0.64	0.48	0.15
YPerch	3	5	SW3	SF	178	1.73	1.58	1.05	1.51	0.95	1.06	1.79	1.54	0.36	1.00	0.88	0.48	0.48
YPerch	3	5	SW4	SF	30								1.09	0.28	1.04	0.99	0.38	0.61
YPerch	3	5	SW5	SF	32			1.17				0.77	1.03	0.39	0.48	0.70	0.42	0.40
YPerch	4	0	AT1	SF	74	1.96	1.42	1.78	0.49	1.25		0.82	1.36	0.61			0.59	0.75
Forage	0	9	FD1	WH	76						3.30	3.62	5.06	2.25	2.45	3.18	3.27	2.57
Forage	1	8	TD1	WH	43			3.41					5.10	3.64	3.64	3.50	2.51	4.54

sp_group	section	reach	station	tiss	total	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Forage	1	8	TD2	WH	20								5.24	2.87	4.46	1.99	4.15	3.67
Forage	1	8	TD3	WH	11								2.84	4.69	4.27	1.76	3.99	4.85
Forage	1	8	TD4	WH	12								3.28	2.79	2.59	1.65	2.87	3.29
Forage	1	8	TD5	WH	30						3.92	3.56	2.79	3.11	5.09	2.23	3.18	2.43
Forage	2	7	ND1	WH	6								4.59	4.68				4.87
Forage	2	7	ND2	WH	6								4.11	5.29				6.71
Forage	2	6	ND3	WH	51								3.90	4.71	4.92	3.80	5.26	6.00
Forage	2	6	ND5	WH	27								6.15	3.98	3.40	3.06	2.41	3.78
Forage	3	5	SW1	WH	11								5.07	3.22	5.24	2.65	3.56	4.89
Forage	3	5	SW2	WH	12								4.62	5.91	3.59	2.11	2.11	4.03
Forage	3	5	SW3	WH	14								2.55	4.25	3.24	3.78	2.80	1.84
Forage	3	5	SW4	WH	11								3.69	3.92	2.17	1.08	2.87	4.53
Forage	3	5	SW5	WH	48						5.38	4.91	5.57	6.20	6.17	5.43	2.62	5.53
Forage	4	0	AT1	WH	73						3.32	2.14	6.40	1.65	4.04	1.96	2.97	2.79
PKSD	0	9	FD1	WH	214	3.20	3.28		2.06	2.24	2.58	2.87	3.00	2.42	2.58	2.00	3.00	2.78
PKSD	1	8	TD1	WH	31			4.47					3.03	2.36	2.11	3.09	2.55	2.65
PKSD	1	8	TD2	WH	30								2.83	2.44	2.70	2.95	3.17	3.03
PKSD	1	8	TD3	WH	34								2.97	2.41	3.21	2.70	3.25	3.44
PKSD	1	8	TD4	WH	30								2.59	3.12	2.46	2.74	2.45	2.89
PKSD	1	8	TD5	WH	155		3.41	2.34	2.05	3.32	3.60	2.38	2.93	2.88	2.81	2.56	2.34	2.68
PKSD	2	7	ND1	WH	15								3.96	4.23				3.66
PKSD	2	7	ND2	WH	11								3.86	4.51				4.00
PKSD	2	6	ND3	WH	39								3.86		3.14	3.26	2.79	2.92
PKSD	2	6	ND5	WH	82								3.24	3.65	3.12	2.15	2.86	3.43
PKSD	3	5	SW1	WH	30								3.17	3.44	3.65	3.27	2.62	2.92
PKSD	3	5	SW2	WH	30								2.66	3.41	2.32	2.32	2.32	2.98
PKSD	3	5	SW3	WH	42								2.85	2.81	2.87	2.14	2.74	1.89
PKSD	3	5	SW4	WH	30								2.61	3.56	2.65	2.29	2.66	3.25
PKSD	3	5	SW5	WH	220	1.89	3.89	3.32	2.23	2.17	2.45	1.88	2.41	3.21	2.92	3.45	3.02	2.64
PKSD	4	0	AT1	WH	216	3.14	3.37	3.37	2.21	2.07	2.83	2.60	2.77	3.00	2.23	3.92	2.57	3.02

Appendix I-D-Attachment 2 Series

Box plots of PCBs in Black Bass from the Hudson River

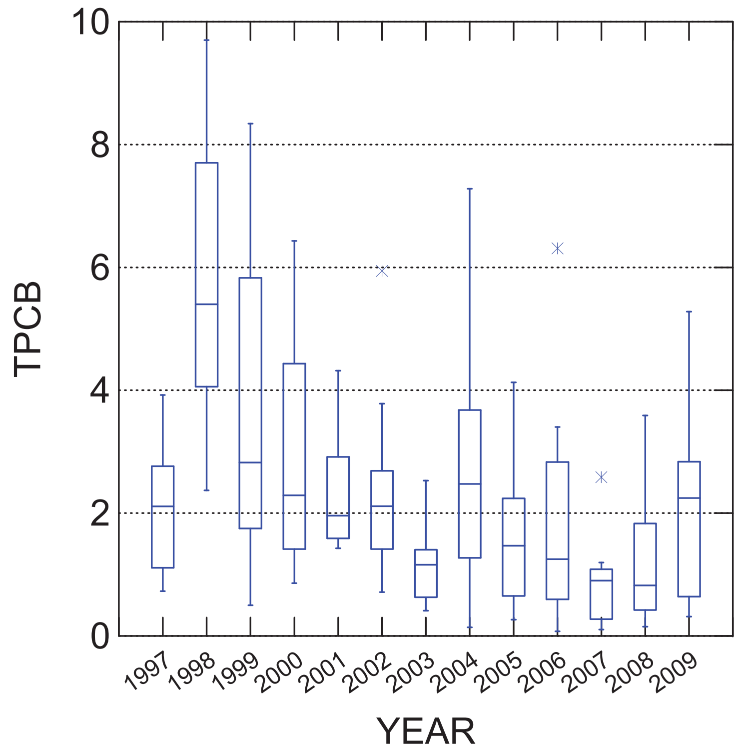
The data are shown by sampling station (one station per page). The left and right graphs on each page are total PCBs (TPCB; mg/kg) and lipid normalized total PCBs (LPCBs; mg/kg lipid), respectively.

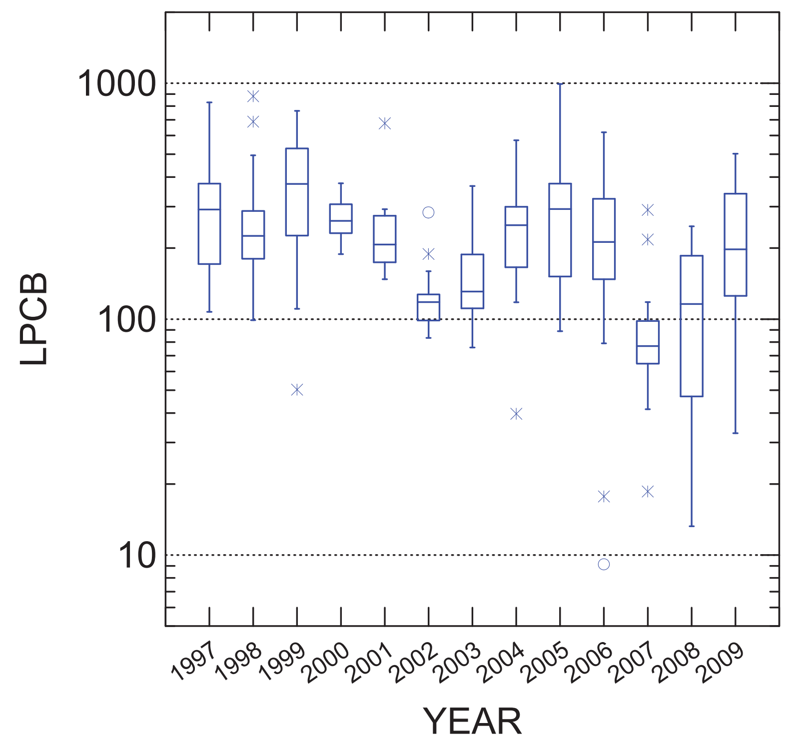
In the box plots, the center vertical line marks the median of the sample. The length of each box shows the range within which the central 50% of the values fall, with the box edges (or hinges) at the first and third quartiles (i.e., 25^{th} and 75^{th}% quartiles). Fences define outside and far outside values and are defined as follows:

Lower inner fence = lower hinge - (1.5 • (Hspread))
Upper inner fence = upper hinge + (1.5 • (Hspread))
Lower outer fence = lower hinge - (3 • (Hspread))
Upper outer fence = upper hinge + (3 • (Hspread))

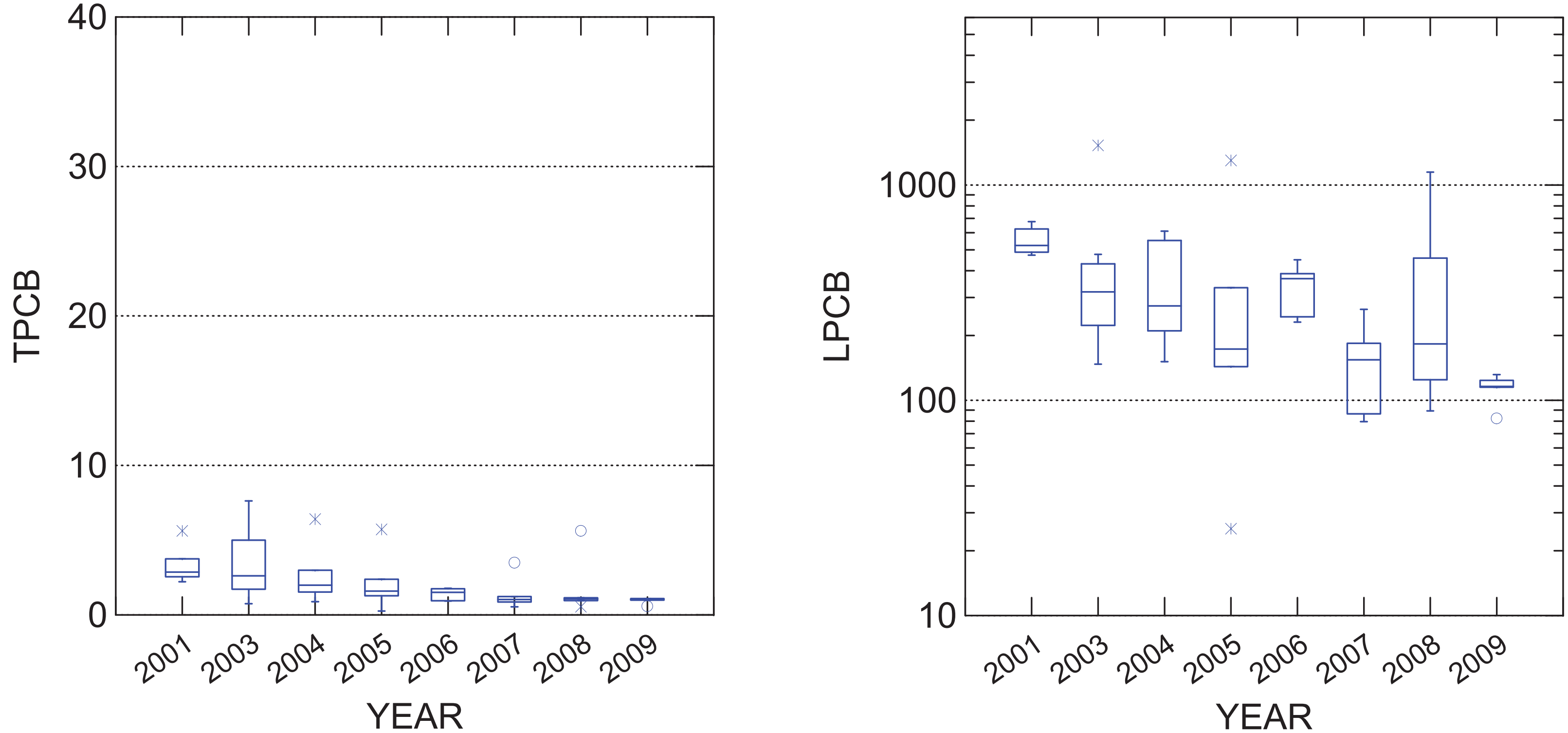
Hspread is comparable to the interquartile range. It is the absolute value of the difference between the values of the two hinges. The whiskers show the range of observed values that fall within the inner fences. Values between the inner and outer fences are plotted with asterisks. Values beyond the outer fences, called far outside values, are plotted with empty circles.

Black Bass (SF): AT1

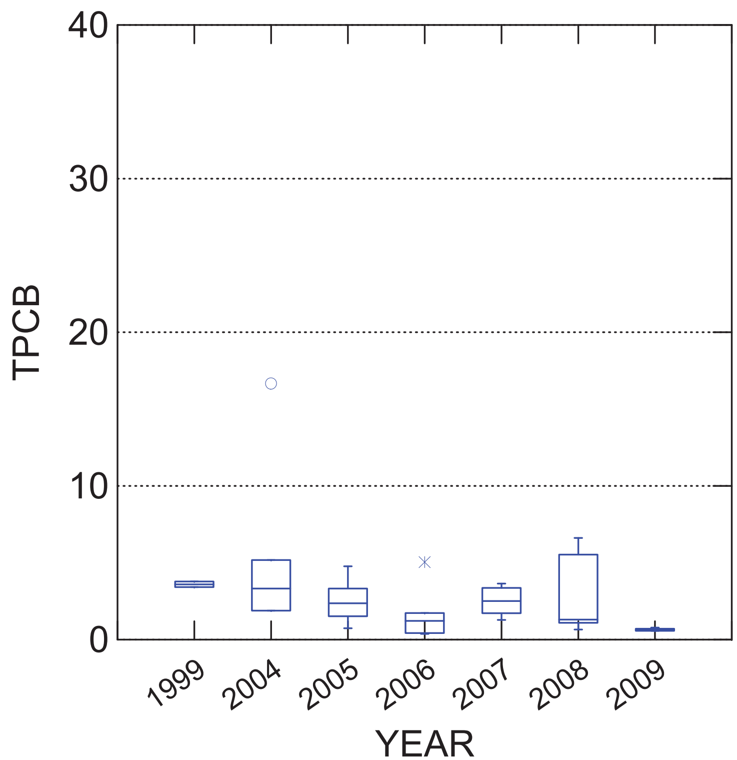


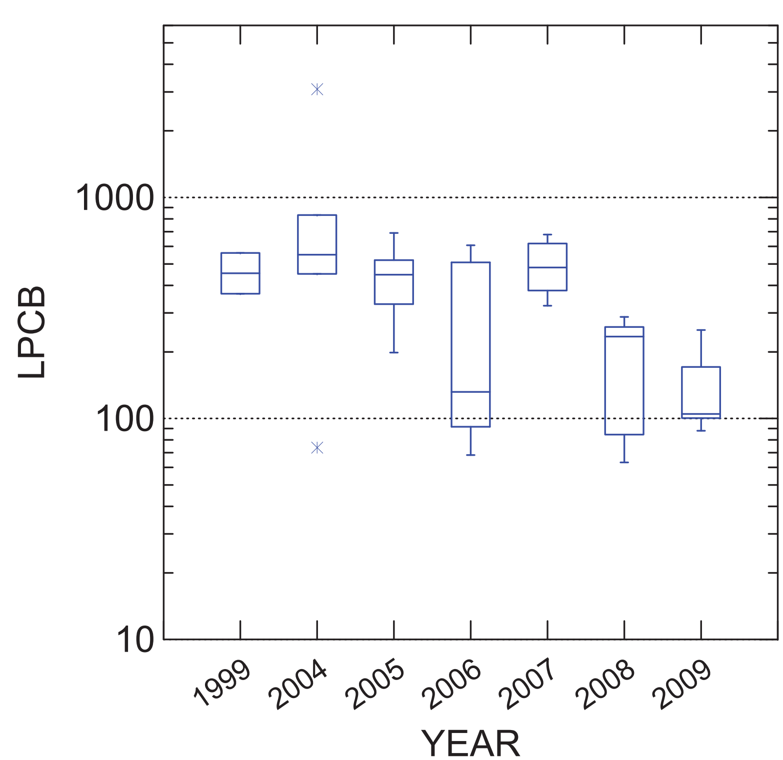


Black Bass (SF): TD1

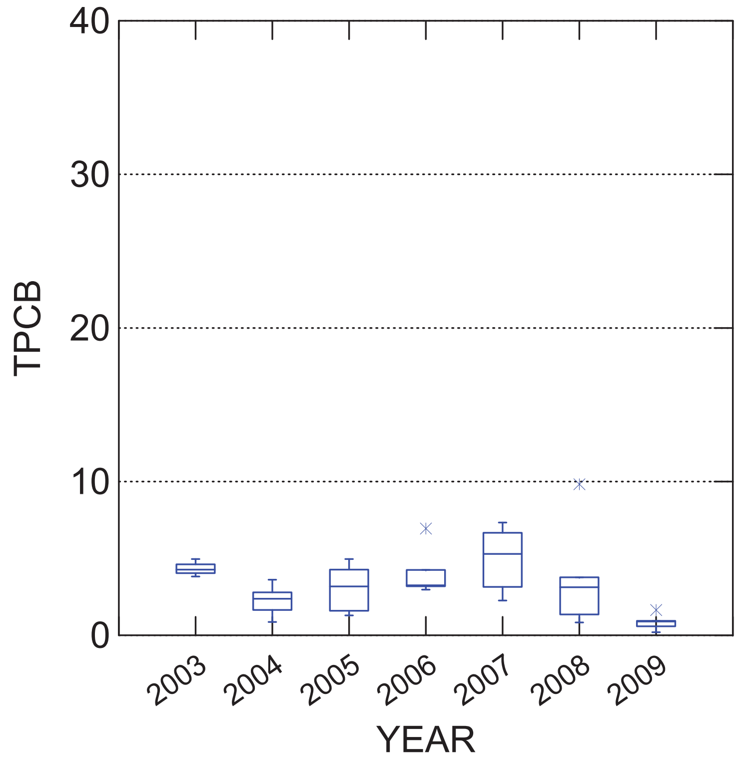


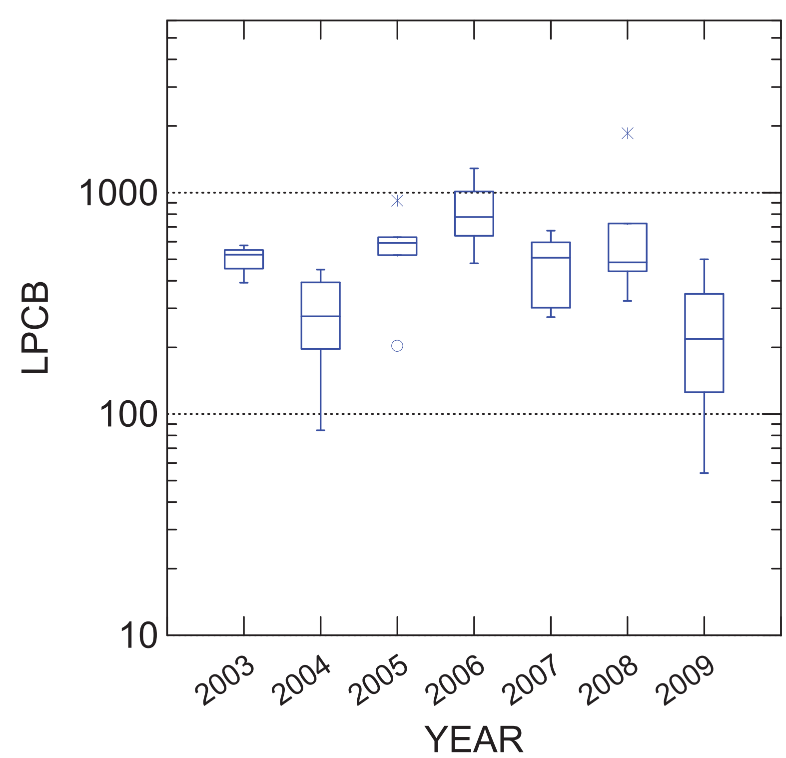
Black Bass (SF): TD2



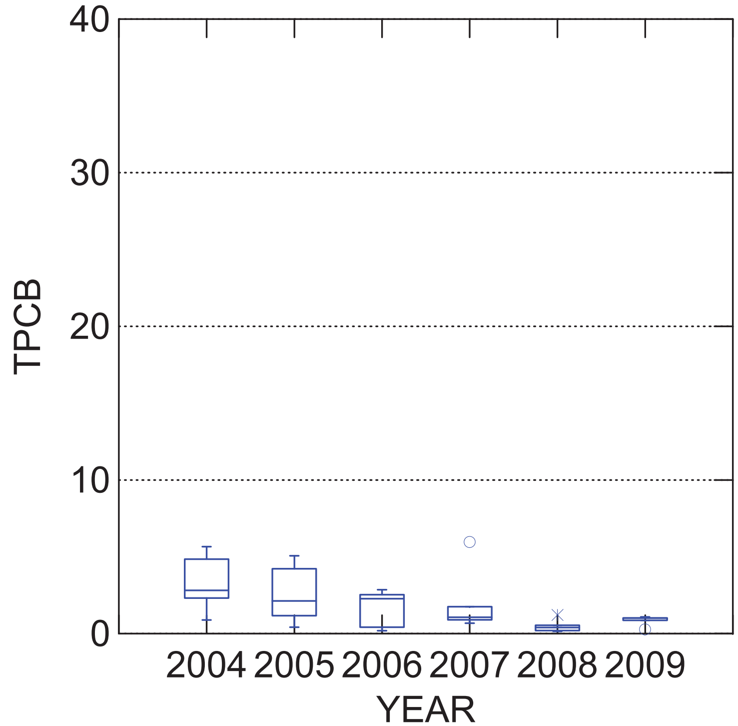


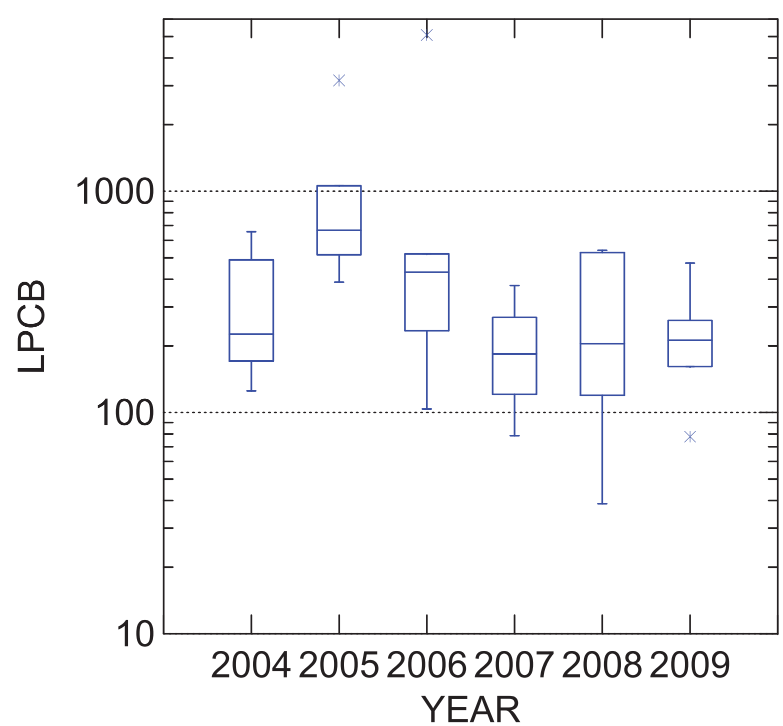
Black Bass (SF): TD3



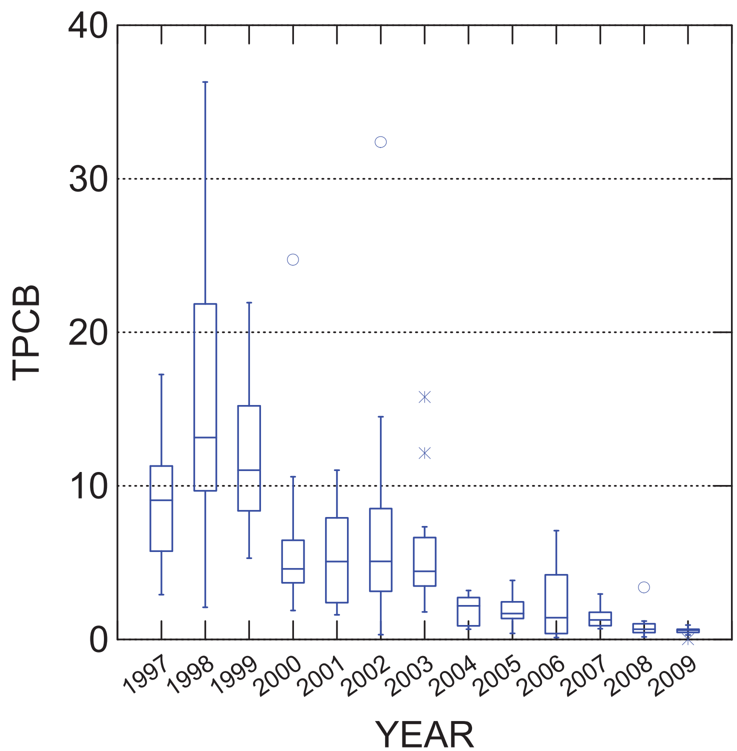


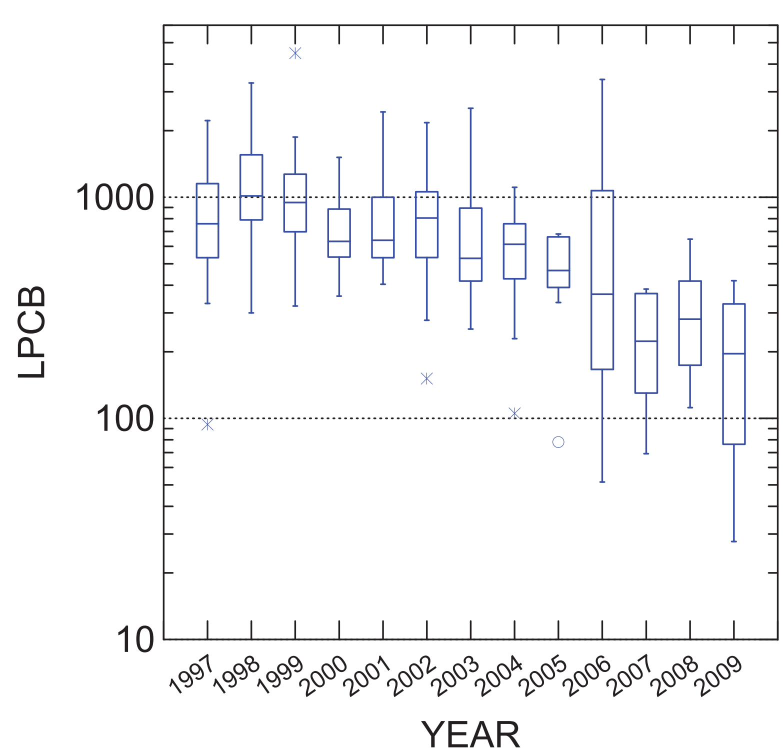
Black Bass (SF): TD4



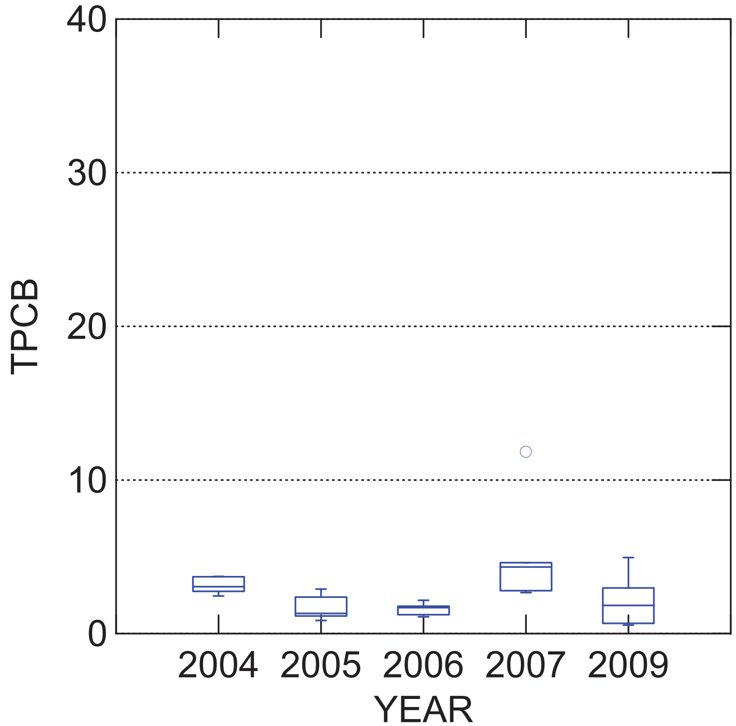


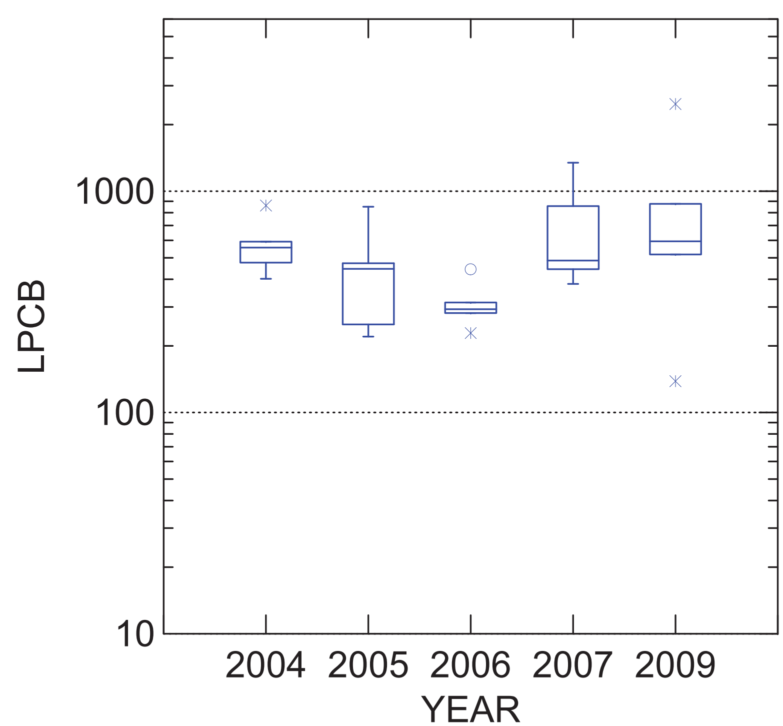
Black Bass (SF): TD5



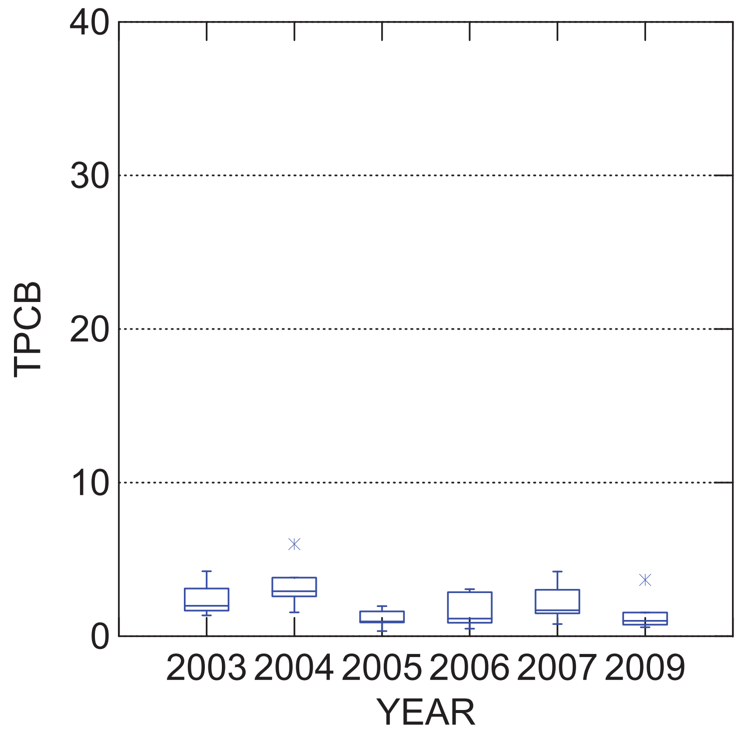


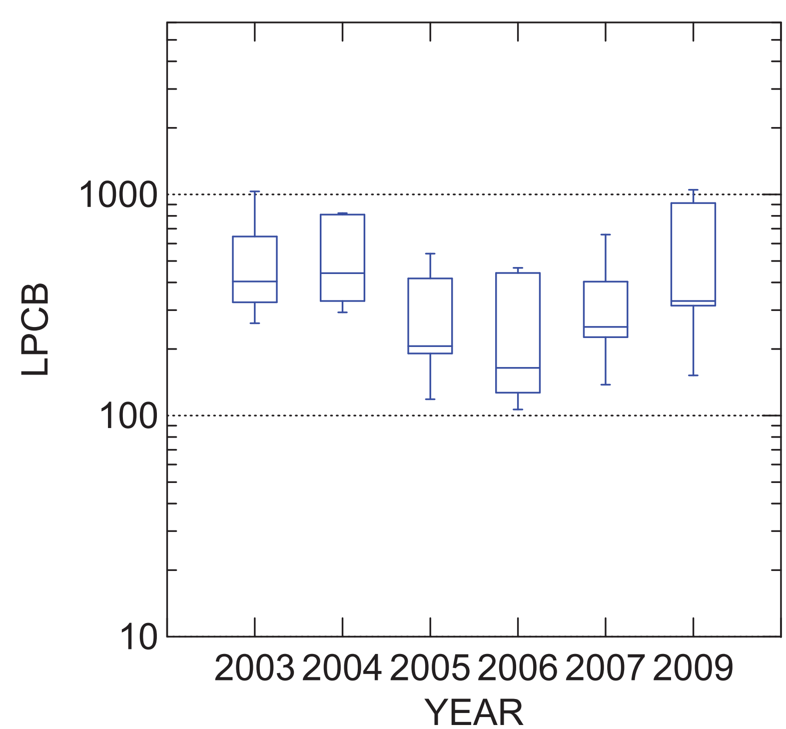
Black Bass (SF): ND1



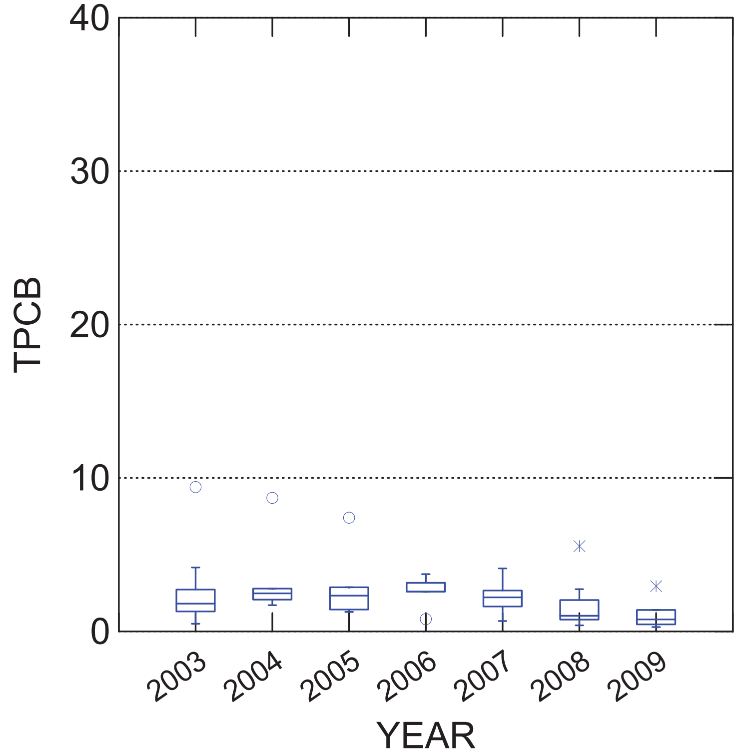


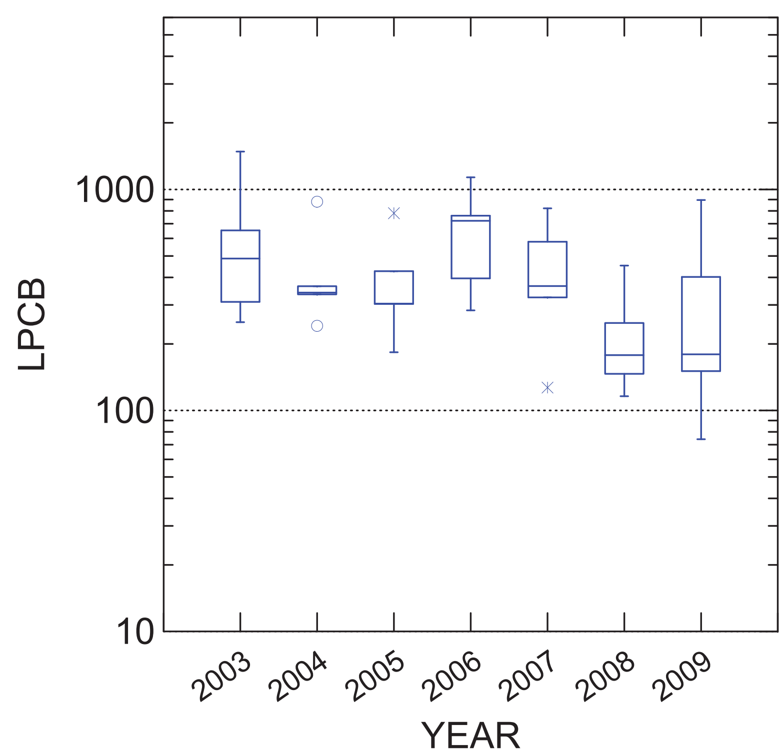
Black Bass (SF): ND2



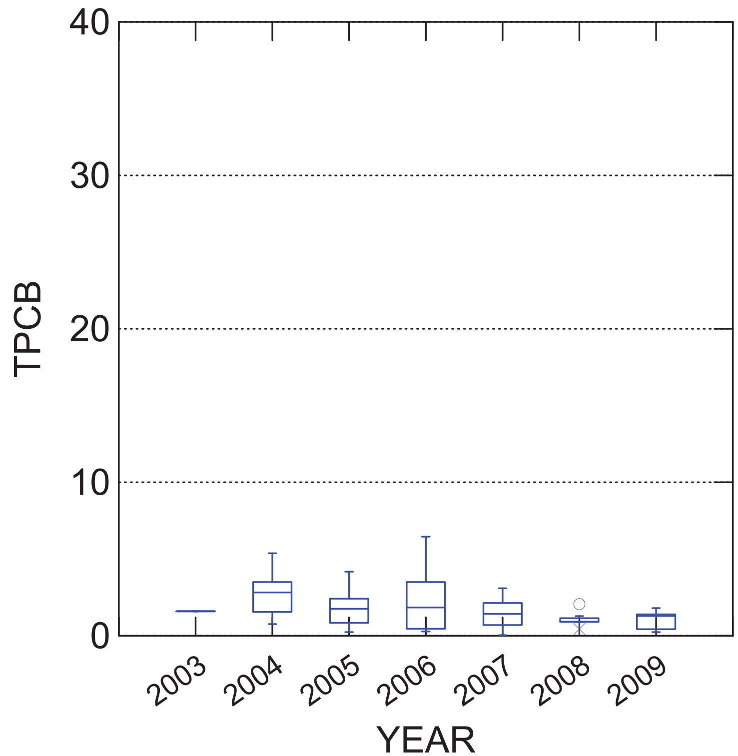


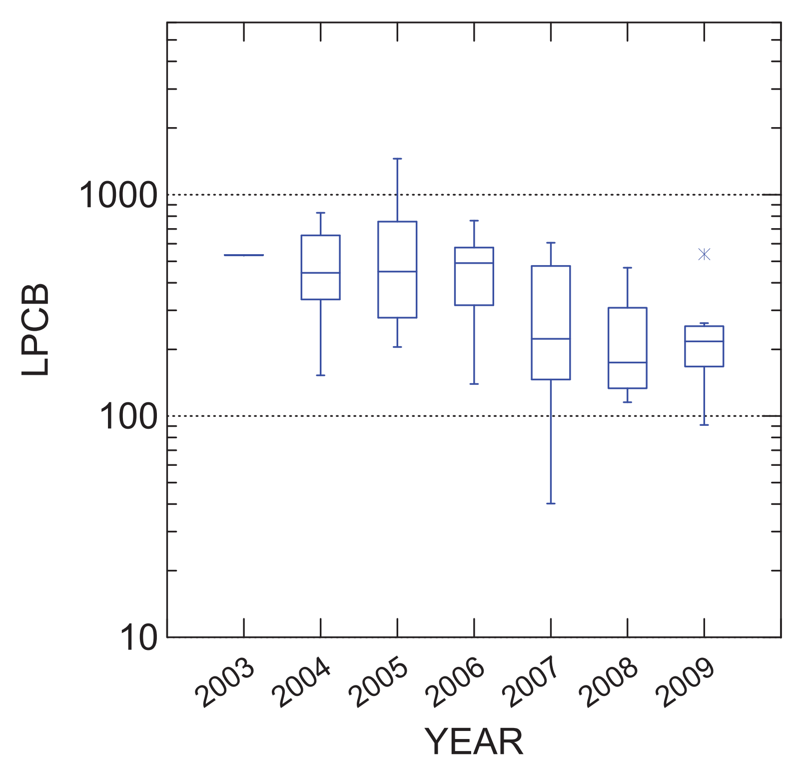
Black Bass (SF): ND3



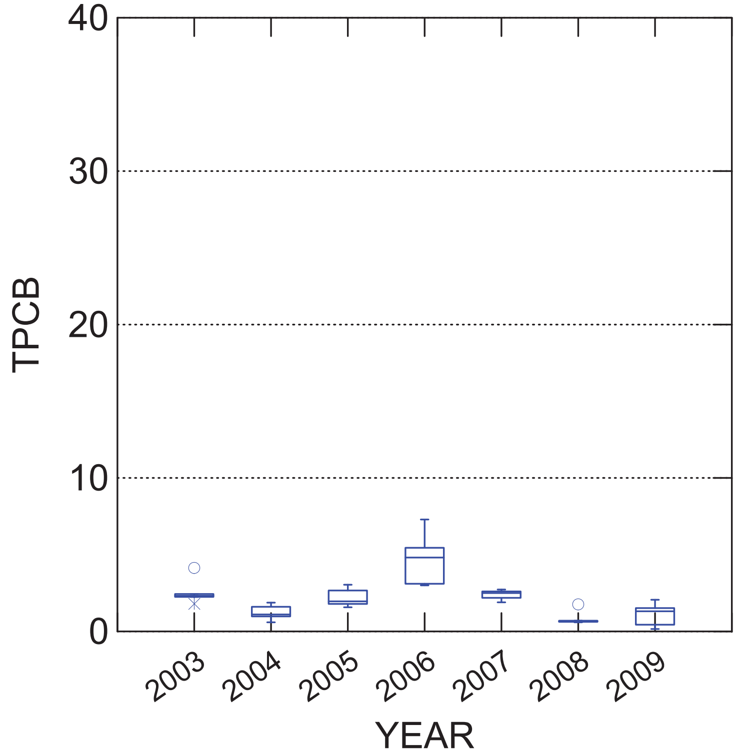


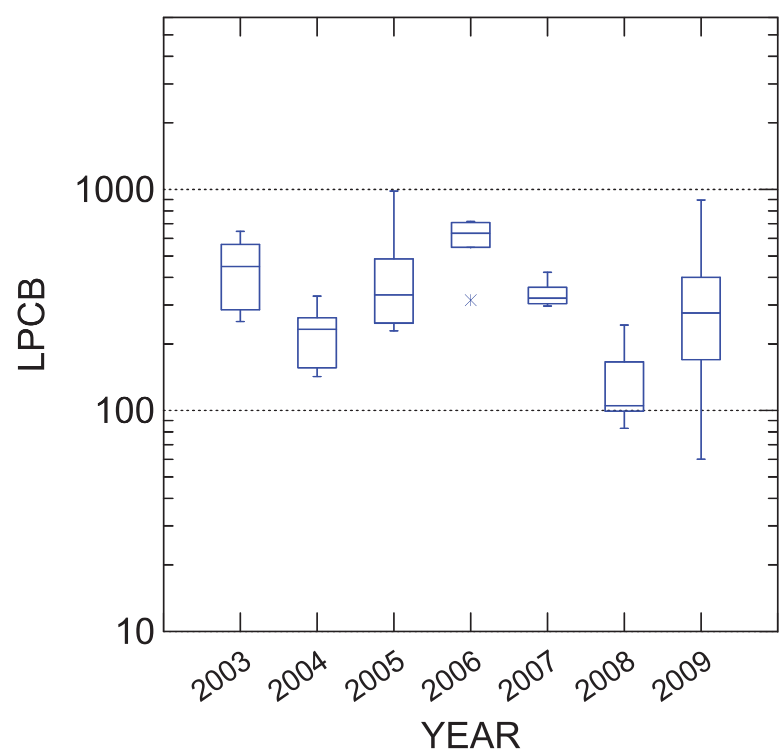
Black Bass (SF): ND5



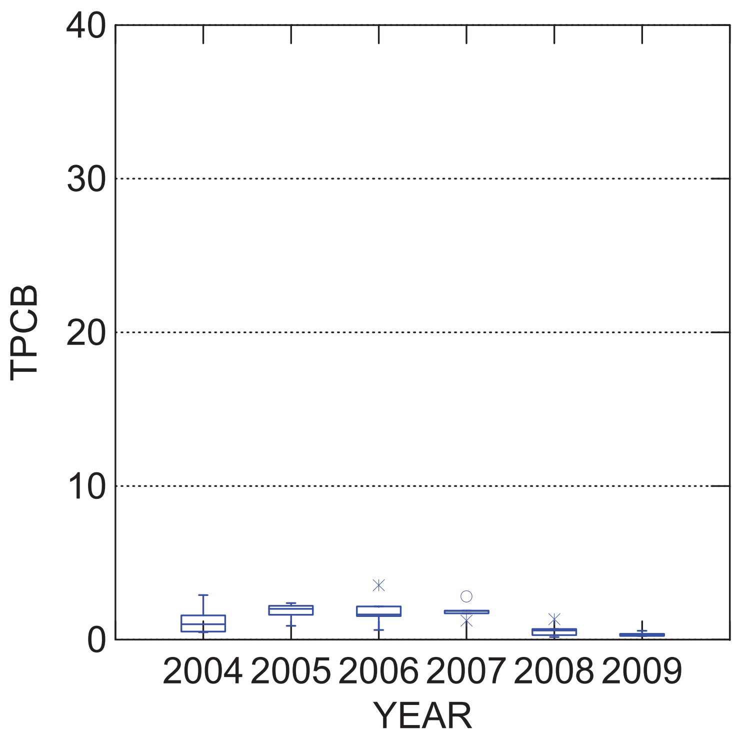


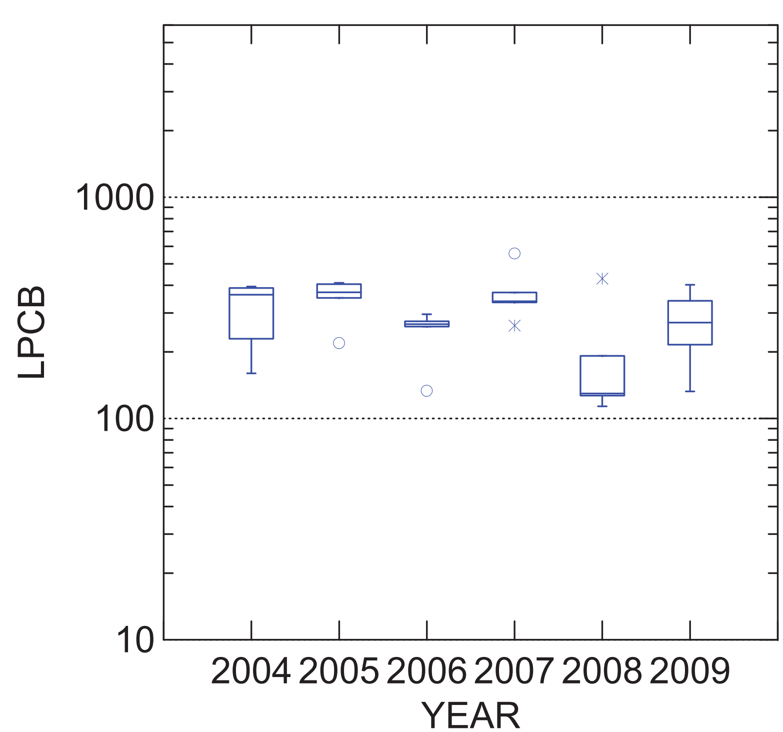
Black Bass (SF): SW1



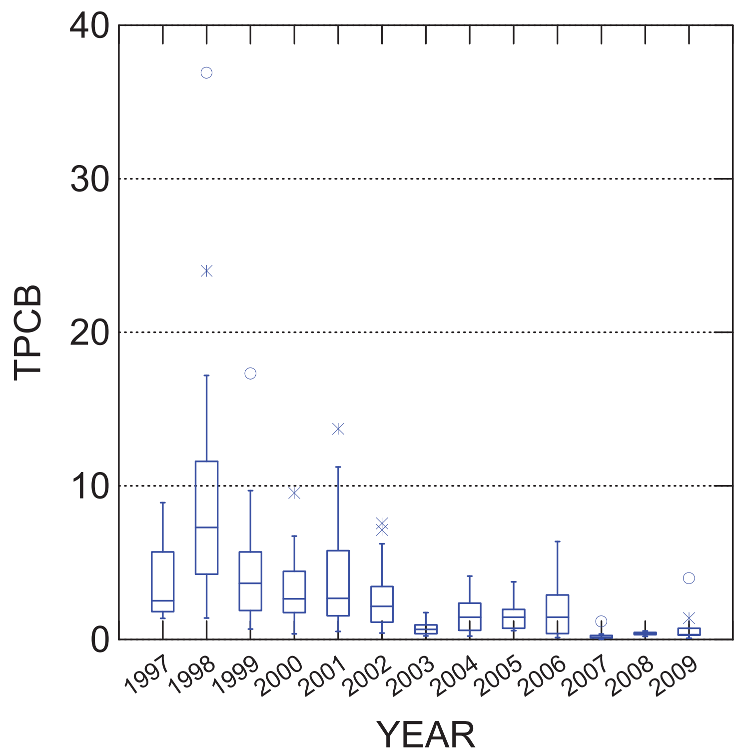


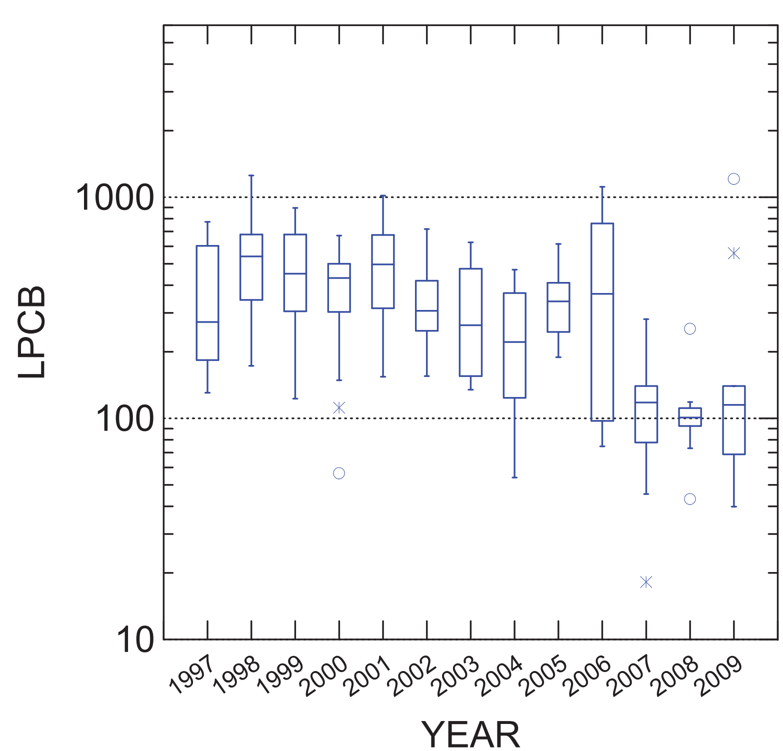
Black Bass (SF): SW2



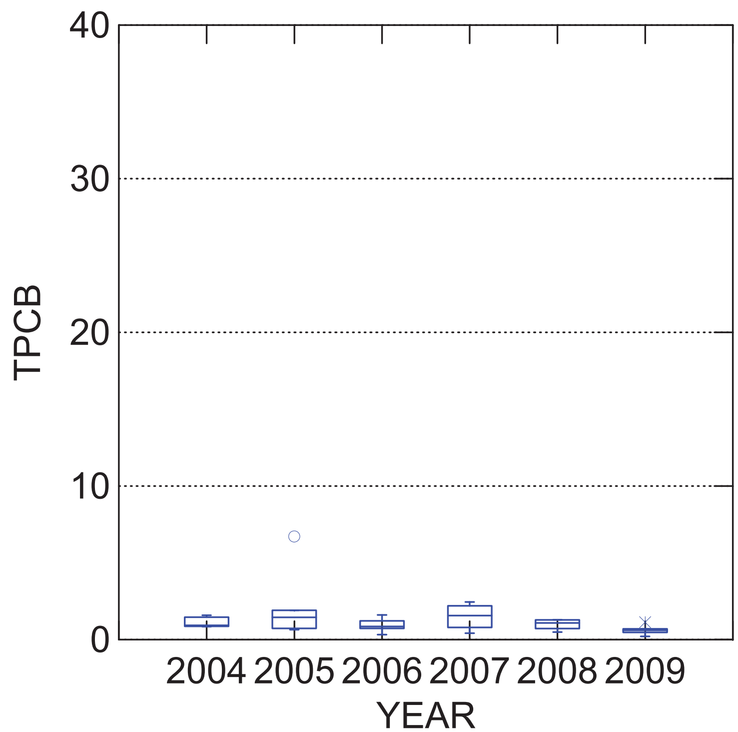


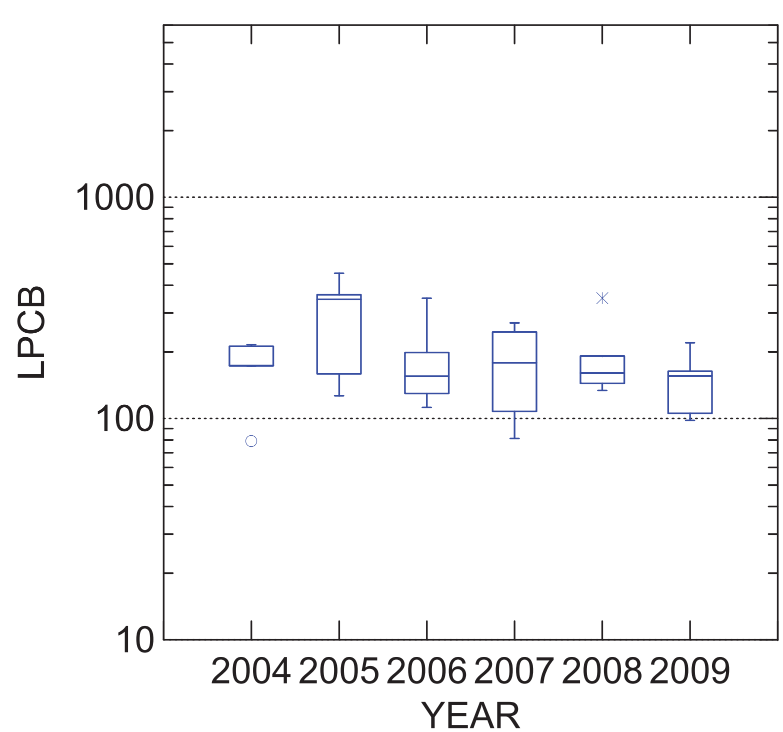
Black Bass (SF): SW3



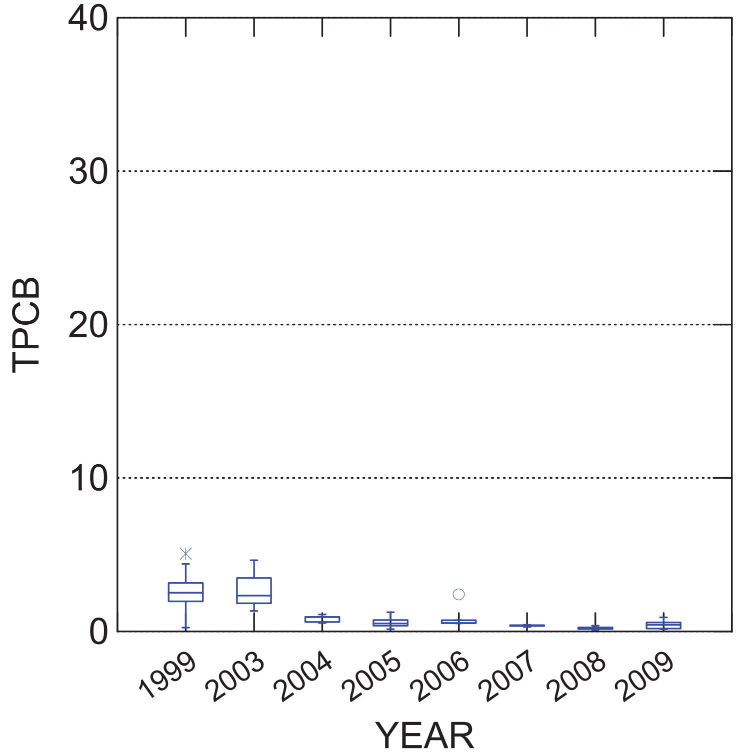


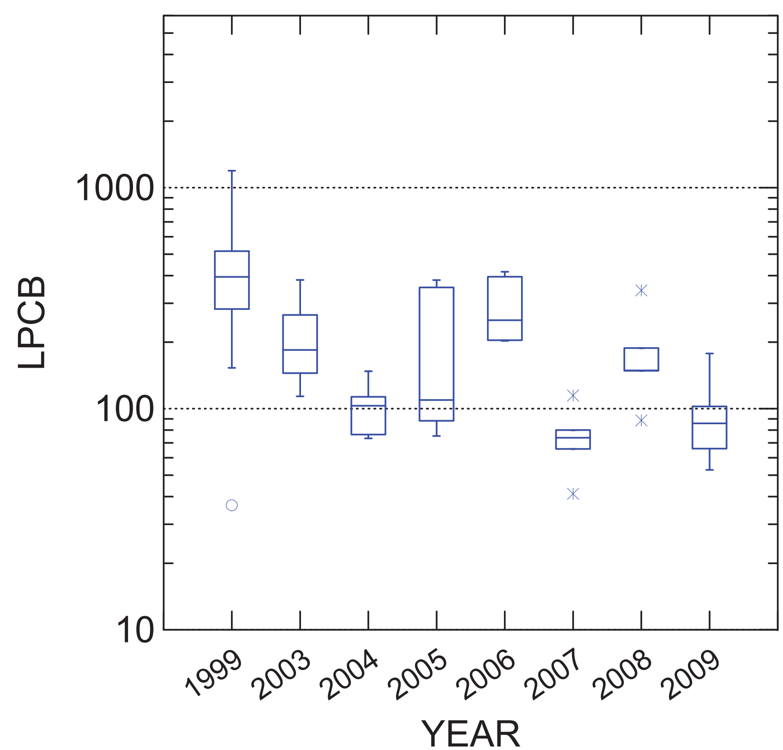
Black Bass (SF): SW4



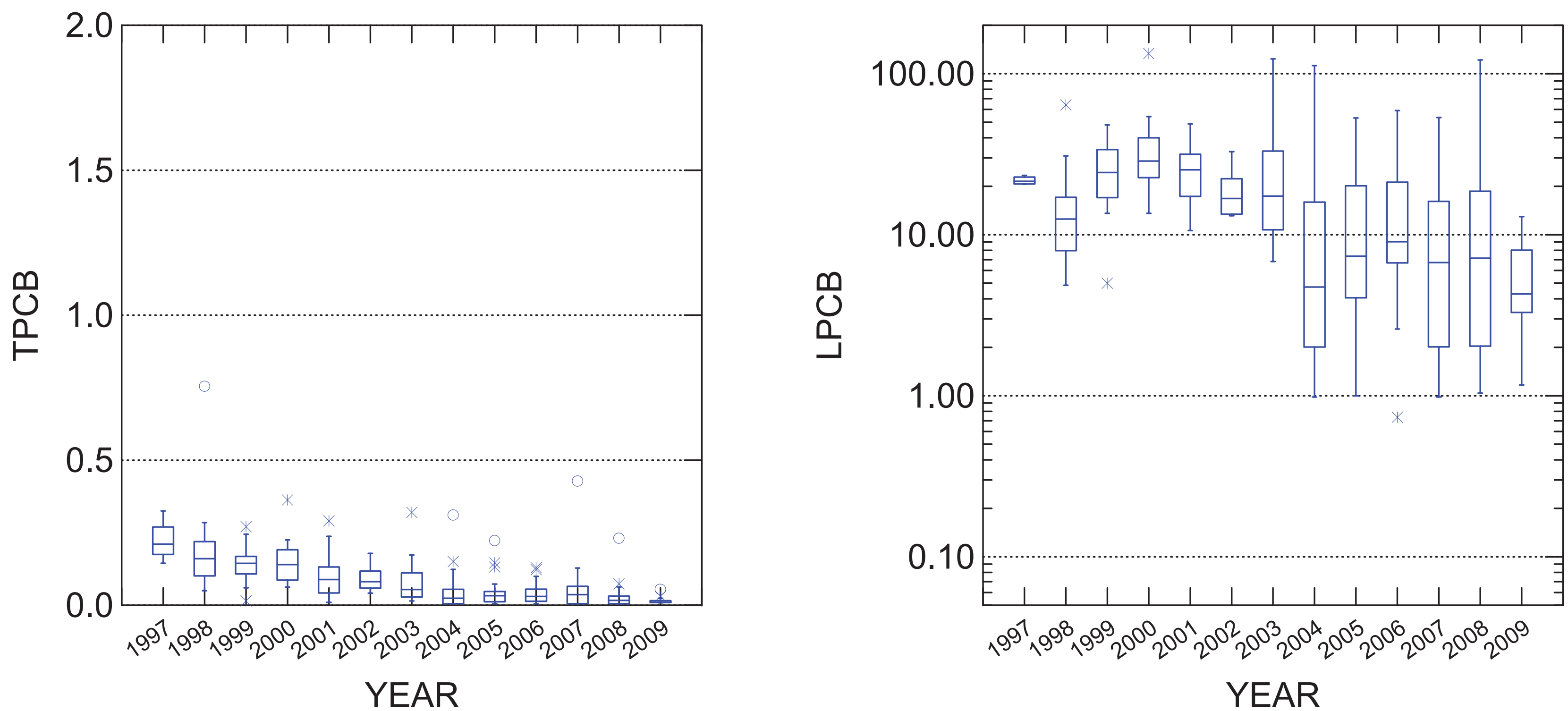


Black Bass (SF): SW5





Black Bass (SF): FD1



Appendix I-D-Attachment 3 Series

Box plots of PCBs in Bullhead from the Hudson River

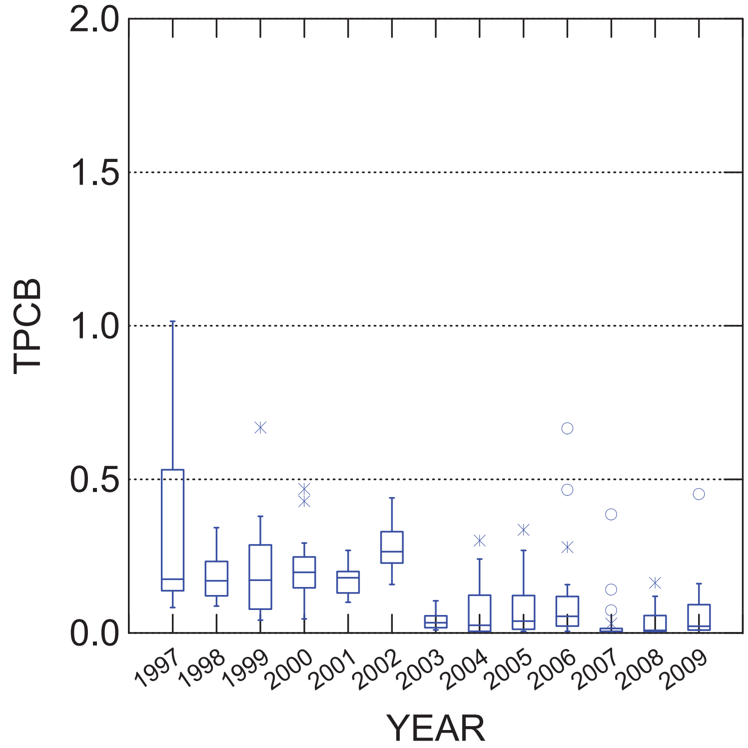
The data are shown by sampling station (one station per page). The left and right graphs on each page are total PCBs (TPCB; mg/kg) and lipid normalized total PCBs (LPCBs; mg/kg lipid), respectively.

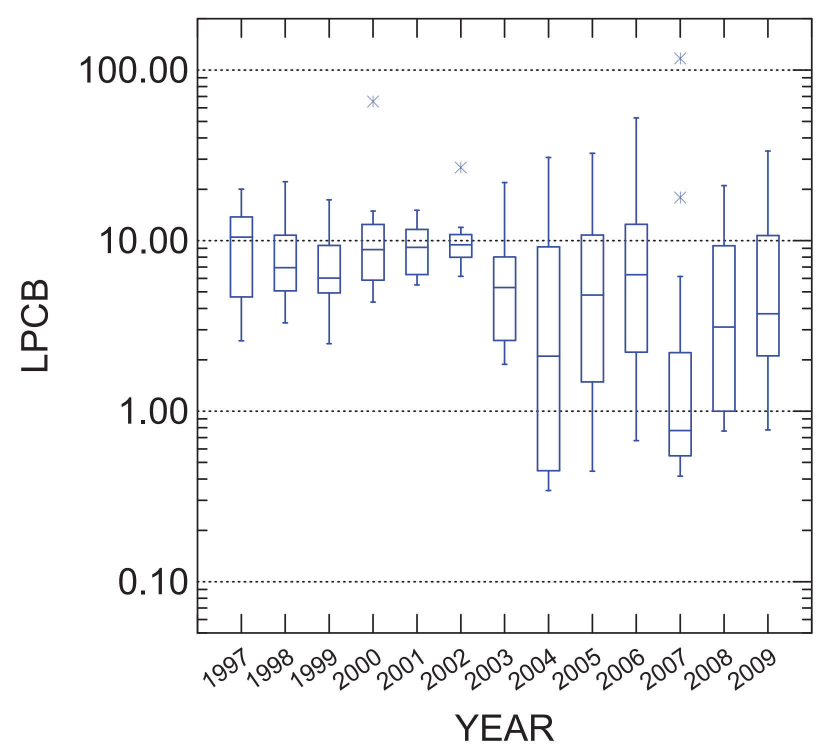
In the box plots, the center vertical line marks the median of the sample. The length of each box shows the range within which the central 50% of the values fall, with the box edges (or hinges) at the first and third quartiles (i.e., 25^{th} and 75^{th}% quartiles). Fences define outside and far outside values and are defined as follows:

Lower inner fence = lower hinge - (1.5 • (Hspread))
Upper inner fence = upper hinge + (1.5 • (Hspread))
Lower outer fence = lower hinge - (3 • (Hspread))
Upper outer fence = upper hinge + (3 • (Hspread))

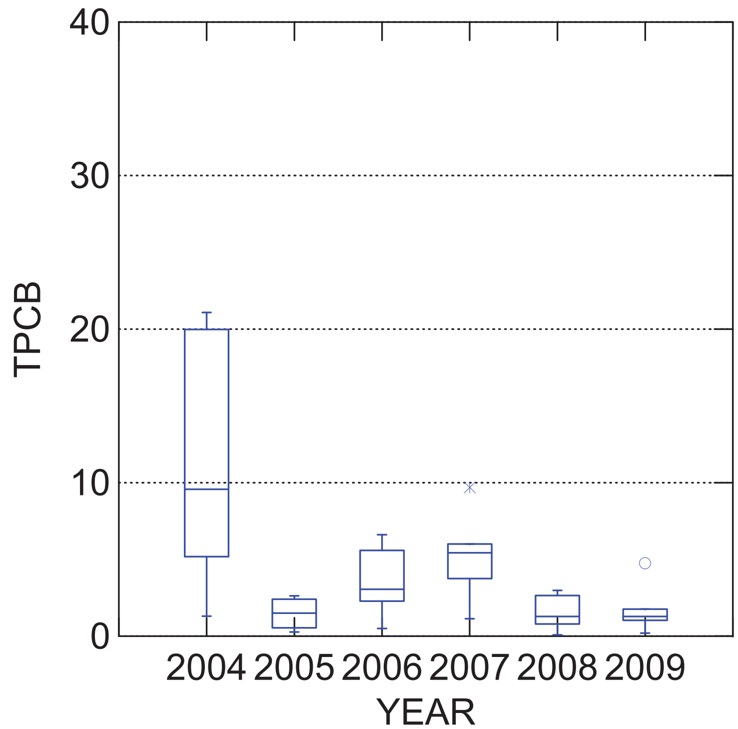
Hspread is comparable to the interquartile range. It is the absolute value of the difference between the values of the two hinges. The whiskers show the range of observed values that fall within the inner fences. Values between the inner and outer fences are plotted with asterisks. Values beyond the outer fences, called far outside values, are plotted with empty circles.

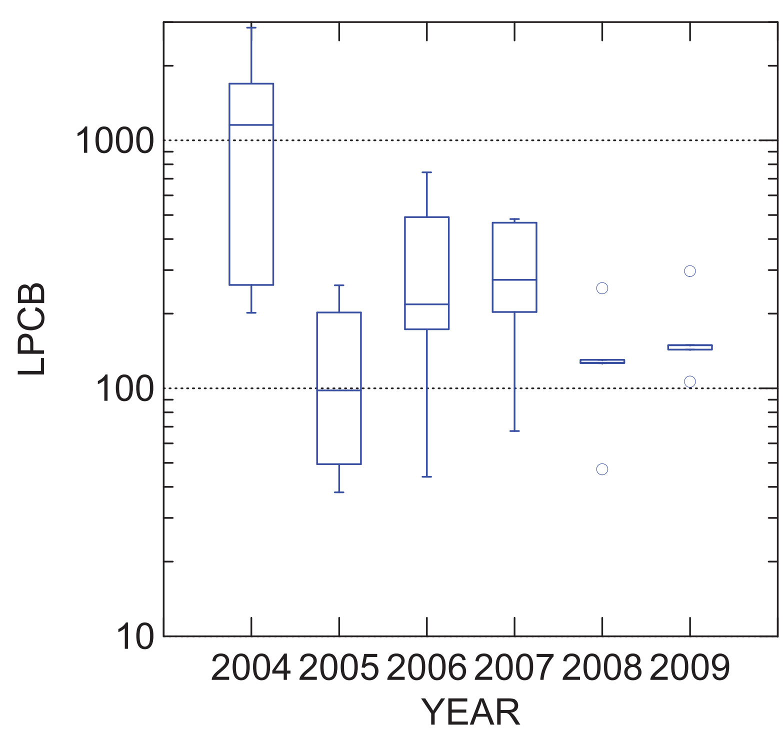
Bullhead (SF): FD1



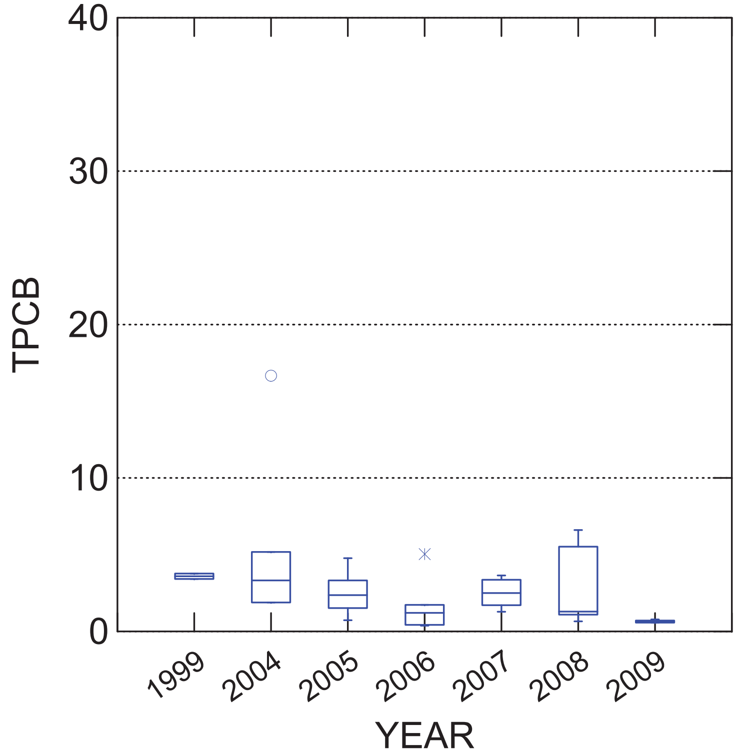


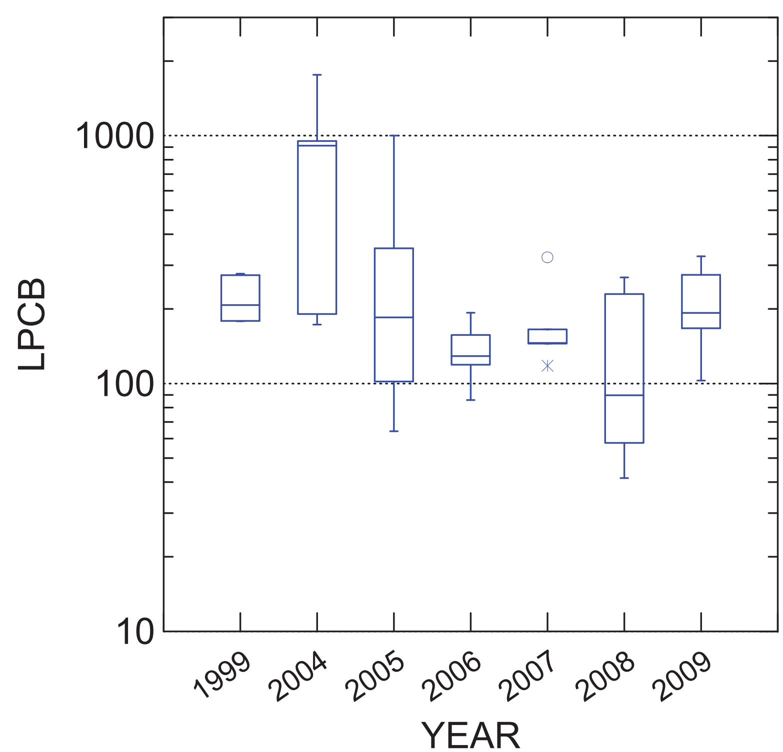
Bullhead (SF): TD1



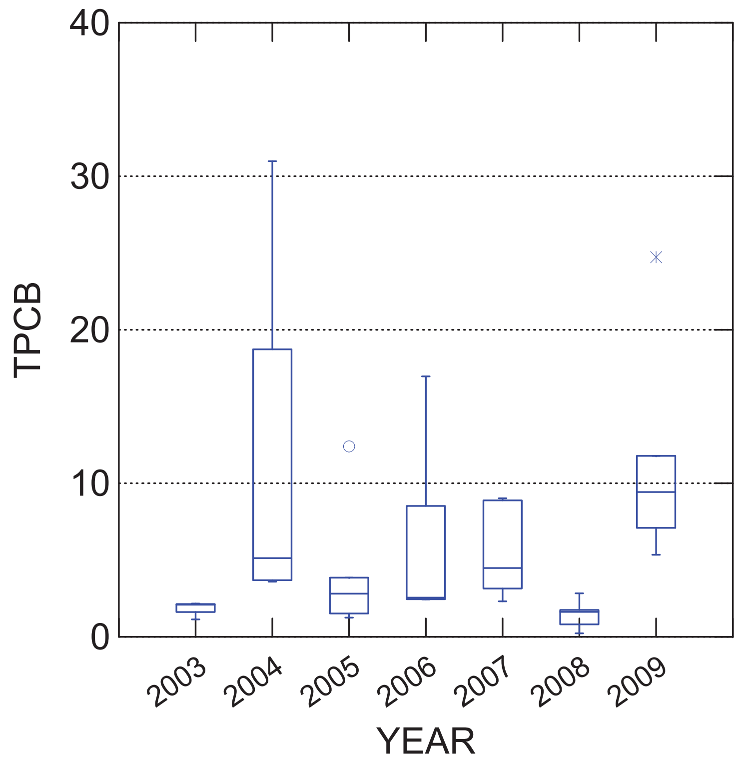


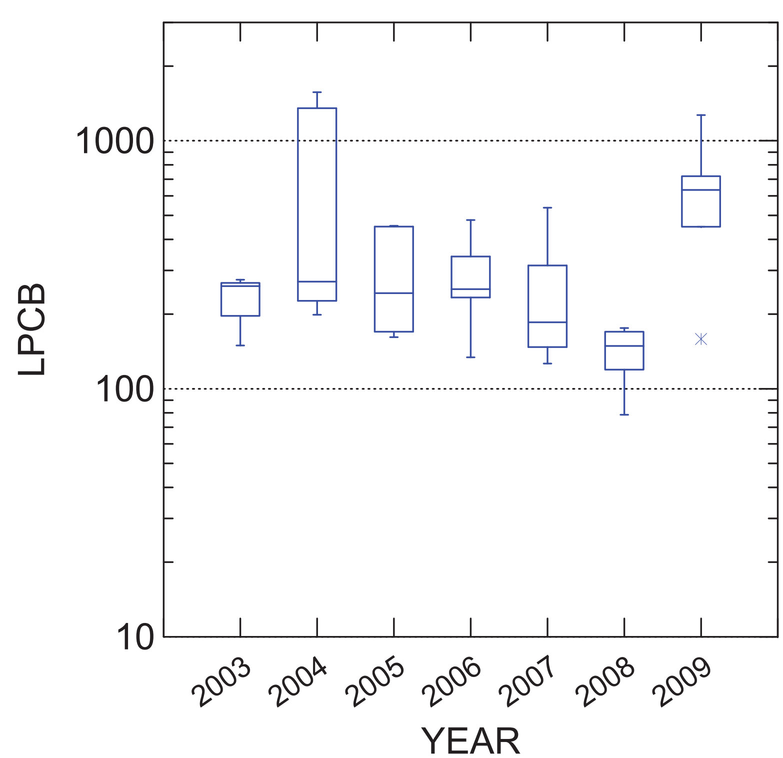
Bullhead (SF): TD2



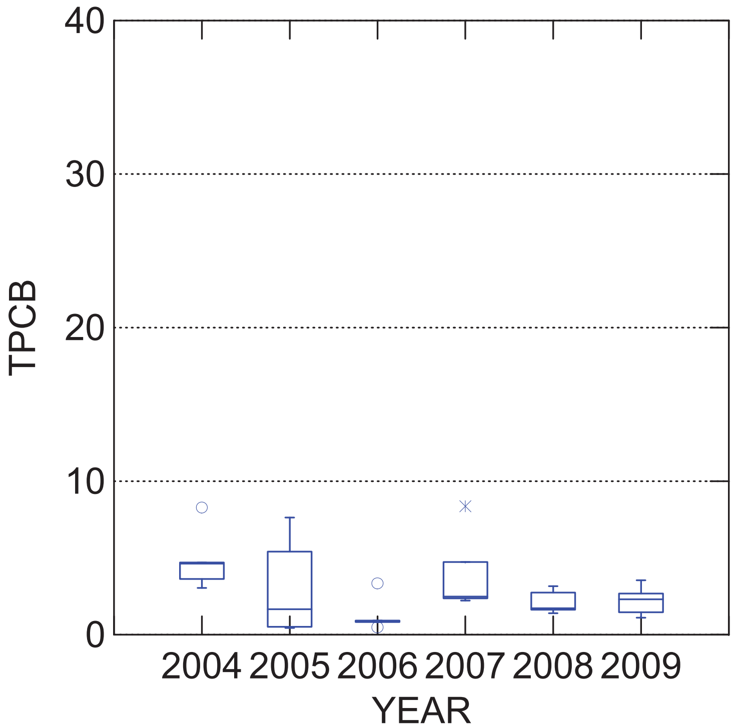


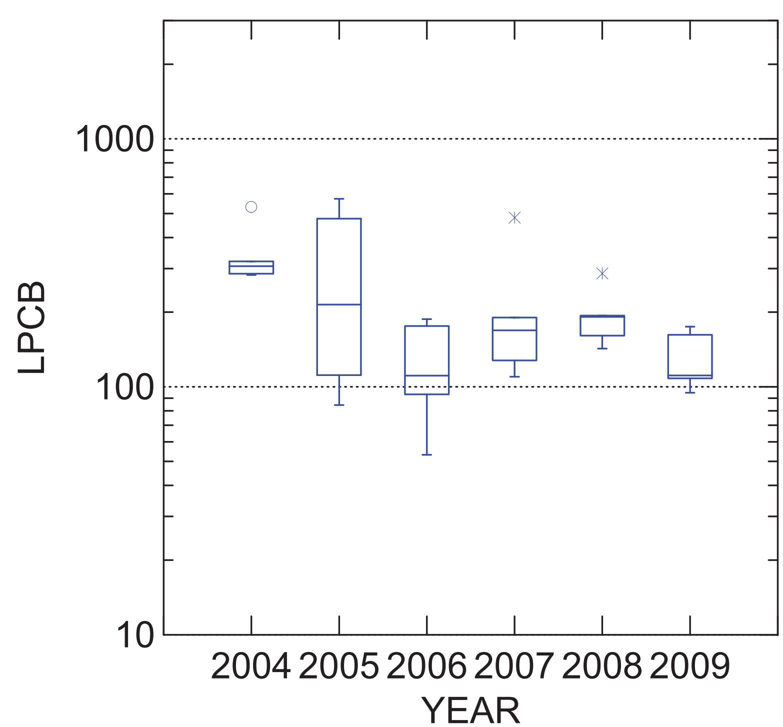
Bullhead (SF): TD3



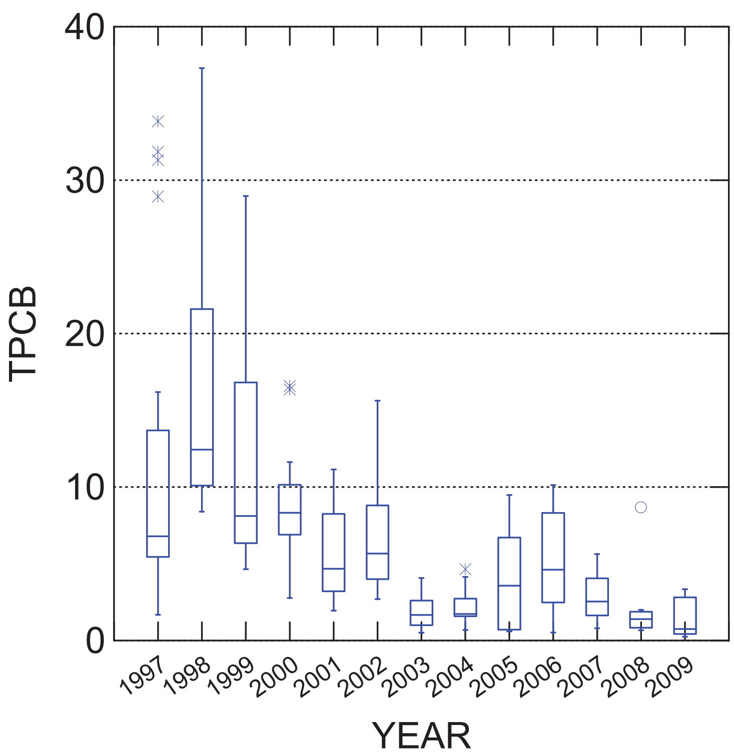


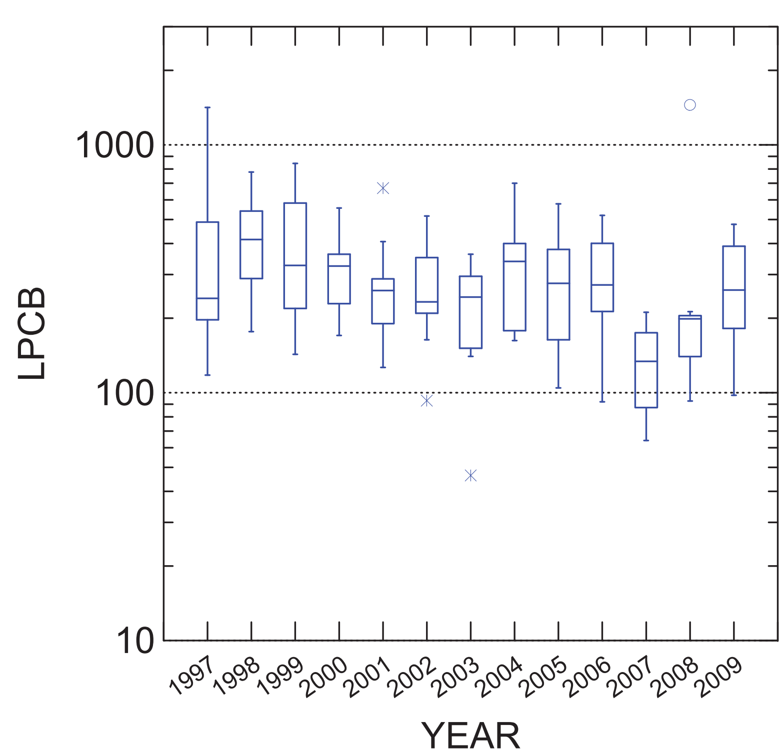
Bullhead (SF): TD4



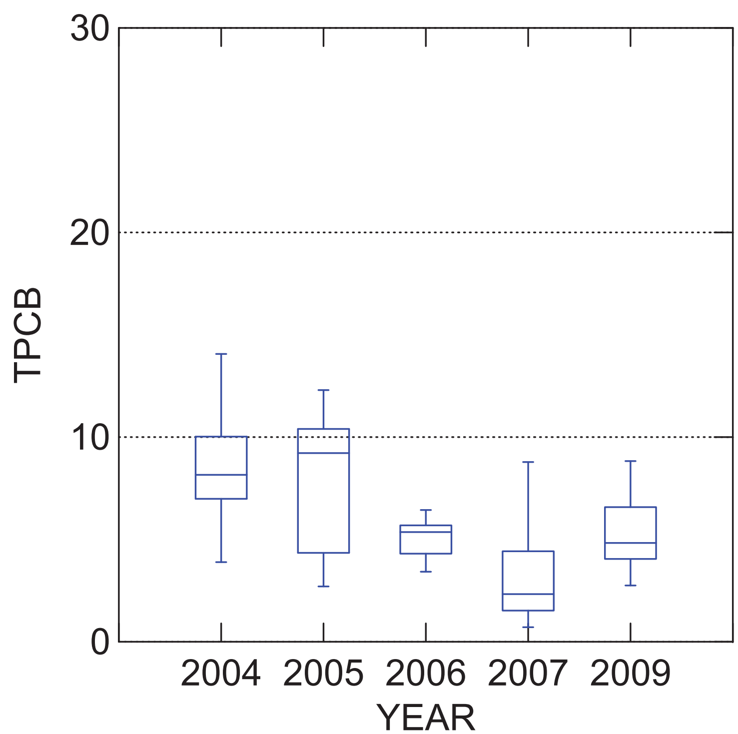


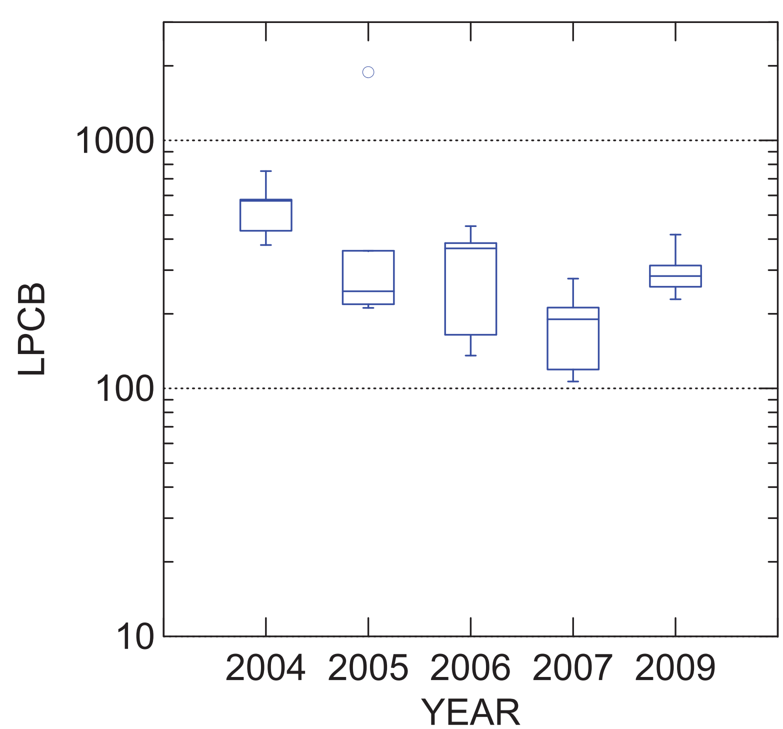
Bullhead (SF): TD5



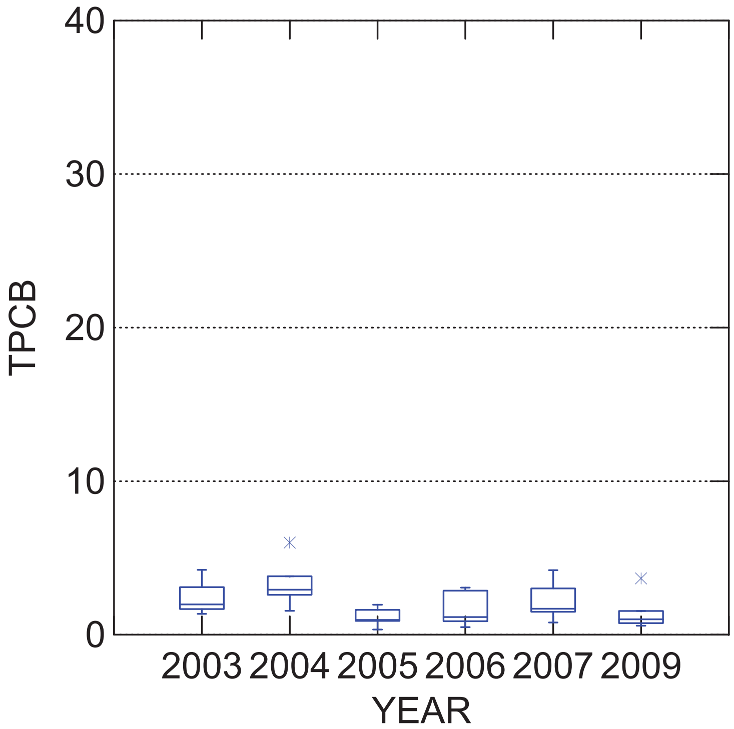


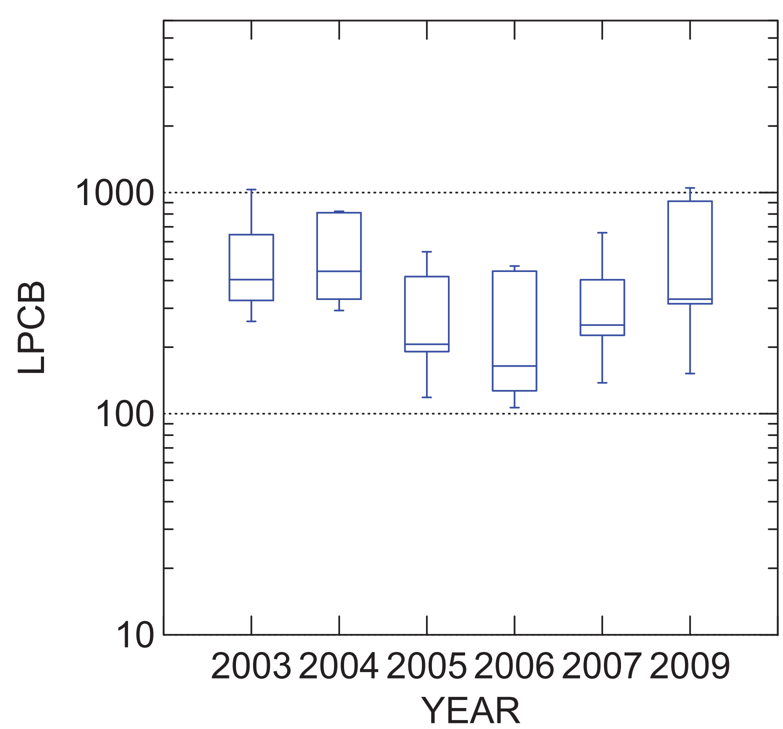
Bullhead (SF): ND1



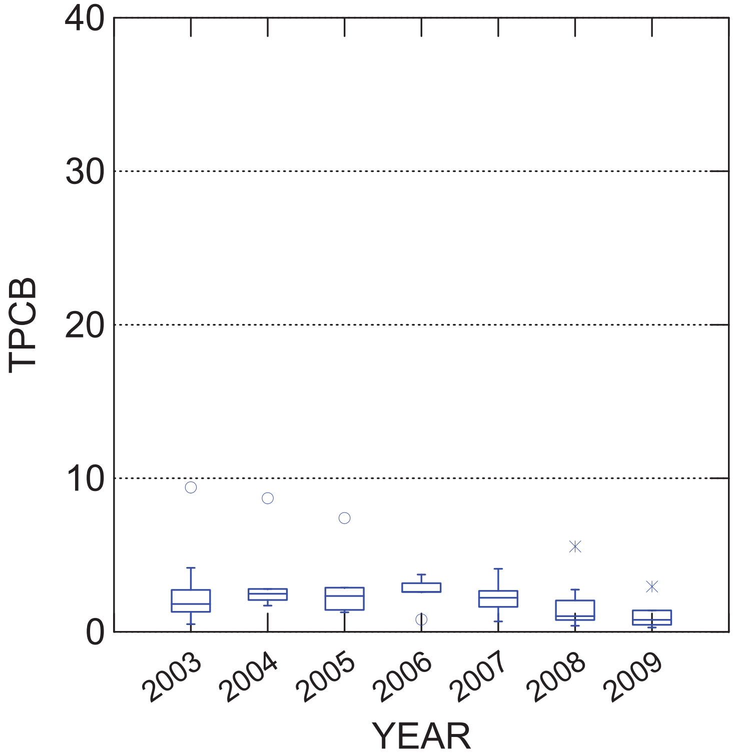


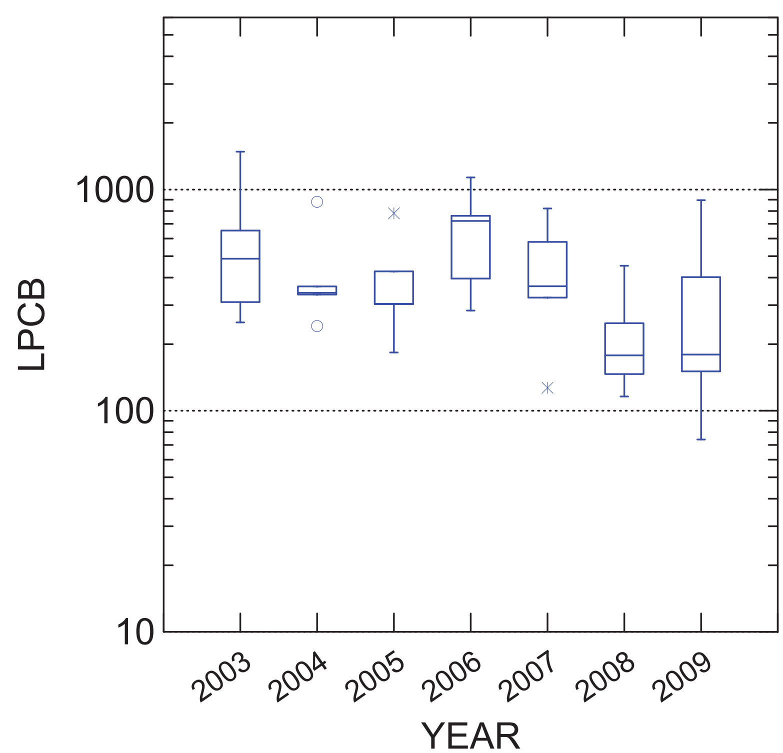
Bullhead (SF): ND2



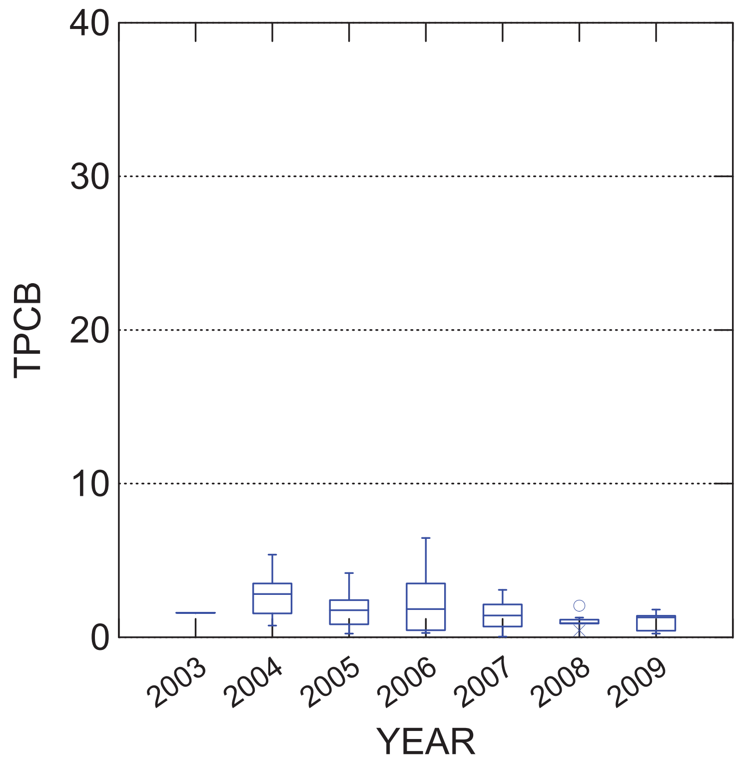


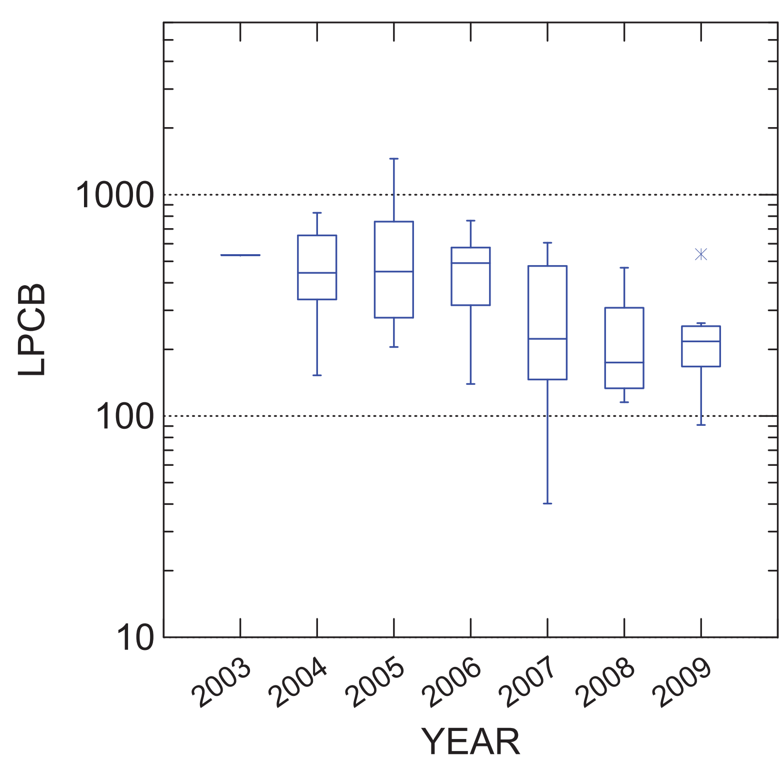
Bullhead (SF): ND3



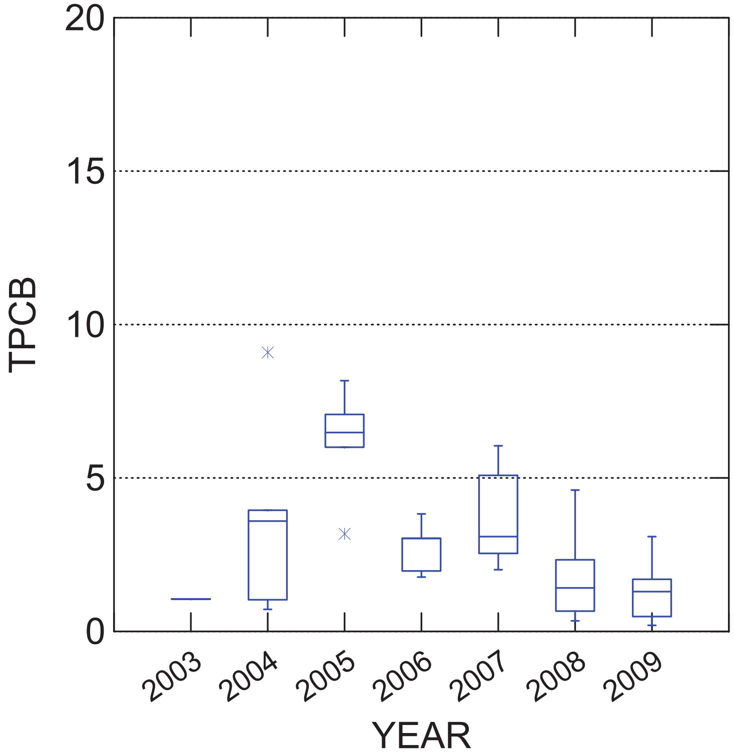


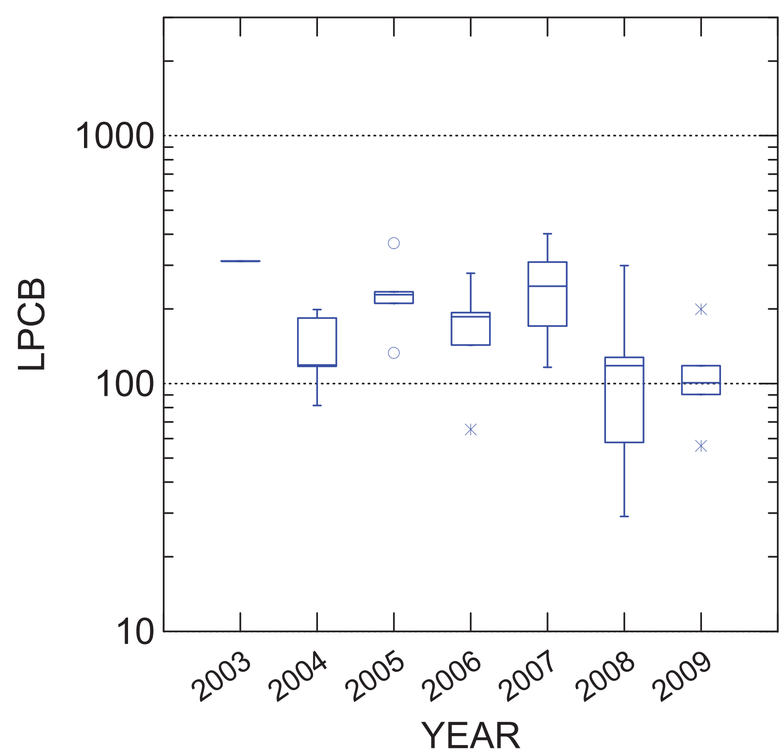
Bullhead (SF): ND5



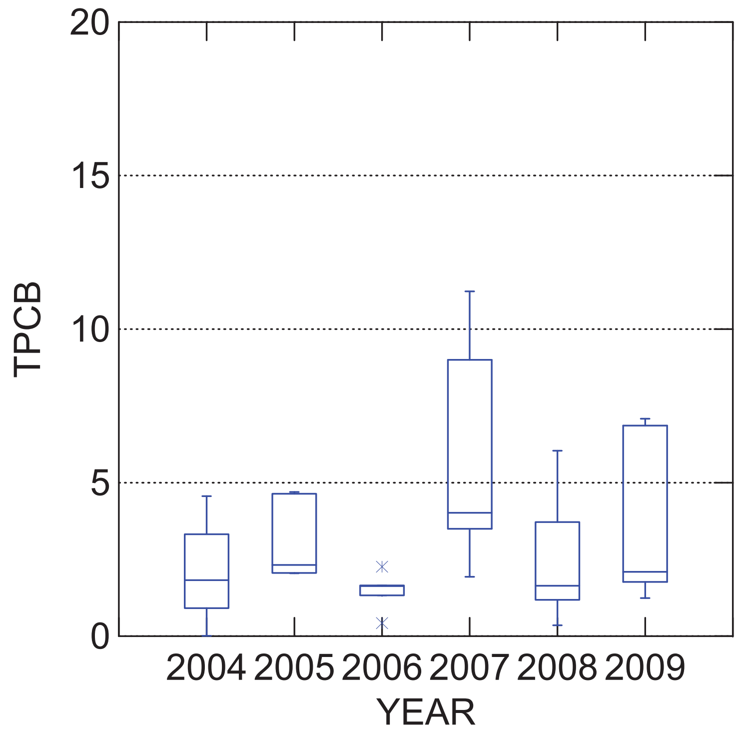


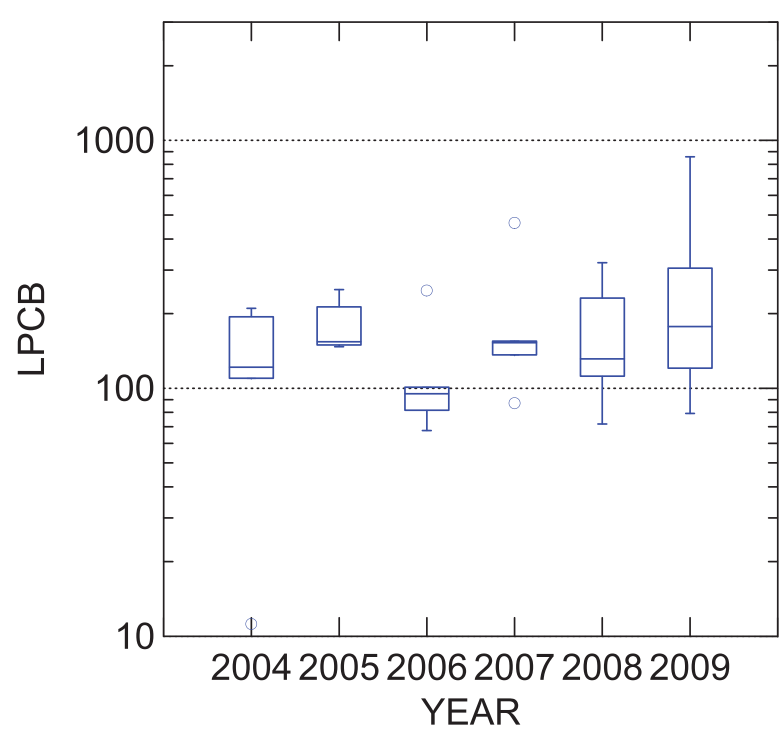
Bullhead (SF): SW1



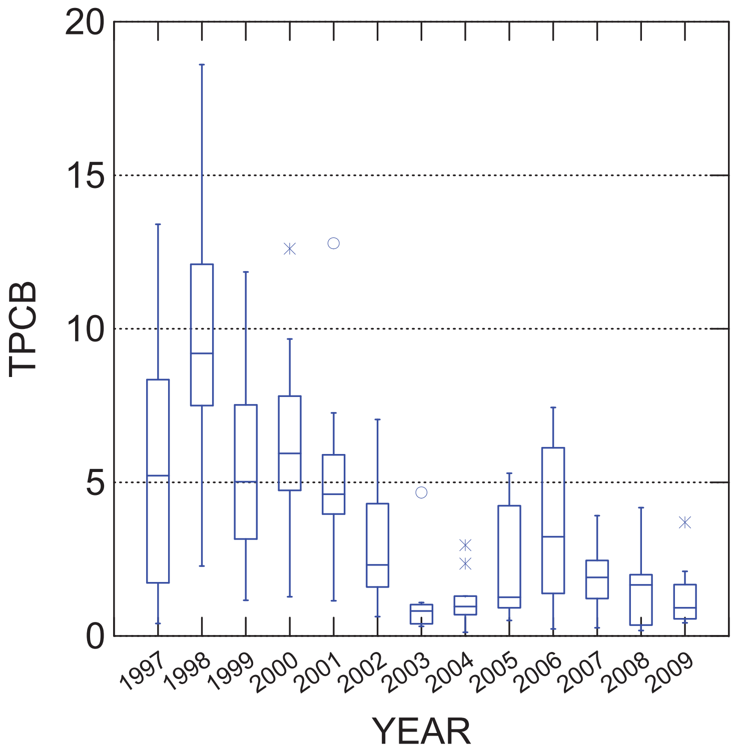


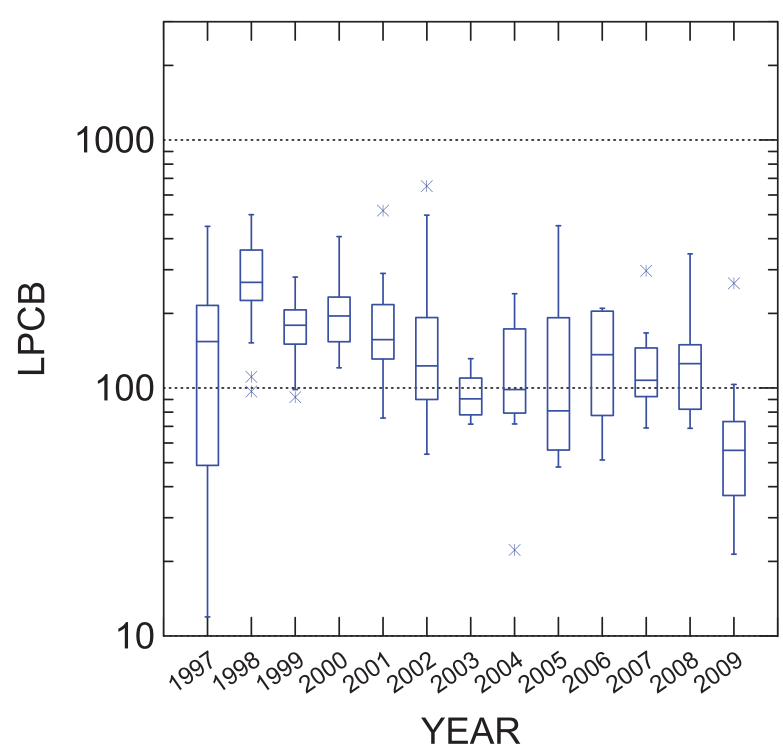
Bullhead (SF): SW2



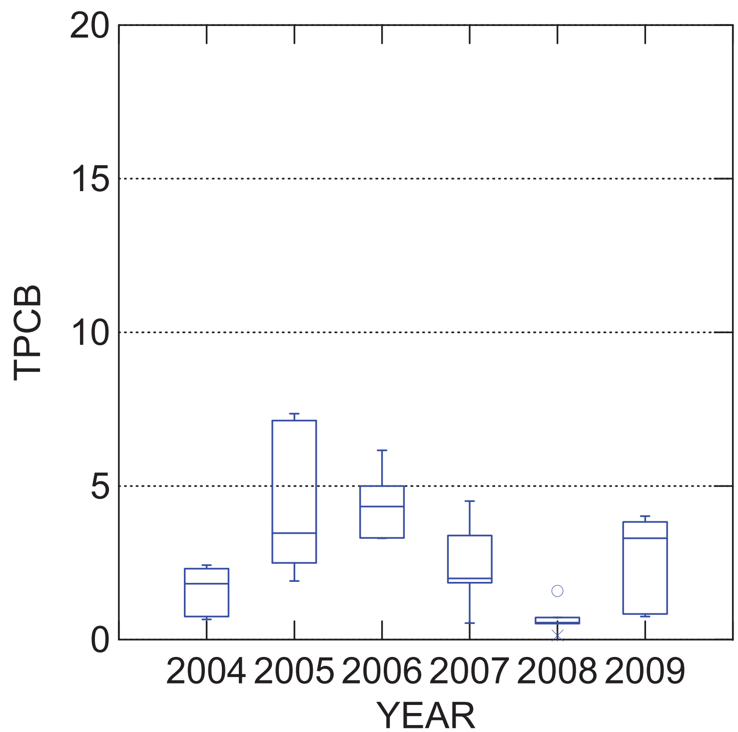


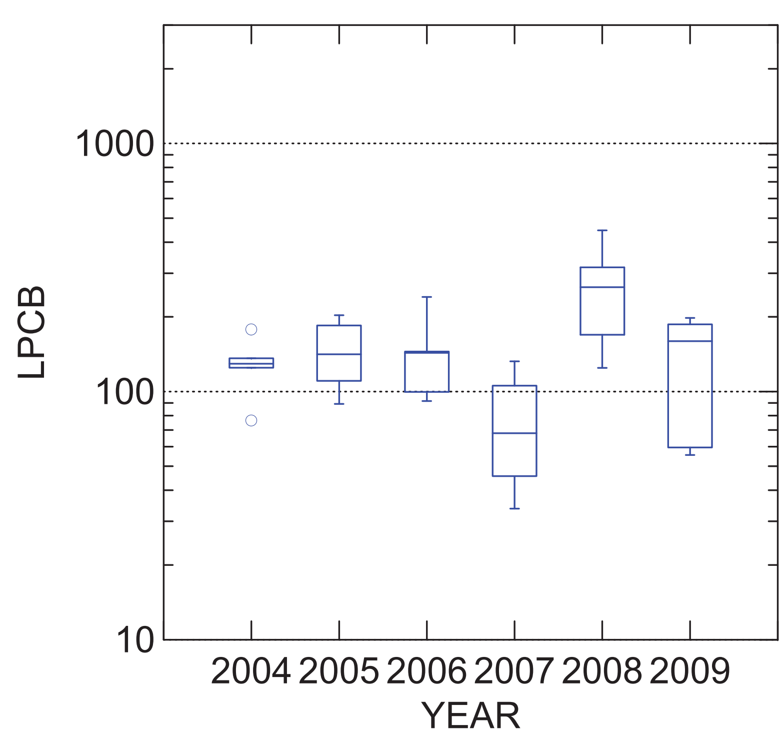
Bullhead (SF): SW3



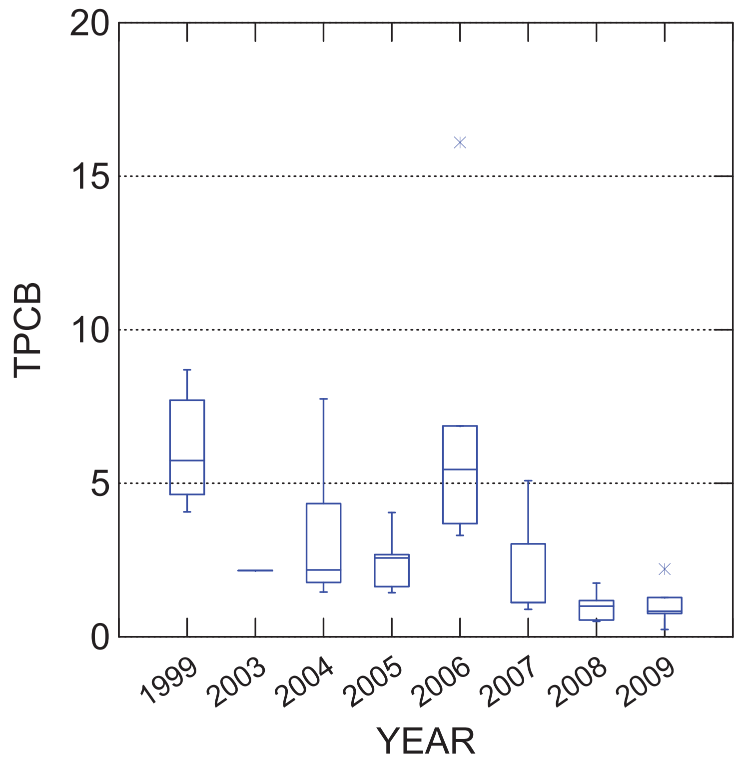


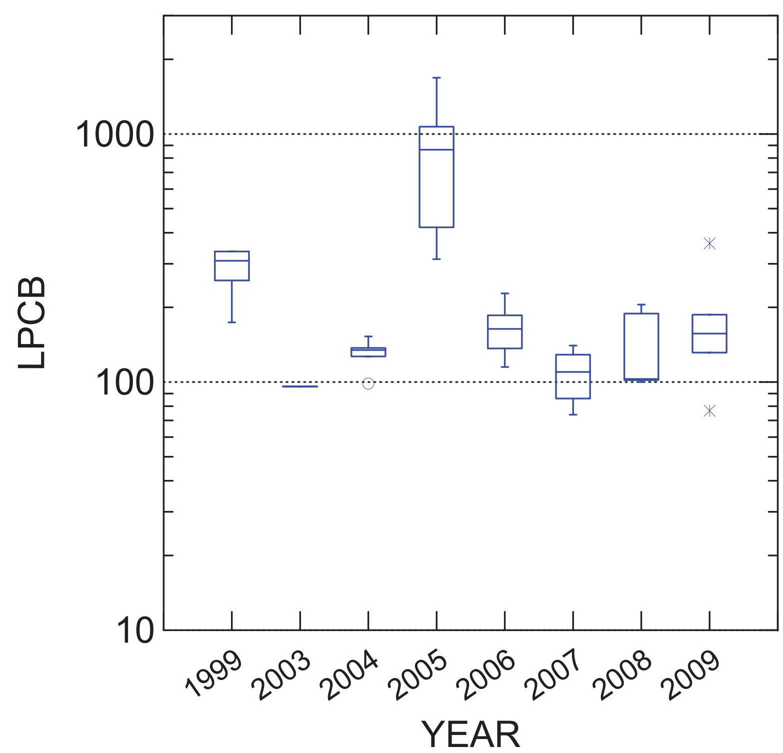
Bullhead (SF): SW4





Bullhead (SF): SW5





Appendix I-D-Attachment 4 Series

Box plots of PCBs in Yellow Perch from the Hudson River

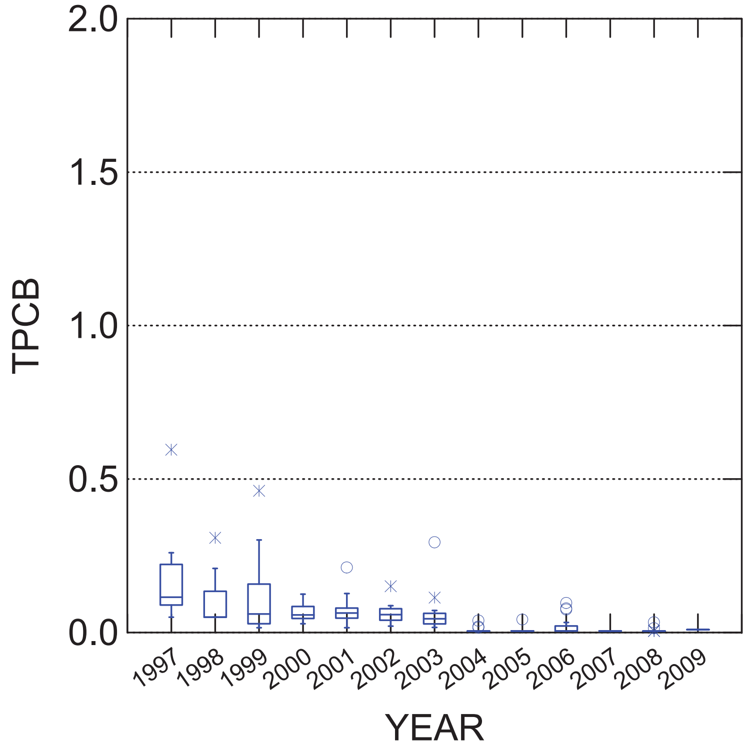
The data are shown by sampling station (one station per page). The left and right graphs on each page are total PCBs (TPCB; mg/kg) and lipid normalized total PCBs (LPCBs; mg/kg lipid), respectively.

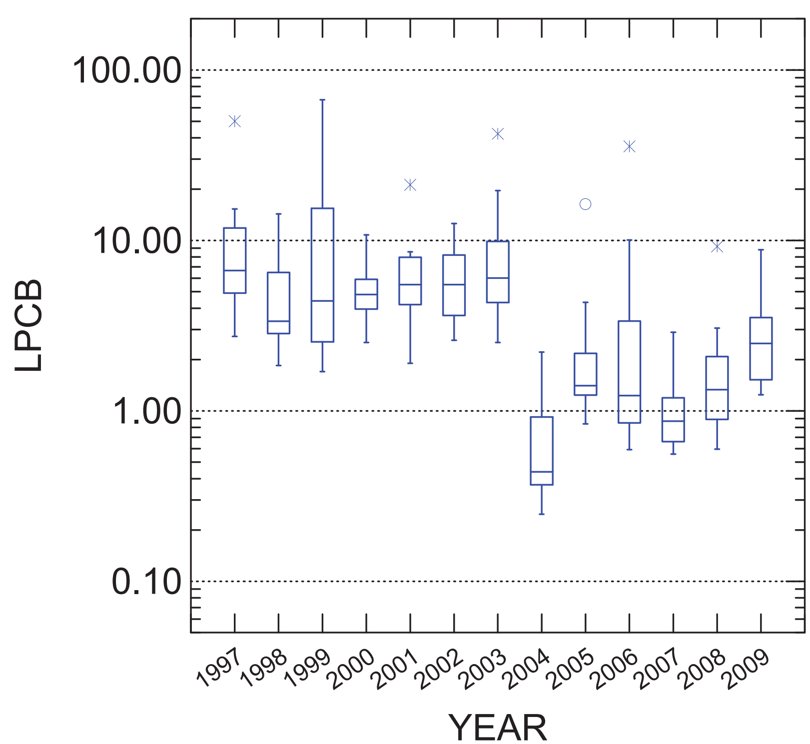
In the box plots, the center vertical line marks the median of the sample. The length of each box shows the range within which the central 50% of the values fall, with the box edges (or hinges) at the first and third quartiles (i.e., 25^{th} and 75^{th}% quartiles). Fences define outside and far outside values and are defined as follows:

Lower inner fence = lower hinge - (1.5 • (Hspread))
Upper inner fence = upper hinge + (1.5 • (Hspread))
Lower outer fence = lower hinge - (3 • (Hspread))
Upper outer fence = upper hinge + (3 • (Hspread))

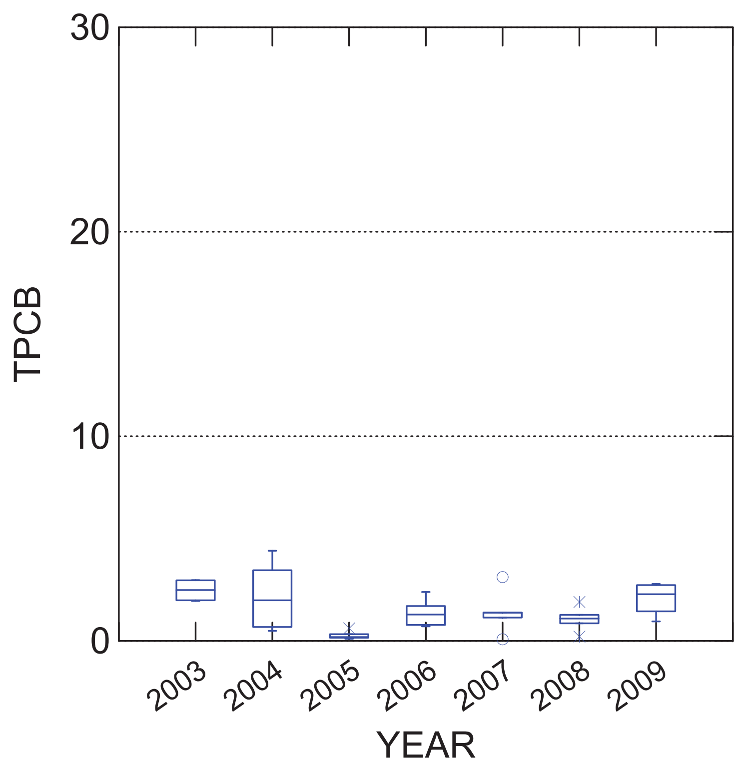
Hspread is comparable to the interquartile range. It is the absolute value of the difference between the values of the two hinges. The whiskers show the range of observed values that fall within the inner fences. Values between the inner and outer fences are plotted with asterisks. Values beyond the outer fences, called far outside values, are plotted with empty circles.

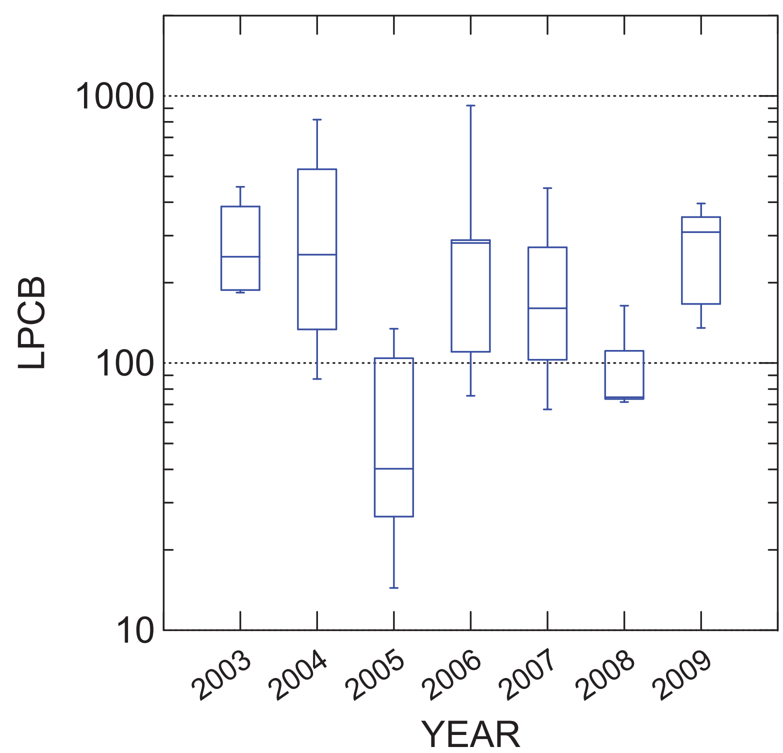
Yellow Perch (SF): FD1



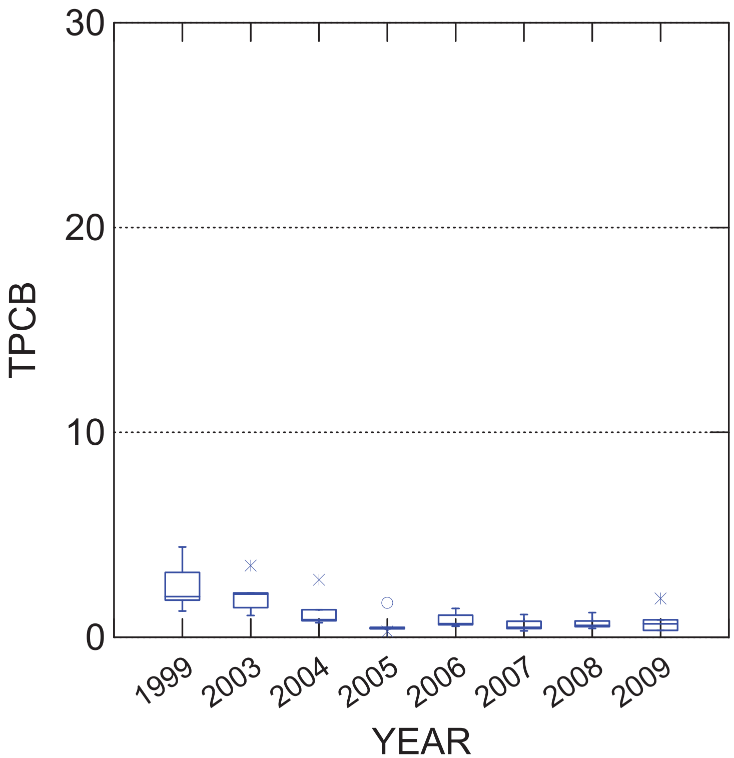


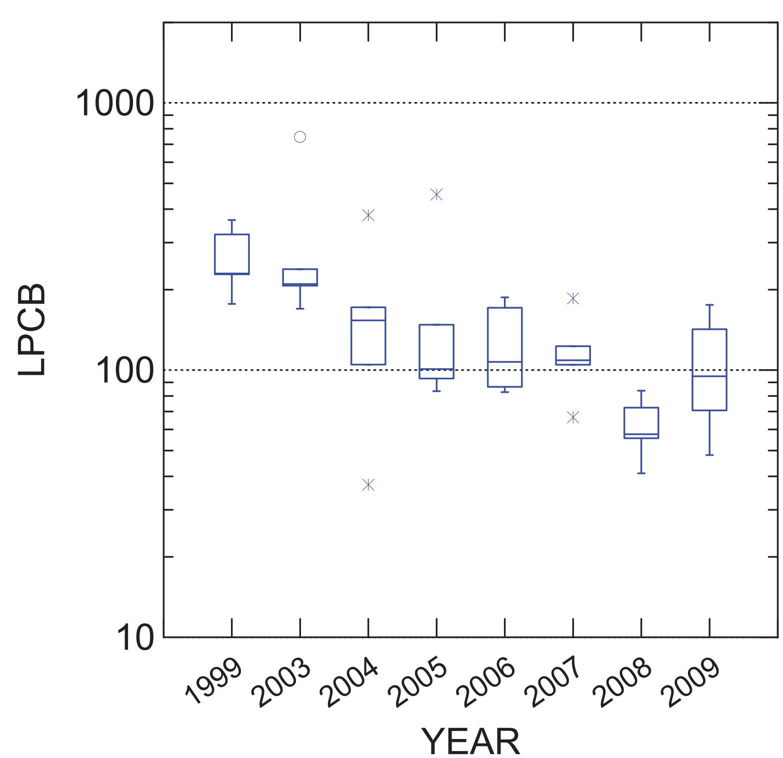
Yellow Perch (SF): TD1



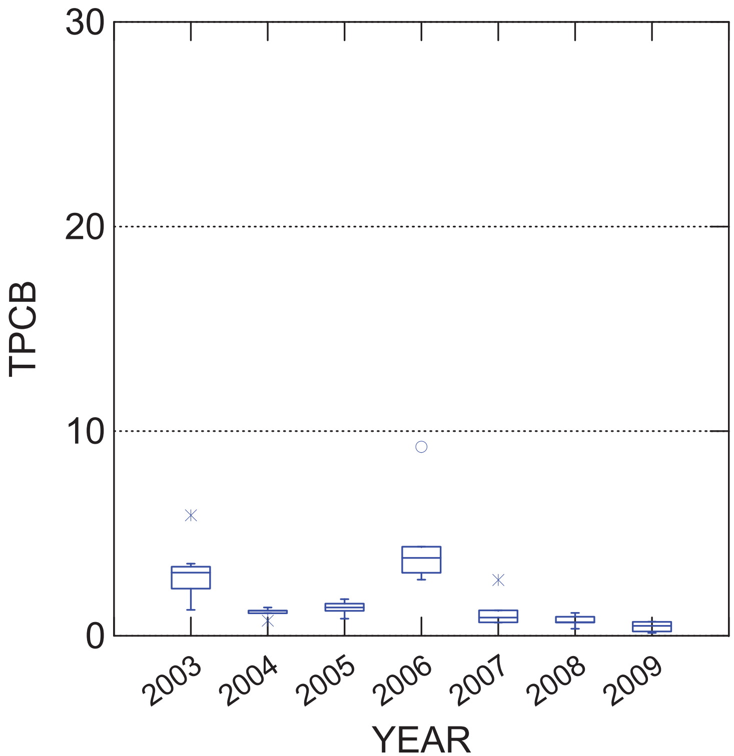


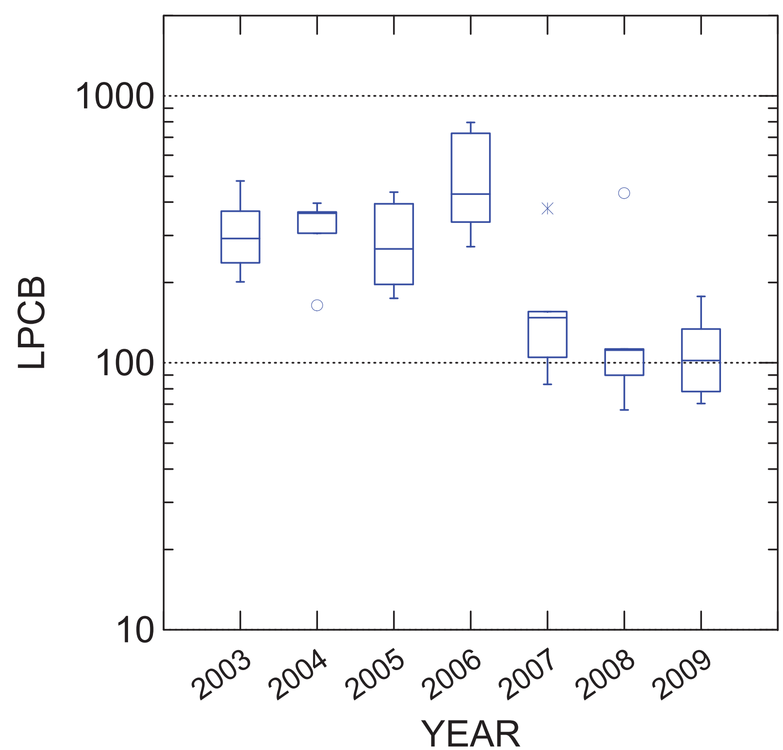
Yellow Perch (SF): TD2



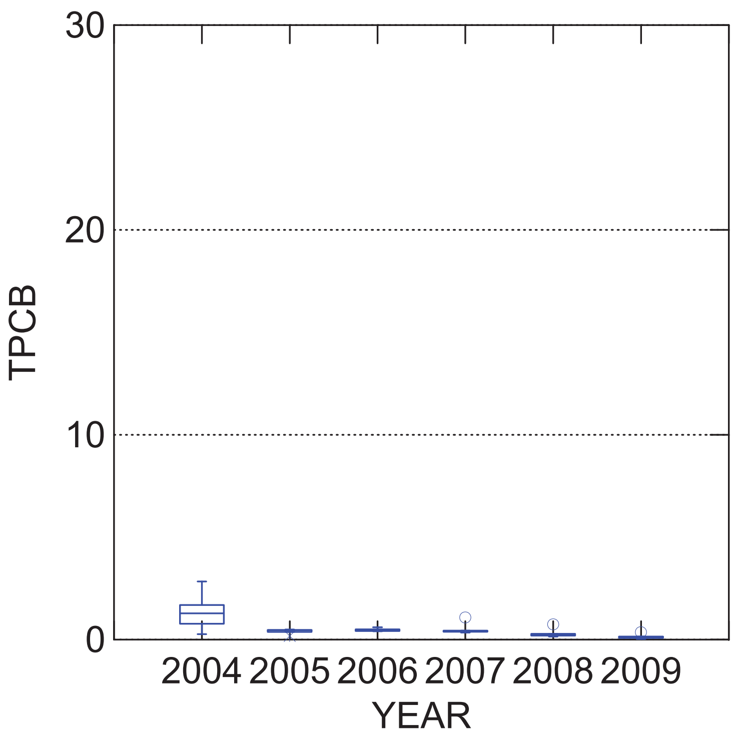


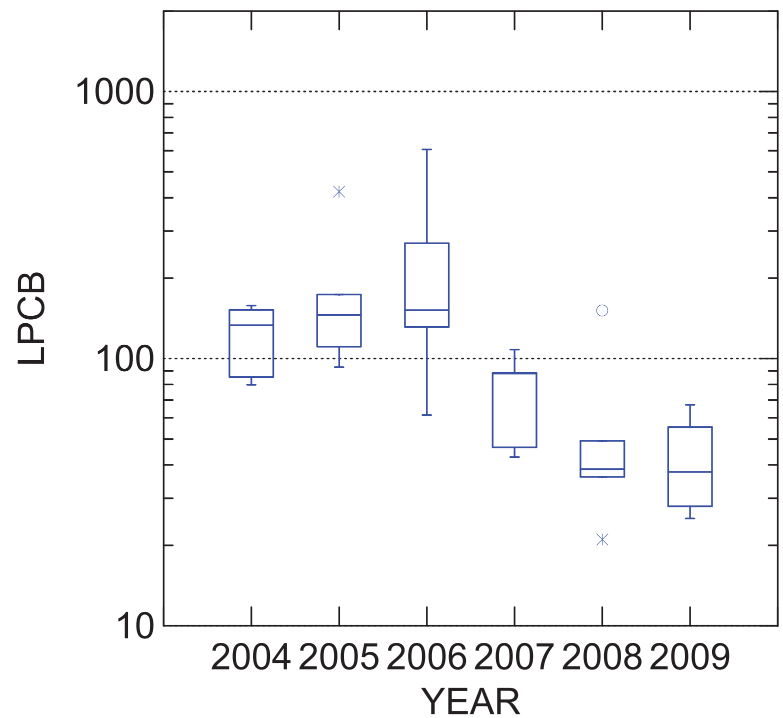
Yellow Perch (SF): TD3



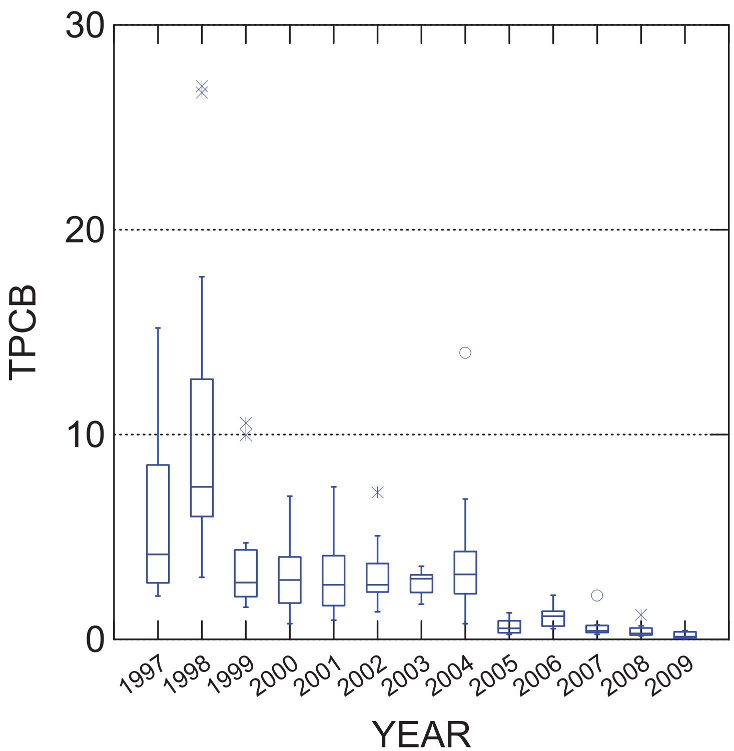


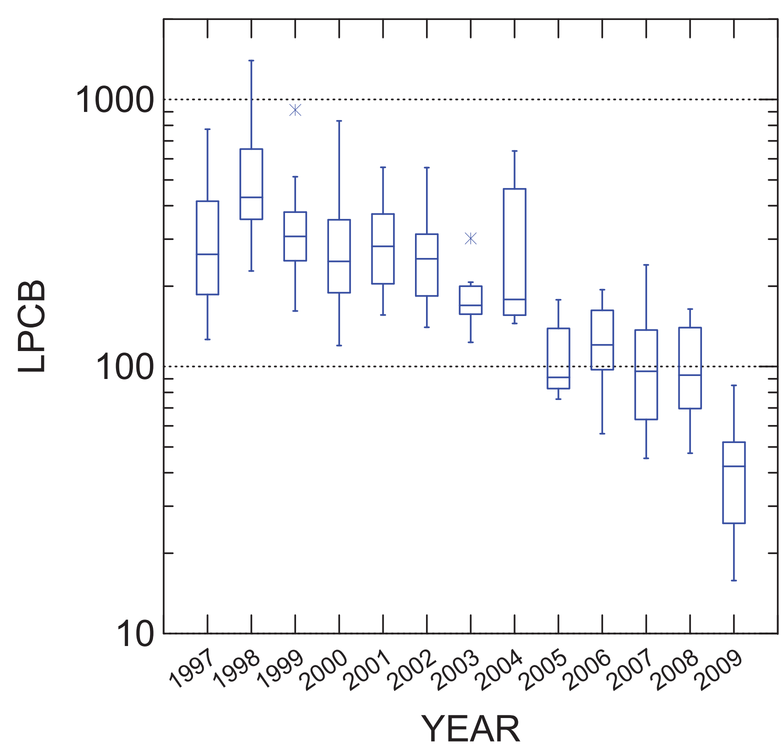
Yellow Perch (SF): TD4



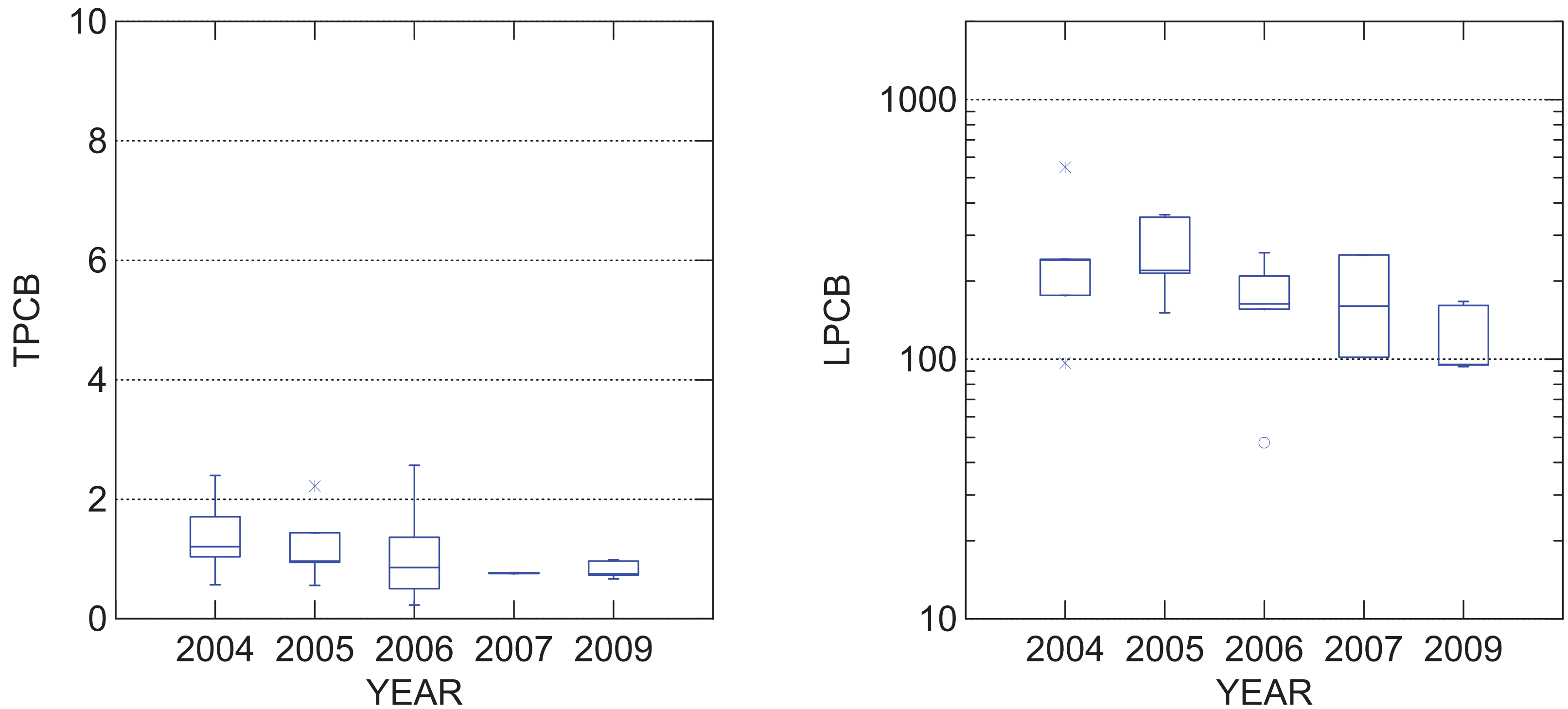


Yellow Perch (SF): TD5

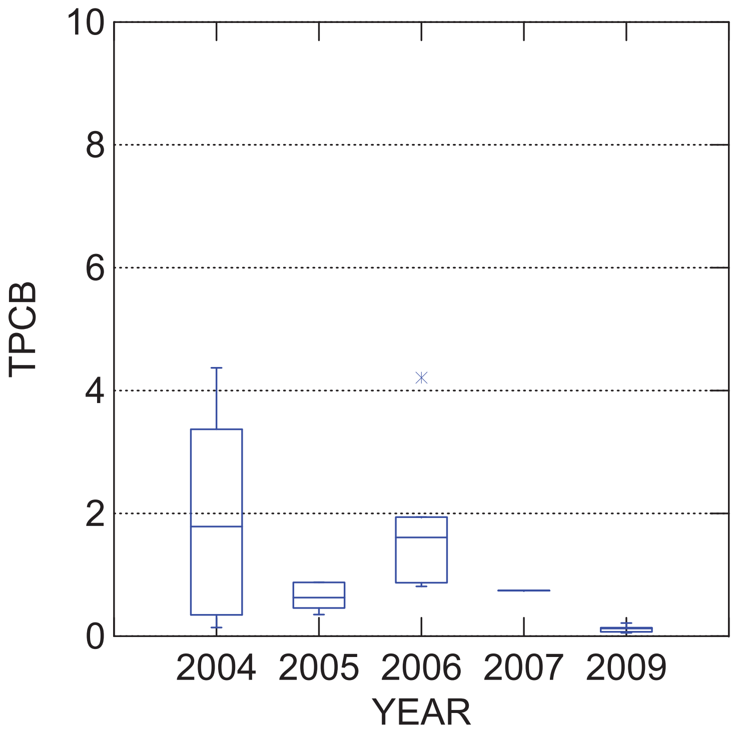


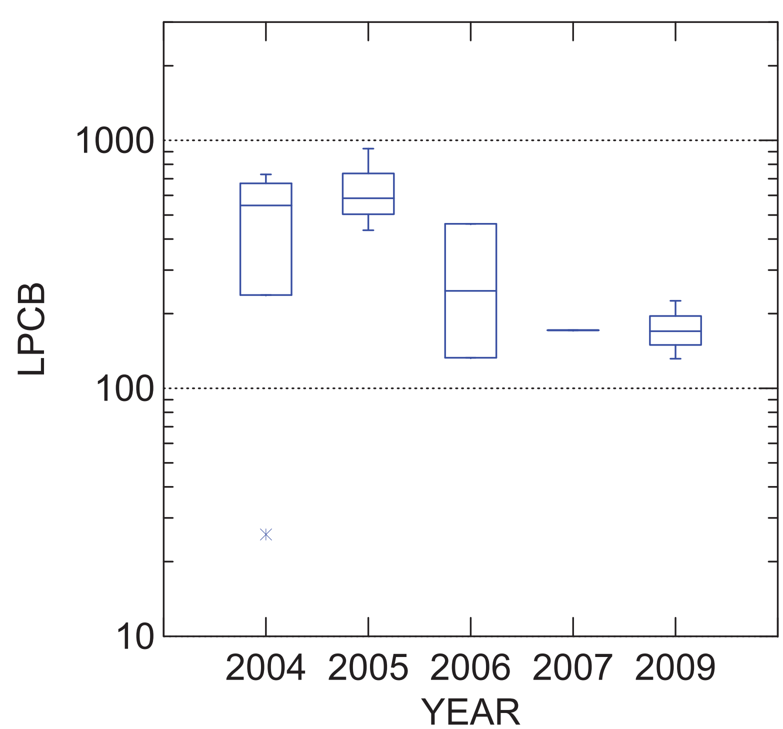


Yellow Perch (SF): ND1

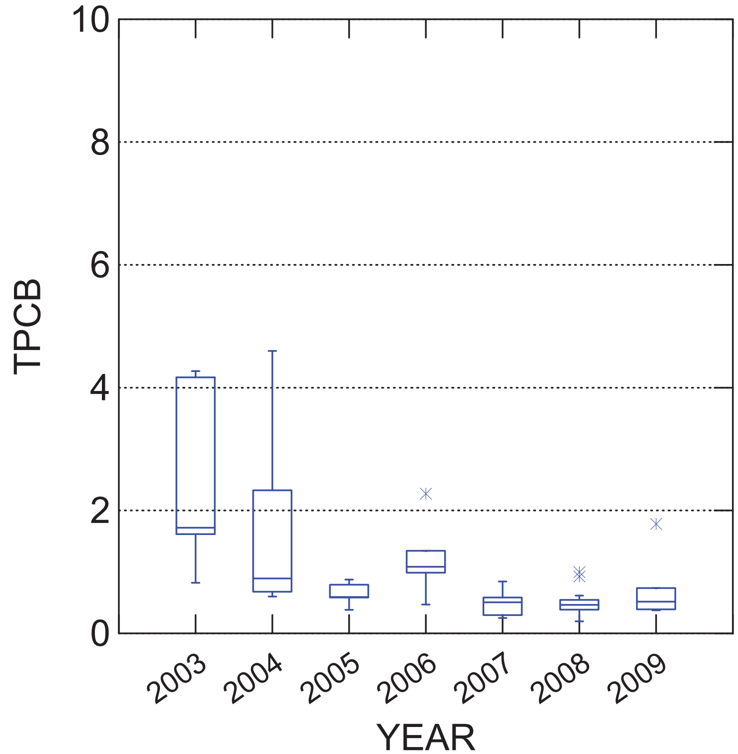


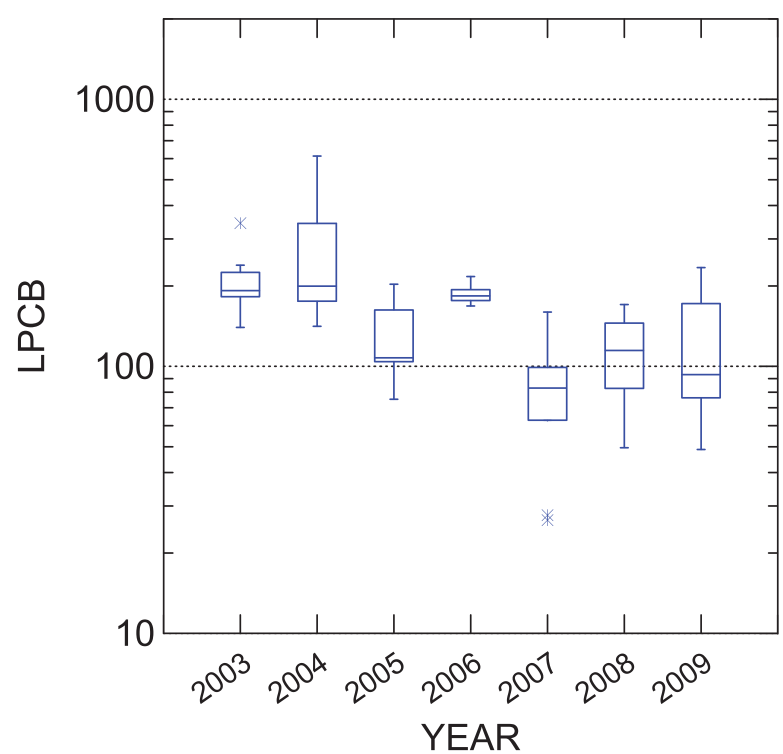
Yellow Perch (SF): ND2



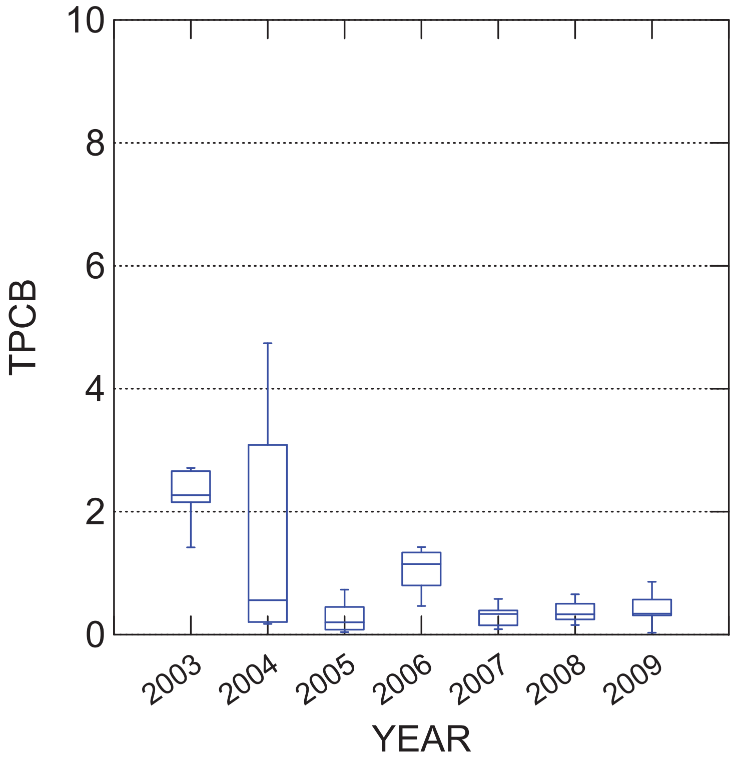


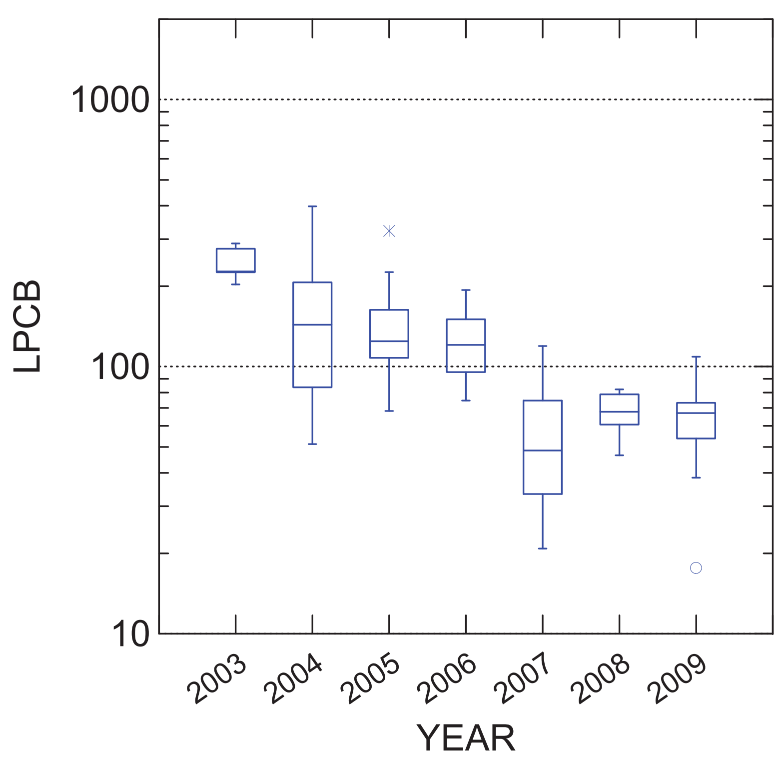
Yellow Perch (SF): ND3





Yellow Perch (SF): ND5





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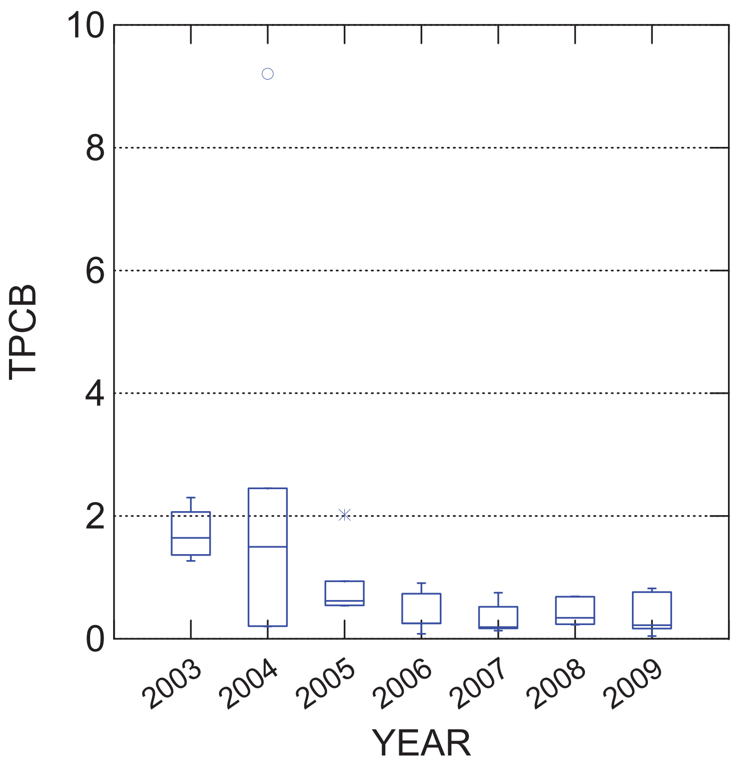

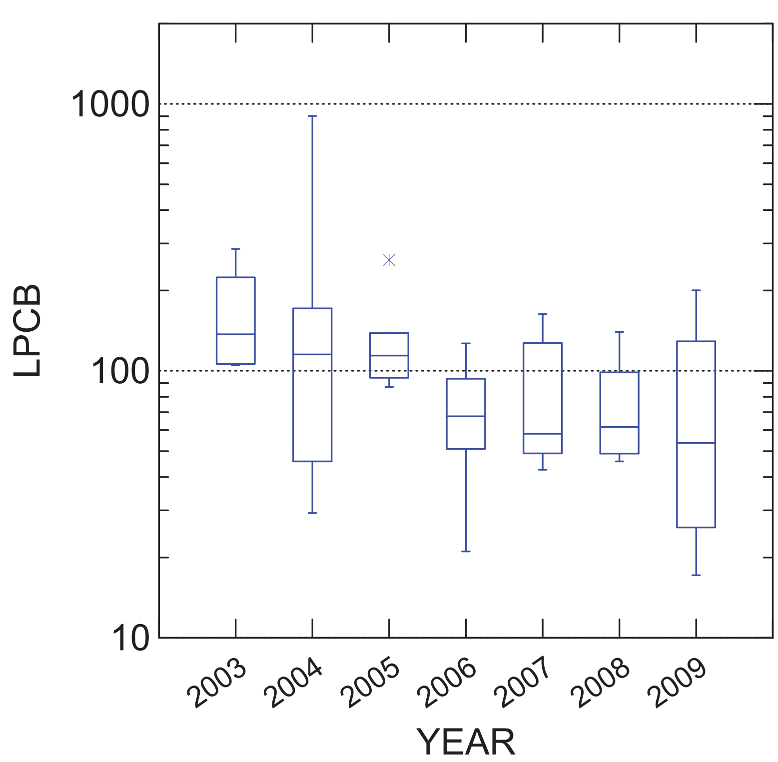

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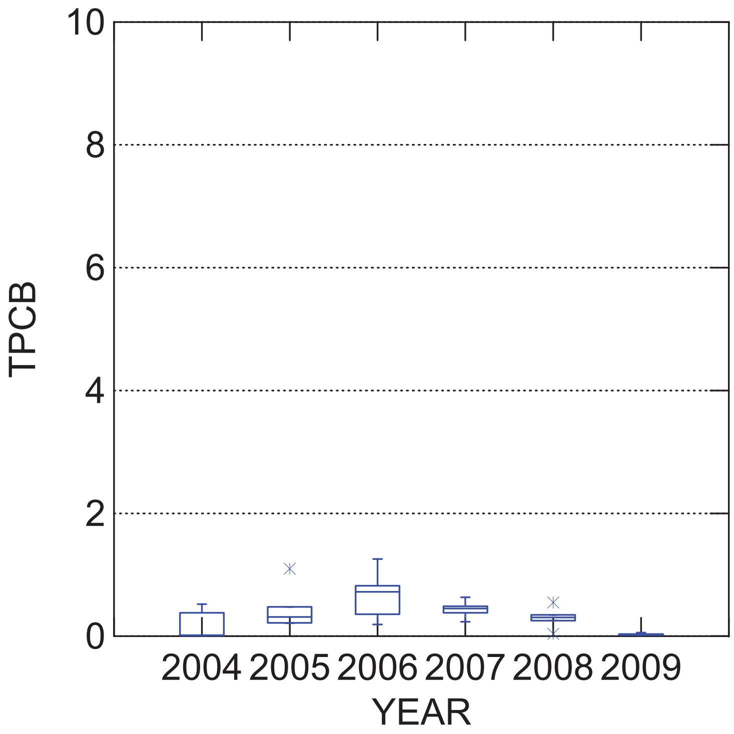

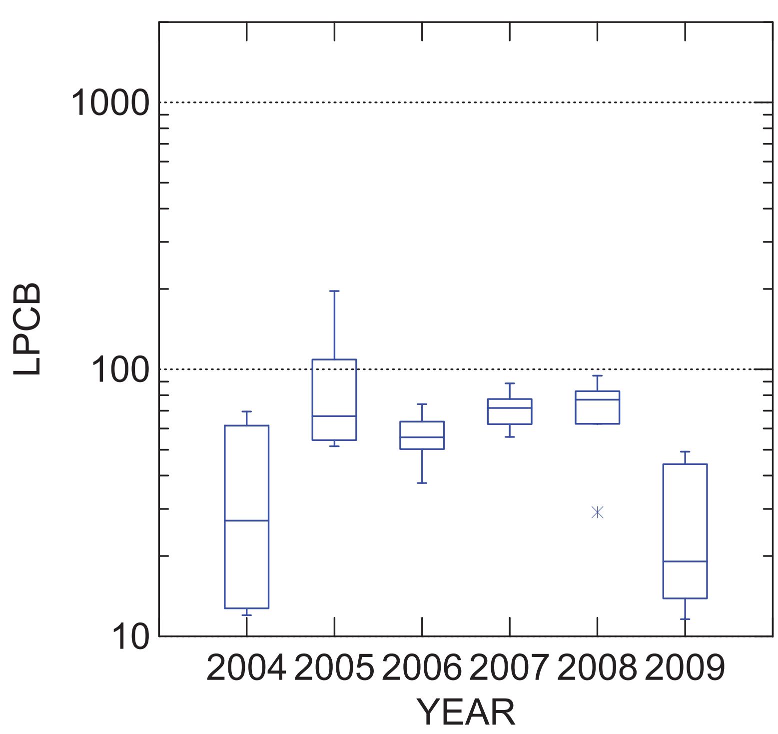

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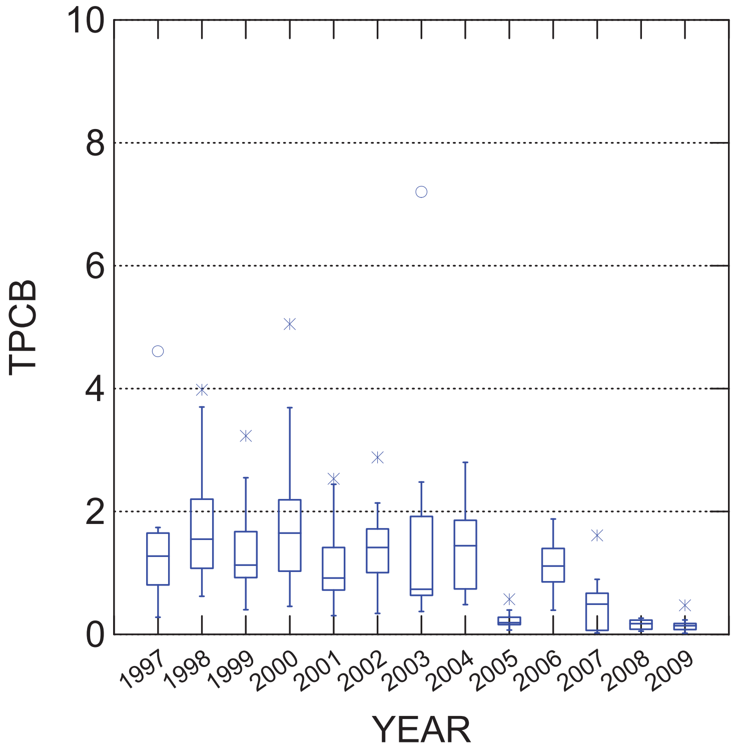

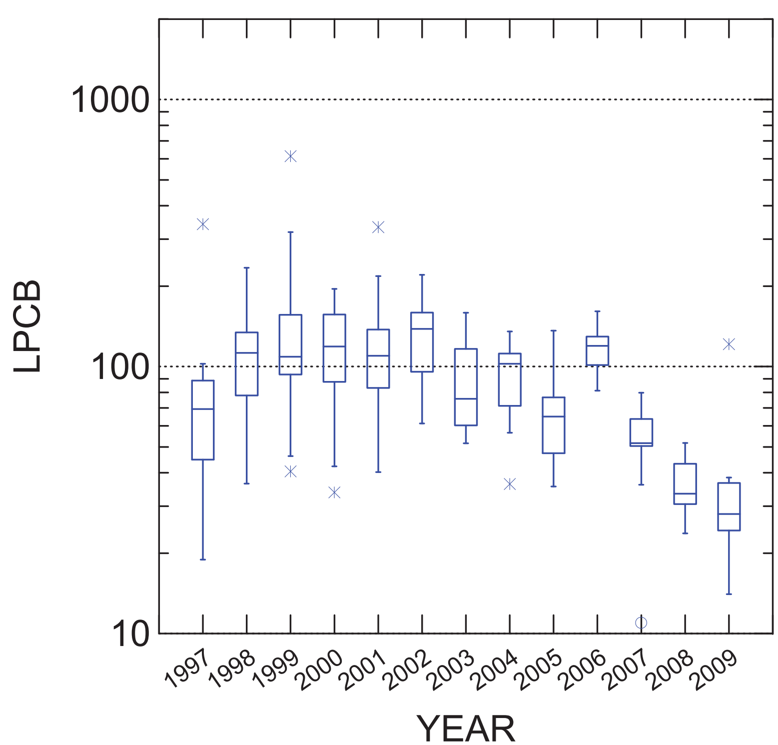

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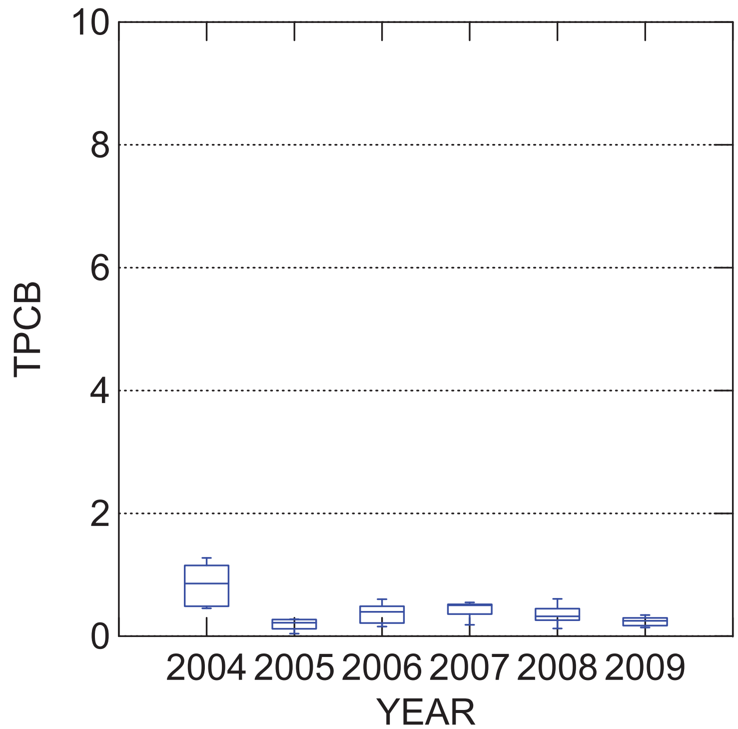
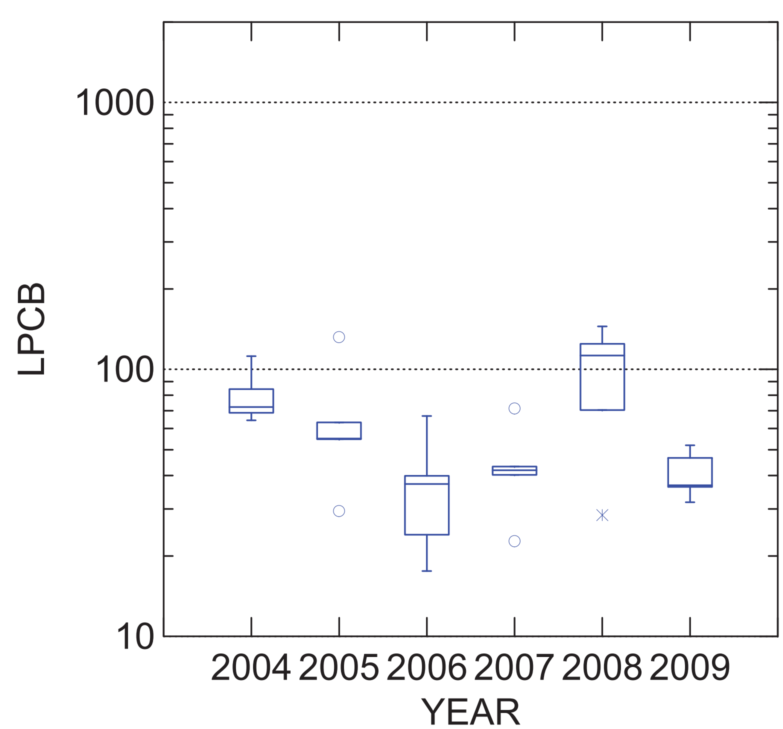
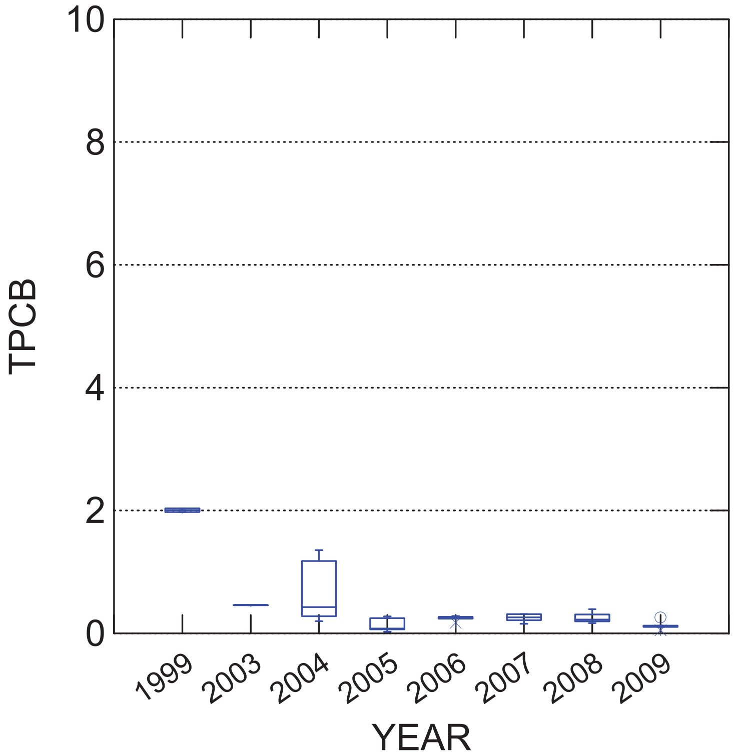
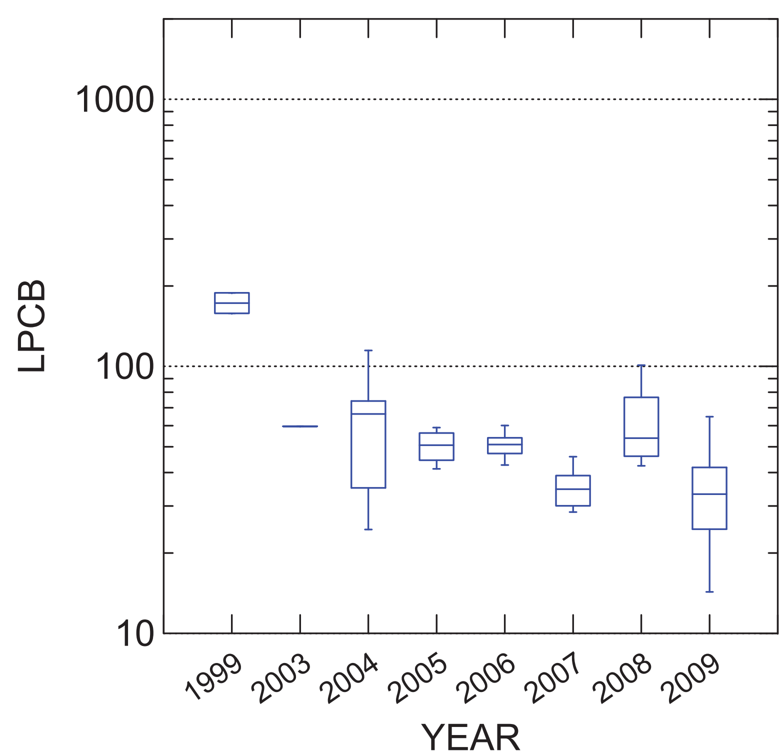


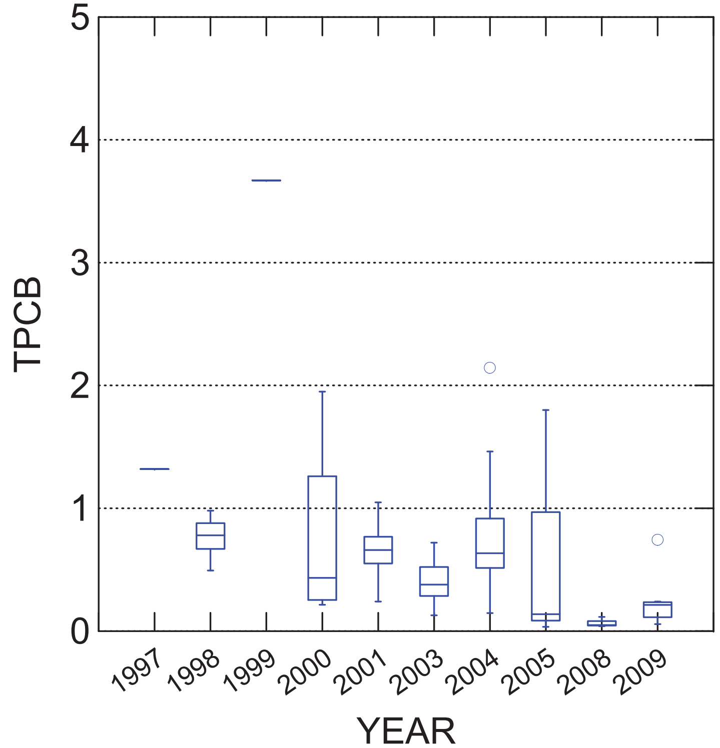


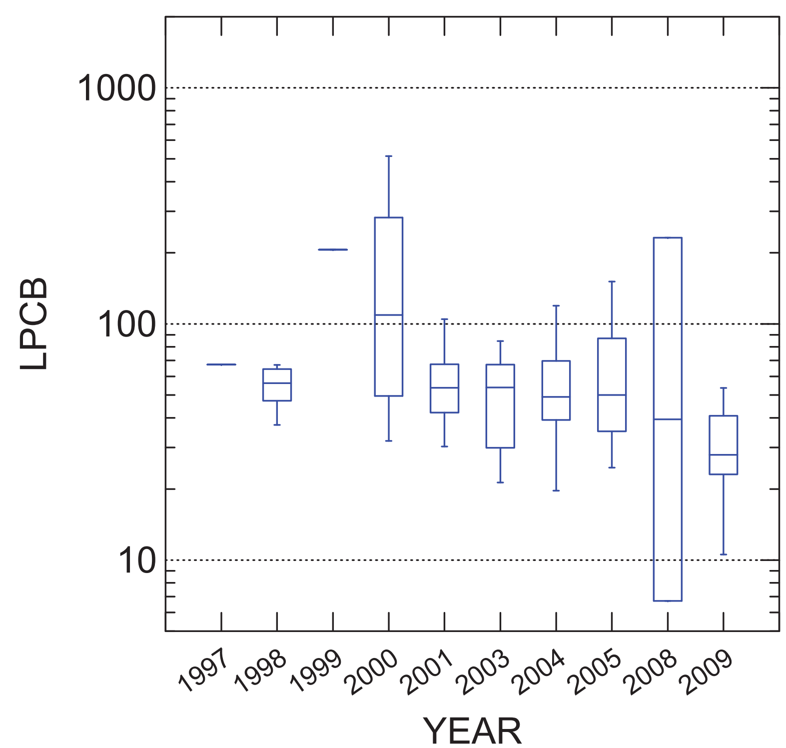
Yellow Perch (SF): SW5





Yellow Perch (SF): AT1





Appendix I-D-Attachment 5 Series

Box plots of PCBs in Pumpkinseed from the Hudson River

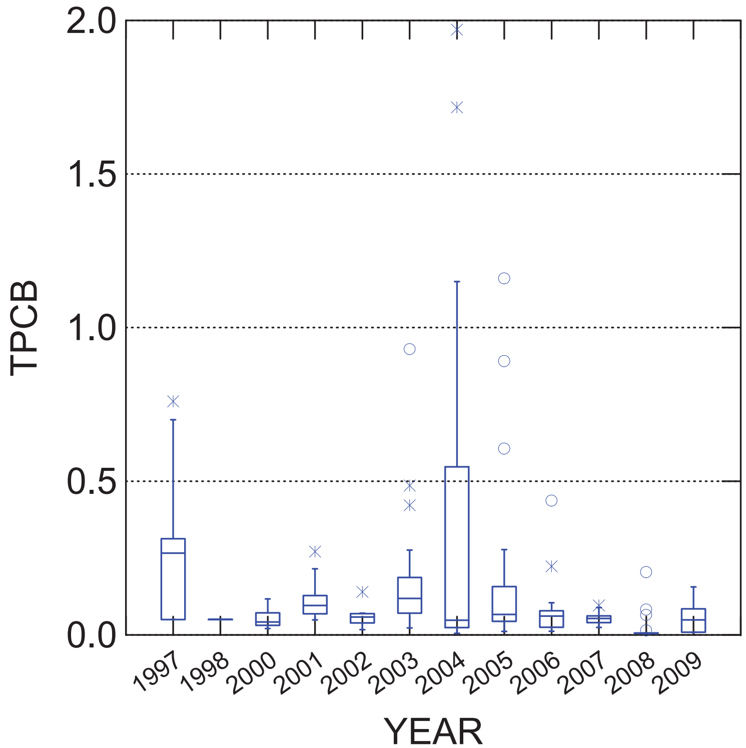
The data are shown by sampling station (one station per page). The left and right graphs on each page are total PCBs (TPCB; mg/kg) and lipid normalized total PCBs (LPCBs; mg/kg lipid), respectively.

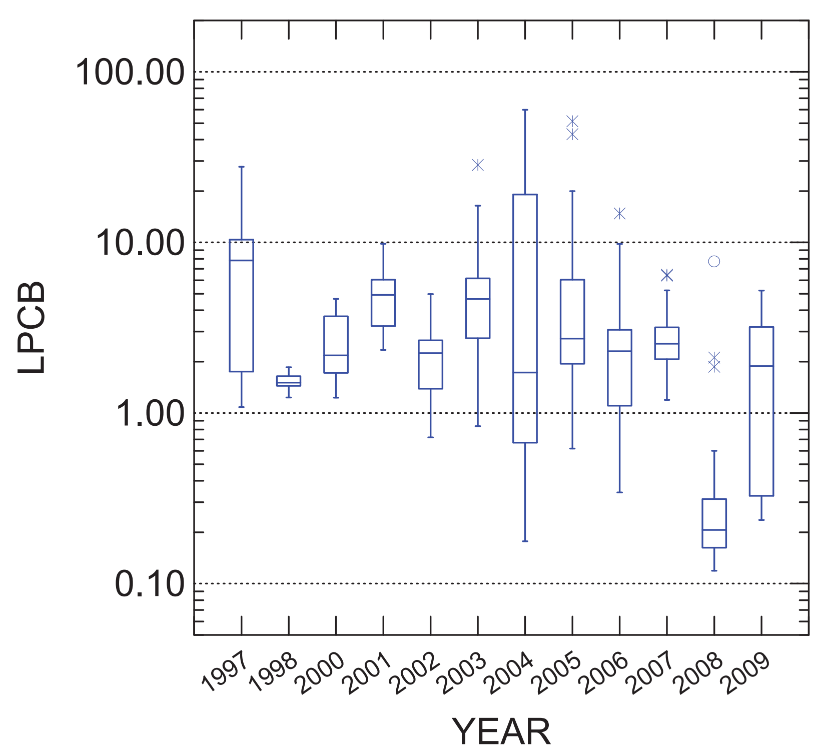
In the box plots, the center vertical line marks the median of the sample. The length of each box shows the range within which the central 50% of the values fall, with the box edges (or hinges) at the first and third quartiles (i.e., 25^{th} and 75^{th}% quartiles). Fences define outside and far outside values and are defined as follows:

Lower inner fence = lower hinge - (1.5 • (Hspread))
Upper inner fence = upper hinge + (1.5 • (Hspread))
Lower outer fence = lower hinge - (3 • (Hspread))
Upper outer fence = upper hinge + (3 • (Hspread))

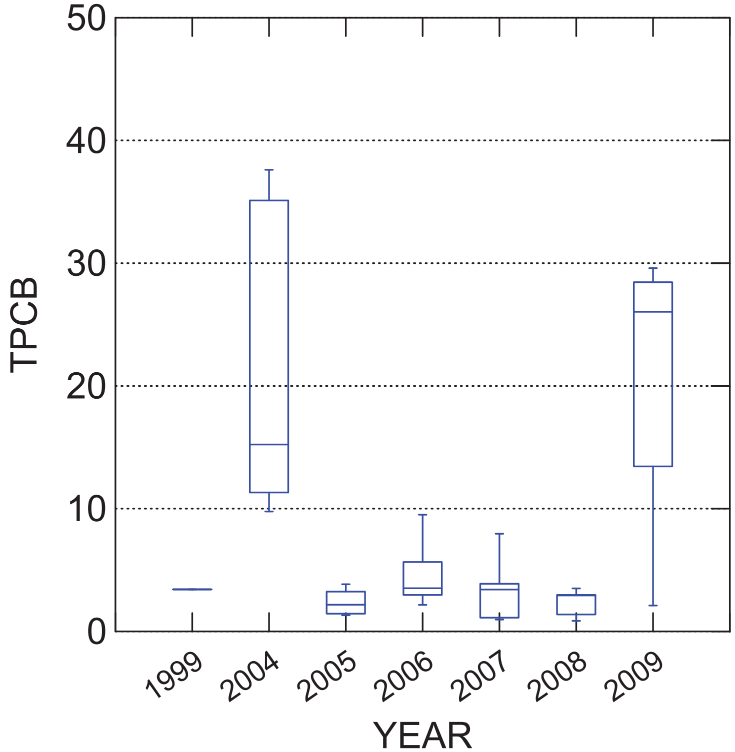
Hspread is comparable to the interquartile range. It is the absolute value of the difference between the values of the two hinges. The whiskers show the range of observed values that fall within the inner fences. Values between the inner and outer fences are plotted with asterisks. Values beyond the outer fences, called far outside values, are plotted with empty circles.

Pumpkinseed (WH): FD1

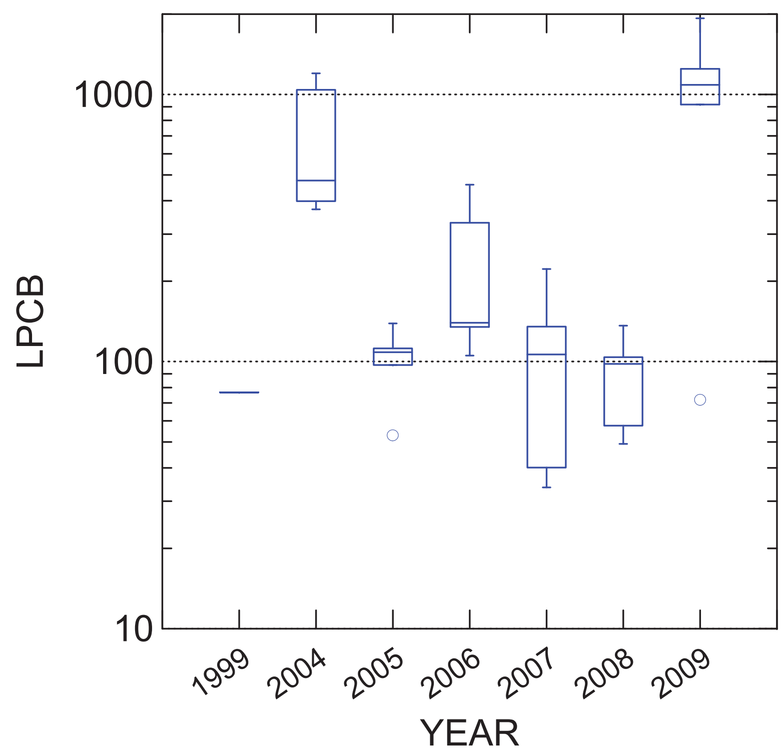




PKSD (WH): TD1

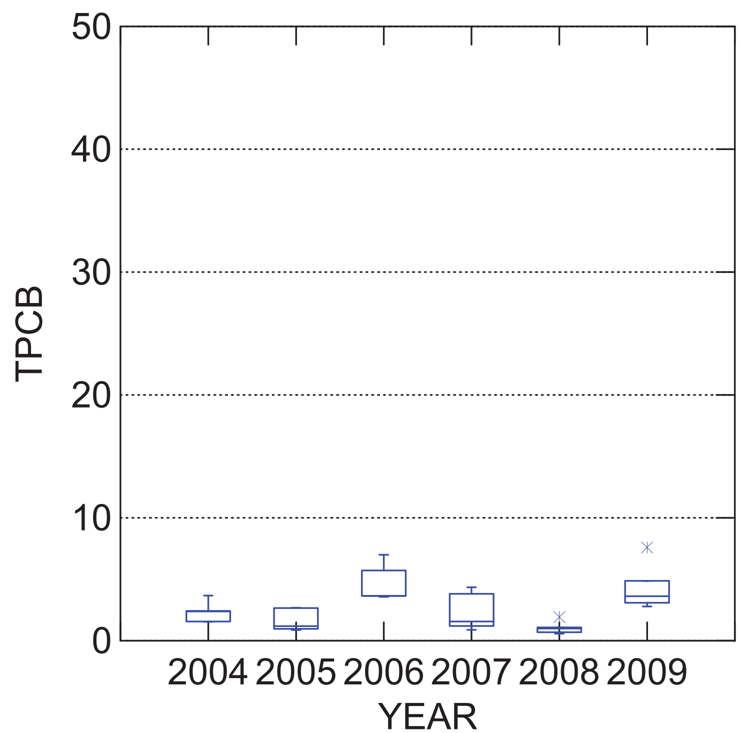


50
40
30
20
10
0
TPCB
1999
2004
2005
2006
2007
2008
2009
YEAR



1000
100
10
LPCB
1999
2004
2005
2006
2007
2008
2009
YEAR

PKSD (WH): TD2


50
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10
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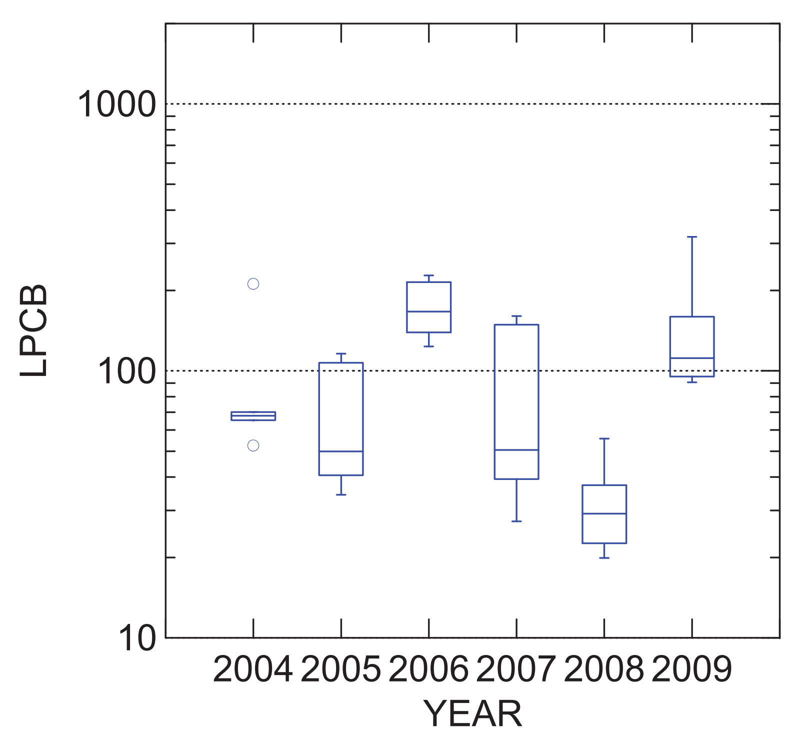
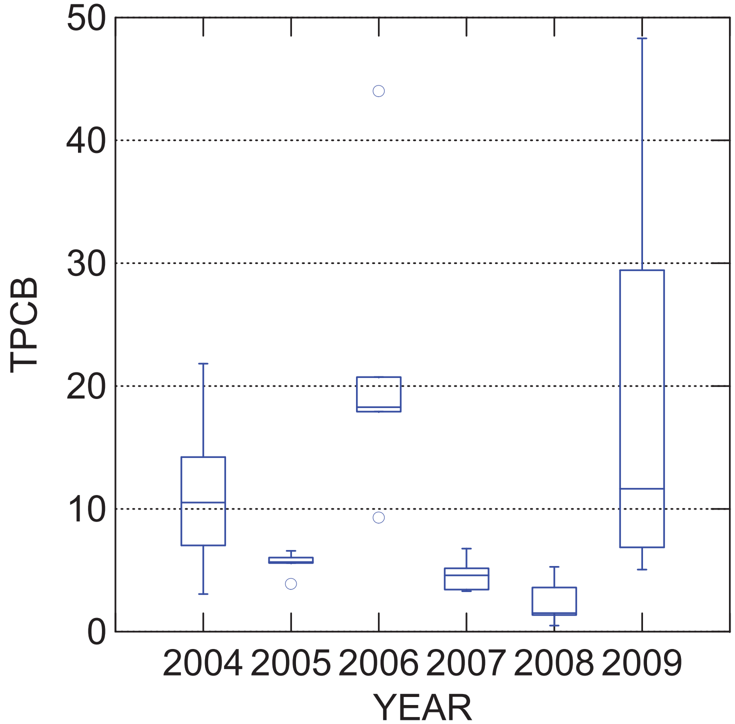
TPCB
2004 2005 2006 2007 2008 2009
YEAR


1000
100
10
LPCB
2004 2005 2006 2007 2008 2009
YEAR

PKSD (WH): TD3



TPCB
0
10
20
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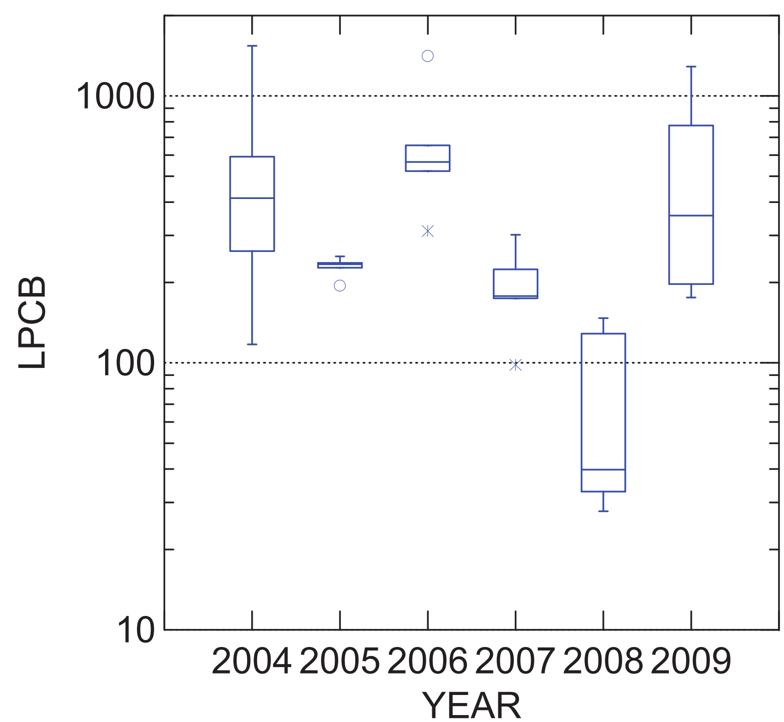
2004 2005 2006 2007 2008 2009
YEAR



LPCB
10
100
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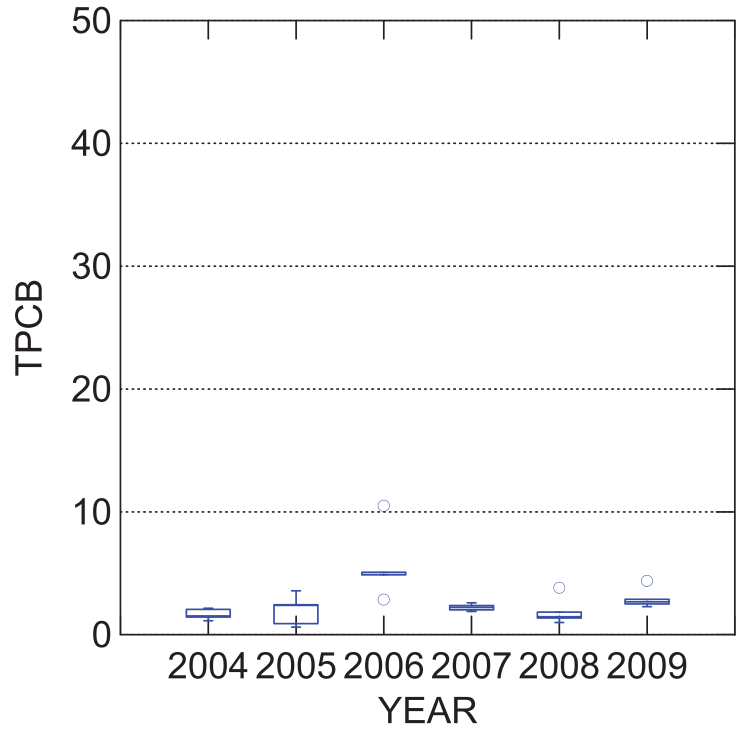
2004 2005 2006 2007 2008 2009
YEAR

PKSD (WH): TD4



TPCB
50
40
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10
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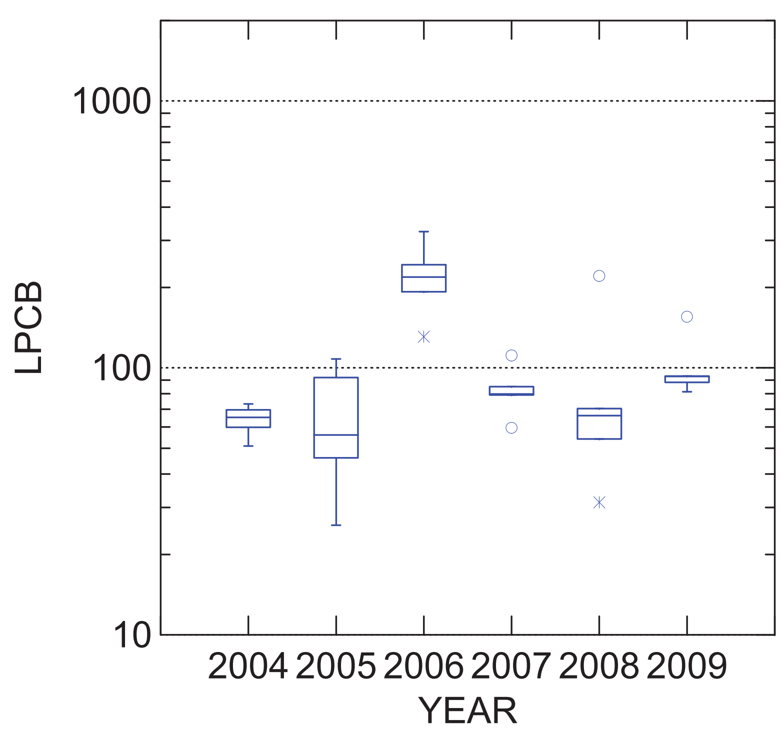
2004 2005 2006 2007 2008 2009
YEAR



LPCB
1000
100
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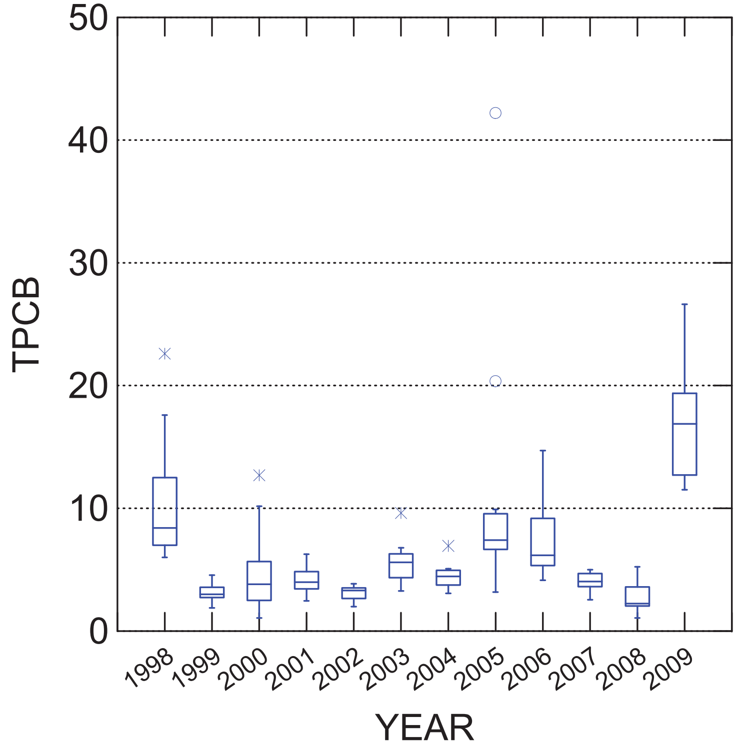
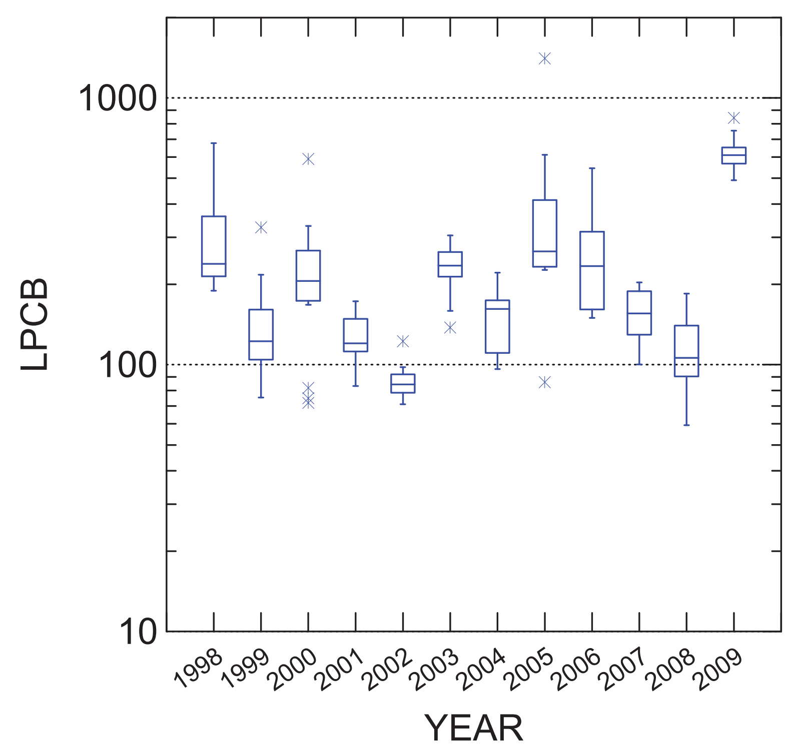
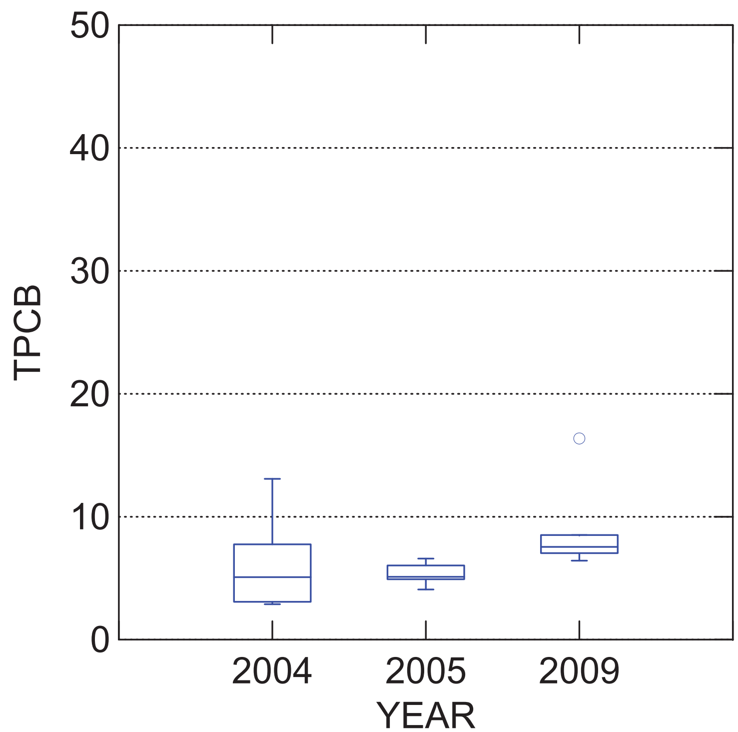
2004 2005 2006 2007 2008 2009
YEAR

PKSD (WH): TD5


TPCB
50
40
30
20
10
0
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
YEAR


LPCB
1000
100
10
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
YEAR

PKSD (WH): ND1



TPCB
50
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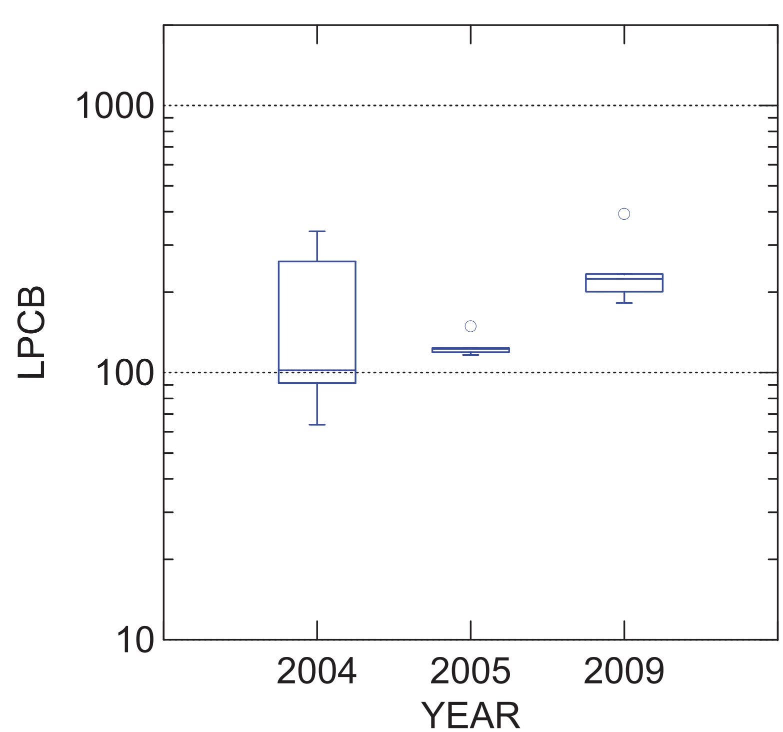
2004
2005
2009
YEAR



LPCB
1000
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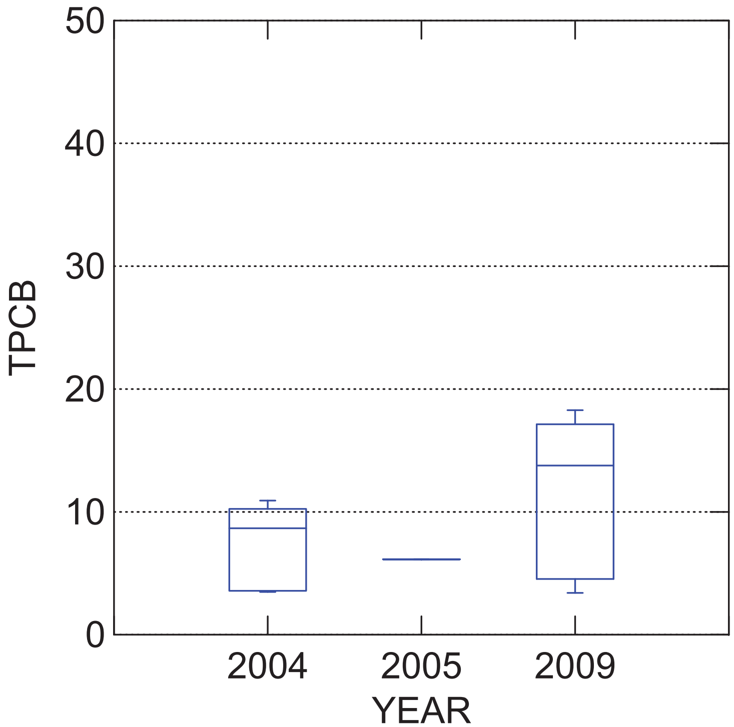
2004
2005
2009
YEAR

PKSD (WH): ND2



TPCB
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2004
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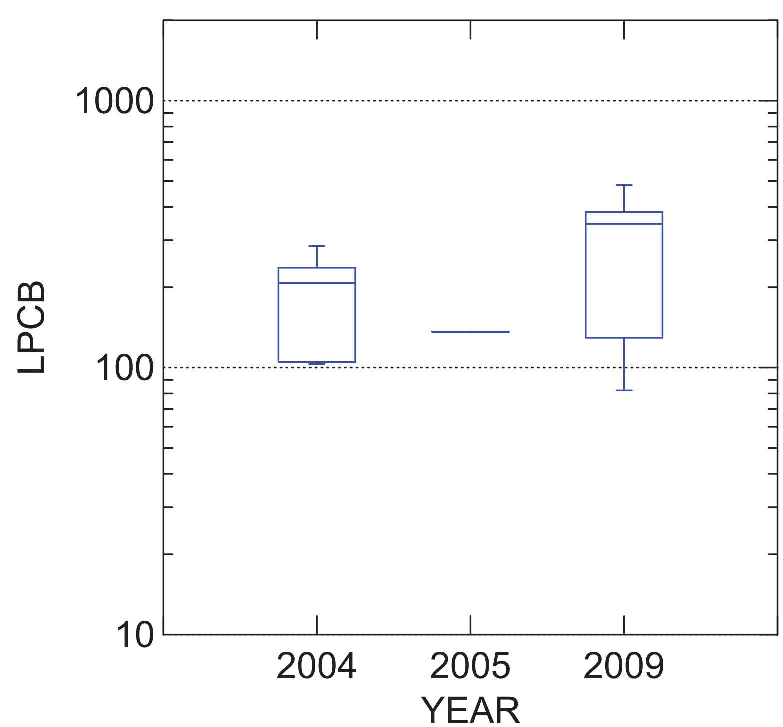
2009
YEAR



LPCB
1000
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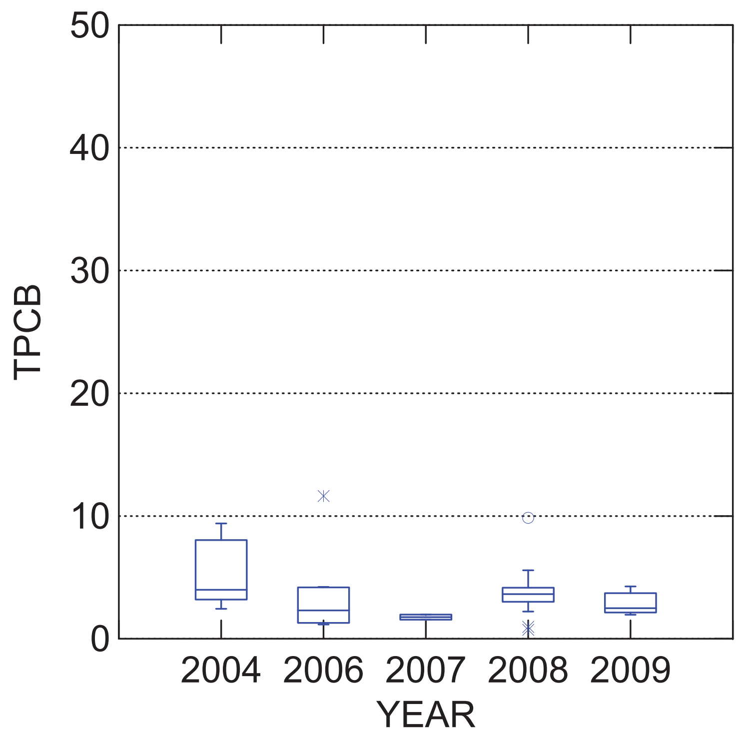
2004
2005
2009
YEAR

PKSD (WH): ND3



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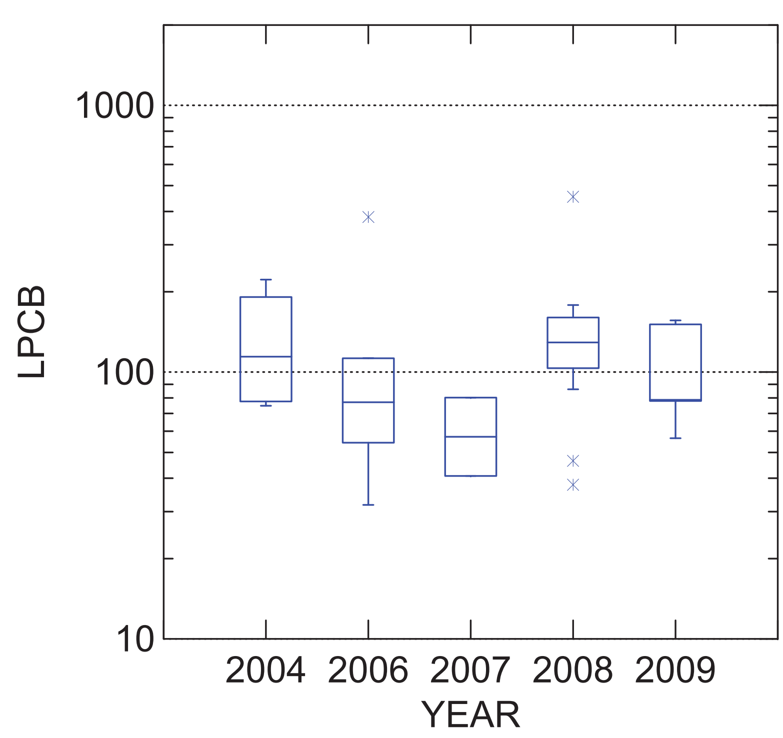
TPCB
2004 2006 2007 2008 2009
YEAR



1000
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LPCB
2004 2006 2007 2008 2009
YEAR

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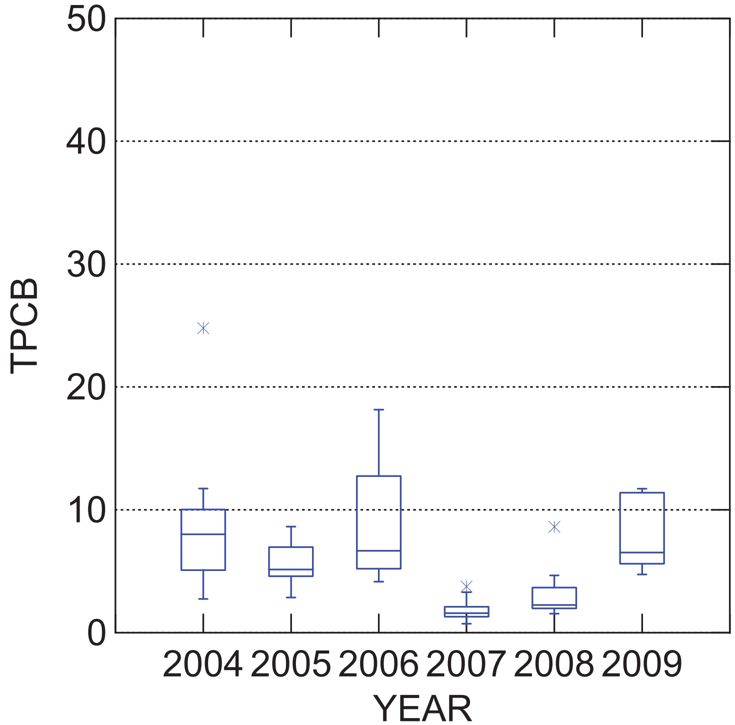

TPCB
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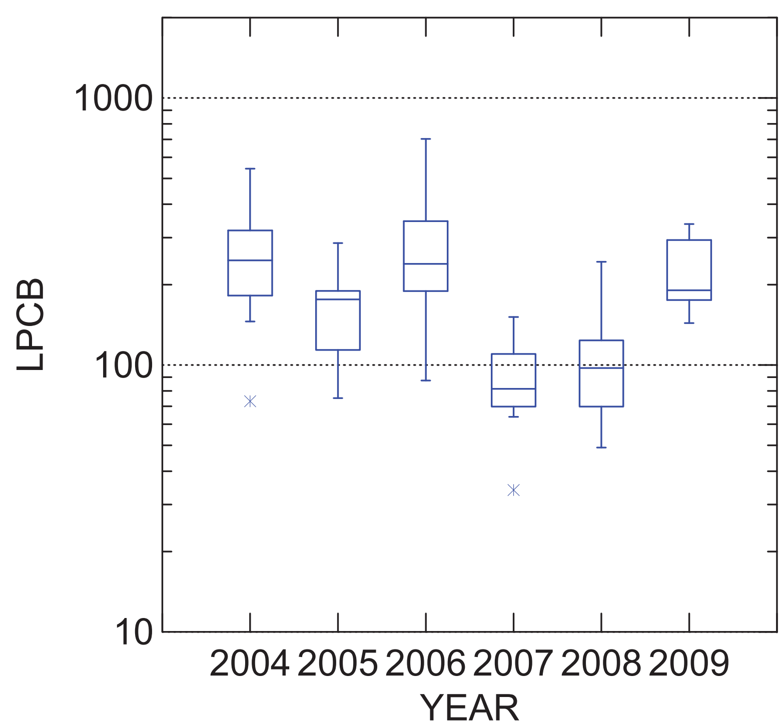
YEAR



LPCB
1000
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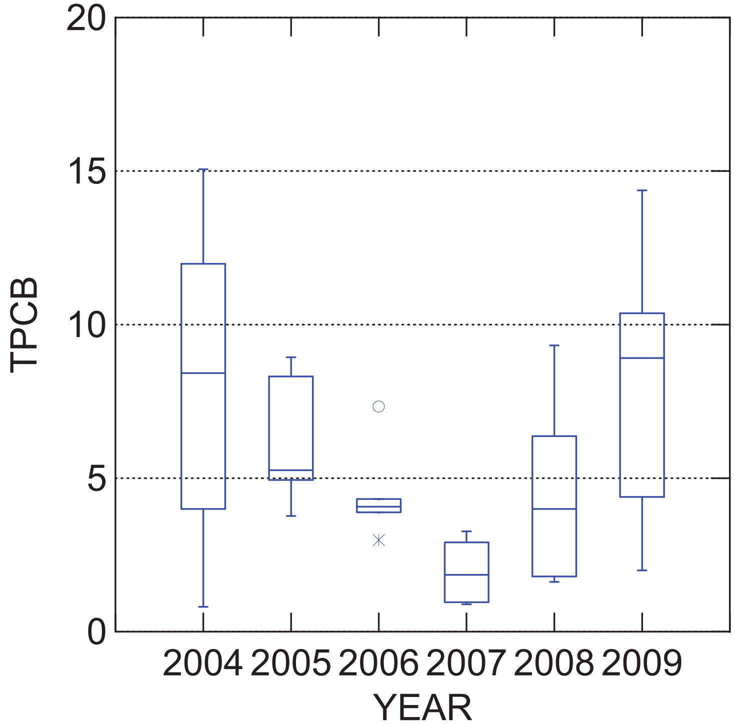
2004 2005 2006 2007 2008 2009
YEAR

PKSD (WH): SW1



20
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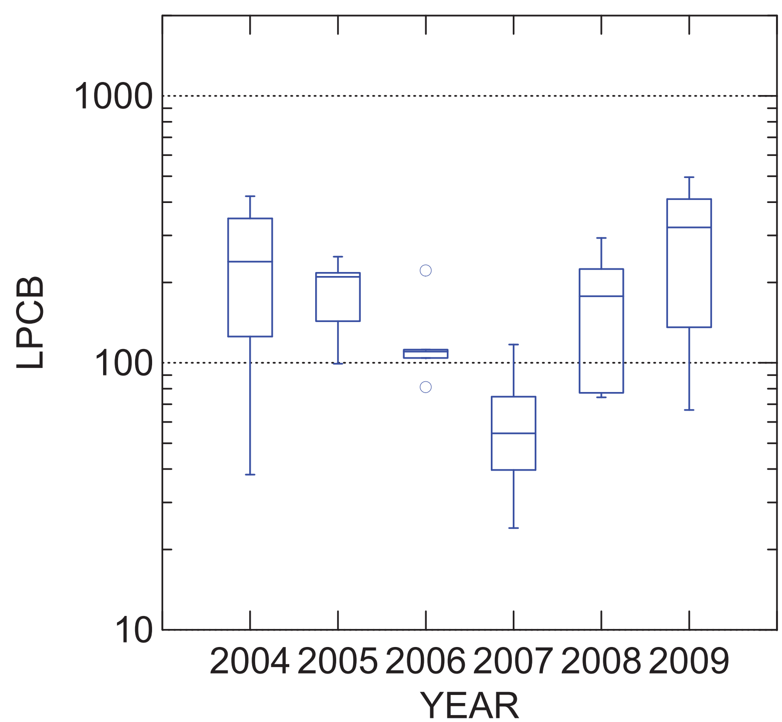
TPCB
2004 2005 2006 2007 2008 2009
YEAR



1000
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LPCB
2004 2005 2006 2007 2008 2009
YEAR

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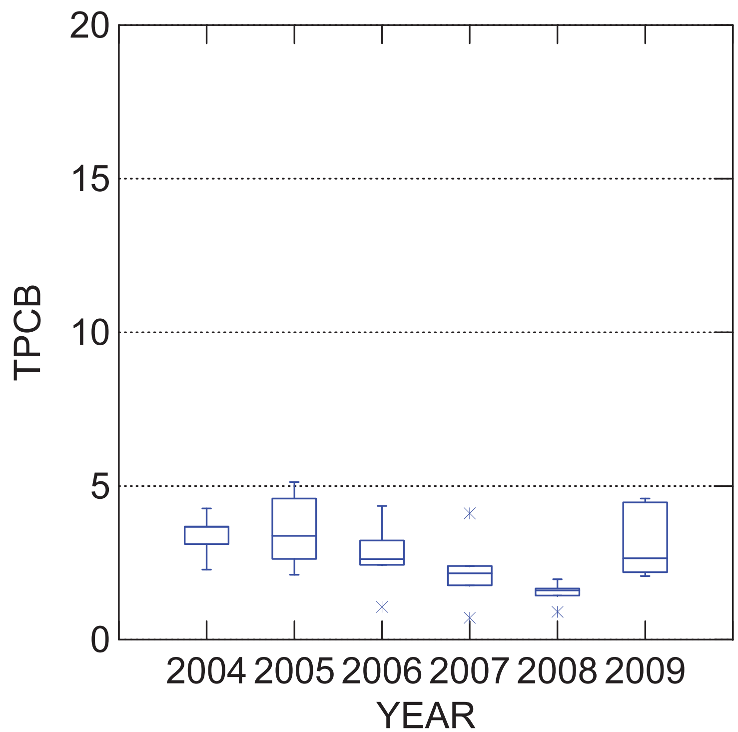

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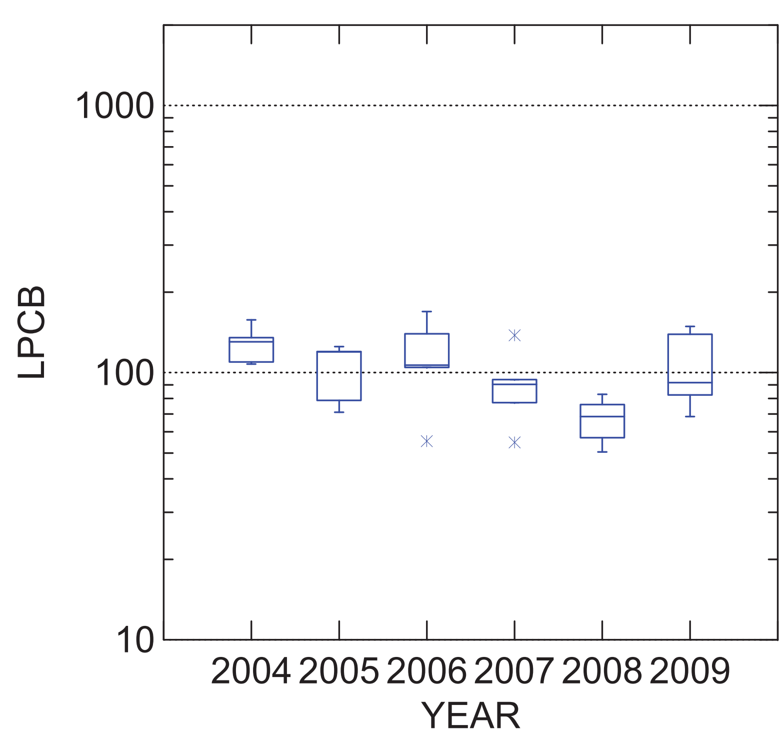
TPCB
2004 2005 2006 2007 2008 2009
YEAR



1000
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LPCB
2004 2005 2006 2007 2008 2009
YEAR

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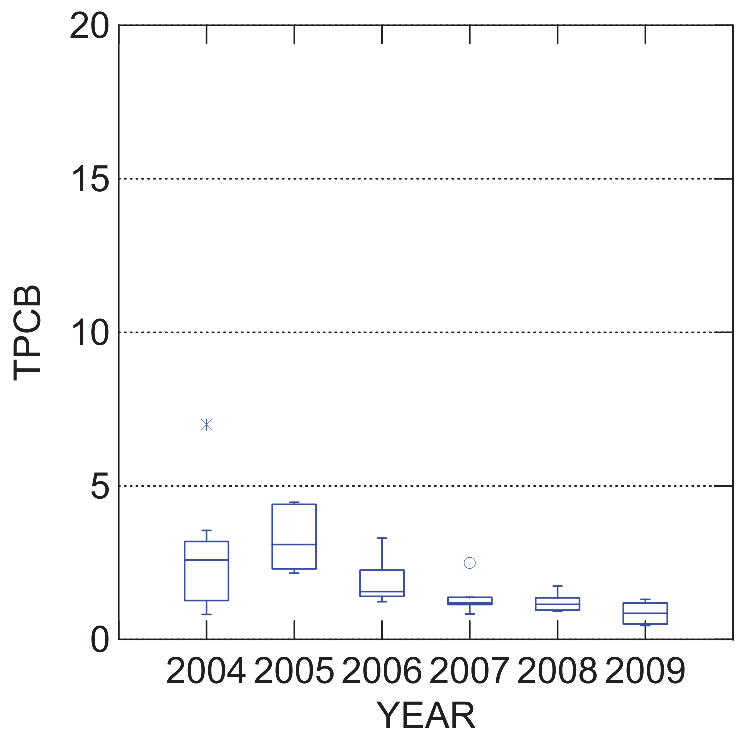

20
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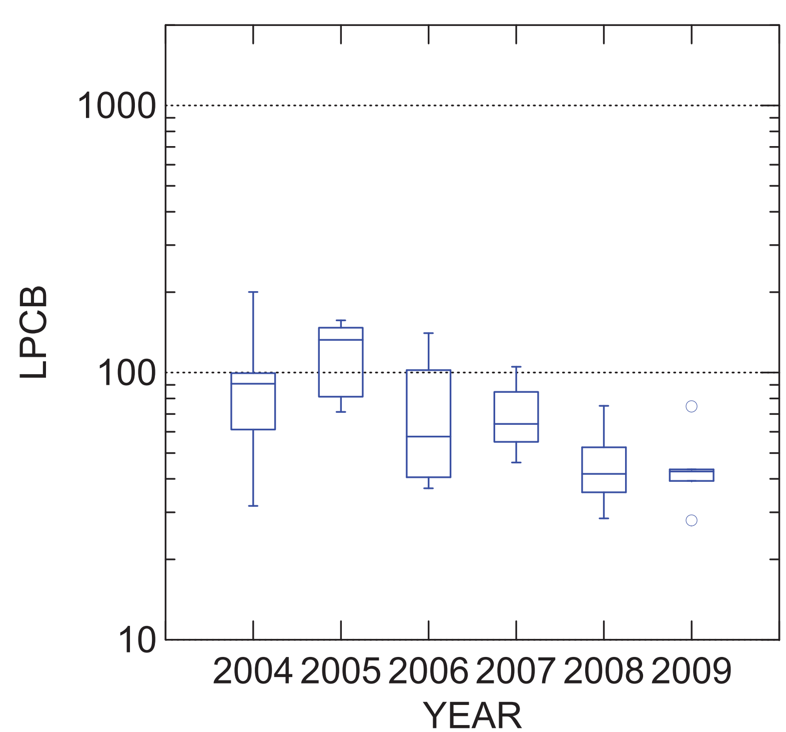
TPCB
2004 2005 2006 2007 2008 2009
YEAR



1000
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LPCB
2004 2005 2006 2007 2008 2009
YEAR

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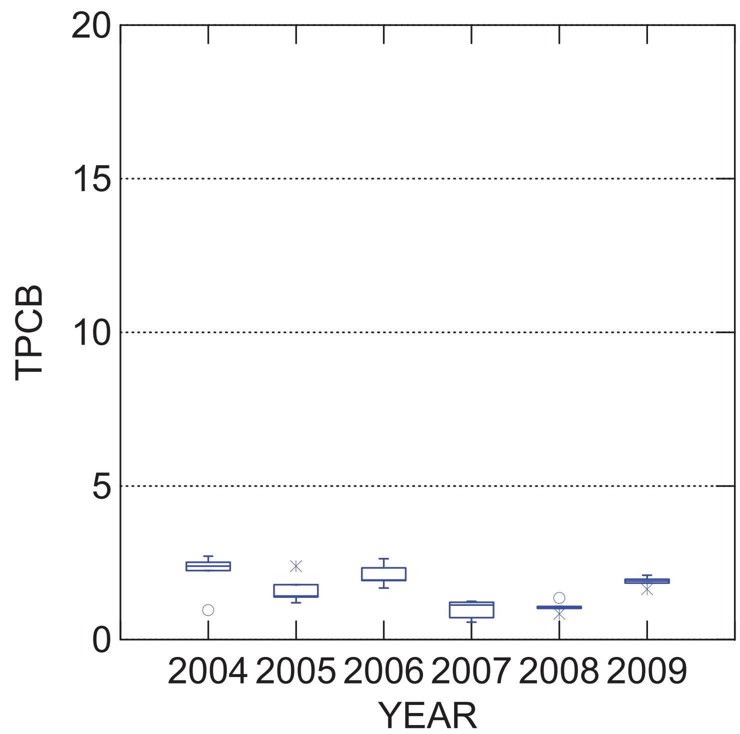
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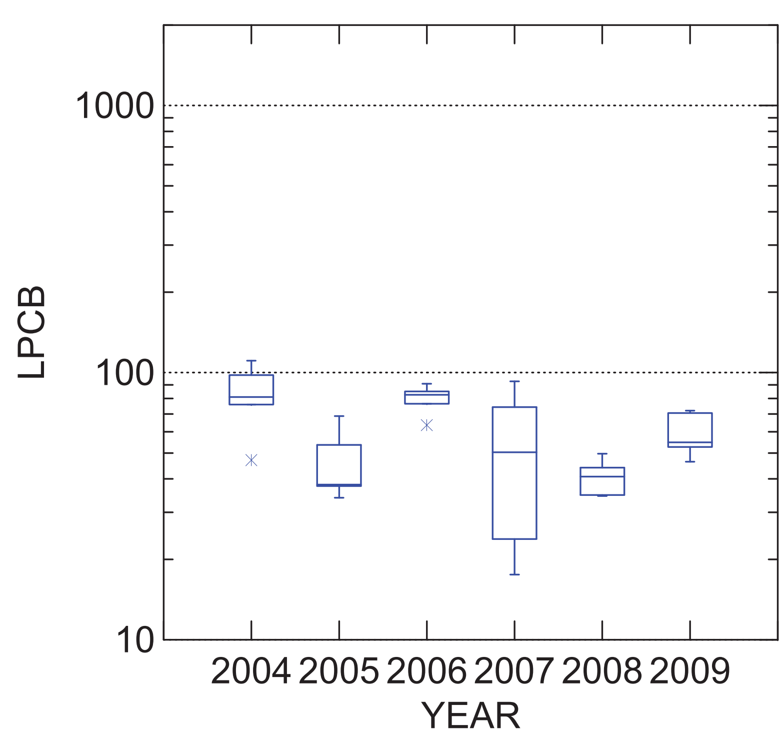
TPCB
2004 2005 2006 2007 2008 2009
YEAR


1000
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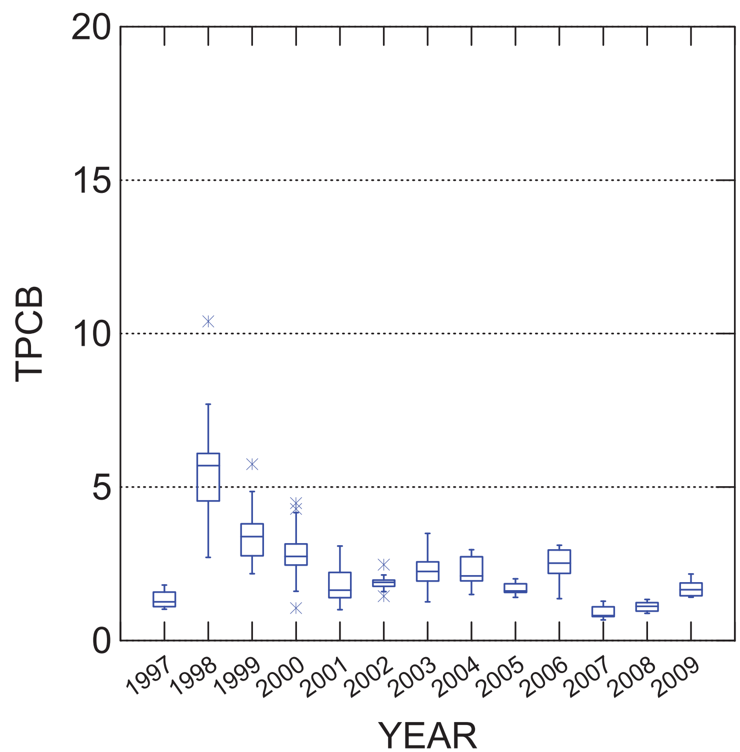
LPCB
2004 2005 2006 2007 2008 2009
YEAR

PKSD (WH): SW5



TPCB
YEAR
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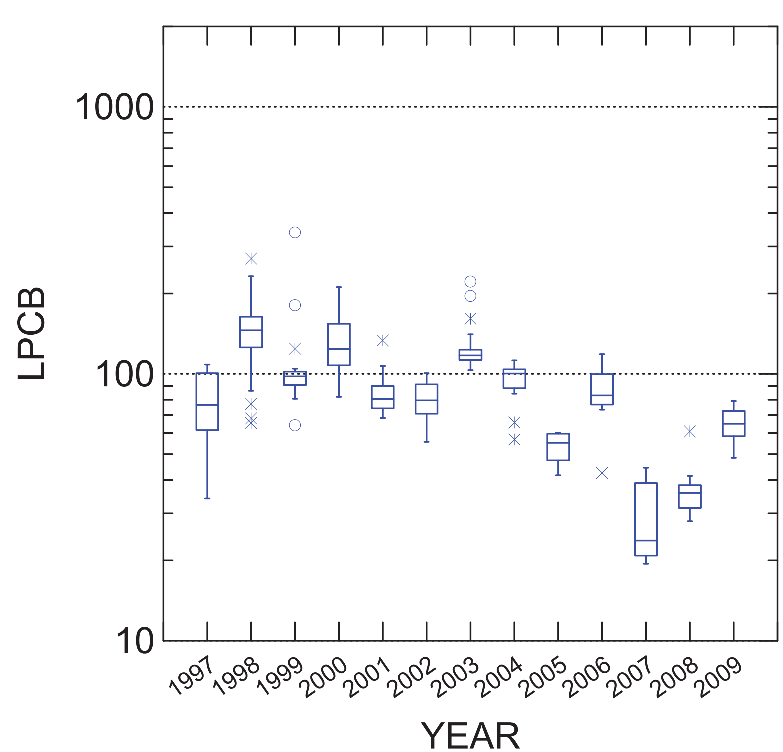

LPCB
YEAR
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1997
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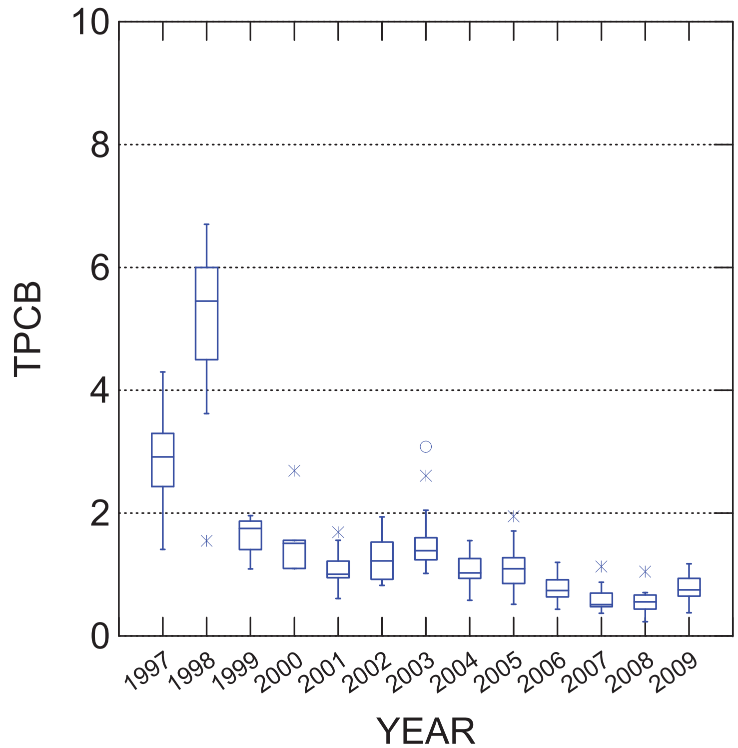
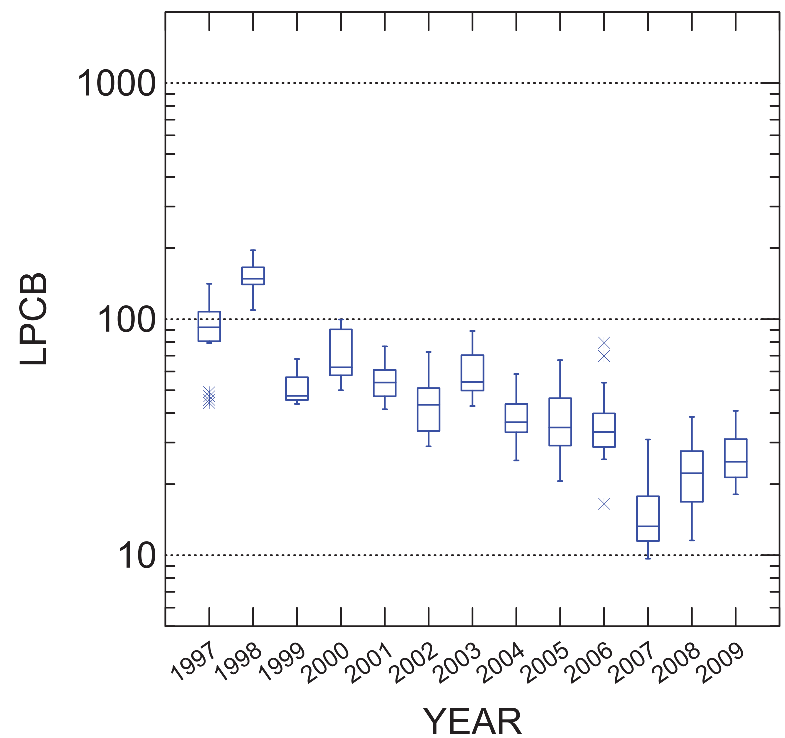
Pumpkinseed (WH): AT1





Appendix I-D

Conditions Associated With Water Column PCB Concentrations: Thompson Island Dam 2009

Appendix I-D

CONDITIONS ASSOCIATED WITH WATER COLUMN PCB CONCENTRATIONS:

THOMPSON ISLAND DAM 2009

Multivariable Analysis of Water Column PCB and Operational Data

March 5, 2010

Prepared for:

United States Environmental Protection Agency
Region 2
290 Broadway
New York, NY 10007-1866

Under Contract to:

Louis Berger Group, Inc.
412 Mt. Kemble Avenue,
Morristown, NJ 07960

.

KERN Statistical Services, Inc.
5175 NE River RD
Sauk Rapids, MN 56379

SUMMARY

It has been conjectured that water column concentrations can be "Predicted based only on PCB removal rate and river velocity". Based on this conclusion and application of such a model, GE broadly concludes (GE presentation to peer review panel *"Resuspension", Feb 15, 2010*) that:

1. EPA –proposed Phase 2 program cannot meet the resuspension performance standard
2. Drinking water standard will be exceeded frequently because of higher rates of dredging than in Phase 1.
3. Redeposition in non-dredge areas will compromise remedy benefits.
4. No practical means to reduce resuspension to standard.

PRIMARY FINDINGS

Subsequent to releasing these results, EPA has conducted a preliminary analysis of factors associated with water column PCB concentrations and has found that while water column PCB concentrations are indeed positively associated with mass of PCBs removed, a more careful analysis suggests that this relationship is due to a combination of several operational factors, some of which are readily manageable in ways that would logically be expected to reduce PCB releases associated with dredging operations.

Based on EPAs recent analysis, it can be concluded that the mechanisms associated with increased water column PCB concentrations are varied and likely, many and should not be simplified to a simple proportionality to mass removed, as suggested by GE. Mass removed is a surrogate for the net effect of all of the processes involved in dredging, and therefore correlates well with water column PCB concentrations. However, this does not preclude that of individual operational variables can be managed to reduce resuspension of PCBs.

Based on a multivariate analyses of the daily process and water column data, EPA finds that water column PCB concentrations are positively associated with several factors, all of which would be expected to influence release and resuspension of PCB contamination, including

1. Sediment removal (*i.e.,* bucket counts, volume removed, mass removed),
2. Flow rate,
3. Vessel traffic (primarily distance traveled by scows),
4. The number of CUs being backfilled in any given day,
5. The area and concentration of freshly disturbed sediments in CUs open to the water column each day,
6. Bucket fill-rate and other surrogates to sediment spillage,

Thirteen of the 28 process variables considered demonstrated statistically significant positive associations with water column PCB concentrations with squared Spearman Rank correlation coefficients ranging from approximately 0.2 to 0.4. EPA emphasizes that these levels of association are individually weak indicating that no single process can be identified as "*the source*" of resuspension, but rather a complex set of interactions among processes appears most likely to be "*causative*". Therefore it is expected that multiple variable models may be necessary to adequately explain variation in water column concentrations. It is further expected that controlling PCB resuspension may be accomplished through a combination of best management strategies applied to several stages in the sediment removal and disposal process—perhaps including application of multiple dredging and backfilling technologies.

Following is a description of the modeling approach used by EPA and the resulting relationships between operational variables and water column concentrations at TID.

OBJECTIVE

The primary objective of this analysis is to develop an empirical data-driven model describing water column concentrations of total PCB as a function of physical and operational variables associated with remedial activities in the Phase 1 project.

INTRODUCTION

Sediment transport investigations are often characterized by limited data, necessitating development of theoretical equations (e.g., models) to describe fate and transport of contamination from sediment to the water column. In contrast, the Phase 1 project is rich in data quantifying all aspects of the sediment removal process. These data are certification unit specific and available on a daily basis and can be associated with daily water column concentrations monitored at near- and far-field stations in Thompson Island Pool.

These rich data provide the basis to develop an empirical model of water column concentration as a function of measured data specific to the operations in the Thompson Island Pool in 2009. A combination of Factor Analysis (Seber, 1977) and Multiple Regression (Neter et al., 1996) is used to statistically identify groups of parameters most strongly associated with water column PCB concentrations. This empirical approach provides the opportunity to test hypotheses and assumptions that otherwise would remain untested in more typical situations where data are less rich—providing the means to evaluate the influence of various remediation processes on water column concentration.

METHODS

Data

Data were collected during the Phase 1 dredging project quantifying the primary aspects of operations throughout the dredging season. In addition, water column total PCB concentrations were measured daily, providing the potential to develop a retrospective model describing relationships between the mechanisms of the dredging process. The data include metrics quantifying, potential sources of PCBs associated with,

1. Flow and temperature conditions,
2. Debris removal,
3. Volume and mass removed,
4. Vessel traffic,
5. Efficiency of removal operations,
6. Resuspension of exposed PCB deposits in open CUs, and
7. Sediment disturbance associated with backfilling.

In all 28 variables were tested statistically for potential to predict water column PCB concentration at far field stations downstream of dredging operations. Data were summarized on a daily basis, so for most variables there were approximately 166 days (May 15th through October 27th) on which PCB concentration could be compared with dredging process variables. Some variables such as bucket fill rates were only available on the 127 days when active dredging occurred within the 166 day time period. Therefore the analyses were repeated for variables measured on all 166 days as well as for the subset of variables measured on just 127 days, primarily after June. Data measured on the smaller subset of days are more closely associated with how dredging was conducted and are therefore the more likely source of information on how dredging and other activities could be modified to reduce resuspension of PCBs to the water column.

Modeling Overview

This approach is used to develop a model of the form

$$C_{water} = C_{baseline} + K_1 C_{Source-1} + K_2 C_{Source-2} + \cdots + K_n C_{Source-n} \quad (1)$$

where the constants K_1, K_2, K_3,… K_n are loosely interpreted as "*net*" sediment to water partitioning coefficients for each source, where it is understood that source terms are based on surrogates for sediment removal processes.

The Phase 1 project is unique in the richness of data available to not only estimate these coefficients, but also to identify those combinations of measured processes that are most important for predicting water column concentrations. Multiple regression analysis is used to identify metrics contributing significantly to prediction of water column PCB concentrations.

Surrogates and Confounding

Metrics described here should be considered primarily as surrogates for physical processes of interest. For example, it is not clear that there is a partitioning coefficient between bucket counts and water column concentrations, however if one were to develop a mechanistic model relating sediment losses per bucket count, then there would be a “net” partitioning of PCBs relating sediment losses from bucket counts and water column concentrations. It is this net partitioning that is estimated by the coefficients of the regression model. Similarly, because the mass removed per day is derived from the bucket count, and other variables, it would also be expected that water column concentration would be correlated with the mass of material removed per day. In fact, mass removal is clearly a surrogate integrating all processes likely to cause PCB losses. Unfortunately this does not provide useful insight into how operational process can be modified to reduce PCB sources to the water column. Essentially any variables that are correlated to material disturbance and removal would be expected to correlate with water column concentration. Additionally some of those variables are also expected to be inter-correlated amongst one another, in statistical terms multi-collinear.

Cause and Effect

Because the data developed through this study are observational as opposed to based on a designed experiment and because many of the process variables are inter-correlated, one cannot infer cause and effect relationships directly. Particularly due to the surrogate nature of most of the metrics, it is important to consider relationships to be associative rather than causative unless other lines of evidence can be used to eliminate some plausible causative processes. For example correlation between bucket counts and water column concentrations could lead one to conclude that use of larger buckets could reduce the daily bucket count per unit volume removed in efforts to reduce water column concentrations. However, if the actual acting mechanism is due to disturbances from scow traffic, which also would be expected to be associated with bucket counts, then modification to the bucket size in efforts to reduce bucket counts would be futile. The data are observational and therefore their use in developing best management practices should take into account that individual metrics may be surrogates for what may be lurking un-quantified processes.

Bivariate Correlation Analysis

The first step in the regression analysis was to analyze the pairing of each individual process variable with water column PCB concentration to test for a positive association. Bivariate relationships between process variables and water column PCB concentration are an indicator of at least a surrogate relationship that could also be a causative mechanism that should be considered for plausibility. These bivariate relationships were summarized by calculating Spearman Rank Correlation coefficients between water column PCB concentrations and each process variable of interest. Correlations were also calculated for water column concentrations lagged by 1 and 2 days respectively to determine if subsequent analyses should incorporate adjustments for travel time between the dredging areas and the far field monitoring station.

Multiple Regression

A fundamental assumption of multiple regression is that the predictor variables (*i.e.*, source terms) are statistically independent. In this situation it is clear that many of the source terms of interest are inter-correlated - more sediment volume removed requires more vessel traffic. Therefore some groups of source terms cannot be entered directly into multiple regression models without careful consideration of their inter relations. In the statistical literature the interrelated predictor variables are called multi-collinear. A great deal of effort has been devoted to the study of the effects of multi-collinearity and methods to mitigate the effects on interpretability of model coefficients as well as the predicted values.

Regression models are typically used for two purposes: 1) prediction of the response variable, and 2) testing and interpretation of the regression coefficients. For prediction one is primarily interested in estimating future water column concentrations under a set of conditions previously measured in the model fitting process. As long as the future conditions are within the range of the variables used to estimate the model coefficients, multi-collinarity generally does not adversely impact predictions. Conversely, multi-collinearity essentially precludes the use of models in efforts to differentiate causative relationships such as the importance of dredging relative vessel traffic more difficult. Careful model construction and evaluation of sub-models to deduce the plausibility of causative processes would be necessary.

Recognizing this limitation of multiple regression models to differentiate individual collinear factors, this analysis is designed to develop a predictive model and to qualitatively evaluate the relative importance of the factors associated with water column total PCB concentrations. From this analysis it is possible to identify groups of process variables that are collectively associated with water column PCB concentrations. Identification of such independent process variables suggests components of the dredging process that should be investigated for potential causative relationships.

Factor Analysis

A set of statistically independent predictor variables are derived from the collection of 28 inter-correlated variables. These independent variables are derived by applying a Factor analysis to the full collection of predictor variables, and deriving surrogates for the dredging processes that are statistically independent and can be entered jointly into multiple regression models. Factor analysis is similar to principal components analysis with the exception that the principal components are "rotated" through an orthogonal transformation that often results in component loadings that are more physically interpretable. It is recognized that there are no unique or optimal factor solutions, however, development of independent scores that are composed of interpretable groups of process variables is desirable for the purposes of developing a predictive model, as well as for interpretation of the relative importance of independent groups of process variables. It is fully recognized that because many process variables are inter-correlated, fully dissecting the relative importance of each process variable may not be possible, but to the extent that factor scores can identify independent groups of variables, the contribution of each group collectively can be distinguished through this approach.

Multiple Regression Analysis

The results of the factor analysis were used to transform each daily set of process variables into a linear combination of independent variables called factor scores. These factor scores have the advantage of being statistically independent and are therefore compatible with the assumptions of multiple regression. A multiple regression was used to identify those factors that were important to prediction of water column PCB concentration. Important factors were defined as those factors with regression coefficients that were significantly different for zero at the 5% level of statistical significance. The resulting model is suitable for use as a predictive model, and by inspection of the factor loadings can be used to identify independent combinations of process variables important to prediction of water column PCB concentrations. Effects due to variables nested within a common factor are difficult to distinguish without other lines of evidence.

The results of this analysis can also be used as a guide to the development of mechanistic models that are specific to individual process variables. In particular, when more process oriented variables are to be calibrated against water column data the interrelations found here through factor analysis should be respected and unless certain processes can be eliminated through other data and analysis, it would not be reasonable to assume that individual process variables can be eliminated purely through identification of other surrogates that are more strongly associated with water column concentrations.

For example, mass removed per day can be tracked relatively accurately, while losses from bucket lifts are much more difficult to measure directly. Therefore, the quality of mass removal data are expected to be much less variable and therefore more likely to correlate with water column concentration than sediment losses. Because of this difference in measurement quality among variables, mass removal per day would be the better apparent predictor of water column concentrations, but this would not eliminate the potential that loss percentages might be the more important process contributing to water column PCBs. The well known adage is that association does not imply causation, but conversely lack of apparent association also does not eliminate causation. Distinguishing the root causes of water column concentration will require extensive and careful multiple variable analyses combined with professional judgment and development of mechanistic models in order to develop sound best management practices. The analysis presented in this section is a first step in this direction, intended to provide an indication of the major groups of processes influencing water column PCB concentrations. Until more detailed sub-analyses are conducted it would be premature to eliminate any process variables from consideration for improvement and refinement.

RESULTS

Thirteen variables representing 5 groups of processes were identified that were associated with water column PCB concentrations at TID. Five variable groups (Factors) were identified that collectively explained 55% and 60% of the variation in water column PCB concentration in the 166 and 127 day models respectively. These factors represented volume and mass removed and efficiency, area of recently disturbed sediments in open certification units, vessel traffic and backfilling. Following is a summary of the results of the analysis.

<u>Bivariate Correlations</u>

Squared Spearman Rank correlation Coefficients for water column PCB concentration with each of the process variables are reported in Table 1. The analysis was repeated with process variables paired with one-day and two-day lagged PCB concentrations to evaluate the potential effects of travel time on the strength of correlation. These squared correlation coefficients represent the proportion of variation explained by the relationship between water column PCB concentration and each variable, analogous to an R^2 from a regression. The Spearman correlation coefficient is preferred because the assumption of linearity inherent in the Pearson's coefficient is relaxed. Results summarized in Table 1 show that:

1. Corrrelations between water column PCB concentrations and process variables are generally weak ranging from 2% for debris removal to 42% for volume and mass removal, indicating that no single variable could be expected to adequately explain the fluctuations in water column PCBs observed during the Phase 1 project.
2. Correlations for water column concentrations lagged by one day were less than those for concurrent measurements and two day lagged measurements produced still lower correlations.
   a. In contrast GE asserted that weekly averages were needed to counter the effects of travel time in their analysis of the water column PCB data.
   b. EPA views this as counterproductive given the lack of correlation between lagged water data and process variables.
   c. Weekly averaging would artificially reduce the power to detect subtle multiple variable relationships suppressing potentially important relationships between water column PCB concentration and operational variables.

3. Statistically significant positive associations were identified for most processes expected to disturb sediments
   a. Volume and mass removed (R^2=0.22 to 0.42)
   b. Dredging efficiency measures such as bucket fill rate and depth of cut (R2=0.08 to 0.22)
   c. Sources due to area of open CUs (R2=0.15 to 0.19)
   d. Debris removal (R2=0.02)
   e. Boat traffic (R2=0.11 to 0.26)
   f. Backfilling operations (Number of CUs being backfilled) (R2=0.09)
4. Weak statistical relationships may be indicative of surrogate relationships that are markers for important, but crudely quantified, sources of PCB resuspension.
5. Water column concentrations were negatively associated with flow at the Fort Edward Station, but the relationship was not statistically significant.

<u>Multiple Variable Analyses</u>

Because water column PCB concentrations were weakly associated with several operational variables, efforts were made to develop a multivariable model that would adequately explain water column PCB concentrations. Because several process variables were derived from basic measurements such as bucket counts it was expected that many process variables would be inter-correlated. In efforts to understand inter-relationships between process variables a factor analysis was conducted to identify a set of independent factors that would be both meaningfully interpretable, as well as providing inputs for a regression model predictive of water column PCB concentrations.

The factor analysis was conducted with only the predictor variables for the subset measured on all 166 days as well as the subset measured on just 127 of the 166 days. Resulting factor scores were used as predictors in a regression analysis to identify important factors for prediction of water column PCB concentrations.

Factor Analysis (127 day model)

Table 2 and Figure 1 show the factor loadings for each of the 28 process variables under consideration. The factor loadings are unitless and range from plus one to minus one and are considered meaningful when they exceed approximately 0.4 in magnitude. Loadings that are less than 0.4 in magnitude are within the opaque rectangular area. Cells in Tables 2 and 3 are shaded green to draw attention to loadings that exceed this nominal level.

There were 5 factors associated with total PCB concentration in the water column describing from 2% to 37% of the total 60% variance in water column PCB concentration explained by the regression model. Regression coefficients, standard errors, variance inflation factors and partial R^2 values are tabulated in Table 4.

Factor-1 includes loadings on bucket counts, mass removed, volume removed, residual Total PCB Concentration in Open CUs and the product of mass and removal efficiency (ME). This factor summarizes potential PCB sources from variables that are directly related to sediment removal, as well as efficiency of the removal process.

Factor-6 loads most heavily on the amount of backfilling being conducted and the product of flow and backfill (a surrogate for load from backfilling). This factor also has substantial negative loadings on bucket counts and temperature. This may reflect that bucket counts incidentally vary inversely with temperature and backfilling operations.

Factor-7 loads most heavily on concentration weighted surface area of open CUs and flow and concentration weighted surface area of open CUs. This factor has a clear signal exclusively related to the amount of open CUs at any point in time that is independent of volume and mass removal.

Factor-8 loads primarily on flow, and the product of flow and total vessel traffic. This factor is also independent of variables in Factor-1 describing removal metrics indicating that there may be an independent PCB source to the water column associated with vessel traffic. This variable is a crude measure of potential sources due to vessel traffic, because it does not account for either water depth or concentration of areas over which traffic occurs. It is expected that refinement of this variable will substantively improve its relative strength as a predictor of water column concentrations.

Factor-9 loads on boat distance which is a single metric that only accounts for distance traveled by vessels.

General Observation

These results suggest that resuspension of PCBs to the water column is associated with a combination of removal activities, backfilling activities, vessel traffic and the surface area and duration that disturbed residuals are exposed in open CUs. This suggests that best practices could be applied to one or several of these processes to reduce concentrations of PCBs in the water column.

Factor Analysis (166 Day Model)

The factor loadings for the 166 day model are summarized in Table 3 and Figure 2. Results were similar because the majority of data were common to both models. The model fit was slightly weaker with and adjusted R^2=55% as compared with 60% for the 127 day model. The five factors were qualitatively similar to those identified in the 127 day model representing variables associated with sediment removal (semi-partial R^2=28%) backfilling (semi-partial R^2=6%) concentration weighted surface area of open CUs (semi-partial R^2=4%) flow times vessel distance (semi-partial R^2=5%) and mass removed (semi-partial R^2=13%). Because performance data related to bucket filling rates were not included in the 166 day model, the separation of variables among factors was less obvious and general surrogates for overall activity such as mass and volume removal and boat traffic tended to group together in the first factor. This suggests that further refinements in the understanding of processes controlling fluxes of PCBs to the water column should focus on variables that characterize how dredging and other supporting operations are conducted as opposed to just on how much dredging is done.

Model Predictions

The fitted model results are plotted on Figure 3 showing that the modeled concentrations generally track day to day fluctuations in concentration in most months, including patterns observed in October that were not well described by GEs simpler model. Estimated regression coefficients, standard errors, partial R^2 and variance inflation factors are summarized in Tables 4 and 5. This suggests that GEs assertion that concentrations are driven exclusively by the amount of dredging may not be fully justified.

Also included in the plot are upper 95% prediction limits which are an added benefit of the regression approach to model development. It can be seen that the prediction intervals indeed capture at least 95% of observations and that when there are excursions above the prediction limits they are frequently tied to situations that may be well understood. For example excursions above or near the prediction limits occur in early August when dredging was halted due to exceedances of critical load thresholds. At these times the process variables are all simultaneously zero leading the predicted values to drop, whereas in these extreme conditions the corresponding reduction in PCB concentrations lagged the change in process operations.

Given that correlations were found to be strongest for water column concentrations paired with process variables measured on the same day (i.e. as opposed to lagged) it may seem somewhat contradictory that water column concentrations remained elevated for several days in August after operations were shut down. It is currently thought that this may be due to the fact that during this time, water was impounded in the East Rogers Island area and water column PCB concentrations were an order of magnitude higher than in the main flow of the river.

Because this water was impounded and isolated from the main flows of the river with approximately a 200 cfs discharge, these PCBs would influence TID water column concentrations as a relatively steady elevated concentration. Because of the slow discharge rate of this very high concentration water would require several days to flush out of the impounded area at a rate of 200cfs, therefore creating in the overall average concentration whereas the effects of day to day fluctuations were identified more immediately over and above the increase in base concentrations. Additional analyses will target the effects of separating these two sources of PCBs on the quality of model predictions.

CONCLUSIONS

This multiple variable analysis should be considered a first step in understanding the processes contributing PCBs to the water column. It is apparent that several processes may be contributing to the PCB loads to the TID far field stations and that there is potential to improve the dredging process while maintaining a high likelihood that the resuspension standard can be met in the Phase 2 project. The most likely factors contributing PCBs to the water column are not unexpected—mass and volume removal, vessel traffic, exposure of freshly disturbed residual sediments to active flows, processes associated with backfilling, and the extent to which dredge buckets may be overly full or dredging is hurried.

This analysis shows that a combination of processes are likely contributing measureable concentrations of PCBs to the water column which presents an opportunity to fine tune dredging operations in Phase 2.

This analysis stops short of development of a final model based solely on process variables, as opposed to factor scores, as this step involves a great deal of care and deliberation in selection of model variables and evaluation of the plausibility that resulting models might be reasonably expected to be causative. The model reported here is clearly associative, but does support the hypothesis that sources of PCBs to the water column are many and varied and that there are likely to be many opportunities to minimize PCB resuspension during the upcoming Phase 2 dredging project. Surrendering to the notion that *resuspension just happens* is probably not a reasonable response to the rich information that is available to further refine and optimize the dredging operation. EPA continues efforts along these lines to investigate factors identified in this analysis and their potential as causative agents as opposed to just surrogates. It is anticipated that these efforts will provide information necessary to develop operational management strategies.

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Table 1. Squared spearman rank correlation coefficients between water column total PCB concentrations lagged by 0, 1 and 2 days. Correlations are more often the strongest when based on concurrent measurements of water column PCBs and sediment disturbance and productivity factors.

Variable	PCB_ngl	PCB_ngl_Lag1	PCB_ngl_Lag2
BargeDist	0.001	0.000	0.003
BargeV_D	0.005	0.004	0.001
BargeVel	0.003	0.002	0.001
BCntTotal	**0.217**	0.174	0.094
BoatDist	**0.338**	**0.315**	**0.189**
BoatV_D	**0.315**	**0.313**	**0.188**
BoatVel	**0.275**	**0.254**	**0.145**
Debris	**0.135**	**0.165**	**0.186**
DrdgDist	0.033	0.016	0.002
DrdgV_D	0.004	0.000	0.001
DrdgVel	0.001	0.002	0.010
Fill Rate	0.095	0.063	0.021
FlowFE	0.014	0.035	0.044
Load_Bfill	**0.091**	**0.094**	**0.094**
Load_CU_Area	0.191	0.190	0.193
Load_MassRem2	**0.379**	**0.316**	**0.191**
LoadBoats	**0.303**	**0.253**	0.136
MassRemTotal3	**0.417**	**0.323**	**0.185**
ME	**0.384**	**0.346**	**0.225**
SbDist	0.108	0.066	0.026
SbV_D	0.118	0.076	0.038
SbVel	0.022	0.007	0.000
ScowDist	**0.265**	**0.220**	**0.140**
ScowV_D	**0.257**	**0.225**	**0.144**
ScowVel	**0.178**	**0.125**	0.072
Temp_C	0.007	0.011	0.013
TotalBfill	**0.090**	**0.094**	**0.093**
tPCB_CU_AREA	**0.146**	**0.147**	**0.148**
VolRemTotal	**0.346**	**0.285**	**0.161**

Notes:

1) Gray cells indicate when water current water column concentrations correlate more strongly than lag-1 measurements or when lag-1 measurements correlated more strongly than lag-2 measurements.

2) Bold numbers indicate that correlations are significantly different from zero at the 5% level of significance.

3) Number of days represents the number of paird observations for values measured concurrently. Sample sizes associated with one and two day lags are reduced by one or two respectively.

Table 2. Factor loadings for each variable for those factors found to be associated with water column Total PCB concentration in Thompson Island Pool from May to November in 2009, Hudson River. Loadings reange from minus 1 to plus 1 and values greater in magnitude than 0.4 (green shaded and bold) are thought to be meaningful. Based on 127 day model.

Variable	Factor1	Factor6	Factor7	Factor8	Factor9
BCntTotal	**0.66**	**-0.40**	0.19	-0.07	0.13
BargeDist	-0.09	0.22	-0.10	-0.04	0.08
BargeV_D	0.02	0.06	-0.04	-0.10	0.09
BargeVel	-0.10	0.22	-0.11	0.00	0.04
DrdgDist	0.04	0.08	0.02	0.01	0.11
DrdgV_D	0.03	0.00	-0.05	-0.03	0.04
DrdgVel	-0.11	0.03	-0.12	0.01	-0.08
Load_Bfill	-0.16	**0.94**	-0.03	0.16	0.06
FlowFE	-0.35	0.12	0.00	**0.86**	-0.19
Temp_C	0.18	**-0.72**	0.16	-0.11	0.09
Load_CU_Area	0.27	-0.09	**0.87**	0.24	0.05
MassRemTotal3	**0.92**	-0.11	0.10	-0.11	0.06
SbDist	0.10	0.05	0.02	0.02	0.12
SbV_D	0.09	0.13	0.02	-0.01	0.11
SbVel	-0.02	-0.03	-0.11	0.02	-0.13
ScowDist	0.34	-0.03	0.14	-0.03	0.20
ScowV_D	0.26	0.04	0.19	-0.02	0.10
ScowVel	0.28	-0.13	-0.15	0.04	-0.05
TotalBfill	-0.14	**0.93**	-0.05	0.03	0.09
VolRemTotal	**0.82**	-0.10	0.14	-0.04	0.08
tPCB_CU_AREA	**0.44**	-0.17	**0.78**	-0.18	0.13
TotalEfficiency	0.32	-0.10	0.16	0.09	0.03
ME	**0.92**	-0.11	0.10	-0.06	0.04
BoatDist	0.36	0.15	0.11	0.04	0.70
BoatVel	0.19	0.03	0.06	0.06	0.14
BoatV_D	0.36	0.09	0.14	0.03	0.68
LoadBoats	0.01	0.32	0.15	0.77	0.41
Semi-Partial R^2	37%	10%	2%	10%	2%
Factor Label	Volume/Mass Bucket Fill	Backfill and Flow Weighted Backfill	PCB/Flow Weighted CU Area	Flow Weighted Vessel Dist.	Vessel Distance/Velocity

Table 3. Factor loadings for each variable for those factors found to be associated with water column Total PCB concentration in Thompson Island Pool from May to November in 2009, Hudson River. Loadings reange from minus 1 to plus 1 and values greater in magnitude than 0.4 (green shaded and bold) are thought to be meaningful. Based on 166 day model.					
Variable	**Factor1**	**Factor4**	**Factor6**	**Factor7**	**Factor12**
BCntTotal	**0.84**	-0.23	0.08	-0.04	0.05
BargeDist	0.08	0.22	-0.12	-0.02	-0.01
BargeV_D	0.12	0.06	-0.04	-0.09	0.04
BargeVel	0.05	0.21	-0.12	0.02	-0.03
DrdgDist	0.18	0.09	0.00	0.01	-0.02
DrdgV_D	-0.02	0.00	-0.02	-0.04	0.08
DrdgVel	-0.16	0.00	-0.14	0.03	-0.07
Load_Bfill	0.06	**0.97**	-0.03	0.11	-0.03
FlowFE	**-0.45**	0.11	-0.03	**0.86**	0.02
Temp_C	0.32	**-0.65**	0.18	-0.12	-0.04
Load_CU_Area	0.32	-0.07	**0.88**	0.17	0.01
MassRemTotal3	**0.84**	-0.09	0.08	-0.12	**0.44**
SbDist	**0.42**	0.09	0.00	0.03	-0.01
SbV_D	0.36	0.16	0.03	-0.03	0.03
SbVel	0.18	0.00	-0.14	0.07	-0.01
ScowDist	**0.95**	0.03	0.08	-0.05	-0.09
ScowV_D	**0.91**	0.07	0.10	-0.02	-0.09
ScowVel	**0.91**	-0.03	-0.15	0.02	-0.14
TotalBfill	0.10	**0.94**	-0.05	-0.01	0.02
VolRemTotal	**0.87**	-0.04	0.08	-0.04	0.12
tPCB_CU_AREA	**0.49**	-0.14	**0.78**	-0.23	0.01
BoatDist	**0.85**	0.18	0.08	-0.02	-0.02
BoatVel	**0.61**	0.07	0.02	0.05	0.00
BoatV_D	**0.83**	0.14	0.12	-0.03	-0.01
LoadBoats	**0.59**	0.37	0.12	**0.60**	-0.12
tPCB_CU_AREA	**0.48**	-0.18	**0.76**	0.10	-0.23
TotalEfficiency	0.32	-0.09	0.16	**0.91**	0.06
ME	**0.91**	-0.10	0.10	0.23	-0.07
Semi-Partial R^2	28%	6%	4%	5%	13%
Factor Interpretation	Volume/Mass Bucket Fill	Flow Weighted Backfill	PCB/Flow Weighted CU Area	Flow Weighted Vessel Dist.	Mass Removed

Table 4. Coefficients, standard errors, tests of significance, squared semipartial correlation coefficients and variance inflation factors for regression of water column Total PCB concentration on factor scores. Analysis is based on the variables measured on 127 of the 166 day season.

Variable	Factor Interpretation	Coefficient Estimate	Standard Error	Students T-Statistic	Significance Level	Squared Semi-Partial Correlation	Variance Inflation Factor
Intercept	NA	237.17	6.31	37.57	<.0001	NA	NA
Factor1	Volume/Mass Bucket Fill	67.21	6.34	10.60	<.0001	37%	1.0
Factor6	Backfill and Flow Weighted Backfill	34.04	6.34	5.37	<.0001	10%	1.0
Factor7	PCB/Flow Weighted CU Area	16.36	6.34	2.58	0.0111	2%	1.0
Factor8	Flow Weighted Vessel Dist.	34.19	6.34	5.39	<.0001	10%	1.0
Factor9	Vessel Distance/Velocity	14.15	6.34	2.23	0.0275	2%	1.0

Table 5. Coefficients, standard errors, tests of significance, squared semipartial correlation coefficients and variance inflation factors for regression of water column Total PCB concentration on multivariate factor scores. Analysis is based on the variables measured on each of the 166 days of the season.

Variable		Coefficient Estimate	Standard Error	Students T-Statistic	Significance Level	Squared Semi-Partial Correlation	Variance Inflation Factor
	Intercepth	214.51	5.95	36.06	<.0001		0.00
Factor1	Volume/Mass Bucket Fill	59.67	5.97	10.00	<.0001	28%	1.00
Factor4	Backfill and Flow Weighted Backfill	27.52	5.97	4.61	<.0001	6%	1.00
Factor6	PCB/Flow Weighted CU Area	23.23	5.97	3.89	0.0001	4%	1.00
Factor7	Flow Weighted Vessel Dist.	24.16	5.97	4.05	<.0001	5%	1.00
Factor12	Mass Removed	41.01	5.97	6.87	<.0001	13%	1.00

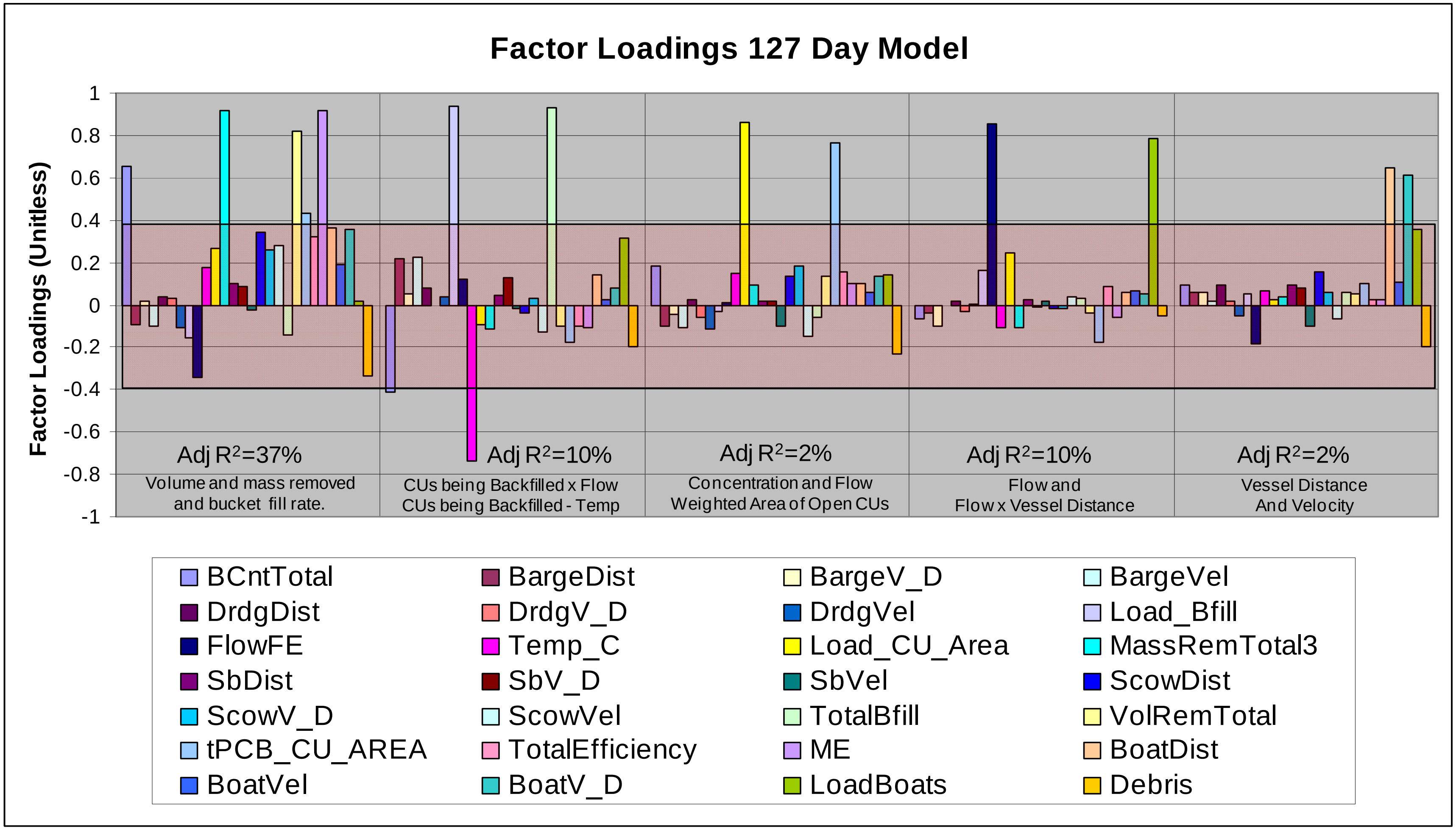


Figure 1. Factor loadings for six factors identified to be important factors for prediction of water column PCB concentrations. R^2 values represent the proportion of variance explained by each factor in multiple regression with water column PCB concentrations at far field stations in Thompson Island Pool. Loadings greater than roughly 0.4 in magnitude are considered meaningful.

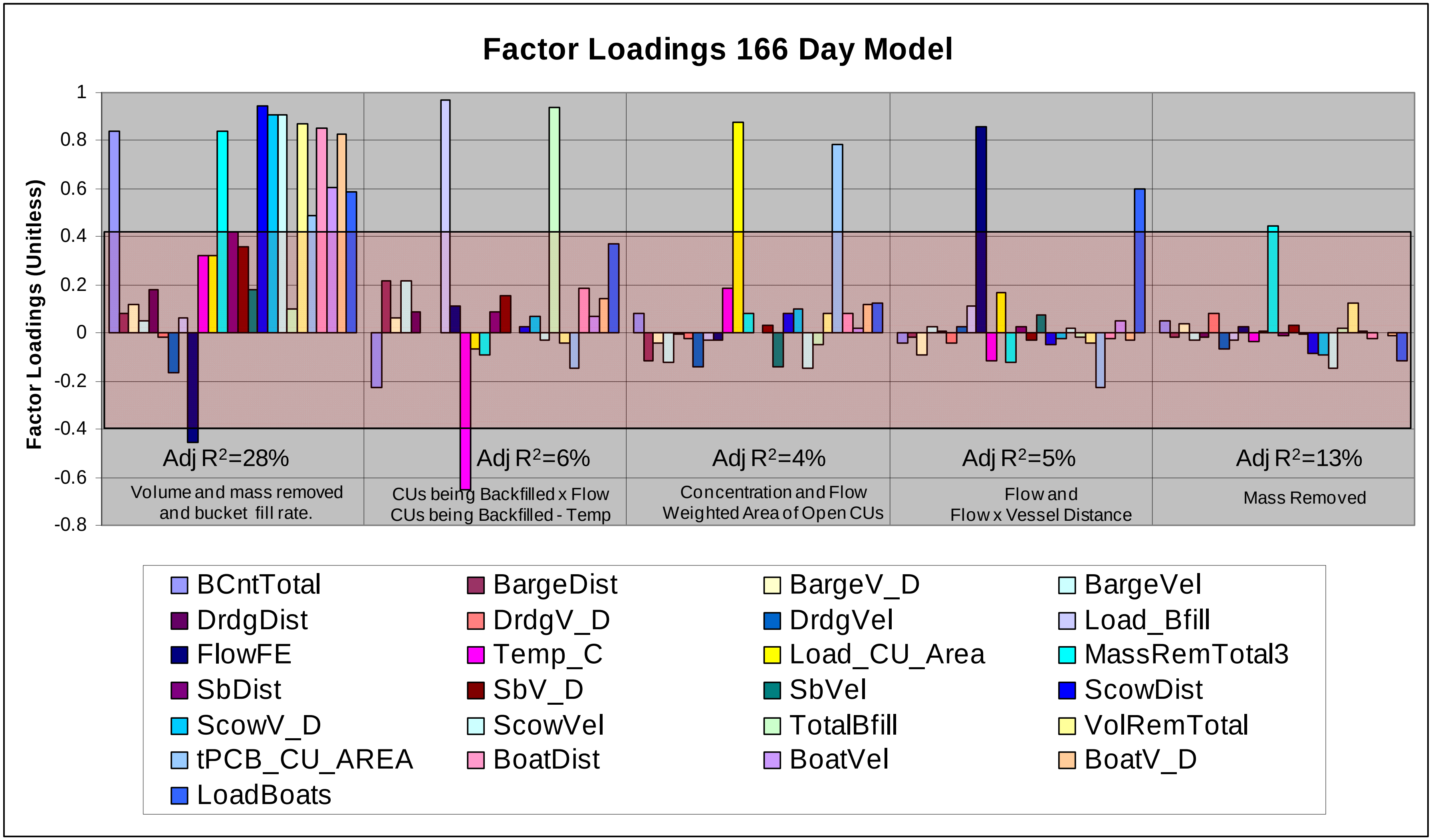


Figure 2. Factor loadings for six factors identified to be important factors for prediction of water column PCB concentrations. R^2 values represent the proportion of variance explained by each factor in multiple regression with water column PCB concentrations at far field stations in Thompson Island Pool. Loadings greater than than roughly 0.4 in magnitude are considered meaningful.

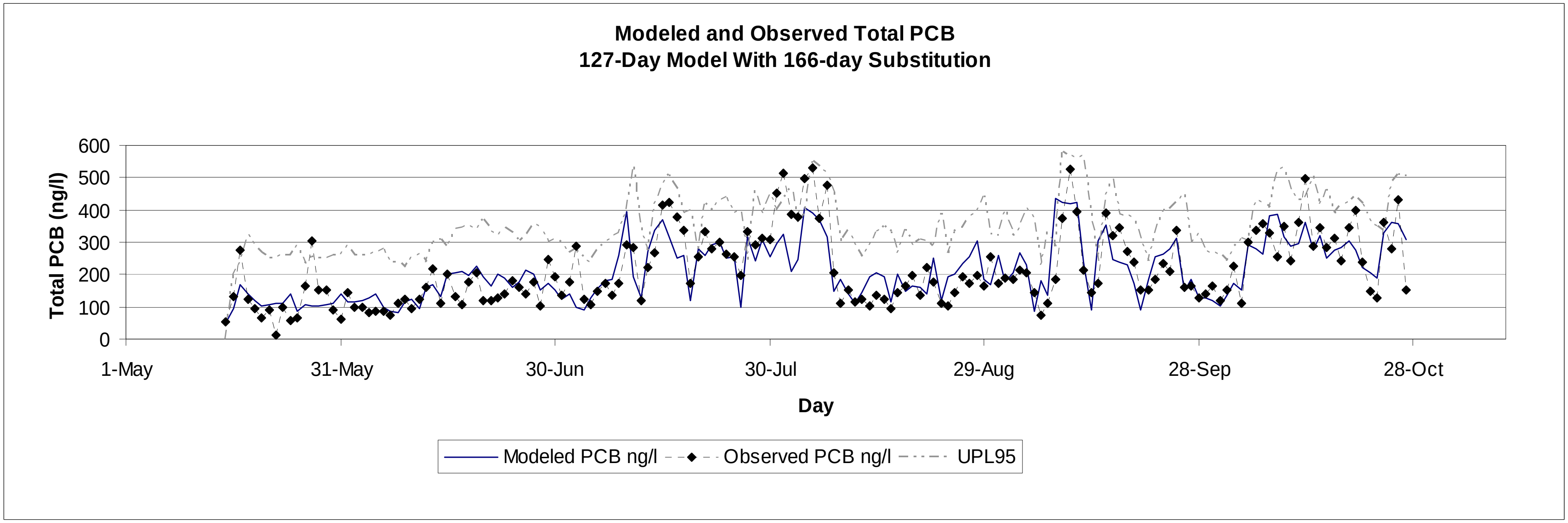


Figure 3. Observed and modeled values for water column PCB concentrations at far field station in Thompson Island Pool. The model is based on variables available on 127 of the 166 day season with modeled values from the 166 day model substituted on the remaining days—primarily in May and June.

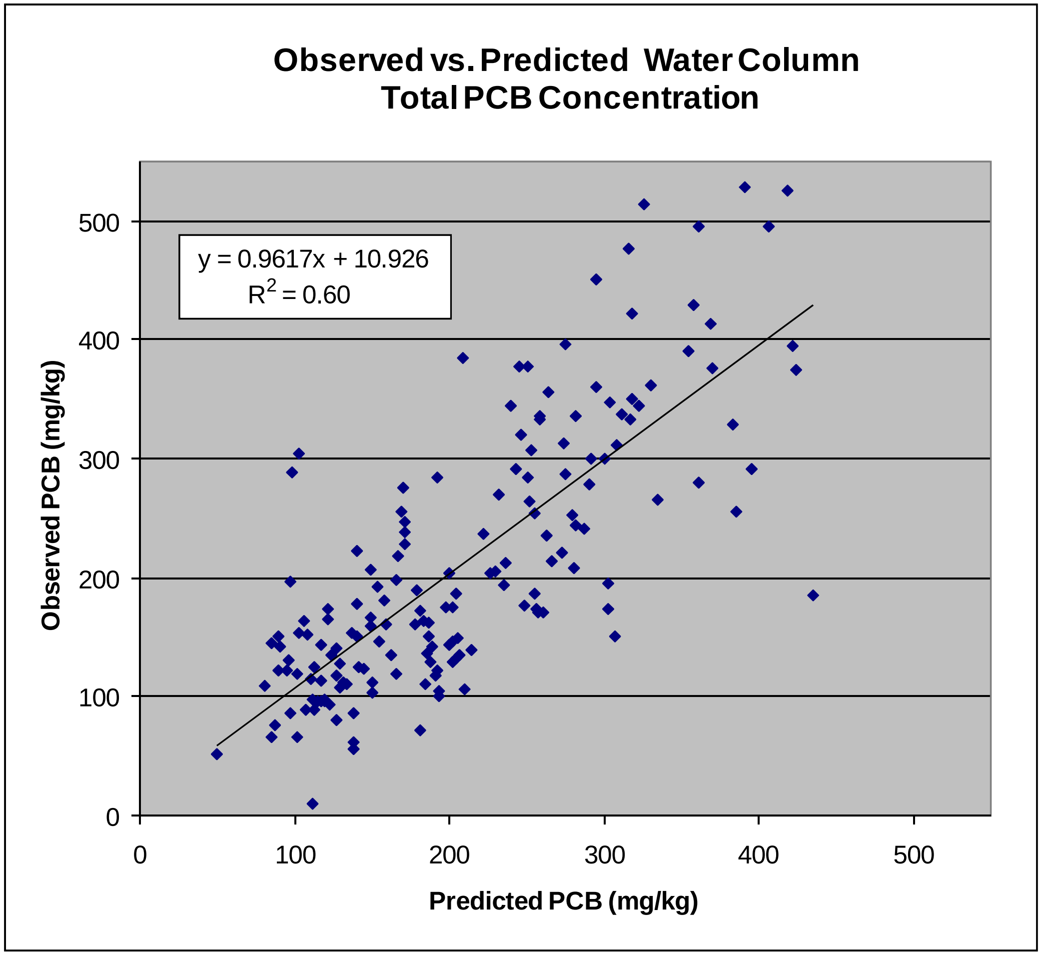


Figure 4. Observed water column Total PCB concentration plotted against modeled values for Thompson Island Pool based on the 127 day model with substitutions from the 166 day model for those days when predictor variables are missing—primarily Sundays, days when dredging was shut down and days prior to the onset of dredging.

Appendix I-E

Methodology for Mass Loss/Export Rate Calculation for Far-field Stations

During Phase I Dredging

Appendix I-E: Methodology for Mass Loss/Export rate calculation for far-field Stations during Phase 1 dredging

Step 1: Calculate Mass of PCB Dredged

Daily Mass of Total PCB (or Tri+PCB) Dredged (kg) = V * *Density* * PCB concentration

where:

V = daily volume ratio based on the bucket file * daily volume dredged

Daily volume ratio based on the bucket file: was per certification unit and per day basis. For example, on July 15, 2009, total volume based on the bucket file was 200 CY. CU1, CU3 and CU5 were dredged on that day with 30CY, 70CY and 100CY, respectively. Thus, the volume ratios of CU1, CU3 and CU5 were 15%, 35% and 50%.

Daily volume dredged: obtained from weekly report

Density = Bulk density based on the bucket file or Density is used by GE

Bulk density based on the bucket file: is per CU and per day basis.

Density is used by GE: is per CU basis; was obtained from 2009-07-15 Resuspension Engineering Evaluation Report from GE to EPA. Density here is calculated by:

$$d = \frac{\text{Mass of TPCB (from Parsons Drawings – Figure 1)}}{\text{Average PCB Concentration (per CU) x total inventory sediment per CU}}$$

PCB Concentration: average TPCB/Tri+PCB per CU and per dredged pass basis.

Average PCB concentration per CU and per dredged pass basis is calculated by: average of all the segments of particular CU and dredged pass whose total PCB is above 1ppm. For instance, CU1, dredge pass 1, the average TPCB and Tri+PCB concentration is calculated by using the set of segment samples whose total PCB concentration is above 1ppm.

Step 2: Estimate Transit Time to each station from Ft. Edward

Thompson Island: If the Ft. Edward flow is smaller than 3800cfs, then the transit time to TI was set to be 1 day, otherwise, 0 day.

Lock 5: If the Ft. Edward flow was smaller than 2,836 cfs, then the transit time of Lock 5 was 2 days; if the Ft. Edward flow was between 2,836 cfs and 6144 cfs, the transit time was 1 day; otherwise, 0 day.

Waterford: If the Ft. Edward flow was smaller than 2,987 cfs, the transit time was 4 days; if the Ft. Edward flow was between 2,987 cfs and 3,815 cfs, the transit time was 3 days; if the Ft. Edward flow was between 3,815 cfs and 5,281 cfs, the transit time was 2 days; if the Ft. Edward flow was between 5,281 cfs and 8,573 cfs, the transit time was 1 day. Otherwise, 0 day.

Step 3: Comparable Daily Loads due to Transit time (kg/day)

The comparable daily load was calculated based on the transit time of flow for each station and net daily load for each station. *For example, if the transit time of TID is 0 day, then the comparable daily load was equal to net daily load of that day. If the transit time was 1 day, the comparable daily load was set equal to the net daily load of the following day.*

Step 4: Mass PCB Lost per unit Sediment Removed (daily, kg/CY)

$$\text{Mass PCB lost per unit sediment removed (daily)} = \frac{\text{Comparable daily load}}{\text{daily volume dredged}}$$

Mass PCB lost per unit sediment removed (cumulative, kg/CY)

$$\text{Mass PCB lost per unit sediment removed (cumulative)} = \frac{\text{Comparable cumulative daily load}}{\text{cumulative daily volume dredged}}$$

Where
cumulative daily volume dredged = daily volume dredged + previous day volume dredged

Step 5: Daily Dredged PCB percent lost to water column (%)

$$\text{Daily dredged PCB(\%)lost to water column} = \frac{\text{Net daily load due to transit time}}{\text{daily PCB mass dredged}}$$

Where: Net daily load due to transit time is depended on transit time from Ft. Edward to each station and daily load. For example, if the transit time was 1 day, the net daily load was equal to the daily load of the following day.

Weekly integrated dredged PCB(%)lost to water column

$$= \frac{\text{sum of 7 – day comparable daily load due to transit time}}{\text{sum of 7 – day daily mass dredged}}$$

$$\text{dredged PCB(\%)lost to water column (cumulative)} = \frac{\text{Net Cumulative daily load due to transit time}}{\text{Cumulative PCB mass dredged}}$$

Where: Net Cumulative daily load due to transit time depended on transit time from Ft. Edward to each station and daily load. For example, if the transit time was 1 day, the net cumulative load equal to the cumulative load of the following day.

Appendix I-F

New York State Department of Health:

Hudson River PCBs Superfund Site Public Water Supply Monitoring Program

STATE OF NEW YORK
DEPARTMENT OF HEALTH

Flanigan Square 547 River Street Troy, New York 12180-2216

Richard F. Daines, M.D.
Commissioner

James W. Clyne, Jr.
Executive Deputy Commissioner

January 12, 2010

Re: Hudson River PCBs Superfund Site Public Water System Monitoring Program

In 2008 and 2009, staff of the Department of Health Bureau of Water Supply Protection collected water samples from public water systems that use the Hudson River as a source of water for the analysis of polychlorinated biphenyls (PCBs). The monitoring program provided information on PCB concentrations at these systems prior to and during the dredging of PCB-contaminated sediments from the Upper Hudson River by the General Electric Company. The results from the 2008 baseline sampling, conducted prior to dredging, were summarized and provided to you in a letter dated March 10, 2009. We recently completed our sampling for 2009, which occurred throughout the Phase 1 dredging period. All results from samples collected prior to and during Phase 1 dredging were below the Federal and State drinking water standard of 500 nanograms per liter (ng/L).

The Phase 1 monitoring plan originally included daily sampling at the Halfmoon and Waterford water treatment plants, frequent sampling at the Stillwater water treatment plant, and periodic sampling of four public water systems in the Lower Hudson River. These plans were amended in response to changes at the Upper Hudson River systems. At Stillwater, our sampling was limited to work confirming that the carbon filters installed by USEPA (which went on-line in early May 2009) were removing PCBs. Following that confirmation, the USEPA oversaw the routine monitoring as part of their operation and maintenance plan for the carbon filter system. During dredging, we did not sample at Halfmoon and Waterford, as these systems opted to obtain water from the Troy public water system instead of the river. Troy uses the Tomhannock Reservoir as its source of water. Since the end of Phase 1 dredging, we have done some PCB sampling to help Halfmoon evaluate if they want to return to the river as a source of water. The enclosed information sheets provide a summary of this work.

The NYSDOH monitoring programs were supported by a grant from the USEPA. We anticipate continued monitoring when dredging resumes in 2011 if funding can be secured. We are in the process of doing that work now. If you have any questions, please contact me or Mr. Patrick Palmer at (518) 402-7711.

Sincerely,

Lloyd Wilson, Ph.D.
Chief, Source Water Protection Section
Bureau of Water Supply Protection

cc: Mr. V. Pisani/ Mr. J. Dunn - BWSP
Mr. P. Palmer - BWSP
Ms. D. Ripstein - BEEI
Ms. F. Schottenfeld - O&E
Ms. A. Gabalski - GFDO
Ms. K. Wheeler - GFDO
Mr. D. Croswell - CDRO
Mr. T. Vickerson - CDRO
Mr. B. Devine - MARO
Mr. C. Obermeyer - MARO
Ms. M. Lenehan - Albany County DOH
Mr. S. Capowski - Dutchess County DOH
Mr. K DuMond - Ulster County DOH

New York State Department of Health

Hudson River Public Water System
2009 Phase 1 Monitoring Program Summary

From May through November 2009, the New York State Department of Health (NYSDOH) collected water samples for polychlorinated biphenyl (PCB) analysis from public water systems on the Hudson River. The monitoring program was developed to provide information about the systems during the dredging of PCB-contaminated Hudson River sediments by the General Electric Company. These samples were compared to samples collected prior to dredging, to help us understand if water quality changed. Samples were collected before treatment (raw water) and after treatment (finished water). All samples were found to have a PCB concentration less than the Federal and State drinking water standard of 500 nanograms per liter (ng/L).

The baseline monitoring included systems in the Upper and Lower Hudson Rivers. We intended to include the same systems for the Phase 1 monitoring. However, prior to the start of dredging, Stillwater received a carbon filtration system from the USEPA (Environmental Protection Agency) to remove PCBs from their well water, while Waterford and Halfmoon decided to use finished drinking water from Troy. As there were no Upper Hudson River systems actively using the river as a water source during dredging, we focused on four Lower Hudson River systems: Green Island, Rhinebeck, Port Ewen, and Poughkeepsie. These systems were sampled approximately every two weeks.

Two methods were used to analyze the samples for PCBs. One was an Aroclor Method, similar to the USEPA Method 508 that is used by most public water systems for routine testing of PCBs. We required the laboratory to report a lower detection limit than is commonly used. (A detection limit is the smallest amount that can be measured). We used an Aroclor Method because it allows for a direct comparison to existing data from the water systems. The other method is called the Green Bay Method, which provides more detailed information about specific types of PCBs, called congeners.

Using the Green Bay Method, PCBs in raw water ranged from less than 9.1 ng/L to 57.5 ng/L, and PCBs in finished water ranged from less than 9.1 ng/L to 29.7 ng/L. Using the Aroclor Method, PCBs in finished water ranged from less than 6.1 ng/L to 71.5 ng/L (see Table 1). These data are within the range of the PCB concentrations measured during the 2008 baseline monitoring.

Our 2008 and 2009 monitoring programs were funded by the USEPA. The USEPA expects dredging to resume in May 2011. The NYSDOH will continue to monitor the Hudson River public water systems during dredging if funding is extended.

The NYSDOH will continue to work with water systems, local health departments, the NYS Department of Environmental Conservation, local elected officials, and the USEPA to protect public water systems during dredging. If you have any questions, please call the NYSDOH Environmental Infoline at 1-800-458-1158, extension 27711.

Table 1. Results of May – November 2009 Phase 1 Monitoring at Lower Hudson River Public Water Systems.
Data are in nanograms per liter (ng/L).

Location	Finished Drinking Water Aroclor Method				Finished Drinking Water Green Bay Method				Raw Water Green Bay Method			
Lower River	Samples	Average	Minimum	Maximum	Samples	Average	Minimum	Maximum	Samples	Average	Minimum	Maximum
Green Island	9	8.3	<6.1[a]	33.7	9	<9.1[b]	<9.1	<9.1	9	<9.1	<9.1	<9.1
Rhinebeck	11	20.9	<6.1	47.2	11	16.0	<9.1	28.8	11	26.1	10.2	53.6
Port Ewen	11	22.1	<6.1	41.0	11	13.2	<9.1	19.0	11	26.1	16.9	36.1
Poughkeepsie	11	23.2	<6.1	71.5	11	12.4	<9.1	29.7	11	29.5	10.9	57.5

[a]<6.1 indicates the sample (or average of samples) was less than the detection limit of 6.1 ng/L for the Aroclor Method
[b]<9.1 indicates the sample (or average of samples) was less than the detection limit of 9.1 ng/L for GBM.

Table 2. Results of May 2009 Monitoring at Stillwater to Confirm PCB Removal by GAC Filters.
Data are in nanograms per liter (ng/L).

Location	Finished Drinking Water Aroclor Method				Finished Drinking Water Green Bay Method				Raw Water Green Bay Method			
Upper River	Samples	Average	Minimum	Maximum	Samples	Average	Minimum	Maximum	Samples	Average	Minimum	Maximum
Stillwater	2	<6.1[a]	<6.1	<6.1	2	<9.1[b]	<9.1	<9.1	2	88.5	84.0	93.0

[a]<6.1 indicates the sample (or average of samples) was less than the detection limit of 6.1 ng/L for the Aroclor Method.
[b]<9.1 indicates the sample (or average of samples) was less than the detection limit of 9.1 ng/L for the Green Bay Method.

Table 3. Results of November – December 2009 Monitoring at Halfmoon to Confirm Decline in PCB Concentrations Post-Dredging.
Data are in nanograms per liter (ng/L).

Location	Post-Filter, Pre-Chlorination Water Aroclor Method				Raw Water from River Intake Pipe Aroclor Method			
Upper River	Samples	Average	Minimum	Maximum	Samples	Average	Minimum	Maximum
Halfmoon	5	8.4	<6.1[a]	13.9	8	28.2	17.9	34.3

[a]<6.1 indicates the sample (or average of samples) was less than the detection limit of 6.1 ng/L for the Aroclor Method.

Appendix I-G

Memo for Rationale and Basis for Revision of the Resuspension Standard

Hudson River PCBs Superfund Site

Date: March 3, 2010

To: Ben Conetta, US EPA

From: Ed Garvey

Subject: Rationale and Basis for Revision of the Resuspension Standard

Summary

This memo outlines the main issues of concern in adjusting the load criteria of the Resuspension Performance Standard. The memo presents a semi-empirical estimate of the impact of dredging related loads on the Lower Hudson and shows that, given the current levels of PCB loads to the Lower Hudson, it is expected that dredging the currently estimated 2.4M cy of sediment necessary for removal[will reduce loads to the Lower Hudson in the long term. It is believed that on a percentage basis, loads due to dredging can be reduced through implementation of selected changes to dredging disposal and backfilling operations. In spite of these anticipated improvements, this analysis proceeds under the pessimistic assumption that future dredging operations will produce rates of release of PCBs similar to those observed in Phase 1. Under this assumption, this memo indicates that loads delivered to the Lower Hudson as a part of the dredging activities on the order of 2,000 kg $\pm$ 25 percent would be followed by a period of sufficiently reduced loads that the remedy produces an overall decline in loads to the Lower Hudson between 14 and 24 years after completion of the dredging. This break-even point is similar to or sooner than the break-even points originally supporting the selection of the dredging remedy. This analysis represents one line of evidence and should be used in conjunction with other evidence concerning revision of the load criteria for the Resuspension Standard.

Introduction

The load requirement for the Resuspension Performance Standard was intended to limit long-term downstream transport of PCBs to the Lower Hudson to the extent practicable, and to maintain the total load delivered to the Lower Hudson over time to less than that anticipated under Monitored Natural Attenuation (MNA). This goal was not intended to accelerate attenuation of PCB problems in the Lower Hudson but rather to simply provide that the remediation of the Upper Hudson did not degrade conditions in the Lower Hudson for the long term. Short term impacts to both the Lower and Upper Hudson were anticipated by the ROD and were considered acceptable in the long term recovery of the Hudson.

The original cumulative net load due to dredging was estimated at 650 kg, representing about 1 percent of the inventory originally identified for removal. This 650 kg was shown to yield an acceptable recovery curve such that the active scenario began to deliver less total PCB mass to the Lower Hudson about 25 years after dredging was completed. Beyond this point, the cumulative load delivered by the MNA scenario was greater than that delivered under the selected remedy. Similar but faster recoveries were noted for Tri+ PCBs. In examining the data collected since the ROD and up to the completion of Phase 1, it has become apparent that both the MNA trajectory and the amount of Total PCB to be released by the remedy are different from what was anticipated. The analysis below is intended to provide a basis for new remedy forecast curves comparing dredging to MNA to re-assess whether the remedy-related impacts will yield lower long term net loads to the Lower Hudson than expected under MNA.

Observations Prior to and During Phase 1

During Phase 1 of the Hudson River PCB remediation, water column concentrations and loads exceeded the criteria set forth in the Resuspension Performance Standard on a number of occasions. In particular, the following exceedances were observed:

- Total PCB loads exceeded the Evaluation and Control Levels at Thompson Island, Schuylerville and Waterford during Phase 1 on multiple occasions. Exceedances were observed most often at TI and least often at Waterford. See Figure 1.
- Cumulative Total PCB loads to the Lower Hudson were on the order of 0.7 percent of the PCB mass removed. However, greater fractional losses were seen at the upstream stations, suggesting higher rates of loss to the Lower Hudson as the remediation moves downstream. These observations plus the revised inventory estimates indicate that the dredging-related losses could represent 1,500 to 2,000 kg over the duration of the remedial action. See Figure 2.
- Water column concentrations exceeded the 500 ng/L MCL at TI on 4 separate sampling events and once at Schuylerville. See Figure 3 for conditions at TI.

Additionally, the mass of PCBs transported downstream past the three monitoring stations represented roughly 2.5, 1.5 and 0.7 percent of the Total PCB mass removed for the TI, Schuylerville and Waterford stations respectively. Similar fractions of Tri+ PCB mass lost were also observed at these stations. These observations represent PCB loads due to dredging that were higher than anticipated by EPA and GE.

Prior to Phase 1e baseline loads forecast by EPA's HUDTOX model were substantially lower than those actually observed for the period 2004 to 2009. Specifically:

- For the Waterford station, the estimated 2004-2009 loads (Beales method) were about 2.5 to 3 times higher than HUDTOX predictions. See Figure 4.
- Based on USGS and GE data from the 1995 to 2008 period, loads at Waterford are declining very slowly, or not at all. A regression of log(load) against time yields a "half life" of 99 years, although this rate is not distinguishable from no-change with time at all. In contrast, the forecasted half time based on the HUDTOX model during the period 1998 to 2008 was approximately 5 to 8-years.
- Integrating the observed loads at Waterford from 1998 to 2008 yields a mass of PCBs delivered to the Lower Hudson 60 percent greater than that predicted by the MNA forecast by HUDTOX for this period, equivalent to roughly 1,300 kg of additional PCBs.

Surface sediment concentrations in the Thompson Island Pool (0-2 inches) as characterized by

GE's ~4,000 cores collected during the design sampling program between 2002 and 2005 showed surface concentrations equivalent to those observed in GE's composite samples collected in 1991. Given the spatial extent of sampling and the sheer number of samples obtained between 2002 and 2005, the results for this period can be considered quite robust, providing a reliable estimate of surface concentrations. See Figure 5.

There is little evidence of a major recontamination event, or for an incompatibility in analytical methods. These data more likely suggest that the earlier composite samples, particularly the 1998 results, may not be reliable estimates of surface concentrations at that time. These composite samples may differ from the more reliable, individual samples collected over the 2002-2005 period. This would have caused problems with model calibration of the HUDTOX model that would be expected to result in an overstatement of forecasted recovery rates.

In any case, the continued presence of elevated concentrations in recent surface sediment samples indicates that existing inventories of PCB-contaminated sediments have not been buried by cleaner material in River Section 1. See Figure 5. A lack of historical data in River Sections 2 and 3 limits our ability to evaluate temporal changes in surface sediment concentration. Taken together, these observations lead to several important conclusions.

1. Loads to the Lower Hudson prior to dredging were and continue to be substantially greater than forecast and show little indication of declining with time, unlike the model forecasts.
2. Surface sediment concentrations remain elevated despite the passage of time and continue to provide a reservoir of contaminated sediments for transport to the Lower Hudson.
3. Dredging-related loads to the Lower Hudson will be greater than originally forecast and greater than the original Resuspension Standard of 650 kg over the duration of the project.

Impacts of Phase 1 Operations on Areas Downstream

An extensive series of measurements were made to identify impacts of the Phase 1 activities to regions downstream. To the extent that no measureable impacts to the Lower River were detected, it can be inferred that future releases of similar duration and magnitude are also likely to have little impact downstream. However, it should be noted that although it is most desirable to have no discernable downstream impacts, short term impacts are considered acceptable in exchange for the long term recovery of the river. Among the more important observations relating to possible downstream impacts are the following:

- Despite the readily measurable increase in water column concentrations in the Upper Hudson, Lower Hudson water column concentrations as recorded by both GE and the NYS DOH did not increase in response to loads from the Upper Hudson. In particular, there were no discernable increases in Total PCB or Tri+ PCBs at the Lower Hudson monitoring locations near Poughkeepsie, Port Ewen or Rhinebeck. See Figures 6 through 8. Tri+ PCB concentrations were also unchanged at the Albany monitoring station, roughly 15 miles downstream of Waterford. See Figure 9. Increases in Total PCB concentration were observed at this station; however the associated congener patterns were considered unusual for the station and are considered to be an analytical artifact and not representative of an actual increase of PCB concentrations at this location. The general lack of concentration increases in the Lower Hudson is not considered surprising given the extensive inventory already in place, estimated as 80,000 kg by Bopp and Simpson, 1989.

- In spite of the increased PCB concentrations and loads in River Section 3, the Upper Hudson fish tissue concentrations at Stillwater did not increase relative to pre-remediation conditions. This finding suggests that fish tissue concentrations will be largely unaffected at conditions similar to those observed during Phase 1. See Figure 10.
- Measurements of fish tissue at other downstream stations confirmed the absence of a response due to dredging-related loads in the Lower Hudson.
- Areas of the Upper Hudson not currently identified for remediation are unlikely to become extensively contaminated due to dredging. This is based on the observation that these areas have already been subjected to years of contaminant transport. Much of the 80,000 kg of PCBs in the sediments of the Lower Hudson (Bopp and Simpson, 1989), largely due to GE discharges, had to pass over these sediments en route to their current locations. Thus the loads due to dredging as conducted in 2009 (expected to be on the order of 2,000 kg) may create temporary local increases of contaminated sediment but are unlikely to have long term impacts in areas not slated for remediation. More to the point, the areas of the Upper Hudson most likely to accumulate any dredging-related deposition are for the most part the same areas that have already accumulated PCB-bearing sediments and are targeted for removal.
- The model forecast of loads to the Lower Hudson under the 350 ng/L scenario was expected to deliver roughly 900 kg additional PCB load to the Lower Hudson above the original MNA estimate but was not forecast to have a lasting impact on Lower Hudson fish recoveries. The increased loads to the lower river were expected to last no more than 10 years after completion of Upper Hudson dredging. See Figures 11 to 14.

Basis for Revising the Resuspension Performance Standard

The above discussions describe several important observations that must be accounted for in revising the load criteria for the Resuspension Performance Standard. Specifically:

- Loads to the Lower Hudson under MNA will be **substantially** greater than those forecast by the HUDTOX model, providing further impetus for the remedy but also indicating acceptability of for greater releases due to dredging provided that it can be shown that they are mitigated by substantially reduced cumulative loads in the future.
- Assuming losses to the Lower Hudson due to dredging may be on the order of 1 percent of the mass to be removed, releases of 1,500 to 2,000 kg to the lower river would be expected over the life of the project.
- Observations, as well as prior modeling analysis, indicate that effects of PCB releases due to dredging during Phase 2 will be limited to short term impacts.

In preparing a proposed revision to the Resuspension Standard, the goal here is not to simply declare that 1 percent of the mass to be removed will now become the *de facto* criterion, but rather to assess whether the amount of PCB load to the Lower River due to dredging in the short term will be exceeded by the reduction in the overall load to the Lower Hudson provided by the remedy in the long term. The objective here is to assess whether loads delivered to the Lower Hudson under the remedy will be less than those delivered under MNA when summed over time. The basis to assess this is centered around revised estimates of the load delivered under the MNA scenario, based on the data trends of the period 1995 to 2008 that were unavailable during development of HUDTOX projections.

Because the dredging remedy will result in initially higher loads, the question becomes: when will the reduced loads that follow the remedial action deliver less PCB mass to the Lower Hudson overall than would be delivered by MNA? (*i.e.,* how many years to the break-even point?). Beyond this point, load reduction for the Lower Hudson due to the remedy[1] will continue to accrue as an overall reduction in Total PCB load. In the original standard, this was estimated to be approximately 20 to 28 years after completion of the dredging. See Figure 15.

Calculation of the breakeven point, given an increased resuspension load allowance, was done following the original basis for the calculation used in the Standard. Specifically, the historical record prior to 2004 only provides an estimate of Tri+ PCB loads at Waterford. Thus the original analysis first derived forecasts of Tri+ PCB loads for MNA and the remedy, as was originally done for the ROD and the Performance Standards. Subsequently, the Total PCB loads to the Lower Hudson were forecast using the average Tri+ to Total PCB ratio observed in GE's 2004 to 2008 data at Waterford. For baseline loads and conditions the ratio was (1:1.7) and for dredging-related releases during Phase 1 the observed ratio was (1:3).

The MNA forecast was obtained from the data presented in Figure 4. An initial calculation of the MNA curve was presented at the Peer Review meeting on February 16, 2010. The analysis has been further extended and improved in response to questions raised during the meeting. As discussed previously, the load observations show no statistically significant decline over time from 1995 to 2008. For this reason as well as to be consistent with the last 5 years of observations, the breakeven point is estimated under the assumption of no change in future loads, as opposed to the forecast rate of baseline decline. The effects of this assumption are subsequently tested through a sensitivity analysis considering cases where loads are decreasing with time. Note that the mean load for the 13-year period from 1995 to 2008 is 320 kg/yr whereas the mean load for the last 5 years, using GE's data alone, is 314 kg/yr, supporting consistent with the notion that loads are relatively constant through time. However, a best fit first-order decay curve to the data, although not statistically significant, yields a half life for Total PCB load of 99 years. While this slope is not different from a flat line (*i.e.,* an infinite half life), it was used as the basis for the MNA curve, given the anticipation that some loads would eventually begin to decay with time. (Note that the reservoir of PCBs in the entire Upper Hudson is probably greater than 200,000 kg, thus it is more than sufficient to sustain a slowly declining annual load of about 300 kg/yr for many years.) It should be noted here that the MNA curve

1 The reader is reminded here that reduction of loads to the Lower Hudson is just one part of the benefit of the remedy. The remedy has many other benefits associated with the RAO's for the Upper Hudson as well, that are beyond the scope of this memo.

shown in Figure 4 is empirically derived, based on the historical record. It is different from the original HUDTOX curve in that the latter was derived mechanistically. However, the empirical curve more consistent with observed conditions.

The best estimate of load to the Lower Hudson based on the data trends indicates that the MNA scenario would deliver roughly 6,000 kg to the Lower Hudson from 2012 to 2037, as opposed to about 1,000 kg as forecast by the model developed for the ROD. This period is selected because it represents the first 25 years after the completion of the original remedial scenario as described in the Resuspension Performance Standard. It also is approximately the period within which the break-even point is attained under the original modeling analysis of the remedy, discussed further below.

The forecast curves are shown in Figure 16 where the impact of the slow decline in load based on the data trend is readily contrasted with the much more optimistic trajectory estimated by the model. These results clearly show the impacts of not implementing the remedy. The reduction in cumulative load to the Lower River that is expected to accrue from the remedy is estimated below.

The HUDTOX model used in the original calculation cannot be directly applied to estimate absolute magnitudes of change over time because it clearly does not represent the measured trend. However, because it is mechanistically based, it can still provide insight into the degree of load reduction to be anticipated by the remedy. The original model forecast for the reduction in load due to the remedy was about 40 percent on average during a 25-year post-remedy period. This calculation excludes any resuspension-related loads and is based on the ratio of the model-based MNA and the "no resuspension" curves shown in Figure 15, beginning in the year 2012. These curves are used to generate an annual load reduction factor for each year after dredging is completed. For the period 2012 to 2067, the factor ranges from 43 to 38 percent reduction.

To produce a loading curve for the entire remedy beginning in 2009, the annual load during the dredging period is approximated by using the empirically estimated MNA baseline loads and adding the additional loads due to dredging. Thus the 2,000 kg release scenario is approximated by adding the observed 170 kg for Phase 1 to the estimated baseline for 2009 and then adding 366 kg/yr ([2,000 kg-170 kg]/ 5 yrs) to the MNA forecast curve for the years 2011 to 2015. A small additional correction is added to the annual load to account for the anticipated decline in the actual baseline during this period. In this manner, the total net load of 2,000 kg is estimated recognizing that the baseline load is effectively held constant during the remedial program as originally prescribed by the Standard. The procedure approximates the total load up to completion of the dredging.

To approximate the load reduction that occurs after the dredging is completed, the annual load for each year after dredging is calculated as the product of the estimated MNA load and the load reduction factor described above. The resulting remedy curve plus the data-based MNA curves are shown in Figure 17. Note that the shaded areas between the remedy curve and the MNA curve represent the short term increase in load due to the remedy during dredging (in gray) and the long term reduction in load after completion of the remedy (in pink). The basic point of this exercise is to determine when and if the pink area becomes greater than the gray.

These curves are integrated as cumulative loads to the Lower Hudson in Figure 18. Besides the 2,000 kg release scenario, two additional scenarios are shown, representing 1,500 and 2,500 kg net dredging release, as a means of examining the sensitivity of the analysis. These latter two scenarios are used to bracket the time when the expected break-even point might occur. The curves in the figure show that relative to the best estimate rate of decline for the MNA scenario, a remediation-related release of 2,000 kg ± 25 percent has a break-even point between 14 and 24 years after completion of dredging.

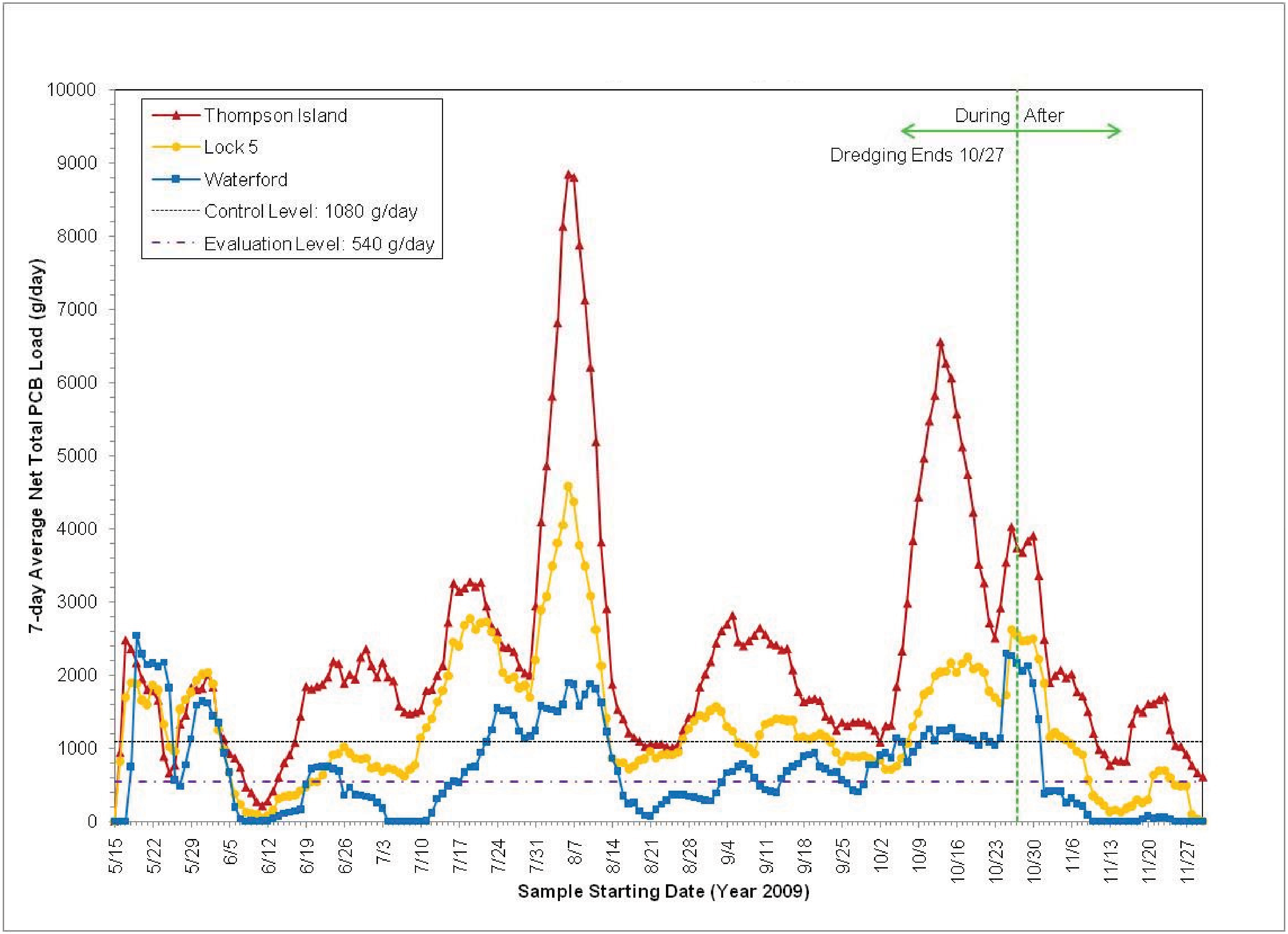
An additional sensitivity analysis was conducted with the estimated rate of decline of the loads to the Lower Hudson under MNA. As noted above the 99-year "half life" is not statistically significant but represents a best estimate. To assess how important this parameter was, two other, more optimistic "half lives" were examined, equivalent to a doubling and tripling of the rate of decline (*i.e.,* 50- and 30-year "half lives". These were again examined with a range of loads due to dredging of 2,000 kg ± 25 percent. The results are shown in Figures 19 and 20. Although rates of decline are notably faster than the best estimate MNA described above, the break-even times are still considered within acceptable bounds and are close to those determined in the setting of the original standard load requirements. Specifically, the 50-year "half life" scenario has a break-even period between 16 and 29 years after dredging is completed and the 30-year "half life" scenario has a break-even period between 20 and 41 years after dredging is completed. These windows are considered comparable to the estimates from the original analysis of 20 and 28 years. Thus, even if the rate of decline is actually 3 times faster than indicated by the prior 13 years of data, the remedy will serve to reduce loads to the Lower Hudson within a time frame consistent with those originally supporting preference for the dredging remedy.

In relative absence of information about temporal trends in water column PCB loads, the mechanistic principles were used to develop the HUDTOX model expected to be predictive of future conditions. Apparent problems with data originally thought to be representative of initial sediment conditions resulted in forecasts that are understood to be optimistic relative to now known temporal load profiles. This mismatch between modeled and now-known PCB loads primarily influences forecasts of future loads under the MNA scenario. The analysis described above replaces model based estimates of loads associated with the MNA scenario with empirical estimates that are informed by newly understood temporal trends in load as well as the much larger reservoir of unexpected PCB inventory in the Phase 1 area.

This analysis provides an assessment of the potential benefits of the remedy that is informed by these new data and is less dependent on modeling assumptions. This analysis also has explicit assumptions regarding future trends, and therefore should be considered in the light of the other observations of the river, including the lack of temporal decline in Upper Hudson loads, the continued presence of high PCB levels in surficial sediments, and the continued presence of high fish body burdens of PCBs supporting advancement of the remedy as quickly as possible. Additionally, given the apparent lack of significant impact of dredging related releases in Phase 1 on the water and fish of the Lower Hudson, this analysis suggests that long term detrimental impacts to the Lower Hudson by implementing the remedy are unlikely. On the contrary, the largely unabated loads to the Lower Hudson observed over the past 13 years strongly indicate that delay is much more likely to have unwanted effects.

Reference

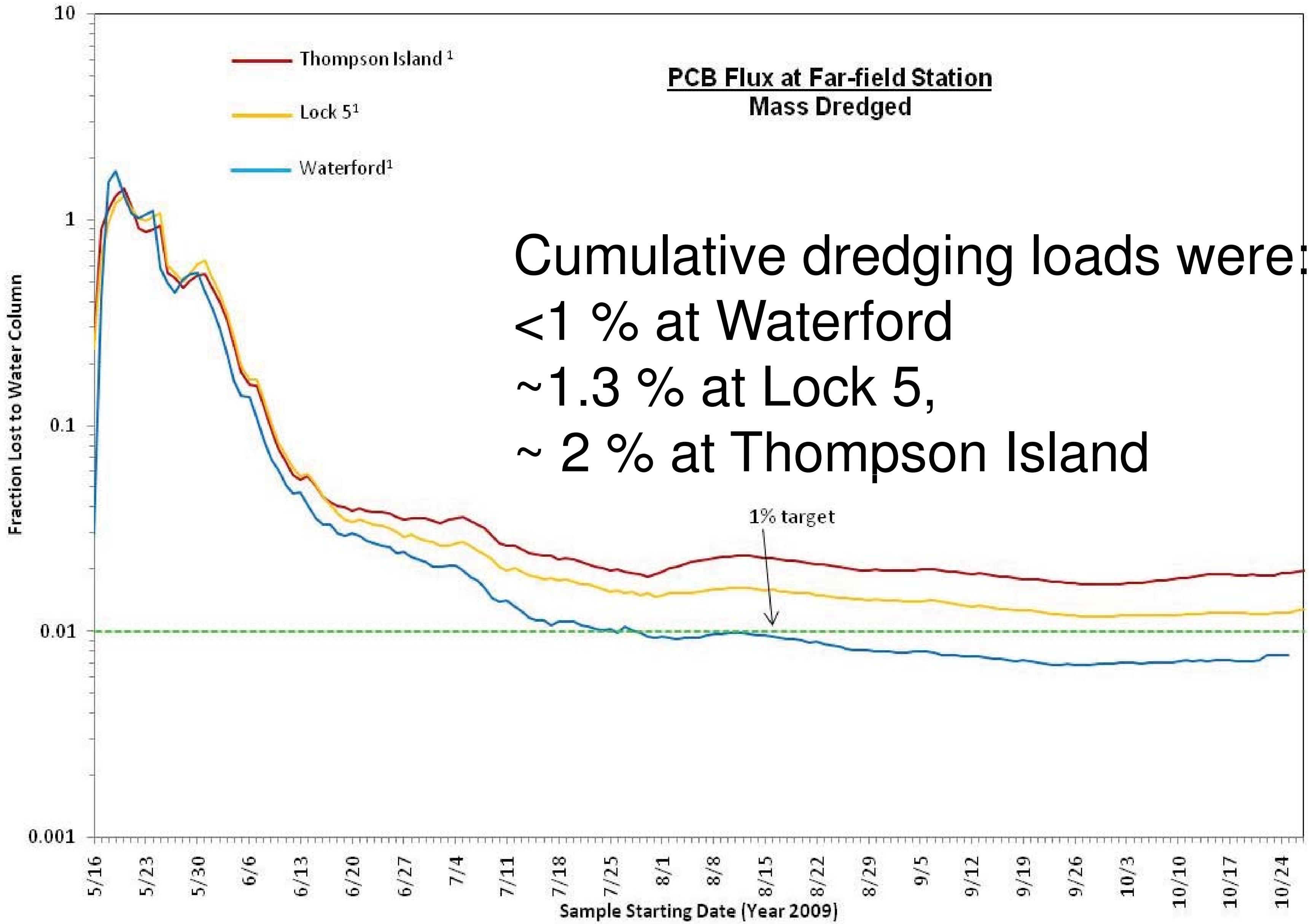
Bopp, R. and Simpson, H.J., 1989. Contamination of the Hudson River: The Sediment Record, in **Contaminated Marine Sediments-Assessment and Remediation**, National Science Foundation, Oct 1989.



Total PCB Loads over Baseline at the Three Main Far-Field Stations during Phase 1 (2009)

Figure 1

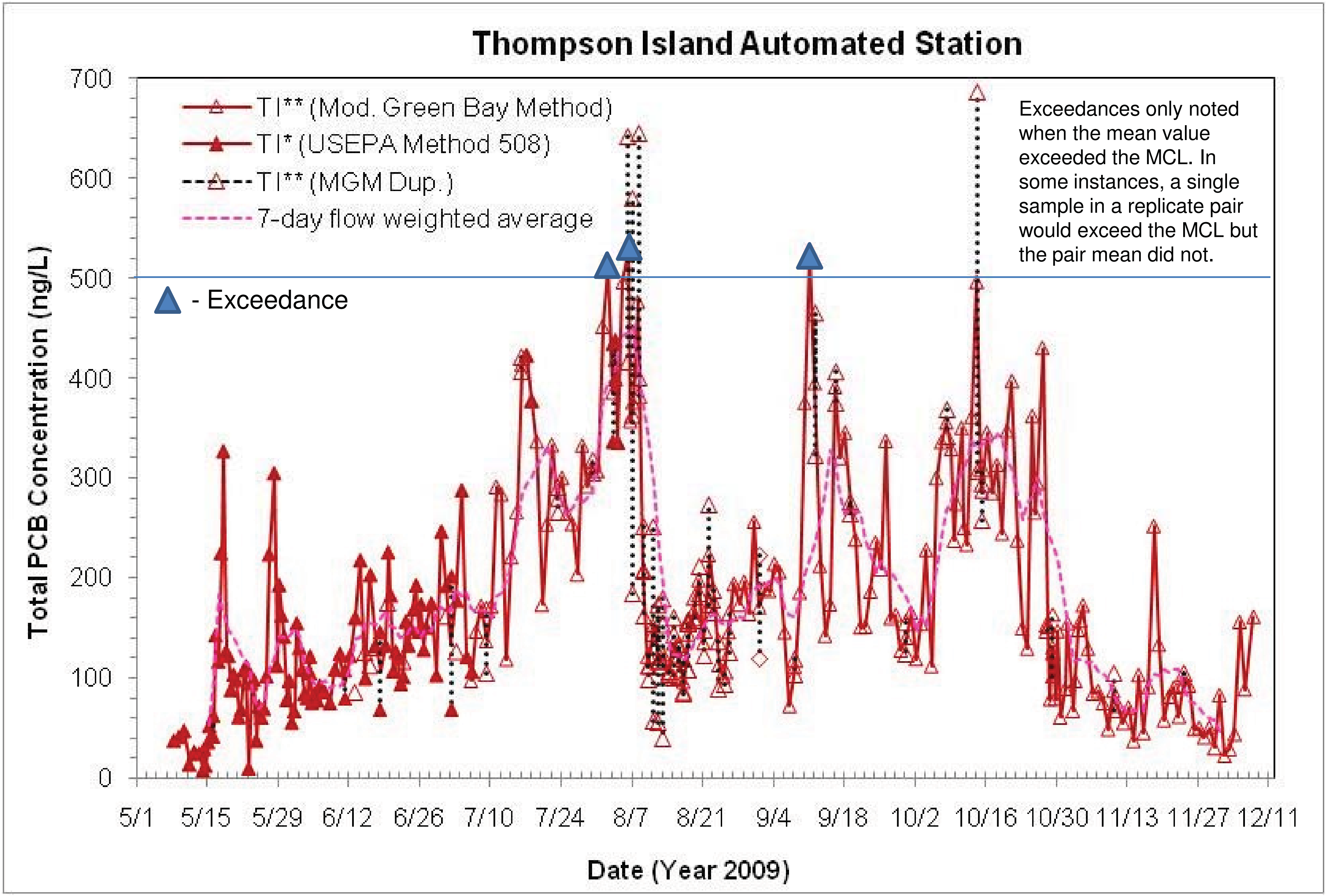
March 2010



Cumulative Total PCB Loads over Baseline at the Three Main Far-Field Stations during Phase 1 (2009)

Figure 2

March 2010

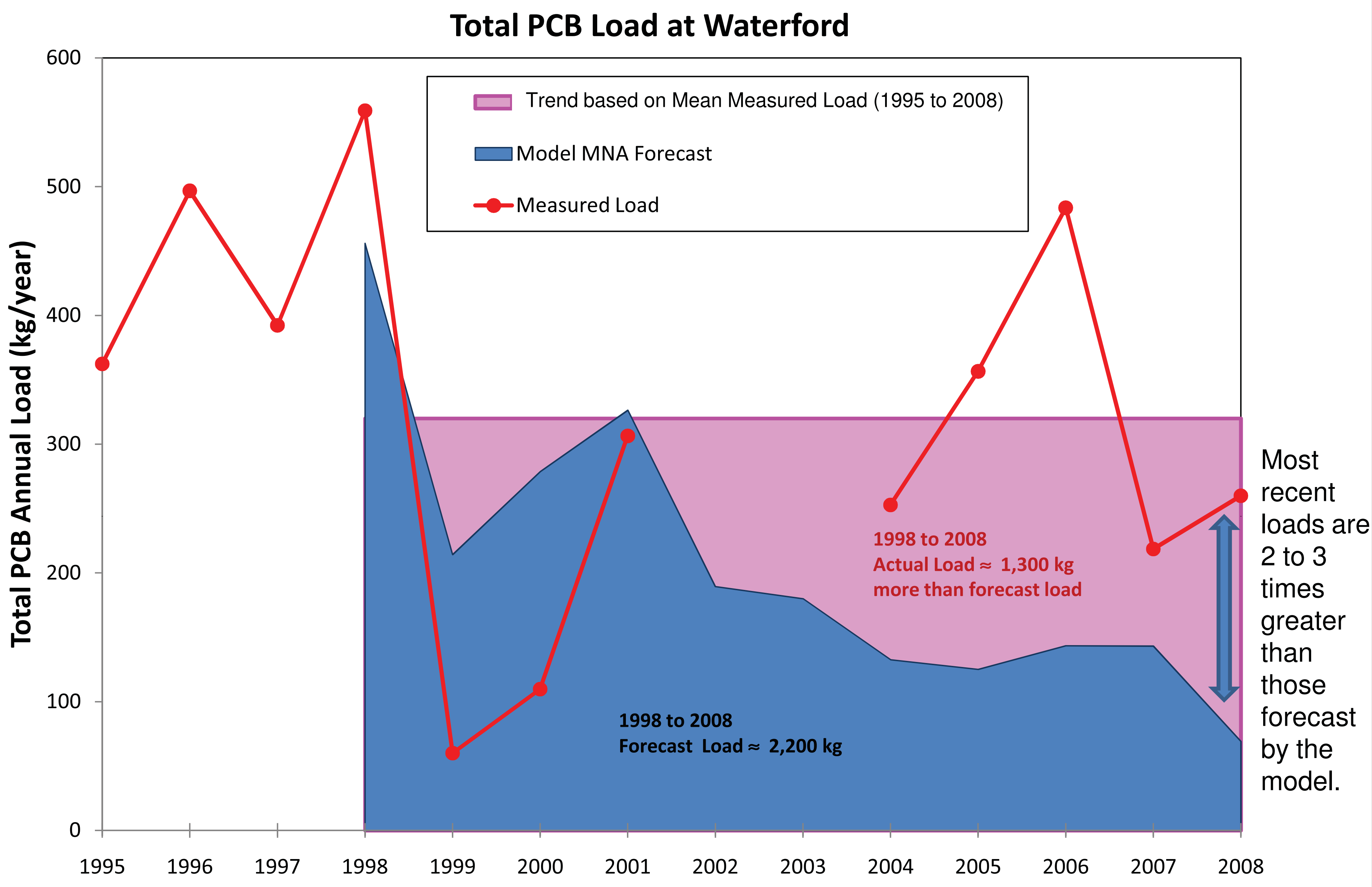


Total PCB Concentration at Thompson Island Station
Exceedances of the 500 ng/L MCL Noted (2009)

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Figure 3

March 2010



Measured loads are calculated from measured concentrations and USGS flow records at Waterford using Biele's estimator.

Total PCB Load at Waterford
1995 to 2008

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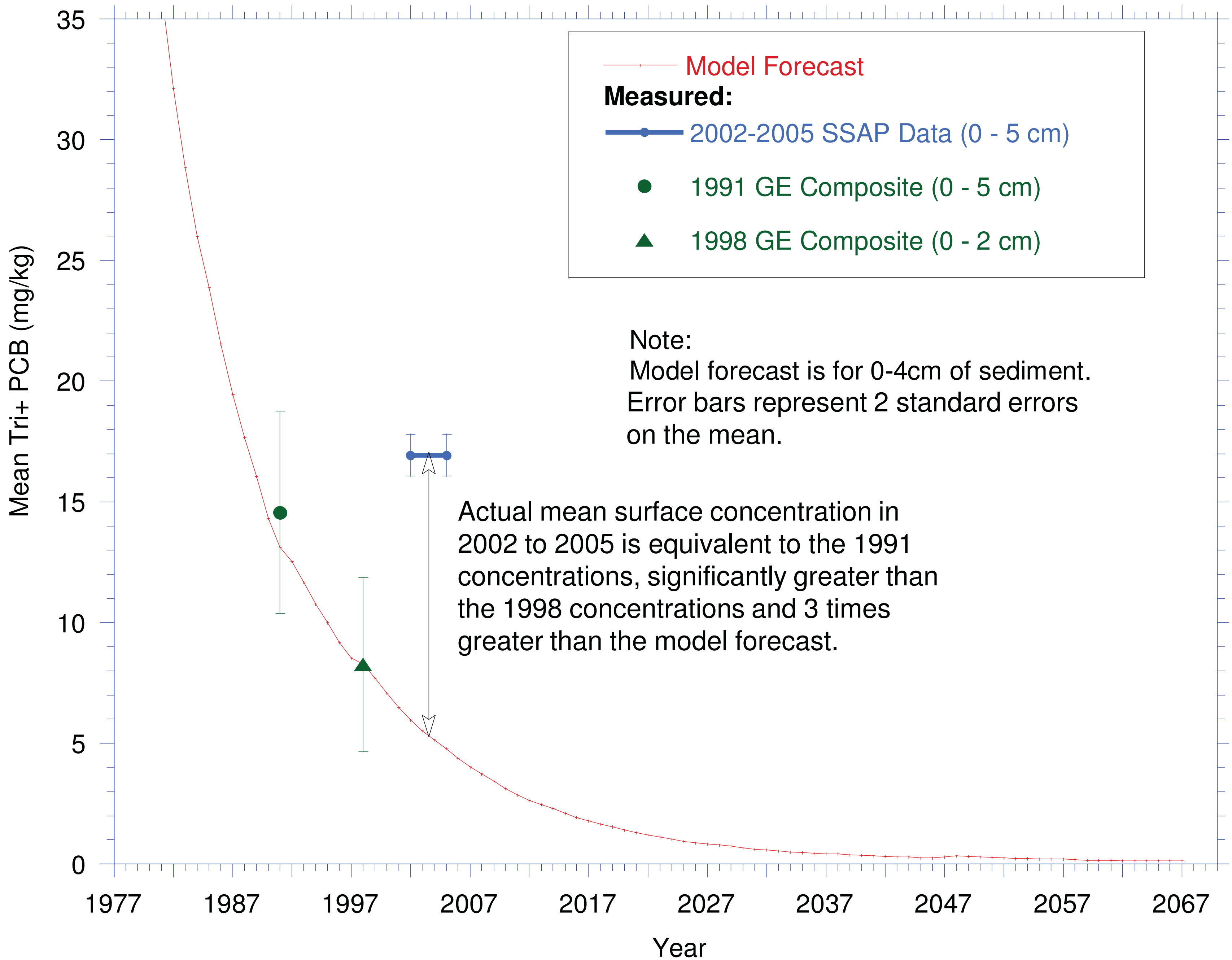
Figure 4

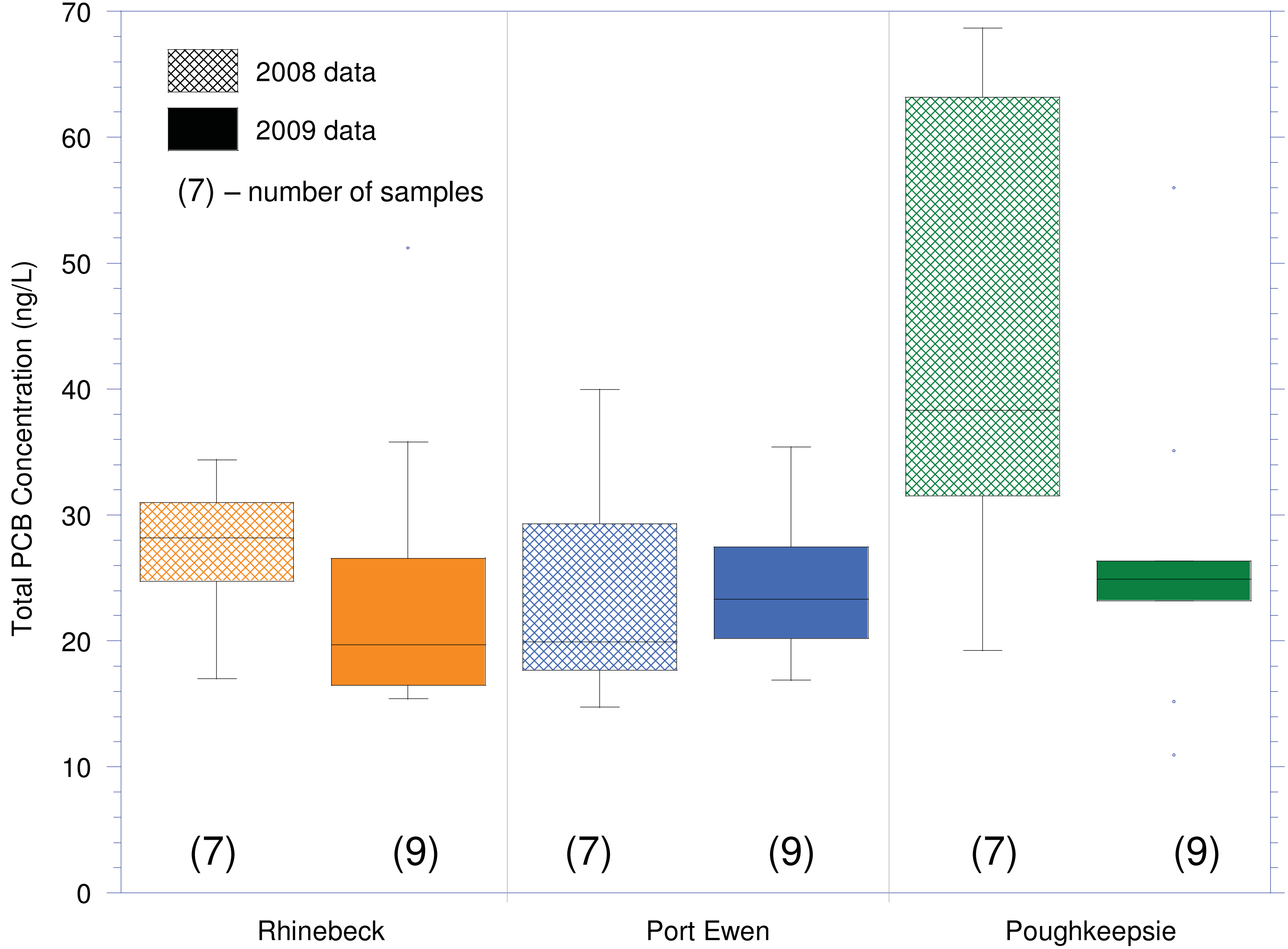
March 2010



HUDTOX Model and Core Data Comparison
All Sediment Types
Thompson Island Pool
EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Figure 5

March 2010

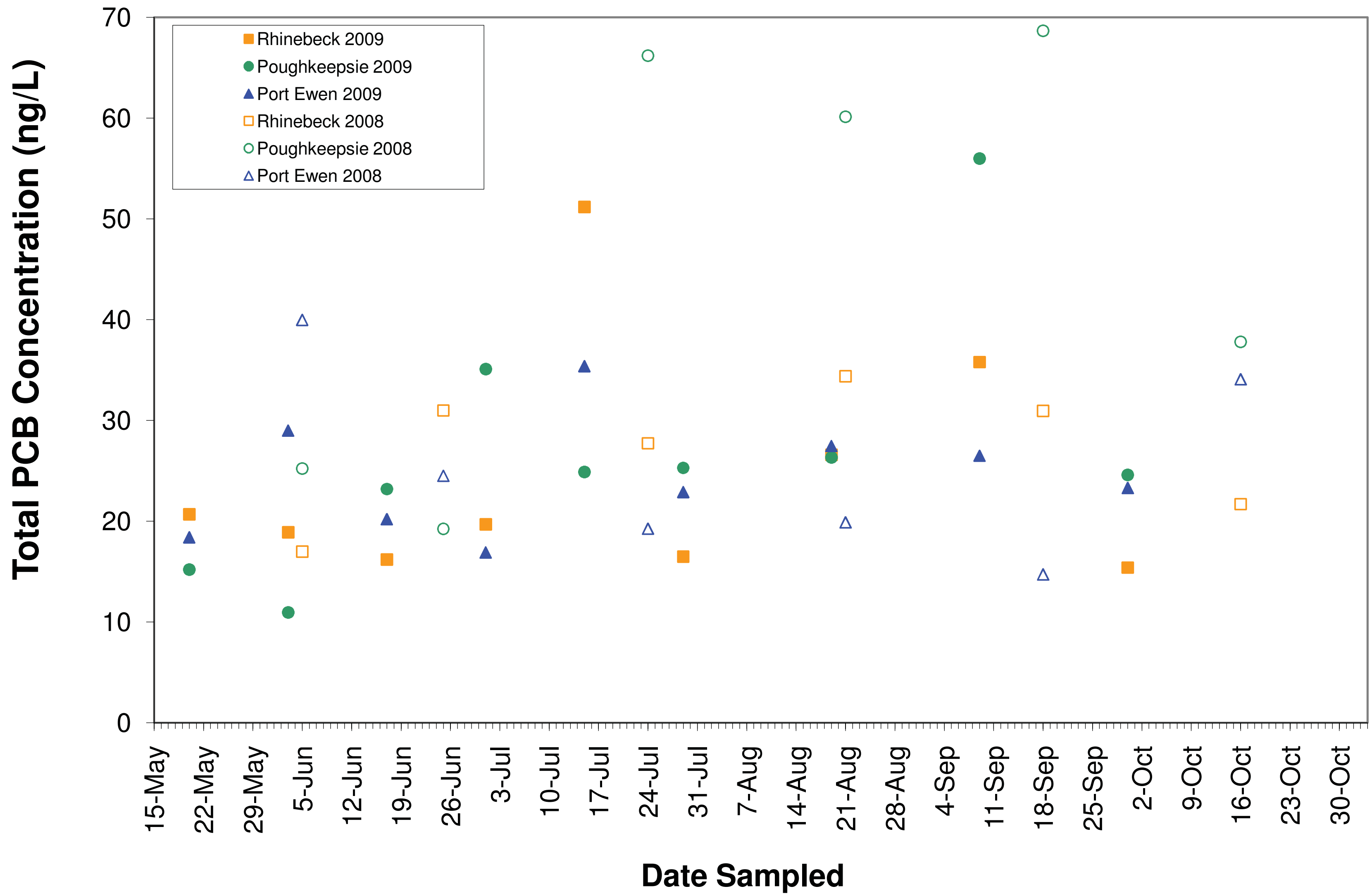


Total PCB Concentration for the Lower Hudson River
Baseline (2008) vs Phase 1 (2009)

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Figure 6

March 2010



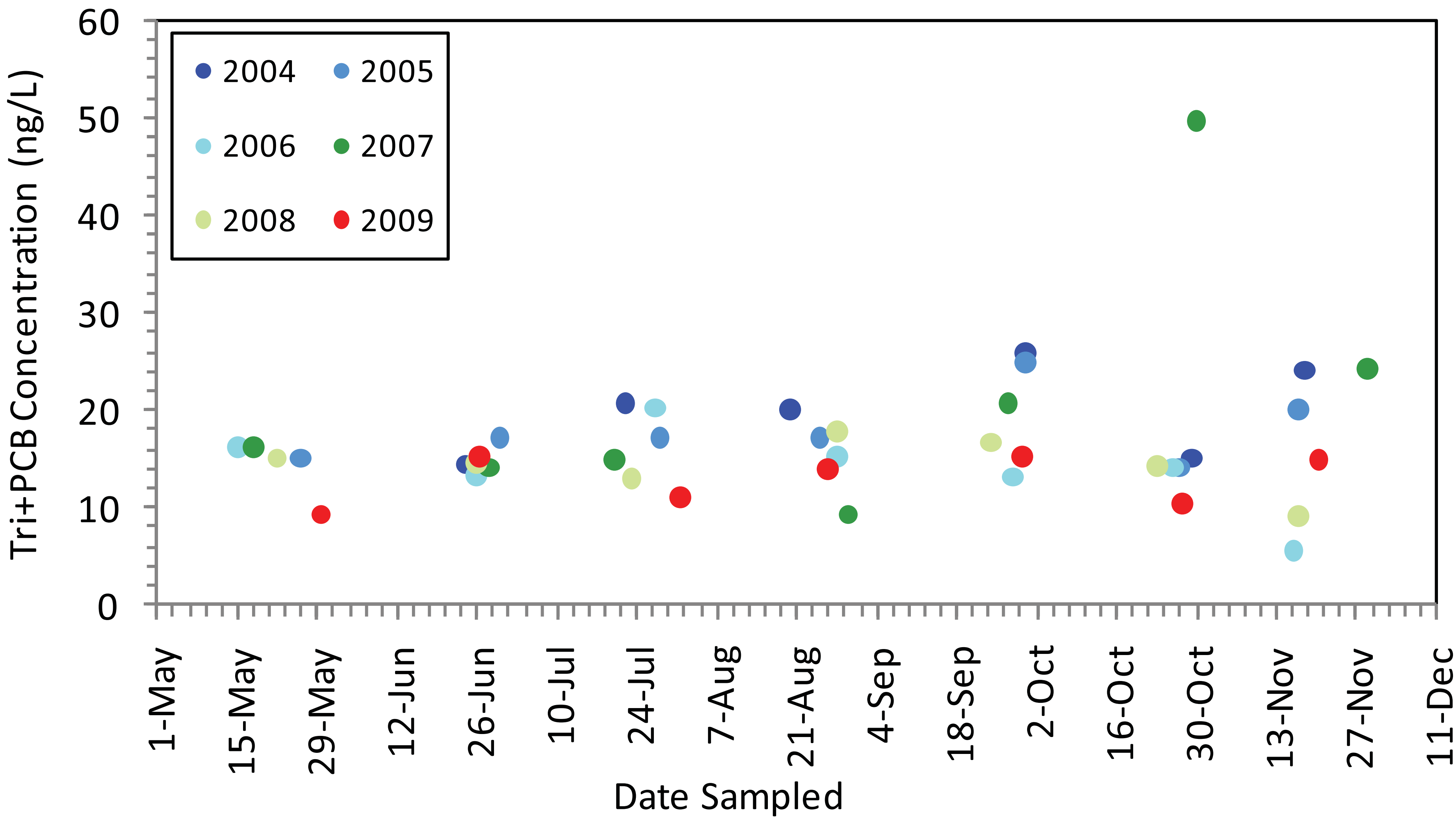
Subject to Joint Prosecution and Confidentiality Agreement. Not for Public Release. FOIA/FOIL Exempt.

Total PCB Concentration for the Lower Hudson River Baseline (2008) vs Phase 1 (2009)

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Figure 7

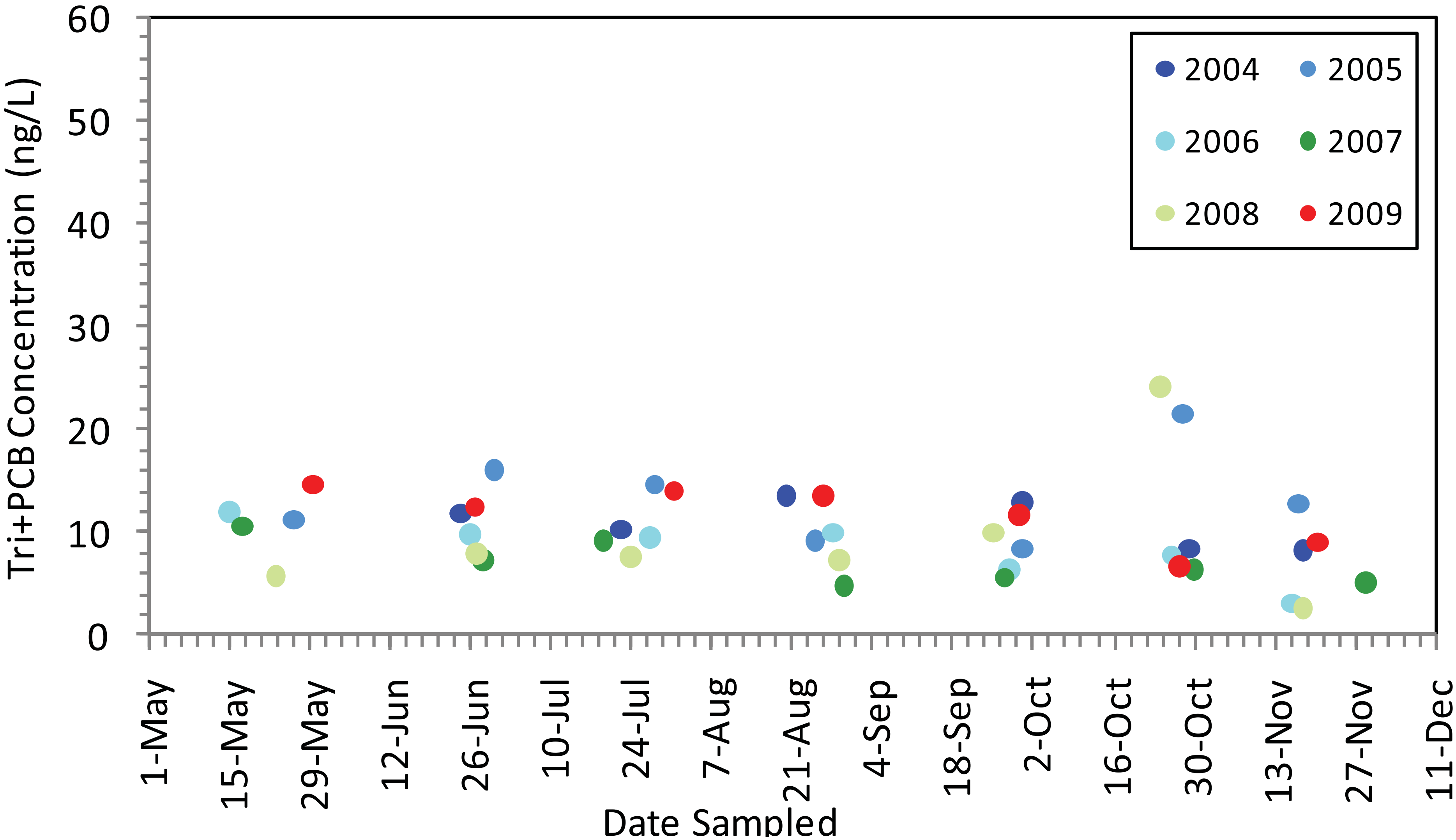
March 2010



Tri+ PCB Water Column Concentration at Poughkeepsie
GE BMP and 2009 Phase 1 Data

Figure 8

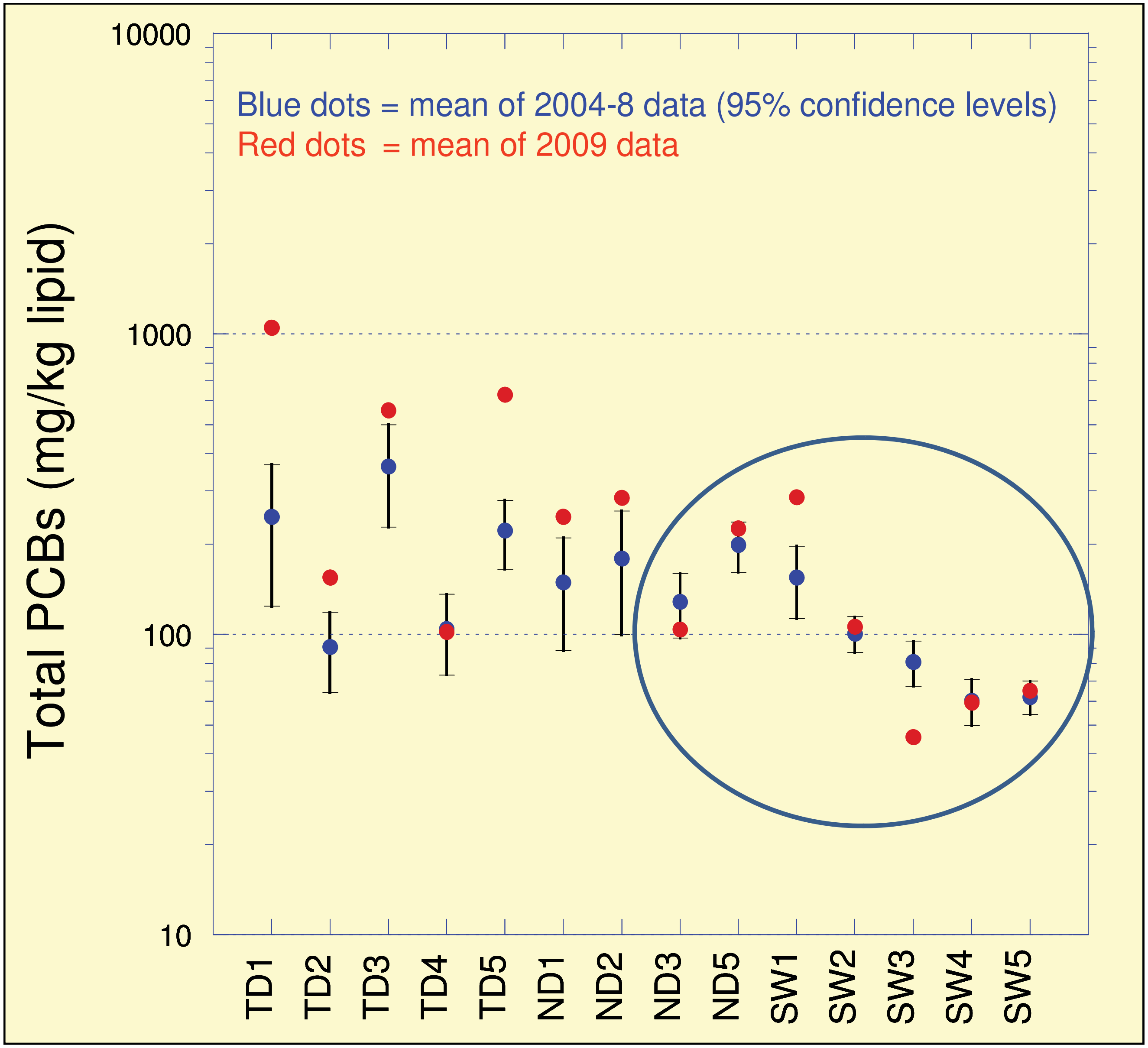
March 2010



Tri+ PCB Water Column Concentration at Albany
GE BMP and 2009 Phase 1 Data

Figure 9

March 2010



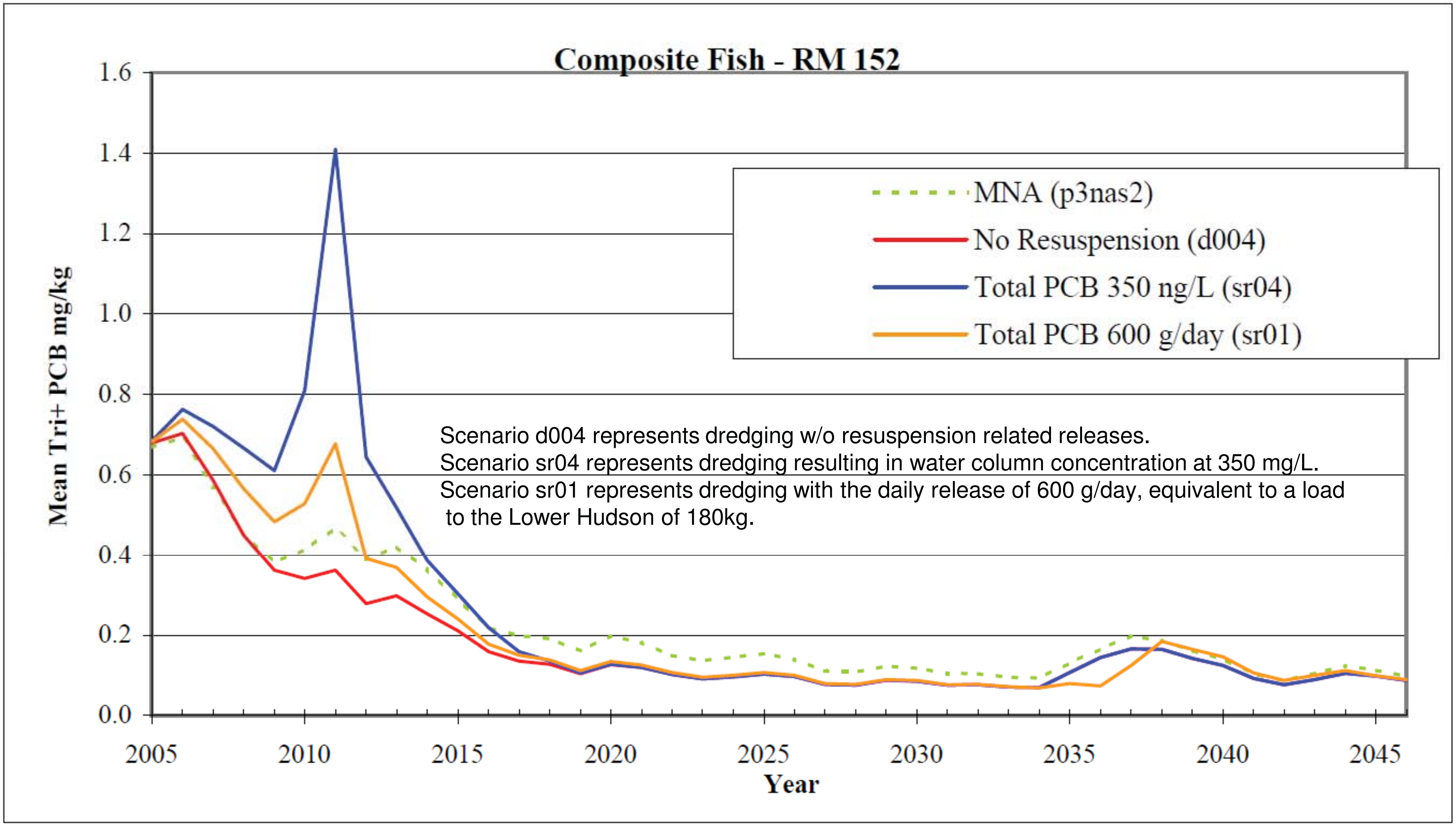
Fish monitoring stations in the lower part of River Section 2 and all of River Section 3 show no consistent measurable impact due to dredging.

TD --Thompson Island Dam
ND-- Northumberland
SW --Stillwater

Hudson River Pumpkinseed:
Baseline vs. 2009

Figure 10

March 2010



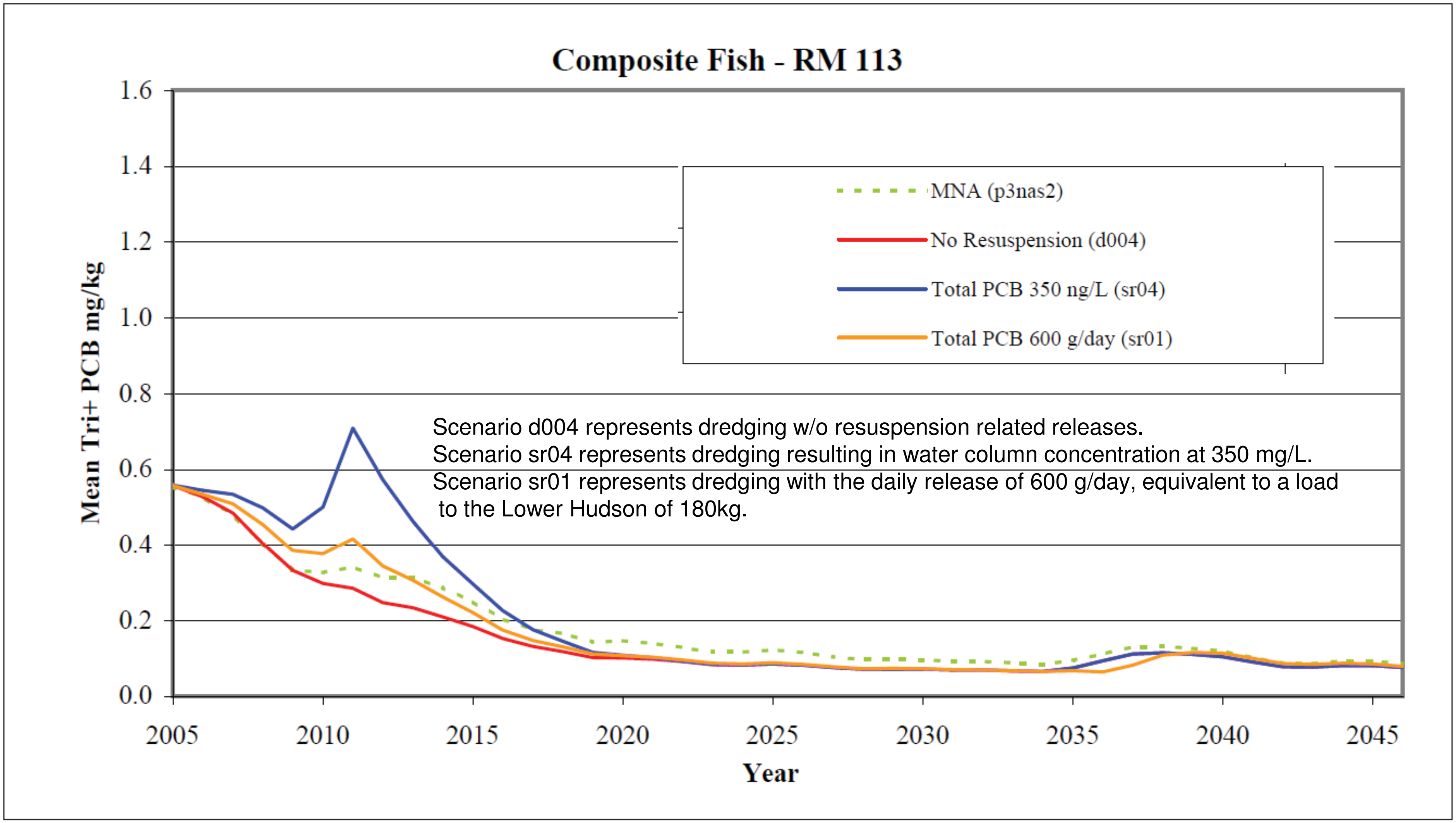
Note:
Fish composite is 47% largemouthbass + 44% brown bullhead + 9% yellow perch
Scenario sr04 represents a net load of ~900kg to the Lower Hudson due to dredging.
Dredging is completed by 2012 in the three latter scenarios.

Composite Fish Tissue Concentrations for the Lower Hudson River At RM 152 based on Original Modeling Analysis

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Figure 11

March 2010



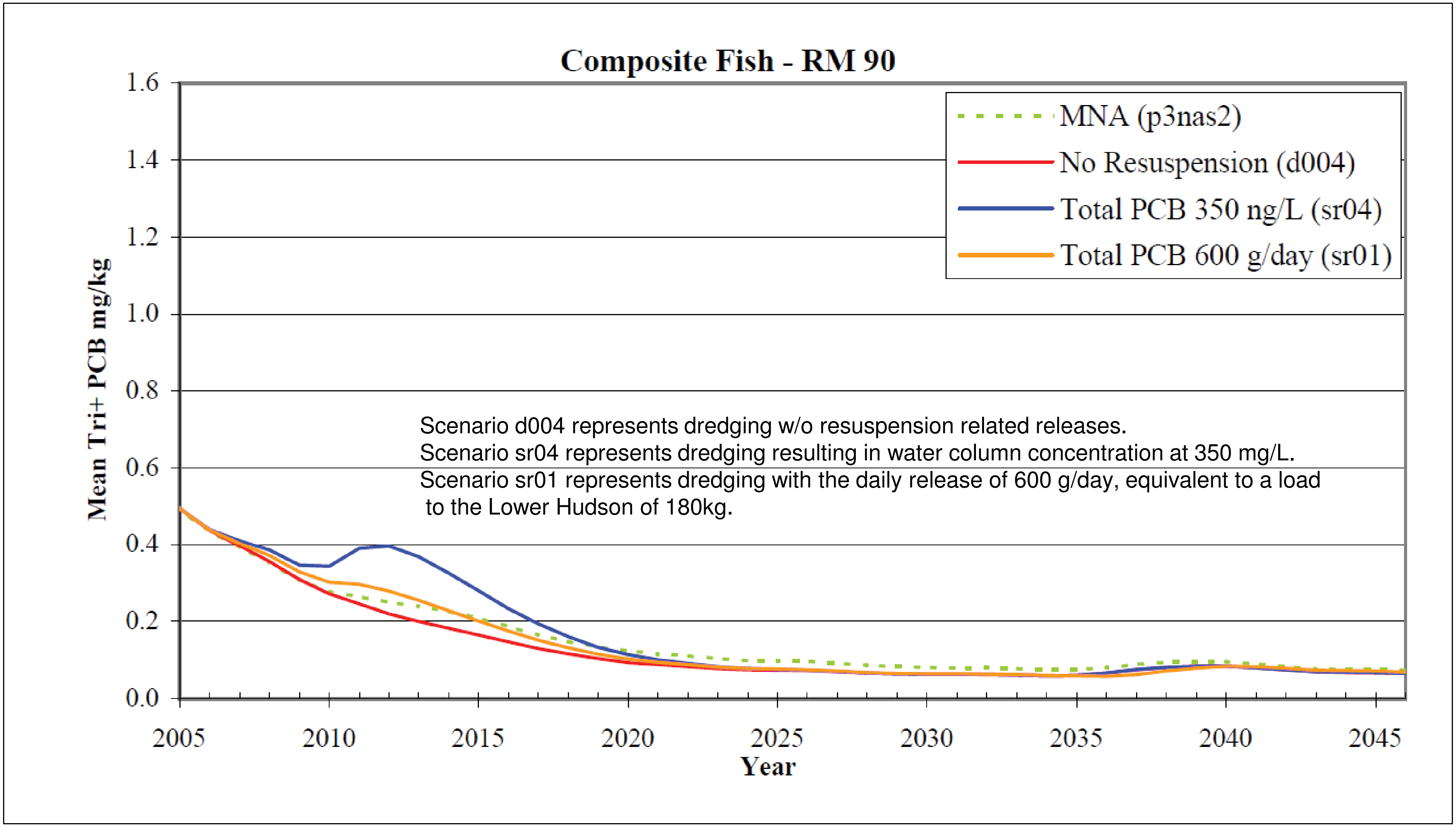
Note:
Fish composite is 47% largemouth bass + 44% brown bullhead + 9% yellow perch
Scenario sr04 represents a net load of ~900kg to the Lower Hudson due to dredging.
Dredging is completed by 2012 in the three latter scenarios.

Composite Fish Tissue Concentrations for the Lower Hudson River At RM 113 based on Original Modeling Analysis

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Figure 12

March 2010



Note:
Fish composite is 47% largemouthbass + 44% brown bullhead + 9% yellow perch
Scenario sr04 represents a net load of ~900kg to the Lower Hudson due to dredging.
Dredging is completed by 2012 in the three latter scenarios.

Composite Fish Tissue Concentrations for the Lower Hudson River At RM 90 based on Original Modeling Analysis

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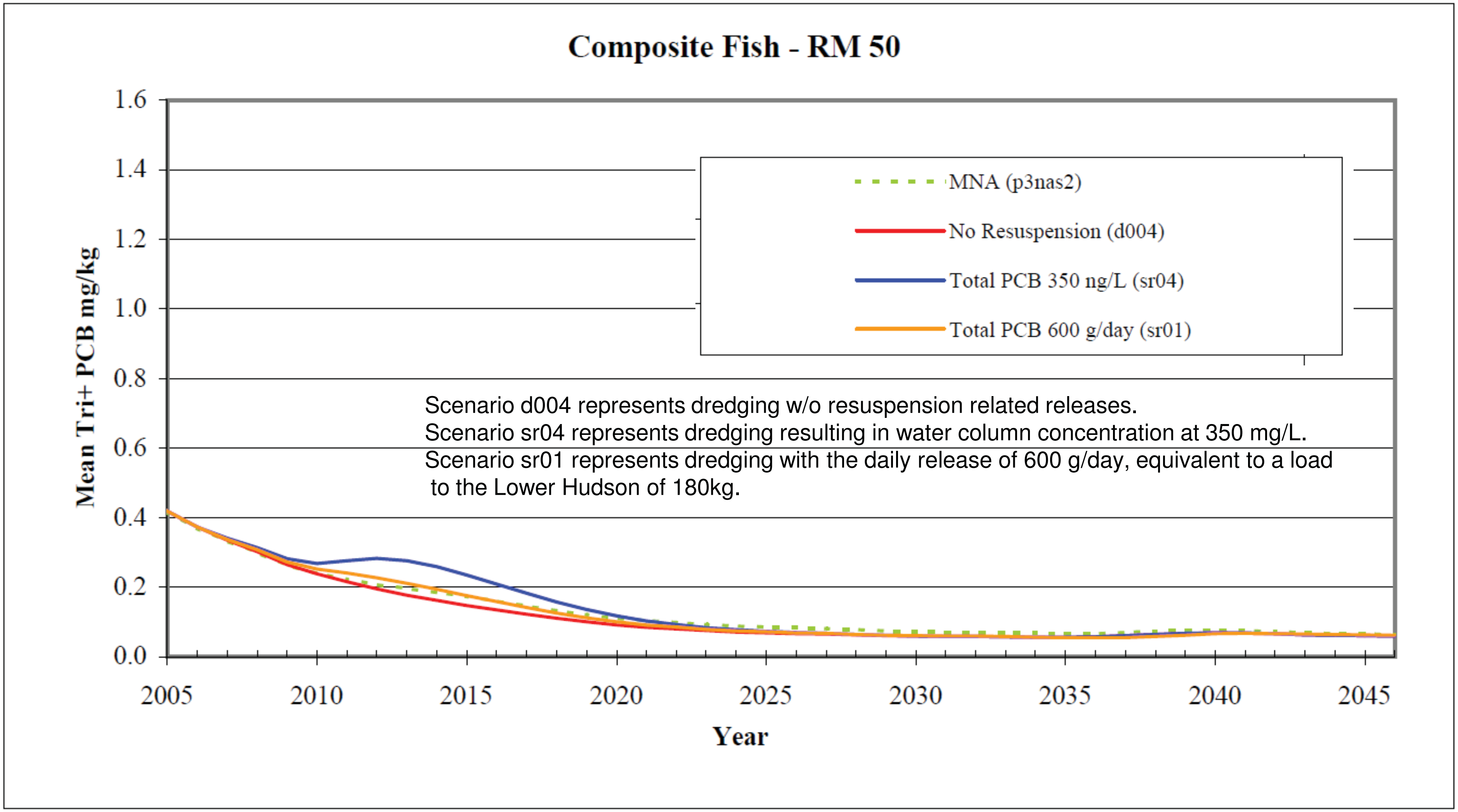
Figure 13

March 2010



Note:
Fish composite is 47% largemouthbass + 44% brown bullhead + 9% yellow perch
Scenario sr04 represents a net load of ~900kg to the Lower Hudson due to dredging.
Dredging is completed by 2012 in the three latter scenarios.

Composite Fish Tissue Concentrations for the Lower Hudson River At RM 50 based on Original Modeling Analysis

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Figure 14

March 2010

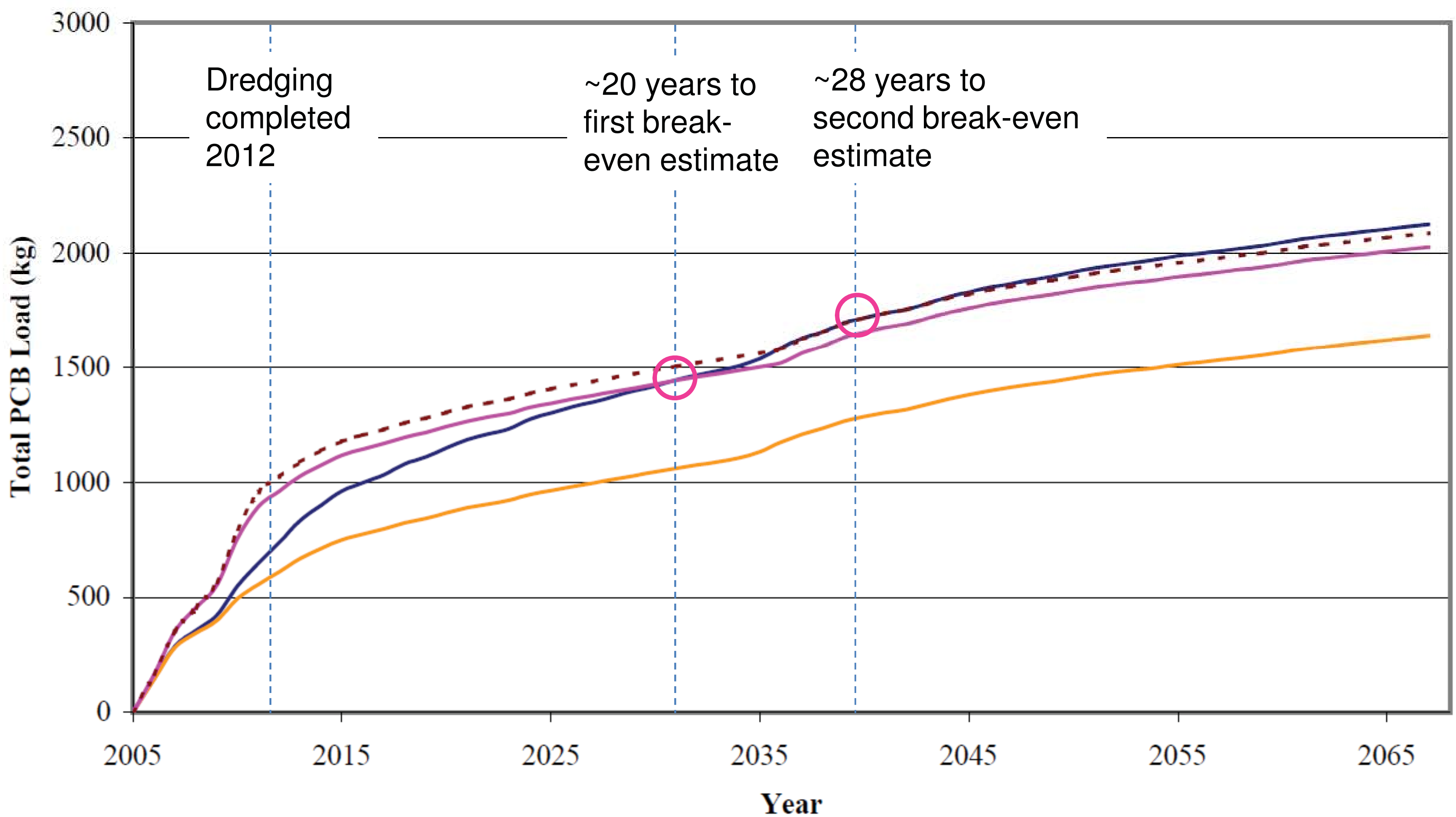
MNA (p3nas2)

Total PCB 600g/day (sr01)........................180 kg to the Lower Hudson due to dredging releases

No Resuspension (d004) ....0 kg to the Lower Hudson due to dredging releases

Total PCB 600 g/day corrected to MNA (sr01)..350 kg to the Lower Hudson due to dredging releases

Each of the 600 g/day scenarios was considered in developing the 650 kg Total PCB delivery scenario.



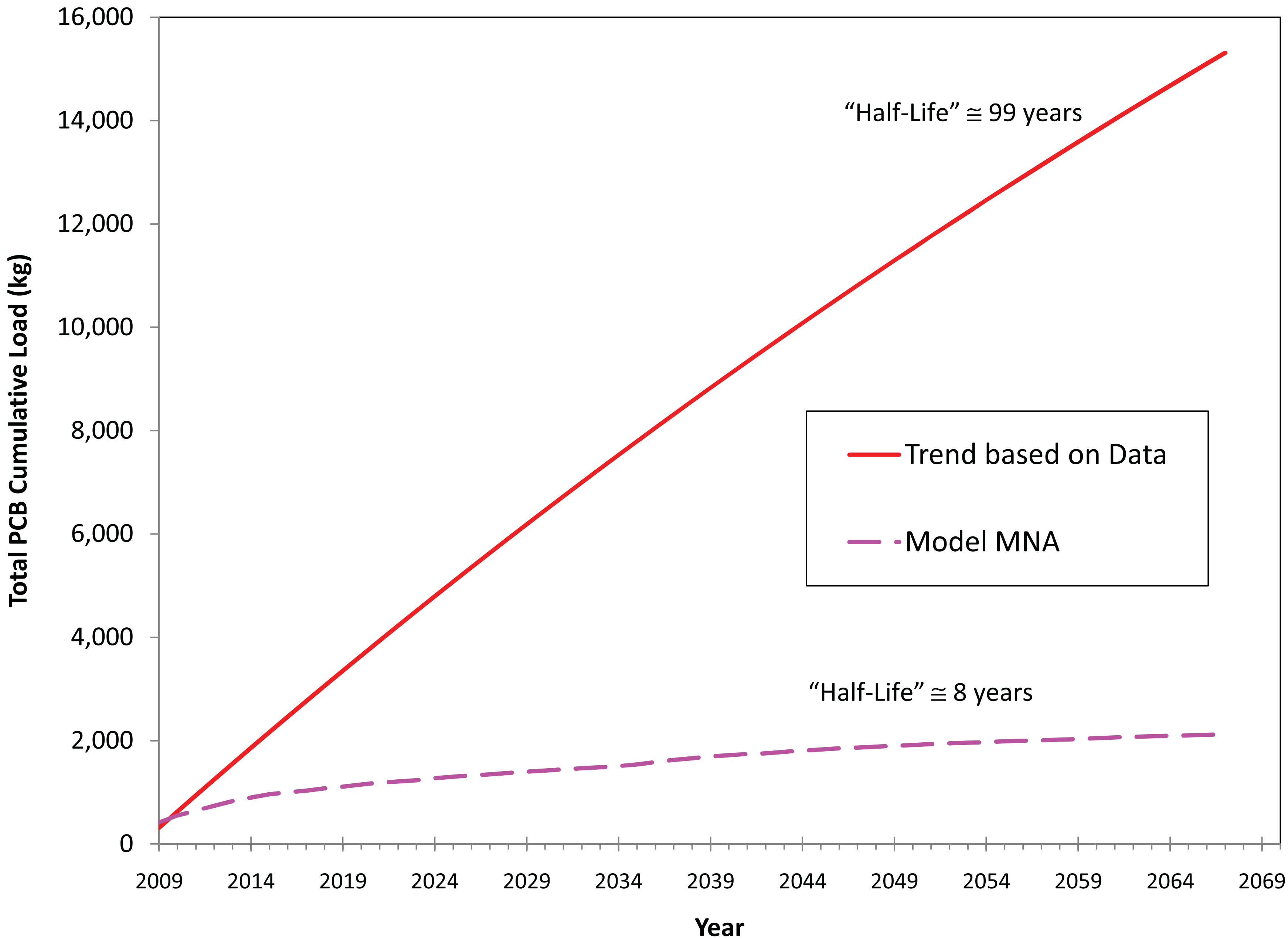
Break-even point is defined as point where the MNA load becomes greater than remedial scenario load.

Cumulative Load to the Lower Hudson River
based on Original Modeling Analysis, Showing Cross Over Years

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Figure 15

March 2010



Total PCB Cumulative Load at Waterford
For Original and Revised MNA Scenarios

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Figure 16

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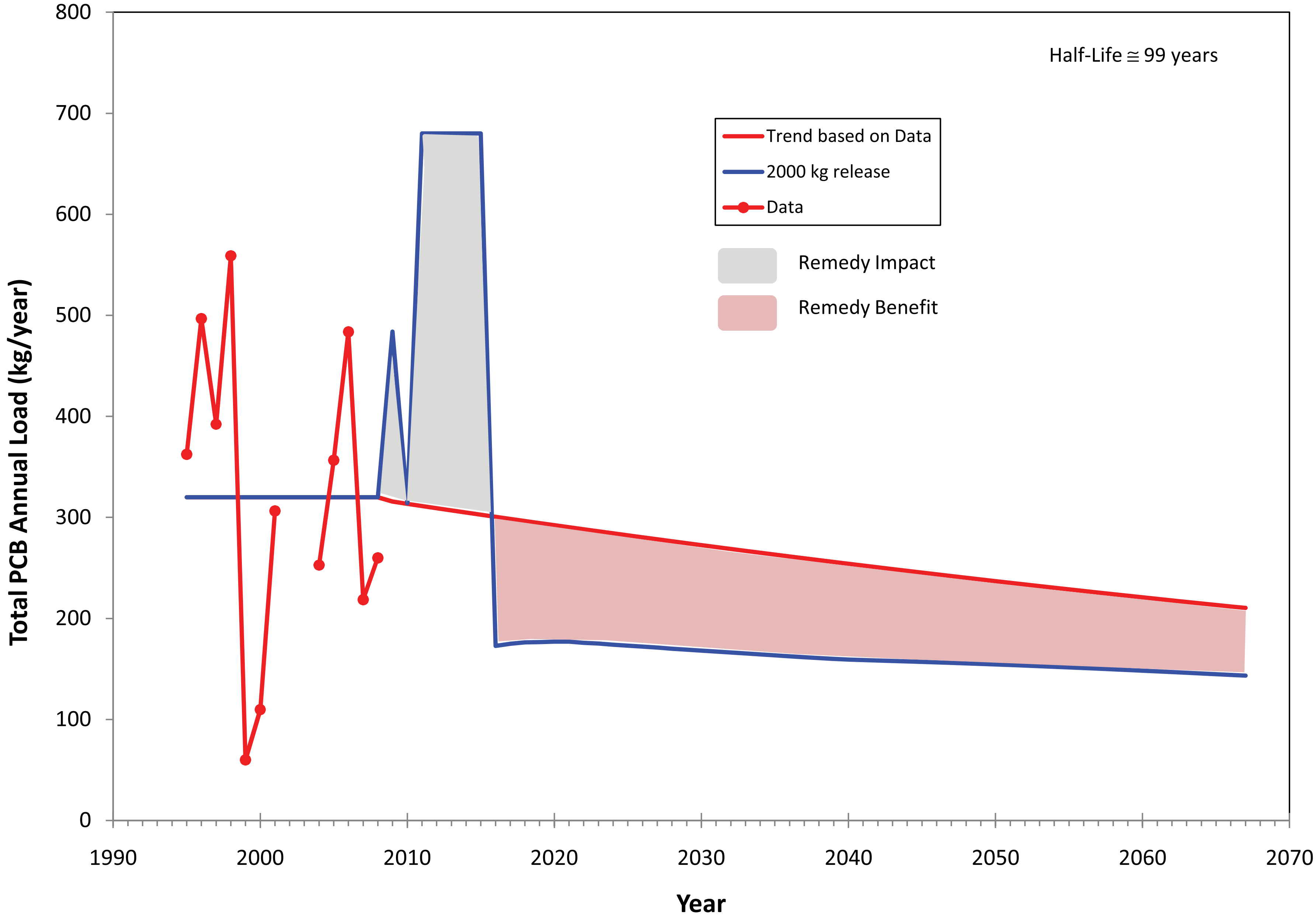

Total PCB Annual Load at Waterford
Half-Life ≅ 99 years

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Figure 17

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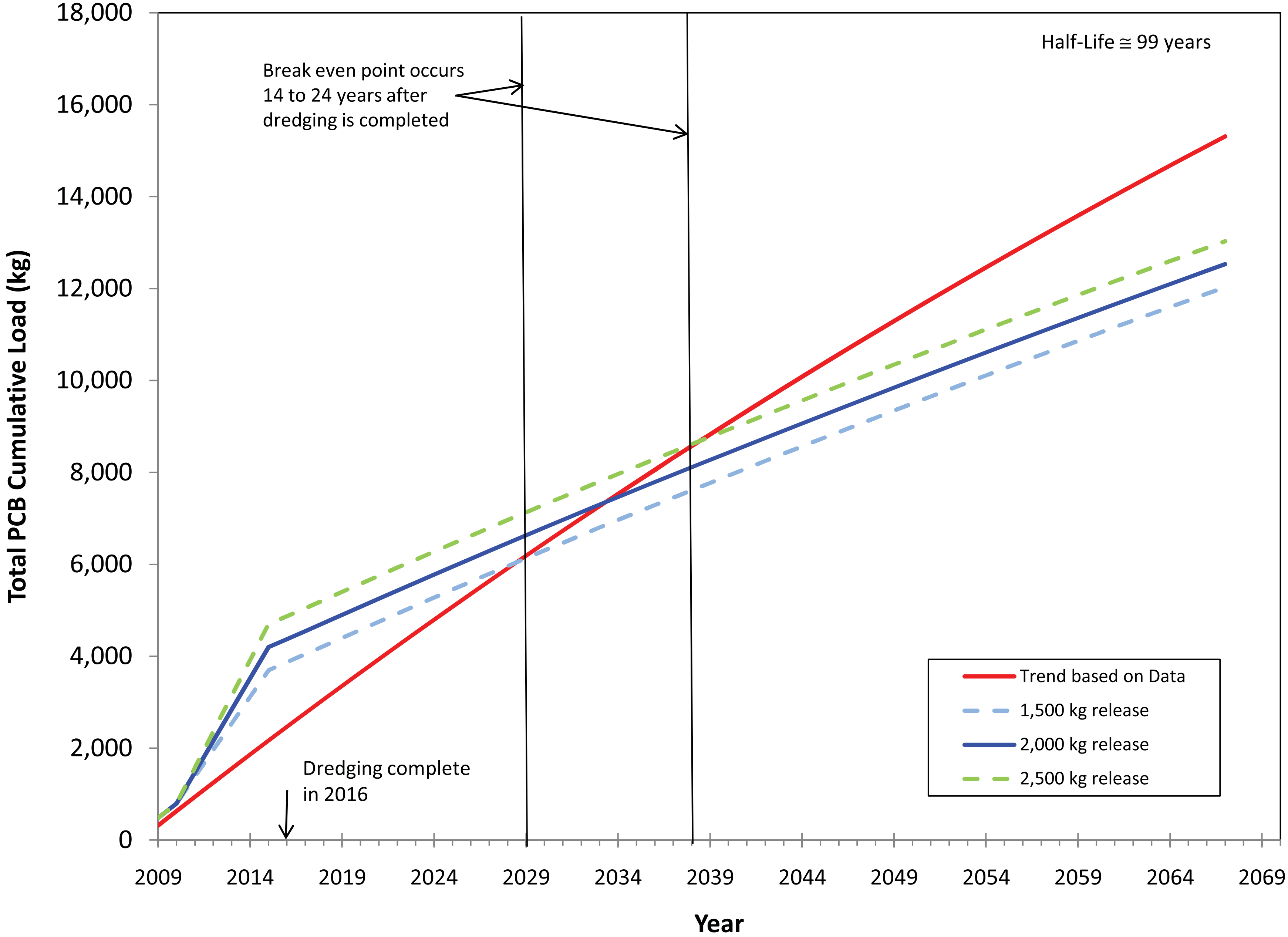

Total PCB Cumulative Load at Waterford
Half-Life ≅ 99 years

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Figure 18

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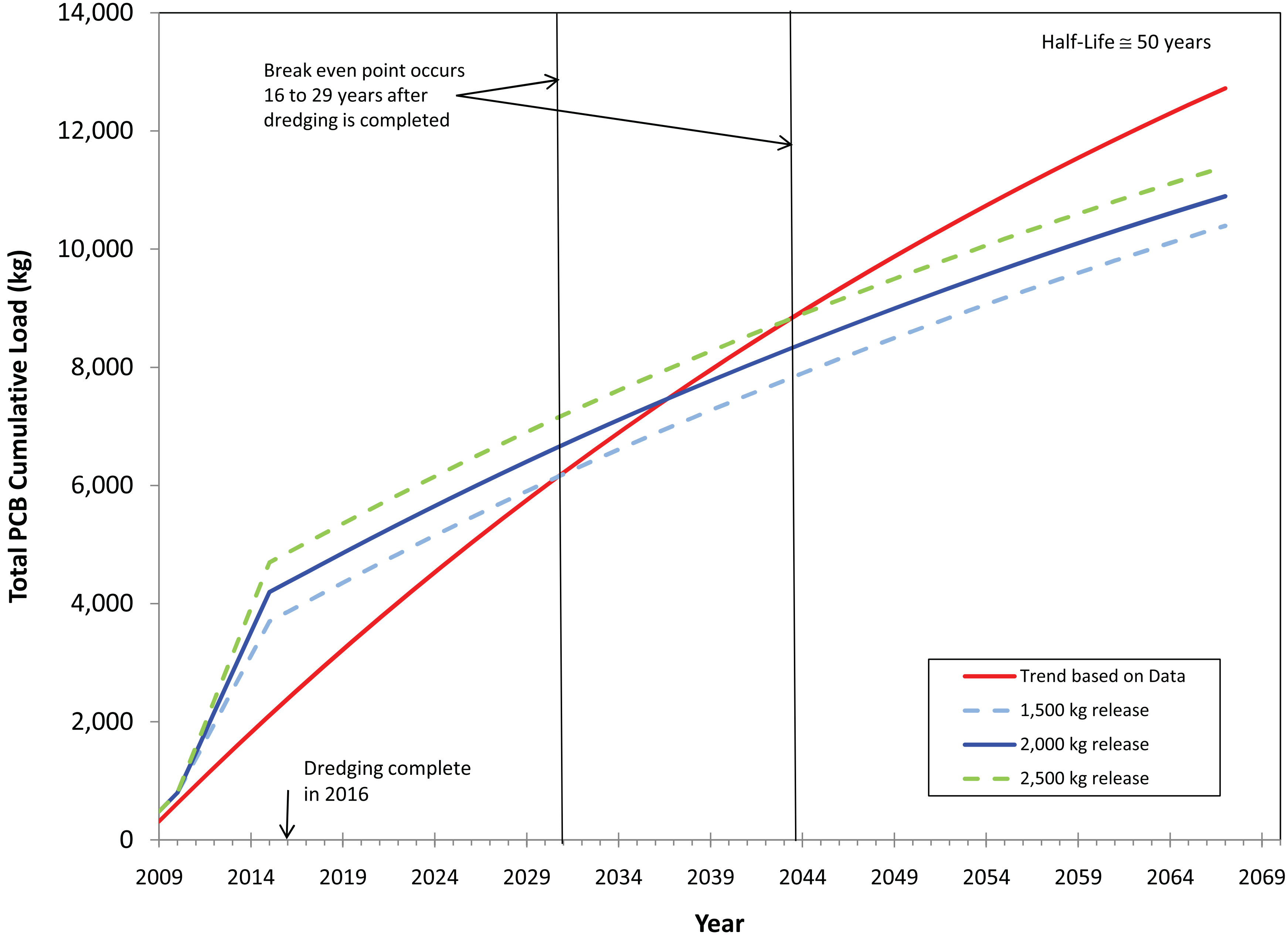

Total PCB Cumulative Load at Waterford
Half-Life ≅ 50 years

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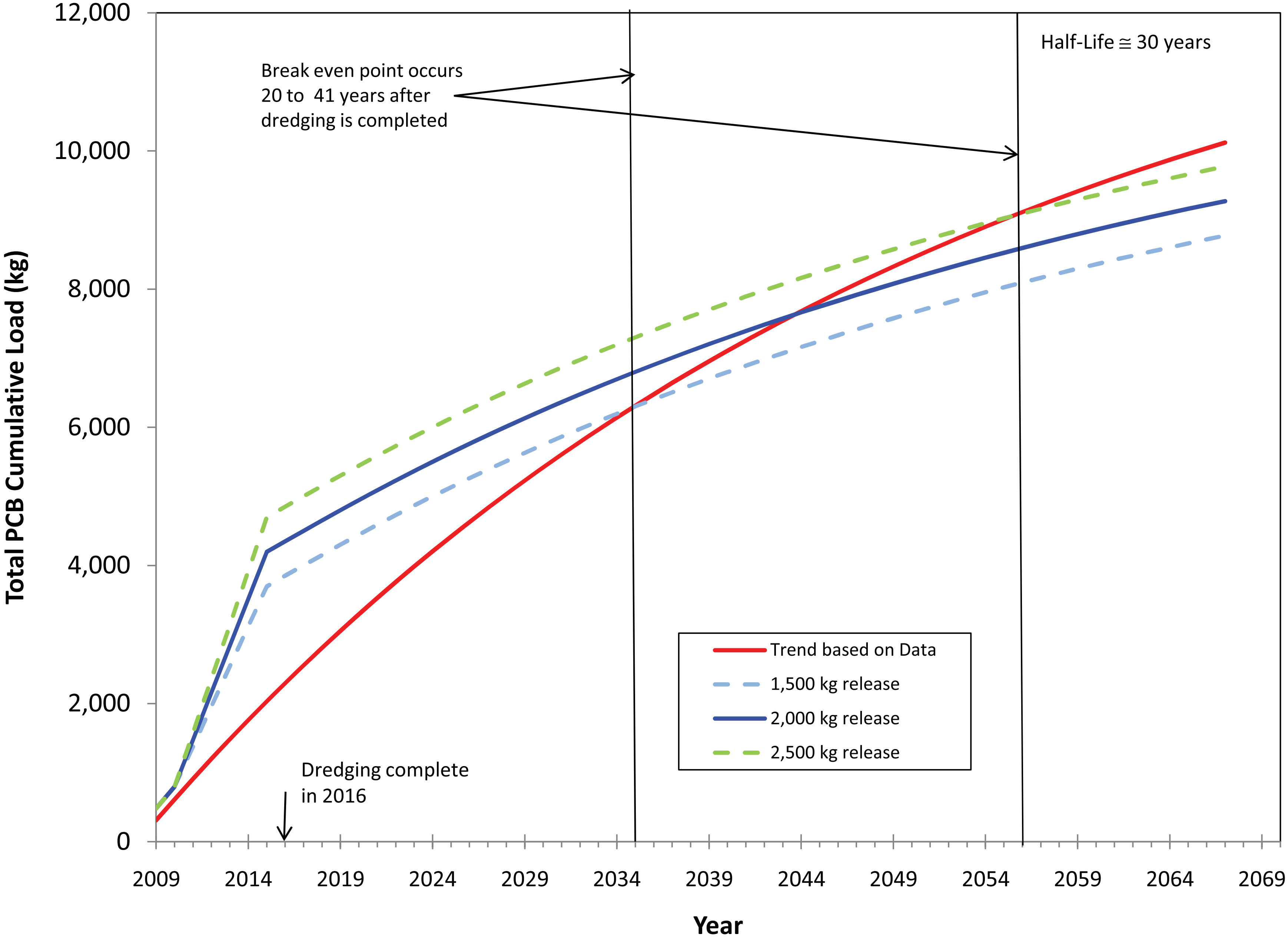
Figure 19

March 2010



Total PCB Cumulative Load at Waterford
Half-Life ≅ 30 years

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Figure 20

March 2010

Appendix I-H

EPA Oversight Report

USEPA Oversight Team

Phase 1 Observations Report

Hudson River PCB Superfund Site

Prepared for:
U.S. Environmental Protection Agency, Region 2

Prepared by:
Ecology & Environment, Inc.

3/23/2010

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Appendix

A Noise Technical Memorandum A-1

B Air Technical Memorandum B-1

Acronyms

$\mu g/m^3$	micrograms per cubic meter
AIS	Automated Identification System
C	comment
CCA	Contingent Containment Areas
cfs	cubic feet per second
CHASP	Community Health and Safety Plan
CMSA	Coarse Material Staging Area
CU	Certification Unit
dBA	decibels – A-weighted
DoC	depth of contamination
E & E	Ecology & Environment, Inc.
EGIA	East Griffin Island Area
EPA	U.S. Environmental Protection Agency
FCSA	filter cake storage area
GE	General Electric Company
GPR	ground-penetrating radar
GPS	global positioning system
H_2S	hydrogen sulfide
HRFO	Hudson River Field Office
HSA	hollow-stem auger
LBG	The Louis Berger Group, Inc.
M	mitigation
mg/kg	milligrams per kilogram
mGBM	Modified Green Bay Method
NAPL	non-aqueous phase liquid
NYSCC	New York State Canal Corporation
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCB	polychlorinated biphenyls
ppm	parts per million
ppt	parts per trillion

QA	quality assurance
QC	quality control
QoLPS	Quality of Life Performance Standards
RAM QAPP	Remedial Action Monitoring Quality Assurance Project Plan
RAWP	Remedial Action Work Plan
RFW	Riverine Fringing Wetland
SOP	standard operating procedure
SSAP	Sediment Sampling and Analysis Program
TID	Thompson Island Dam
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
VTS	vessel tracking system

1.0 Introduction

This *Phase 1 Oversight Observations Report* has been prepared for the U.S. Environmental Protection Agency Region 2 (EPA) to support the evaluation of the initial phase of the Hudson River PCBs Superfund Site Dredging Project during 2009 (Phase 1). This document briefly describes Phase 1 activities and Oversight Team observations and any associated issues or concerns regarding observed activities. The report also includes lessons learned and potential contingencies, changes in approach, best management practices, or controls that could be considered for implementation during Phase 2.

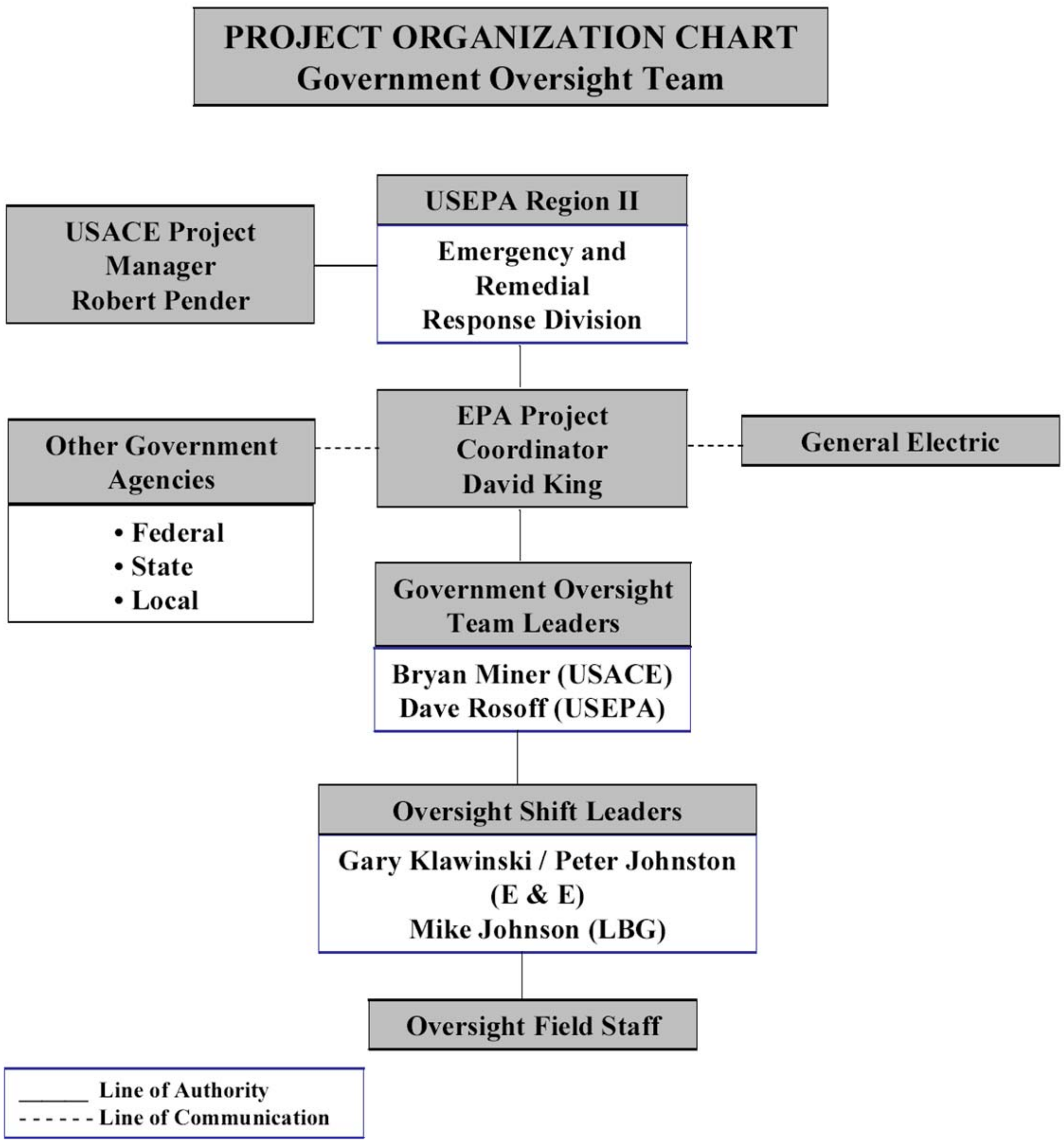
The overall purpose of this document is to improve compliance with project Performance Standards to promote successful completion of Phase 2 of the project. In general, EPA believes that Phase 1 of the project was implemented well by General Electric Company (GE) and its contractors. However, given the nature of this project (as expected) there were lessons learned by GE and its contractors. EPA's observations of the Phase 1 work (as outlined in this report) support the view that there is room for improvement for Phase 2.

Mitigation discussions within this report are not intended as directives to GE but are discussions of items to be considered between GE and EPA. Comments, conclusions, and possible recommendations described in this report are subject to change as EPA and GE continue to review data from Phase 1 and as comments from the Peer Review Panel and the public are received.

It should be noted that there is some Phase 1 work remaining, mainly habitat reconstruction, which is scheduled to begin in spring 2010.

2.0 EPA Oversight Team Description and Brief Project Background

During Phase 1, the EPA Oversight Team (see organizational chart below) observed and reported on all dredging-related activities, including tree trimming, debris removal, in-river dredging (inventory and residual), backfilling/capping of dredged areas, sheet pile installation, sediment sampling/processing, cultural resource evaluation, Performance Standard monitoring, and Processing Facility operations. After observing project activities in the field, team personnel developed a daily report that was submitted to the EPA Oversight Team leader for review. A daily report summarizing the EPA Oversight Team's observations was then distributed to appropriate project personnel. Digital photos documenting project activities were also taken.



The following is a brief timeline summary of the major Phase 1 project milestones:

- Processing Facility set-up and testing was completed in May 2009.
- Pre-dredging construction activities (e.g., tree trimming, debris removal, etc.) began on April 17, 2009 and were completed on June 16, 2009.
- Inventory dredging within the West Channel of Rogers Island began on May 15, 2009.
- Inventory dredging within the East Channel of Rogers Island began on June 1, 2009.
- Inventory dredging within the East Griffin Island Area (EGIA) began on June 25, 2009.
- Backfilling operations began within the EGIA on September 14, 2009.
- Phase 1 dredging activities ended on October 27, 2009.
- Phase 1 in-river operations were completed in early December 2009.

3.0 <u>Phase 1 Overview</u>

This report is based on EPA's Oversight Team observations and documentation (including daily observation reports), several EPA Oversight Team meetings (including meetings on November 19 and 24, 2009) and input from EPA Oversight Team members. Data was also obtained from GE's *Phase 1 Data Compilation Report*, received November 13, 2009 and supplemented on January 15, 2010 and February 2, 2010.

The report has been formatted to allow for easy retrieval of Phase 1 information and is divided into three major sections: river operations, facility operations, and miscellaneous observations. Miscellaneous observations are primarily issues concerning project management.

EPA Oversight Team observations are located at the beginning of each subsection and are italicized. Comments (C) and possible mitigation (M) efforts follow under each observation. Comments provide the reader with additional information about each of the observations, such as specific occurrences of the issue/item, data collected on the issue/ item, or information about why the issue/item is discussed. In order to provide potential solutions to any of the issues observed during Phase 1, recommendations in the form of mitigation are discussed. Mitigation sections include proposed actions that can be put in place if a particular issue/item occurs again in the future.

4.0 River Operations and Related Activities

4.1 Vegetation/Stump Removal

4.1.1 Sediment Resuspension during Stump Removal

Several stumps and trees partly buried in sediment needed to be removed prior to dredging in Phase 1.

C – It was observed that stumps and trees partly buried in sediment can stir up significant sediment during removal. In at least one case an operator had difficulty removing a partly buried tree and had to pull up and down on the tree to free it from the sediments.

M – Where they can be implemented, the use of silt curtains or other resuspension-control measures should be considered to reduce the dispersion of resuspended sediments during stump/submerged tree removal. In addition, consideration should be given to implementing near-field PCB transect sampling if these activities are occurring in a large enough area to have the potential to be a significant source of PCB release to the water column. This data will be helpful in determining the impact of these activities on overall resuspension. Since the methods used by the dredge operators to remove stumps can affect the amount of resuspended sediment, consideration should be given to developing a standard operating procedure (SOP) for this task, along with operator training so that the work is performed in a manner that minimizes resuspension, to the extent practicable.

4.1.2 Tree Trimming

No issues associated with tree trimming were observed.

M – Tree trimming in Phase 2 should be conducted in a manner similar to Phase 1 tree trimming.

4.2 Debris Removal

4.2.1 Target Definition and Delineation

Debris targeted for removal based upon geophysical survey data gathered in 2005 impacted target delineation and reduced productivity.

C – The design target geophysical survey data was four years old, which resulted in more than expected unsuccessful attempts to locate and remove debris from the river bottom. GE reported a 60% success rate for targeted debris. It is likely that in some instances debris identified in the out-of-date geophysical data had been relocated or buried by normal river processes. In other cases, debris that should have been targeted for removal, which had been deposited after the geophysical survey, was not identified or removed. Therefore, it had to be removed later by the dredge bucket (possibly limiting closure of the dredge bucket) during dredging operations.

It is expected that some amount of PCB-contaminated woody debris will be encountered throughout the river, as it was observed in essentially all of the Phase 1 areas. During Phase 1, more woody debris was encountered in the active Certification Units (CUs) at the northern end of the Thompson Island Pool (i.e., CUs 1 through 8) than at the southern end (i.e., CUs 17 and 18). It is anticipated that woody debris will be encountered throughout the Thompson Island Pool and possibly within other areas during Phase 2.

M – Geophysical survey data should be collected during the field season before target removal. Other equipment to potentially improve the success of debris removal should be considered, with the goal of removing large debris and allowing the smaller debris to be removed by the dredge bucket. In areas where there is a large amount of debris, including debris mixed within the sediment, debris removal as dredging occurs may be the best approach. To the extent possible, debris removed in advance of dredging should be placed in hopper barges to limit air emissions.

4.2.2 Sediment Resuspension during Debris Removal

Sediment resuspension was noted during some debris-removal activities that coincided with spikes in PCB concentrations at the far-field water monitoring stations.

C – On some occasions the procedure and equipment (i.e., grapplers) used during debris-removal activities resuspended sediment when multiple attempts were made to remove debris targets. In addition, debris prevented the dredge buckets from closing completely, resulting in the deposition of sediment and debris. (Note: This topic is further discussed in Chapter I, Section 3.3.2, of the Phase 1 Evaluation Report.)

M – Operational changes that should be considered to reduce resuspension during debris removal include the following:

- Choose/select a dredge bucket that improves closure when wood is encountered,
- Consider other removal equipment (e.g., different size grapplers, etc.)
- Consider the number of in-place attempts to completely close removal equipment and/or dredge buckets (e.g., opening and closing the dredge bucket to achieve closure may have been a greater source of resuspension than a single attempt). A camera survey of removal equipment and/or dredge bucket closure in debris areas could help determine if, in general, it is better to make one or several attempts to remove debris targets.

Where possible, placing silt curtains to control the dispersion of silt and sediment during debris removal may also be helpful. In addition, floating booms with absorbents to control the dispersion of resuspended PCB oil during debris removal should be used. Near-field transect monitoring for PCBs should be done downstream of invasive work (e.g., debris removal) to monitor the extent of contaminated sediment released downstream during these activities.

4.2.3 *Staging of Debris-Laden Barges*

Debris was typically piled within hopper barges or placed on platform barges. Air moving over this material contributed to PCB air releases, especially when full barges were not processed quickly and material was permitted to dry.

C – During the initial stages of Phase 1, debris barges were often staged at the mooring dolphins south of Lock 7. When barges were moored for extended periods of time, material within the barges was exposed and allowed to dry, possibly contributing to the air emissions exceedances that were recorded at nearby monitoring locations. On occasion, air emissions exceedances were reported at the Processing Facility when debris was off-loaded from the barges at the Unloading Wharf and allowed to remain in place for extended periods of time. Woody debris stockpiled at the CMSA was tested on June 25, 2009. Results from the 13 samples collected showed elevated concentrations of PCBs within the woody debris, with an average PCB concentration of 41 parts per million (ppm)[1]. While this concentration is relatively high compared with the 1 ppm clean-up goal, it is not known if these results are representative of typical debris within the river.

M – Debris barges should be processed as quickly as possible. In addition, debris piles should remain damp or continually wet. Consideration should also be given to covering barges if they are to be staged for extended periods of time. Priority for immediate processing should be given to barges with debris from CUs that have high PCB levels. PCB air emissions from debris on platform barges was higher than hopper barges due to greater exposure to wind. Therefore, consideration should be given to limiting the use of platform-type barges for debris (when possible); instead, hopper-type barges should be used. Staging debris at the Unloading Wharf, where it is exposed directly to the wind, should be minimized. Debris in CMSA at the Processing Facility did not appear to be a cause of air emission exceedances reported at the perimeter of the Processing Facility. Therefore, this location should continue to be used to stage off-loaded debris. However, debris staged at the CMSA should be covered to the extent practicable once piles are established and no longer being worked on (see Section 5.3.1, *Coarse Material Staging Area [CMSA]*).

In addition, additional sampling of woody debris from the river should be considered. The goal of this sampling program would be to better quantify PCB concentrations within buried woody debris.

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[1] Results were obtained from GE's Monthly Progress Report for June 2009, as presented in Table 2.7-5 of the Phase 1 Data Compilation Report provided by GE to EPA.

4.3 Dredging

4.3.1 Access/Navigational Dredging-Related Issues

4.3.1.1 Impacts of Access/Navigational Dredging on Productivity

The timing of navigational/access dredging impaired the use of hopper barges within CU 1, limited access to portions of various CUs, and reduced dredging productivity.

C – The shallow water depths at the southern end of CU 1 limited the amount of sediment that could be loaded into hopper barges, significantly increasing the downtime of the dredging operation and reducing the productivity of dredging in CU 1. Barge access improved in CU 1 once areas were dredged in the navigation channel downstream in CU 2, CU 3, and CU 4. Access dredging completed in portions of CU 8 worked well and allowed efficient removal of sediments in those shallow areas.

Before Phase 2 begins, identifying areas where navigational/access dredging may be needed to increase production (i.e., improve access for hopper barges) should be considered. A comparison of the use of smaller hopper barges (which can be moved through shallow water) instead of navigational/access dredging (which allows for the use of deeper drafting hopper barges), should be made to determine which would be more efficient. If navigational/access dredging is determined to be more efficient, then it should take place before dredging operations begin within a CU. This will allow a more effective utilization of the deeper drafting hopper barges.

Mini-hopper barges used in Phase 1 were able to access shallow areas but created air emission problems when highly contaminated material was being dredged (see Section 4.13.1.1, *Air Monitoring*) and could only hold limited amounts of water (see Section 4.3.2.6, *Hopper Barge Sizing*). Any evaluation comparing the use of mini-hopper barges in lieu of navigational/access dredging should also consider using other types of barges outside of the three types employed during Phase 1 (i.e., barges that have different drafting requirements).

4.3.1.2 Classification of Removed Sediment

Navigational/access dredged material was considered part of inventory quantities in Phase 1.

C – In Phase 1, navigational/access material dredged outside of CU boundary lines was considered part of the inventory quantity, but it was determined, based on pre-dredge sediment sampling, that it did not meet the dredging criteria. During Phase 1, dredged material from these areas and contaminated material from within CU boundary lines was handled similarly.

M – Material removed during navigational/access dredging should continue to be handled as contaminated material. Any areas that will require navigational/access dredging in

Phase 2 should be evaluated so that the volume and mass to be removed can be quantified in a manner consistent with that used during Phase 1.

4.3.2 Inventory- and Residual Dredging-Related Issues

4.3.2.1 Definition of Inventory vs. Residual Dredging

There was confusion between EPA and GE on what constitutes an inventory or residual dredging pass.

C – During Phase 1 it was determined that the depth of contamination (DoC) established prior to the start of work was not well-defined in a majority of the Phase 1 CUs. This resulted in additional inventory and residual dredging. During the CU certification process, differences between EPA and GE on the type of pass that was made through a given CU caused some confusion, making overall decisions on whether to dredge deeper or to backfill/cap more difficult. In addition, GE's contractors defined inventory and residual dredging differently than EPA project documents.

M – GE and its contractors should use the same definitions for inventory or residual dredging. Material removed down to the 1 milligram per kilogram (mg/kg) cutline (which includes the recommended overcut), clay layer (i.e., native soils), or bedrock should be considered inventory material (see Section 4.3.2.2, *Inaccurate Delineation of Depth of Contamination);* an accurate delineation of the DoC would result in the removal of a majority of the contaminated material targeted for remediation during inventory dredging. This would limit both the need for multiple inventory passes and residual dredging, thereby improving dredging efficiency and productivity, and reduce resuspension caused by dredge bucket disturbance.

4.3.2.2 Inaccurate Delineation of Depth of Contamination

The DoC established before the start of Phase 1 dredging operations did not accurately indicate the depth of PCB contamination.

C – The establishment of an accurate DoC in most of the Phase 1 CUs was unsuccessful. This was due, in part, to the inability of the sediment-sampling device to penetrate the entire depth of the sediment stratum (refusal). While in some areas this refusal may have been because bedrock was encountered, it is believed that often the refusal was due to localized obstructions (i.e., cobbles, woody debris, and boulders). Since the DoC was estimated using certain assumptions and an incomplete evaluation of the sediment stratum, contaminated sediment was unexpectedly encountered at greater depths and intermixed with debris.

During the development of the Phase 1 Intermediate Design Report (IDR), EPA raised concerns with GE that the estimation of the DoC when using incomplete cores (i.e., low-confidence cores) would result in additional dredging beyond the design cut lines. At the time, EPA had recommended that co-located sediment cores be evaluated further to better refine the estimation of the DoC. This evaluation did not occur during the design period before the start of Phase 1 operations. A review of some high-confidence co-located core data gathered during Phase 1 suggests that the discrepancy between the actual DoC and the design DoC was approximately 11 inches.

While some error in the estimation of the DoC was expected during the design period, GE indicated that if additional dredging beyond the design cut lines was necessary, the capacity of the Processing Facility was sufficient to handle the additional sediment that may be removed during Phase 1 operations. Phase 1 operations have shown that the estimation of the DoC had a greater impact than originally expected during Phase 1 design.

M – Consideration should be given to refining the current sampling SOP to provide more discretion to sediment sampling teams in the field when relocating because of sampling device refusal. This would assist in determining if refusal was due to localized obstructions and potentially allow a sediment sample to be obtained through vibracoring. Alternatively, two possible options that could mitigate sampling device refusal would be:

- Using a hollow-stem auger (HSA) or other sampling device during sampling instead of a vibracorer to penetrate through any debris encountered through the sediment stratum, and/or
- Using the dredge buckets to remove the debris prior to vibracore sampling, similar to the way the “test pits” were excavated within CU 1.

Experience gained during Phase 1 indicates that the assumption that PCB concentration decreases with depth is not universal. As found throughout many areas, the PCB concentration within the riverbed was not always stratified. Therefore, before the start of Phase 2, an evaluation should be conducted to determine if re-sampling is necessary in the areas where sediment samples were unable to be collected due to sampling device refusal or where incomplete sediment samples were obtained (i.e., areas defined as low confidence). Any future sediment samples collected in areas where debris is encountered or that have low core confidence should consider one of the options listed above so that the sample is representative of the sediment stratum. As discussed in Chapter II, Section 3.3, of the Phase 1 Evaluation Report, and Section 4.7.1 below, *Proper Characterization of Sediment Stratum*, any post-dredging sediment samples should initially be analyzed down to 2 feet or to native soils (whichever is shallower) and through the remainder of the sediment sample if the DoC cannot be determined within the first 2 feet.

Along CU boundaries immediately adjacent to shoreline areas, additional sediment sampling should be completed if needed to better define the DoC in these areas and fill in any data gaps (i.e., such as toe of slope of the shoreline bank). The eastern shoreline of CU 17 is an example of an area where additional sampling would have provided better DoC determination.

As mentioned within the Phase 1 Evaluation report, the current design cut may provide an adequate basis for the first dredging pass in Phase 2 remediation. However, consideration should be given to defining the inventory cut for Phase 2 as the bottom of the clean segment (i.e., less than 1 mg/kg total PCB) plus an additional 3 inches. As discussed in Chapter II, Section 4.1.1, of the Phase 1 Evaluation Report, 70% of the Phase 1 Sediment Sampling and Analysis Program (SSAP) locations required an additional 6 inches of dredging beyond the design cut, and 55% required at least 12 inches. This re-delineation of the design cut would allow a higher percentage of material to be removed within the inventory pass and help reduce the necessity of a residual pass, preventing situations where thin layers of contaminated sediment are targeted for removal.

4.3.2.3 Procedures When Encountering Clay or Bedrock

Procedures to determine when clay and/or bedrock were encountered during dredging were not initially well-defined.

C – Procedures for determining when clay or bedrock was encountered during dredging were not well-developed before the start of Phase 1 dredging operations. This led to situations where multiple passes were made within the same CU to remove thin layers of contaminated material. In response, EPA and GE worked together to develop an approach that included placing EPA oversight staff on dredge barges to confirm when clay or bedrock was encountered. GE drafted an email to EPA during Phase 1, outlining the general procedure for determining the limits of clay and bedrock.

M – The procedure submitted by GE during Phase 1 should be refined to determine when clay, bedrock, or boulders are encountered and how to efficiently remove any remaining sediment in these situations. The goal would be to limit the level of effort expended to remove the remaining residual and eliminate situations where relatively small amounts of contaminated sediment remain and additional dredging passes are required. If it is determined that a mechanical dredge bucket is unable to remove significant amounts of the material (e.g., in rock crevasses and between boulders), then other types of removal equipment should be considered (see Section 4.3.2.4, *Limitations of Mechanical Dredging*, and Chapter II, Section 4.1.1, of the Phase 1 Evaluation Report).

4.3.2.4 Limitations of Mechanical Dredging

There are some challenges with removing thin layers of contaminated sediment over certain subsurface features using mechanical dredges.

C – Mechanical dredging was able to remove thin layers of sediment in most locations, except when dredging in boulder fields, on clay or rock, in which case the dredging efficiency (i.e., the ability of the dredge bucket to remove the remaining contamination) was reduced. A significant amount of time was spent trying to dredge thin layers (6 inches or less) of contaminated sediment during inventory and residual passes in these areas. The thinner the layer of material, the more water that remained in the bucket, which was decanted (when using mini-hopper barges) or placed into the larger hopper barges. Additionally, more bucket attempts made within a given area may have resulted in an increase in sediment resuspension (see Section 4.2.2, *Sediment Resuspension during Debris Removal*, and Chapter I, Section 5.1.2, in the Phase 1 Evaluation Report).

M – The use of smaller dredge buckets in tight areas (e.g., along shorelines, at bridge abutments, etc.) could help reduce the amount of excess water within the dredge bucket and increase the potential for removing thin layers of sediment in those areas. It is understood that in some situations, the smaller dredges may not have the necessary reach to remove some material and therefore their use may not be feasible.

4.3.2.5 Dredge Barges Remaining Idle

A significant amount of dredge operation downtime was noted during Phase 1.

C – As reported in the activity logs maintained by GE's Dredging Contractor, it appears that effective working time of the dredging operations was 60%. While some downtime was unavoidable as a result of relocating dredge barges or high river flows, a significant amount of downtime could have been avoided or eliminated.

It should be noted that a majority of the downtime incurred by the dredge barges (26%) was directly related to the off-loading operations at the Processing Facility (see Section 5.0, *Facility Operations and Related Activities*). It should be noted that GE made adjustments as Phase 1 progressed and reviewed productivity issues on a daily basis to improve productivity. GE also closely tracked the movement of all vessels using the VTS system.

M – Actions that could be implemented to minimize dredge barge downtime include:

- Improving management of hopper barges, including increasing the number and types of hopper barges available,
- Planning vessel deployment (e.g., locating dredge barges and/or hopper barges in a manner that does not hinder work performed by other dredge barges nearby),
- Improving the availability of tug boats to assist in moving dredge and hopper barges.

Reducing unnecessary downtime of dredge barges would improve individual dredge operation efficiency. This will be an important factor for Phase 2 because a lower number of dredge barges operating on the river would help to reduce the amount of project-related resuspension. It is believed that improving the productivity of both the off-loading operations at the Processing Facility and minimizing the downtime incurred by the dredge barges will increase the overall dredging productivity.

The size, capacity, and draft of the hopper barges used for Phase 2 should be considered to optimize overall dredging operations (see Section 4.3.2.6, *Hopper Barge Sizing)*.

4.3.2.6 Hopper Barge Sizing

The size of hopper barges influenced dredging operation efficiency.

C – In shallow water the deep draft of the large hopper barges restricted the amount of sediment that could be loaded into them. In other situations, the freeboard of the mini-hopper barges often limited the amount of contaminated sediment that could be loaded due to their instability, especially when a large volume of water accumulated within them. Both of these instances reduced the efficiency of dredging operations by requiring hopper barges to be cycled out at an increased rate.

It is understood that stability was a concern with both the mini-hopper barges and also with the large hopper barges. It is not clear why some large hopper barges were filled to near capacity at a draft of 7 to 8 feet when others that operated in sufficiently deep water were not filled to the same extent.

M – Before dredging operations begin within a given CU, draft restrictions should be considered as well as the location of the dredging activity (e.g., shoreline, navigation channel, etc.). Guidelines based upon observations and information gathered during Phase 1 should be developed to determine the best hopper barge size for the area to be dredged. As discussed above in Section 4.3.1.1, *Impacts of Access/Navigational Dredging on Productivity*, the use of access/navigational dredging in lieu of using shallow draft hopper barges (i.e., mini-hopper barges) should be evaluated.

In addition, mini-hopper barges may be too small to be effective. Super mini-hopper barges (a more moderately sized hopper barge) may work better when carrying water because of the larger capacity and greater stability than the mini-hopper barge. Consideration should be given to hopper barges with sufficient capacity and shallower draft than those used in Phase 1 (i.e., hopper barges with more buoyancy), potentially increasing the number of hopper barge types available from the three used during Phase 1. Evaluation of hopper barges for use in Phase 2 should consider the limitations of the dredge barges to be used during Phase 2 (e.g., the reach of the dredging equipment and any potential difficulties this could present while loading hopper barges).

4.3.2.7 Operations between Contiguous Certification Units

CUs being actively dredged in Phase 1 spread out the support vessels (tugboats and hopper barges) to the point where it may have reduced productivity and efficiency.

C – When dredging operations were occurring concurrently in many CUs, situations arose where support vessels were spread out over a large section of river. At one period of time during Phase 1, all ten CUs were actively being worked on. This situation reduced productivity of the dredge barges because they were often waiting for support vessels to relocate them or for empty hopper barges to load.

M – To minimize some of these concerns, work in CUs downstream of an active CU should be minimized in Phase 2. In situations where contiguous CUs exist, dredge cut lanes could be oriented and essentially merged such that dredge barges could continue working within the same cut lane through multiple CUs. For example, cut lanes within CUs 14, 15, and 16 could be oriented so that a dredge barge operating within a cut lane on the western side of the CUs could continue downstream from CU 14 into CU 16. This would limit issues associated with working downstream of active areas, reduce the amount of vessel movement needed to relocate dredge barges to new dredge lanes, and allow concurrent side-by-side dredging in multiple CUs. The current CU layout should be evaluated to determine possible areas where this orientation may be practical.

In areas where it is deemed unfeasible, dredging operations should occur as specified in Chapter III, Section 5.3, of the Phase 1 Evaluation Report, in that multiple CUs can be worked on concurrently, to the extent deemed manageable based upon the dredging productivity and the length of time remaining within the dredging season. Closing out (i.e., backfilling) a CU should continue from upstream to downstream during the dredge season, with invasive river operations occurring downstream of sediment sampling, backfill/capping, or other noninvasive operations.

4.3.3 Sediment Resuspension and Sheen Issues

4.3.3.1 Decanting Water from Dredge Buckets

Dredge operators drained water from the dredge buckets before depositing material inside hopper barges.

C – In order to limit the amount of excess water being loaded into hopper barges, in particular the mini-hopper barges, dredge operators were suspending the dredge bucket to allow water to drain from the side and bottom of the dredge bucket. Based upon an analysis of GE’s Bucket Decant Water Sampling Study, water decanted from the dredge buckets had significant levels of PCB contamination.

M – A procedure should be developed regarding dredge bucket operation to minimize the amount of water decanted from the dredge buckets. It is understood that some water will leak from buckets when debris prevents bucket closure. Draining water from ports or flaps on buckets designed to relieve water pressure (as the bucket closes) may be acceptable. Phase 2 operating protocols should be adjusted to limit the volume of untreated water free-draining from dredge buckets to the river, to the extent possible. Maximizing the volume of sediment within each dredge bucket will limit the volume of water and reduce the number of dredge cuts, thus helping to limit resuspension.

4.3.3.2 Vessel-Related Sediment Resuspension

Sediment plumes caused by vessel movement in shallow areas were observed in the river.

C – Sediment plumes from propeller wash were observed on occasion in Phase 1. The use of tugboats in shallow areas resulted in the resuspension of sediment due to the tugboat's propeller wash. In some cases this was unavoidable to safely control and relocate barges. The requirement that all in-river vessels limit their engine speed to 1,000 rpm was implemented to help reduce the amount of vessel-related resuspension. GE monitored vessel movement during Phase 1 using VTS, and project vessels were directed to stay in the navigation channel to the extent possible.

M – Further consideration should be given to vessel engine speed and the appropriate number and type of vessels needed to safely move barges, understanding that safety and proper control of vessels outweighs limiting thrust to minimize resuspension. The angle of thrust employed by these vessels also should be reviewed. To the extent possible, tugboats should direct their propeller wash away from shoreline areas and towards the channel. This topic is discussed further in Chapter I, Sections 5.1.2 and 5.2.2, of the Phase 1 Evaluation Report.

4.3.3.3 Sheen Control

Measures for managing non-aqueous phase liquid (NAPL) sheens can be improved for Phase 2.

C – The significant presence of sheens was unexpected in Phase 1. Project documents did not contemplate a need for a contractor's requirement to control or capture PCB sheens. The SOP that was developed during Phase 1 to address sheens within the river appeared to work well but was not consistently implemented. The response to sheen control was slow at times. Procedures for sheen control during Phase 1 evolved as experience was gained by the project team. GE's oversight of sheen control improved as Phase 1 advanced, but identification of sheens and directions on control actions to be taken were not consistent. GE did test various absorbents to help absorb/capture sheens, and once an absorbent was identified that worked fairly well GE had the material on-hand and available for use.

M – The SOP for sheen control measures needs to be reviewed, including an evaluation of control measures to address the presence of free PCB oil throughout the water column. The absorbent materials tested in August and September by GE[2] showed MyCelx was the most effective absorbent of the materials tested. As discussed in Chapter I, Section 5.2.2, of the Phase 1 Evaluation Report, it is recommended that a more extensive material testing program be considered and other materials should be evaluated to determine their effectiveness in comparison with MyCelx. Based upon the results of further evaluation, the absorbent material determined to be the most effective product should be kept in adequate supply on each dredge barge, or on the response team vessels, for effective and rapid deployment by the Spill Response Team. The use of a passive control measure such as MyCelx or a more effective product should be used in conjunction with an active control measure, such as a skimmer, to remove PCB oils and sheens. Additional control

[2] Sheen Sampling data is located in Table 2.8-5 of the Phase 1 Data Compilation Report provided by GE to EPA.

equipment should be considered to address sheens during Phase 2 operations. These requirements and a revised SOP should be included in the Remedial Action Monitoring Quality Assurance Project Plan (RAM QAPP) and Remedial Action Work Plan (RAWP) so that they are properly executed.

In addition, a qualified spill response contractor whose responsibility it is to design, monitor, and execute a spill response plan for river operations should be required. Increasing the number of spill response vessels or teams on-site dedicated to PCB sheen control would reduce response time, limiting the amount of PCB oil lost downstream. When substantial sheens were detected, downtime occurred while dredge crews awaited the arrival of the Spill Response Team. Containment booms and absorbents should be placed around each dredge in Phase 2. In areas with high PCB concentrations, Spill Response Teams could be permanently assigned to dredge barges working in that area.

In Phase 1, containment booms, absorbent material, and silt curtains were placed at the surface and extended down into the water column. It is believed that in some cases oil droplets were emulsified into the water column by dredging activities and migrated downstream. Therefore, consideration should be given to anchoring the silt curtains to the bottom of the river, potentially limiting the ability of the suspended oil droplets to migrate under the silt curtain. With silt curtains anchored to the river bottom, the droplets are more likely to be driven upward in the water column and appear at the surface where they can be collected. It is not known if bottom-anchored silt curtains would create higher resuspension concentrations in the water column than top-anchored curtains. Ultimately the goal should be to limit these higher PCB concentration particles (dissolved, emulsified, and particulate phase) from going around or through the silt curtain. Additional research and discussion with the material vendors is needed. See Section 4.3.3.4 below, *Silt Curtain and Containment Boom Usage*, for further discussion of the use of these control measures during Phase 1.

4.3.3.4 Silt Curtain and Containment Boom Usage

Both temporary and permanent silt curtains and containment booms were not set up in an optimal way at times, limiting containment.

C – At times, the contractor did not effectively deploy containment booms and absorbent materials, nor did they consistently monitor, adjust, and maintain these facilities.

Some concerns regarding the setup and maintenance of silt curtains and containment and absorbent booms included:

- Containment and absorbent booms around dredged areas were not adequately fastened, resulting in insufficient containment.
- The maximum depth below the water of temporary containment booms was approximately 36 inches. Therefore, in deeper water, there was a greater chance of material moving under the containment. Deeper silt curtains were established

in some areas during Phase 1, including south of CUs 17 and 18 and along portions of the West Channel south of CU 9.
- The containment booms relative to river flow were not placed optimally (i.e., on the upstream side of dredge barge instead of the downstream side).
- At times containment booms became entangled or twisted during dredge bucket operation and/or vessel movement.
- Positioning the containment and/or absorbent booms by using the dredge bucket resulted in sheens and plumes being washed over and outside of the containment, damaging the integrity of the containment.

At times it appeared unclear as to who was responsible (the Dredging Contractor or Spill Response Contractor) for the deployment and maintenance of containment measures. Suspended sediment and/or PCB sheens were observed leaving the containment systems deployed by the Dredging Contractor and/or Spill Response Team on a few occasions as a result of the manner in which the containment systems were deployed and maintained.

M – The current SOP outlining the use of silt curtains and/or absorbent booms should be evaluated to determine areas that require improvement. Whenever a containment system is deployed, the Dredging Contractor or Spill Response Team should ensure that resuspended sediment or PCB oils are contained. Some key areas of concern are:

- Ensuring that containment systems have a "pinch point" when secured to dredge barges or hopper barges. The goal would be to eliminate the large gaps observed between the containment system and the object they were fastened to.
- Funneling sheens to a designated location within the containment system to allow for removal, to the extent practicable.
- Proper deployment of absorbent booms with overlapping end points.
- Quickly adjusting the containment system whenever they became entangled.
- If possible, deploying the containment system in such a way that allows access to the dredge barge without disturbing the containment system.

In general, the contractor responsible for deploying the containment systems (either the Dredging Contractor or the Spill Response Team) should be attentive to maintaining the containment systems to limit the amount of resuspended sediment and PCBs migrating downstream.

4.3.3.5 Sheet Pile Usage

A containment wall created with sheet piling was effective at preventing the downstream transport of resuspended sediment during dredging operations. However, releasing the impounded water in a manner that limited resuspension was challenging, and contaminated water inside the sheet pile enclosure contributed to air emissions and low dissolved oxygen levels. Also, construction and removal of the enclosure resulted in some resuspension and noise-related concerns.

C – A series of sporadic exceedances of the Air Quality Performance Standard were recorded at the residential property adjacent to and east of the sheet pile enclosure in CUs 17 and 18. This was caused by the resuspension and containment of highly contaminated sediment and water within the sheet pile enclosure. The transfer of material from mini-hopper barges inside the enclosure to large hopper barges outside the enclosure also contributed to the increase in air emissions.

M – Temporary containment should be established around sheet pile enclosures when they are installed or removed to limit resuspended sediment from migrating downstream (see Section 4.3.3.4, *Silt Curtain and Containment Boom Usage).* Sheet pile installation/ removal in general is not expected to be a large contributor to resuspension but should be contained to the extent possible, regardless, in an effort to reduce overall resuspension in Phase 2. To limit the impacts of resuspended material on the Quality of Life Performance Standards, PCB oil sheens or areas of concentrated resuspended material should be removed through the use of an active control measure (see Section 4.3.3.3, *Sheen Control).* Consideration should be given to not installing sheet pile enclosures in areas near receptors and/or temporarily relocating nearby residents during the installation and removal work. In certain circumstances sheet pile enclosures may be necessary because of high PCB sediment concentrations. Some examples of this would be the areas around East Griffin Island and the Three Sisters Islands. Due to the nature of the work (i.e., utilization of sheet pile enclosures) planned to occur in these areas, consideration should be given to working in one of these areas on a yearly basis.

In addition, the utilization of temporary "wing walls" or groins should be considered in selected areas to help reduce the river velocity in areas requiring dredging. During Phase 1, limiting the flow of water (e.g., East Channel of Rogers Island) was found to be an effective measure to control resuspension.

4.3.3.6 Potential Resuspension Issues with Relation to Thompson Island Dam Far-Field Automated Sampling Station

Three exceedances of the Resuspension Standard were recorded at the Thompson Island Dam Far-Field Automated Sampling Station during Phase 1. As dredging operations move farther downstream during Phase 2, there is potential for an increased number of exceedances.

C – As dredging operations proceed downstream in Phase 2, the potential for an increased number of exceedances of the Resuspension Standard exist. As the distance between dredging operations and the downstream public drinking water supplies decreases, the notification system outlined in the current Community Health and Safety Plan (CHASP) will need to be adjusted.

M – Once dredging operations are closer to the Thompson Island station, consideration should be given to adjusting the Resuspension Standard. Currently, Lock 5 is used as the point of compliance once dredging operations are within 1 mile of the Thompson Island station. A station constructed at Stillwater should be considered as an additional automated data collection location when dredging is taking place at the southern end of the Thompson Island pool (see Chapter I, Section 5.2.1, of the Phase 1 Evaluation Report).

4.3.4 General Productivity Issues

4.3.4.1 Delays Related to High River Flows

At times, high river-flows halted dredging operations in the West Channel of Rogers Island due to safety concerns and the potential for increased resuspension.

C – Due to safety concerns, and in order to lower the potential for resuspended material to migrate downstream, the use of the 385 dredge barges was suspended when river-flows exceeded 8,500[3] cubic feet per second (cfs) in the west channel and all in-river operations were halted when river flows exceeded 10,000 cfs. During the spring thaw and following large precipitation events, these flow restrictions resulted in the suspension of dredging operations on at least 23 different occasions during Phase 1. It should be noted that these temporary stops in work were expected and planned for in Phase 1.

M – No alterations to the river-flow restrictions are suggested. However, consideration should be given to the number of high-flow events that were experienced during Phase 1 and to historic data so that downtime can be accounted for. Since most of the concern was in the northern portion of the West Channel, where dredging is complete, these restrictions are likely to be less of a concern for Phase 2. However, project vessels will be in this area for Phase 1 habitat reconstruction work during spring 2010. The total number of dredge days in a season needs to account for some temporary stops in work due to high flow.

4.3.4.2 In-River Transfer Operations

At times, the in-river transfer of contaminated material in combination with transport time and availability of mini-hopper barges reduced dredging productivity.

C – The use of a single transfer point at the southern end of the West Channel of Rogers Island along with transport time of the mini-hopper barges at times reduced dredging productivity. In the West Channel areas, where a large portion of the dredging operation used mini-hopper barges, long periods of inactivity were noted while dredges waited for mini-hopper barges. The transfer of material that occurred on a more limited basis, in other portions of the river, did not appear to have issues with productivity.

M – A sufficient number of mini-hopper barges should be made available when work is to be performed in shallow areas in order to limit downtime. Alternatively, multiple

[3] On June 5, 2009, EPA agreed to GE's proposal to raise the river flow restriction for dredging in the West Channel of Rogers Island from 7,000 cfs to 8,000 cfs. On June 19, 2009, the restriction was again raised from 8,000 cfs to 8,500 cfs during daytime hours.

transfer points could be used or methods developed to improve off-loading speed so that a fewer number of mini-hopper barges are necessary to operate efficiently.

4.4 Backfill Operations

4.4.1 Issues Relating to the Release of Fines from Type I Backfill

As anticipated, a silt plume of clean fines from backfill material was noted downstream of backfill operations.

C – Placement of Type I and Type II backfill, which contains a “fine” material portion, resulted in silt plumes downriver. Although this material is uncontaminated, it resulted in turbid water downstream of backfill operations, sometimes creating “foam” caused by the loss of organic material to the surface.

M – GE completed testing backfill placement methods at the beginning of backfill operations. It was determined that the best approach for distribution of placement was by doing the placement from the surface. Placement from below the surface did not provide good backfill distribution. Even though the method of backfill placement used in Phase 1 was acceptable, consideration should be given to other backfill placement methods that may lower the amount of resuspended backfill in the water column. An evaluation of the current backfill methodology should be completed to determine if this fine material is reaching the river bottom and staying in place.

4.5 Shoreline and Bathymetric Surveys

4.5.1 Shoreline Survey-Related Issues

The 119-foot elevation contour at the shoreline was not well identified in the field, creating some uncertainty for the oversight personnel as to the limits of remedial activities (i.e., limits of the dredge cut).

C – During dredging operations, the shoreline and near-shore boundaries were not clearly marked in the field. Some stakes at the 119-foot elevation were in place but were spaced approximately 100 feet apart. This created uncertainty regarding the dredge cut limits in these areas. Some areas were noted by the Oversight Team to be far from shore, while others seemed close (i.e., right up against tree roots on the shoreline). Cuts made along the shoreline areas were not always parallel with the 119-foot elevation but were instead “staggered” due to the design cut shown on the dredge barge’s computer system.

M – More clearly defined delineation of the 119-foot shoreline with current survey data is suggested, potentially through the use of more closely placed stakes. This would provide a visual means for oversight personnel to identify the design shoreline. Cuts made along the shoreline could be made parallel with the 119-foot elevation by allowing the dredge operator to manually control the dredge bucket so that it is “flush” with the shoreline, rather than relying only upon the onboard computer system. This approach would also allow for in-the-field adjustment of the cut location to account for unique shoreline areas. Alternatively, a global positioning system (GPS) (backpack type) could be used to better define the 119-foot shoreline areas.

Additional delineation of the shoreline areas could also assist in proper application of shoreline stabilization measures, as discussed in Section 4.9, *Shoreline Stabilization/ Habitat Restoration*.

4.5.2 Bathymetric Survey-Related Issues

The 10-foot by 10-foot grid size may not have been detailed enough in some areas to determine the depth of cut at the near-shore area.

C – The near-shore areas may require a grid size and shape that is more sensitive to the sediment slumps and the potential "wedge" of sediment above dredging criteria within these areas.

M – Review of the depth of cut at the shoreline and where it meets the dredge cut line should be performed in the field along shoreline areas prior to dredging to confirm that a reasonable approach is taken. The "wedge" of material that is being evaluated may not be best defined at the shoreline using a 10-foot by 10-foot survey grid. It is suggested that consideration should be given to using a finer grid when assessing the dredged shoreline. In general, the shoreline areas should be reviewed prior to Phase 2 to determine the best approach in each area (see Chapter II, Section 2.3.1.2, of the Phase 1 Evaluation Report).

4.6 Sediment Sampling

4.6.1 Dredging and Sediment Sampling Occurring Simultaneously

C – To get representative sediment samples, it is suggested that remedial activities continue to be completed at upstream locations before samples are collected downstream. Such coordination is important to avoid deposition of potentially contaminated sediment in areas where sampling has been completed, especially when analytical results indicate these areas are ready for backfilling.

M – This approach should be continued in Phase 2. Allowing sediment sampling activities in a subsection of a single CU on a case by case situation should also be considered for Phase 2.

4.6.2 Discrepancies between Sediment Probing and Soil Descriptions

Soil descriptions from sediment probing were often different than those generated during sample processing.

C – Soil descriptions recorded by the sediment sample processing personnel often varied significantly from those recorded by the sediment sampling personnel (probing data) in the field.

M – Sediment sampling personnel should clearly explain that the data from probing is limited information and the descriptions should be qualified as such. Project documentation should not be presented with probing soil descriptions alone but should always be accompanied with the sample processing data. Probing should be limited to indicating the depth at which refusal occurred and an estimation of the soil type probed through (noting the difficulty with which the probe penetration occurred [i.e., hard or soft refusal]). The sediment probing logs from field sampling should be compared with the sample summary logs so that it can be noted where they disagree.

Consideration should be given to determining the starting elevation of the sediment sample prior to collection. This would help determine the elevation where the changes in sediment stratum occur and whether the sample had been pushed through material that had caved in.

4.6.3 Target Coordinate Issue

The initial target coordinates served as the reference point for the first sediment sample at each node location. The first acceptable core needed to be collected within 20 feet of the target coordinates. Once the sediment sample was collected, that sampling location became the new reference point for that node, and any future sediment samples collected needed to be within 10 feet of those coordinates. GE's sampling personnel, at times, may not have been using the new reference coordinates during subsequent sampling events. Instead, they used the initial target coordinates and as a result it appears that a few (about 6) of the approximately 860 locations were incorrectly located outside of the 10-foot maximum offset from the new reference coordinates (i.e., the first sampling location).

C – Upon review of the Phase 1 Data Compilation Report, it was found that some sampling locations used the initial target coordinates for each sampling event at that specific node location.

M – Prior to Phase 2 sample collection, sampling personnel should confirm that they are using the appropriate target coordinates. It should be noted that even with the mix-up in target coordinates, none of the sediment samples were more than 30 feet off from the appropriate location. Because the node locations are widely spaced at approximately 70 feet and the contaminate distribution varies, this issue is not expected to be significant for Phase 1 but should be corrected for Phase 2.

4.6.4 Vibracorer Refusal Due to Debris

Refusal of the sediment sampling device during sediment sampling activities, due to debris, resulted in an incomplete representation of the sediment stratum at depth.

C – During Phase 1, refusal due to localized obstructions (i.e., cobbles, woody debris, and boulders) prevented collection of complete sediment samples. The incomplete evaluation of the sediment stratum resulted in the inaccurate delineation of the DoC in some areas.

M – As discussed in Chapter II, Section 3.2.6, of the Phase 1 Evaluation Report, other methods of penetrating the debris to determine the DoC (such as using a drill rig with an HSA) should be considered for Phase 2. Alternatively, an approach for dredging through the debris to allow sampling (as was done in the test pits in CU 1) could be developed so that the DoC can be determined accurately (see Section 4.3.2.2, *Inaccurate Delineation of Depth of Contamination)*.

4.7 Sediment Sample Processing

4.7.1 Characterization of Sediment Stratum

During Phase 1, only the top 6-inch segment of the sediment samples was analyzed at times, with the remaining segments archived for subsequent analysis, if needed.

C – Initially, only the top 6-inch segment of the post-dredging sediment samples was analyzed. This approach was consistent with the Engineering Performance Standards. This resulted in delays when determining the necessary action to take before resuming dredging operations in the respective area (e.g., re-delineating the dredge cut). However, as it was identified that the DoC was deeper than expected in many areas, GE began to analyze more samples with depth (limited by the ability of laboratory capacity).

M – As mentioned in Chapter II, Section 4.1.1, of the Phase 1 Evaluation Report, post-dredging sediment samples should initially be analyzed down to two core segments that meet the dredging criteria or native soils (i.e., Glacial Lake Albany clay), whichever comes first. In addition, the DoC should be defined within each post-dredging sediment sample collected. If the DoC cannot be determined (defined as two contiguous segments that meet dredging criteria) within the first 2 feet of the sediment sample, then the remainder of the sediment sample (which in some cases may be archived) should be analyzed.

4.7.2 Characterization of Clay Layers

During sediment sample processing, characterization of the clay layer is important.

C – The sediment sample summary sheets used during the CU certification process delineated the clay layer to the nearest 6 inches. Observations during sampling processing indicated that the clay interface (located within a 6-inch segment) was often measured and recorded. Although the maps provided this information, the logs provided by GE documenting the clay layer location within the sediment sample did not. Since the clay interface often provided a clear delineation of the DoC, the location within the sediment sample is critical information.

M – Documentation of the clay layer within a sediment sample should clearly indicate where "clean" clay is encountered to the nearest inch. Sediment processing personnel's delineation of the "clean" clay layer should match up with the oversight personnel's determination of the "clean" clay layer any disagreement should be discussed and worked on when the core logging occurs. Other types of sediment interfaces should also be documented, as described above, by the sediment sample processing personnel.

<u>4.8 Certification Unit Review Process</u>

4.8.1 Quality Control on Data Packages

During Phase 1, corrections were provided by EPA to GE on the "draft" Acceptance (Form 1 and/or Form 2) Packages.

C – GE submitted completed Form 1 or Form 2 packages to EPA as drafts for review and comment prior to submitting the packages for formal approval. The draft Form 1 and Form 2 submittals were returned to GE with edits each time. GE should improve its quality assurance/quality control (QA/QC) review. GE revision time contributed to the length of the overall CU approval process time.

M – GE should use the experience gained through the Phase 1 Form submittals and EPA's comments to guide the process for Phase 2 so that Phase 2 preparation, review, and acceptance is more efficient. Procedures should be adjusted to allow field operations to continue while form submittals are completed.

4.8.2 Time Restraints within Current System for Approval

CU Acceptance Packages were often provided to EPA and other agencies with little time for review prior to approval.

C – Data were presented to EPA during the 4:00 p.m. daily meetings (or just before the meetings) for review, comment, and approval. This gave EPA and the Oversight Team little time to discuss the information. On numerous occasions, drawings and maps were being plotted out as the meeting was under way or being e-mailed to the participants calling in after the review process had taken place during the meeting. This process made EPA's review and acceptance longer and more challenging than needed.

M – For Phase 2, EPA will require that all data being submitted by GE for EPA review be received a minimum of 24 hours before approval decisions are needed. It is suggested that a list of typical items discussed and submitted be developed by GE. EPA will take the list and provide GE with a list of the standard review times that will be required (some of which could be less than 24 hours). In certain cases, information needs to be reviewed by project specialists (e.g., habitat reconstruction information). Therefore, the review time needed by EPA will vary based on the topic. EPA will continue to provide approvals in a timely manner, to the best of its ability, and will involve the appropriate staff during decision-making. The goal is to identify the items that need quick conditional acceptance to allow project activities to continue with little or no delay in Phase 2.

4.8.3 Data Format

The data, maps, and drawings presented to EPA were, for the most part, presented in a .pdf format, with subsequent data/presentation limitations.

C – The .pdf format did not allow the project team to import information into other software programs, such as GIS or AutoCAD, so that particular details could be reviewed. Also, the .pdf format is not conducive to overlaying maps, which is an important feature for review. The two-dimensional .pdf maps typically showed the third dimension (depth) as colors. While this approach worked, it needs to be supplemented with data so that EPA can further review the depth information in other software programs and/or review the cross-sections of key areas, as needed.

M – During Phase 2, electronic data throughout the CU acceptance review, discussion, and approval process should be provided, along with cross sections of key areas. If, for example, GE presents information in a non-traditional mapping format (which occurred during the CU acceptance process) GE should provide software that will allow EPA to fully evaluate the data presented. When GE provided accessible electronic survey data of CU areas that had previously been presented in a non-traditional format, EPA consultants were able to develop three-dimensional (3-D) views of the post-dredged river bottom from the survey data. The 3-D images could be rotated, allowing views of the completed work from almost any angle. The 3-D images helped EPA develop a clear understanding of the post-dredging conditions that could not be obtained from the non-traditional mapping. In a number of other instances, GE requested that EPA approve modifications to approved standard construction details in order to resolve a unique condition that had developed in a CU. A 3-D image that can be rotated, showing the pre- and post-modification conditions, would have made EPA’s review and decision-making process much simpler. This type of 3-D electronic format should be provided as requested by EPA. The goal for Phase 2 will be to view data that is generated by GE in the same or similar way that GE is viewing the data and within a similar timeframe, thus minimizing confusion between those implementing the project and those reviewing it.

4.9 Shoreline Stabilization/Habitat Restoration

4.9.1 Timeframe for Installation of Shoreline Stabilization

In several isolated areas, shoreline degradation was observed between the start of near-shore dredging activities and the onset of backfill operations. Biologs were deployed along these areas to attenuate wave energy and buffer the fluctuations of river flow velocity. These measures are most effective when deployed soon after dredging activities.

C – Shoreline stabilization measures were undertaken in selected areas after the completion of dredging or, sometimes, backfill operations. Delays in installing these stabilization measures resulted in less effective shoreline stabilization because wave energy and fluctuations in the river flow velocity continued for a longer period of time.

M – Temporary shoreline stabilization with biologs or some similar technology is needed at the time the dredge cut is made (in less stable areas) to stabilize the existing shoreline. Stabilization of the 119-foot shoreline elevation will also require development of a clear and practical protocol to install, remove, and reinstall stabilization measures in less stable areas during and between dredging and backfilling operations. Shoreline stabilization is particularly important where steep banks are present near shoreline and shoreline areas that are near residential properties.

Alternatively, consideration should be given to permanent shoreline stabilization once the dredge cut is made. It is anticipated that many areas could be stabilized shortly after the dredge shoreline cut is made, which would eliminate the loss of shoreline. This would reduce the need of having to return later to install permanent stabilization measures to replace any temporary stabilization measures that may have been installed. It is understood that in some situations the installation of permanent shoreline stabilization measures at the time the dredge shoreline cut is made may not be practicable, and therefore temporary stabilization measures should be taken until permanent measures can be employed.

Once shoreline stabilization measures have been undertaken, the Dredging Contractor should continue to monitor the shoreline as necessary. Also, a review of biolog use and installation procedures is needed.

4.9.2 Proper Documentation of Current Shoreline

A thorough survey of shoreline conditions to accurately assess any damage caused by future dredging operations is recommended.

C – According to GE, photo documentation of the shoreline was performed before Phase 1 dredging, but the information has not yet been provided to EPA. In some circumstances, it was unclear whether or not the degradation of the shoreline above the 119-foot elevation was project-related or not. This created confusion when determining if the Dredging Contractor was responsible for repairing the damaged area. In CUs 3 and 8 the location of the shoreline cut associated with the 5,000 cfs or 119-foot elevation (i.e., the design shoreline) did not correspond to the location of the actual 119-foot contour identified in the field by GE surveyors immediately prior to the installation of shoreline stabilization measures. As a result, shoreline stabilization measures previously identified in the field and indicated on the Contract 4 drawings were not necessarily appropriate for the specific section. In addition, stabilization measures for some segments were left “to be determined in the field by the contractor” but no guidance was provided for these segments.

M – A current pre- and post-dredge survey of shoreline areas should be conducted. The survey should include aerial images (leaf-off), shoreline photos, and a survey of the location of the 119-foot elevation contour. GE should provide the information they currently have for Phase 1 areas (in a pre- and post-dredging format) to EPA for review.

Alternatively, the survey could be focused around areas of potential concern, such as potentially unstable shoreline areas, residential areas, and areas where stabilization is already in place and will be disturbed. Attention should be given to near-shore areas where deep dredge cuts are expected.

<u>4.10</u> <u>Cultural Resources</u>

4.10.1 Protocols for Unanticipated Cultural Resource Discoveries

During Phase 1, several unanticipated cultural resource were discovered, including near the site of Old Fort Edward in the East Channel of Rogers Island.

C – An extensive study for cultural resources was conducted prior to the start of dredging. The study defined two types of cultural resource discovery situations: those that needed documentation before removal and those that needed to be avoided. Although the study was thorough, there was an understanding that unanticipated discoveries could be found because of the nature of the project. With this understanding, a protocol was put in place so that the discoveries would be appropriately managed. The Oversight Team prepared a PowerPoint presentation for GE that provided a generic visual and graphic summary of cultural resources that could be found on the bottom of the Hudson River. With the awareness that GE's contractors are not experienced in identifying cultural resources, the Oversight Team also met with GE's contractors to provide them with information on the type of potential in-river resources (i.e., what to watch for and the actions to take if a cultural resource were uncovered).

GE's contractors were instructed to immediately notify the Oversight Team if and when they encountered any debris that may have appeared to be a cultural resource and to be careful of the resource when making this determination. Once the Oversight Team was notified of the discovery, they visited the dredge barge to view and document what had been discovered. Photographs of the resource were taken and a decision made as to whether or not the resource needed to be saved for further documentation or if it could be disposed of with the other contaminated material. If the resource was to be saved, it was to be placed aside, protected, and unloaded separately at the Processing Facility where more documentation could be completed (if needed).

Among unanticipated resources discovered during dredging were wooden cribbing, chained planking, and remains of the shipways of a local barge manufacturing company. The most significant find included a portion of the bastion of the historic Fort Edward.

In Phase 1, the protocol of notifying EPA of unanticipated cultural resource discoveries during dredging worked well. The Oversight Team was notified in a timely manner and was able to respond to the discovery.

M – A similar approach should be established for Phase 2. A thorough review of culturally sensitive areas should be conducted and a buffer should be established to avoid sensitive areas, where appropriate. It should be noted that although cultural resource studies conducted prior to dredging did address the existence of historic Fort Edward, they did not indicate that the remains of the fort could extend into the dredge cut area. This is an example of where an extended buffer near a known cultural resource could have been applied to limit the potential for inadvertent impacts. In addition, the unexpected discovery of the Old Fort Edward timbers occurred during nighttime dredging operations when the operator's ability to see what was being dredged was more difficult. For Phase 2, protocols should be considered to limit dredging to daylight hours near sensitive areas and, in some cases, with archaeological oversight. Also some culturally sensitive areas in Phase 2 will need to be avoided.

It appears that even with limited knowledge the contractor was able to identify potential resources once removed from the river, but continued education addressing the potential for cultural resource discoveries in specific areas of the river could improve the ability of the contractors to identify cultural resources. When dredging in or near culturally sensitive areas, dredge operators should be briefed on the specifics of the area they are in and what to look for. This additional knowledge should help the crews exercise the appropriate level of care.

4.11 Vessel Movement

4.11.1 Adherence to Vessel Speed Limits and Control of Wakes

Dredging operations contributed to a significant increase in boat traffic on the river.

C – The significant increase in boat traffic related to dredging operations resulted in a noticeable increase in vessel wakes along the Phase 1 corridor. At certain speeds, these wakes could impact shoreline areas and private property along the river's edge. The impacts of the increase in vessel traffic within the river are difficult to determine (see Section 4.9.2, *Proper Documentation of Current Shoreline).*

M – It is suggested that GE continue to be attentive to this issue during Phase 2, including enforcing river speed limits, using appropriate speeds in work zones, keeping vessels in the navigation channel to the extent possible and holding vessel operators responsible for the wakes generated from their vessels. Enforcement of vessel movement (along with continued use of VTS) to limit these issues will be important for Phase 2. Project efficiency needs to be balanced with safe vessel speed while taking into account potential wake damage in shoreline areas.

4.12 Special Area Considerations

As dredging operations proceed farther downriver, certain special areas of concern, such as bridges and dams, will be encountered.

C – As work continues downstream, some special areas of concern—dams, bridges, land-locked sections, hydroelectric power plants, etc. —will be encountered. Considerations in these special areas included:

- Higher river velocity
- Swirling water
- Shallow water depths
- Lack of access to land-locked areas
- Maintaining shoreline stability near rip-rap or other shoreline structures
- Protection of water intakes
- Stability around bridge abutments.

M – Consideration should be given to developing the appropriate procedures and plans before work begins in these areas. The focus of the evaluation would be on identifying any potential safety concerns in these areas and developing the appropriate controls to mitigate the inherent risk associated with these areas. In particular, detailed consideration regarding work near dams will be needed for Phase 2. The evaluation process should include considering whether the area can be dredged or accessed safely. If not, other approaches should be discussed, such as potentially avoiding or capping the area.

4.13 Monitoring

4.13.1 Quality of Life Monitoring[4]

4.13.1.1 Air Monitoring

During Phase 1, GE's Quality of Life Contractor conducted continuous 24-hour air monitoring during river operations. As of December 18, 2009, GE's contractor had collected approximately 2,000 air samples from 62 different locations along the dredging corridor. From May 15, 2009 to December 18, 2009, 81 exceedances of the Residential/ Commercial Standard occurred in the dredging corridor and three complaints related to dust at the Route 4 Staging Area were reported (see also the Technical Memorandum on Air).

C – In April and May, GE's contractor conducted background air monitoring along the dredging corridor prior to the start of Phase 1 dredging operations. This was used to establish a baseline of typical PCB concentrations within the air column. Once in-river operations began, GE's contractor was to conduct continuous 24-hour air monitoring.

[4] Data located in Attachment E of the Monthly Progress Reports, found in Appendix F, the Monthly Complaint Summary, found in Appendix X, and raw data, found in Appendix V, of the Phase 1 Data Compilation Report provided by GE to EPA.

The goal of this monitoring was to measure the potential release of PCBs into the air. This monitoring was performed throughout the Phase 1 dredging corridor at both upwind and downwind locations. Originally, samples were to be collected at both upwind and downwind locations (when prevailing wind directions could be established), surrounding each CU. In the first few weeks of dredging, monitoring locations were adjusted to focus on providing more representative PCB concentrations at the nearest receptors rather than at individual CUs. These adjustments were performed in consultation with the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH).

Between May 15 and December 18, 2009, 81 exceedances of the Residential/ Commercial Standard occurred in the dredging corridor. The Residential Standard is 0.11 micrograms per cubic meter ($\mu g/m^3$) and the Commercial/Industrial Standard is 0.26 $\mu g/m^3$. Of the reported exceedances, the maximum PCB concentration reported was 4.2 $\mu g/m^3$ with an average Residential Standard level exceedance of 0.17 $\mu g/m^3$ and an average Commercial/Industrial Standard level exceedance of 0.75 $\mu g/m^3$. The overall average total PCB air concentration recorded during Phase 1 for compliance purposes near dredging operations was 0.04 $\mu g/m^3$. For the 166-day dredging season, less than 4% of the total number of samples collected to demonstrate compliance exceeded the standard.

Potential causes of these exceedances include the following:

- Dredging operations were occurring close to air monitor(s). It should be noted that in some situations, air monitors were relocated to better represent the PCB concentration closer to the receptor.
- Highly contaminated sediment and or debris was being removed.
- Staging barges containing highly contaminated sediment and/or debris remained at the mooring dolphins for extended periods of time. It should be noted that EPA requested that barges containing high PCB concentrations be staged for as short as period of time as possible and quickly off-loaded and processed.

In addition to the reported exceedances, there were three dust complaints received related to river operations. All three complaints were related to dust generated on the access road to the Route 4 Staging Area. In response to these complaints, water trucks were dispatched to wet down the access road and mitigate the issue.

M **–** Prior to the start of Phase 2 sampling activities, a field review of proposed sampling locations should be performed. During this evaluation process, Oversight Team members and GE's contractor should determine suitable monitoring locations along the dredging corridor that will provide representative samples of PCB concentrations at nearby receptors. The goal of this evaluation should be to provide sufficient coverage of the river operations area and nearby receptors while also limiting the number of sampling locations, to the extent practicable (see the Technical Memorandum on Air for additional discussion).

In addition to this review process, various other forms of mitigation could be implemented, as discussed above throughout Section 4.3.2, *Inventory and Residual Dredging Related Issues*, to reduce the amount of PCBs released into the air column. In general, these measures could include:

- Limiting the amount of time material is staged at the mooring dolphins south of Lock 7 or other on river areas, to the extent practicable.
- Sufficiently covering material and/or debris within hopper barges with a thin layer of water.
- Employing covers on barges, including consideration of floating covers or other covers that can be safely deployed.
- Covering higher-concentration sediments with lower concentration sediment.
- Alternating dredging operations between higher and lower concentration areas.

The effectiveness of the management practices used to control air emissions in Phase 1 varied but, overall, in combination the measures taken reduced air emissions sufficiently to allow work to continue.

4.13.1.2 Noise Monitoring

During Phase 1, GE's Quality of Life Contractor conducted continuous 24-hour noise monitoring during river operations. As of December 18, 2009, GE's contractor had conducted approximately 23,000 one--hour noise measurements from 46 different locations along the dredging corridor. From May 15, 2009 to December 18, 2009, 85 exceedances of the Noise Performance Standard and nine noise complaints associated with river operations were reported (see also the Technical Memorandum on Noise).

C – During Phase 1 activities, sound measurements were recorded at 46 different locations along the dredging corridor. Noise levels were measured using noise monitors located along the shoreline nearest to the dredging activity. On May 14, 2009, GE's contractor conducted background noise monitoring along the EGIA dredge corridor (CU 18) within an 8-hour period of time to establish baseline noise levels prior to the installation of the temporary sheet pile containment wall. Once in-river operations began, GE's contractor conducted continuous 24-hour noise monitoring. The goal of the monitoring program was to measure noise levels at nearby receptors while river operations were occurring. Measurements were to be collected on a continuous 24-hour basis at suitable locations that were representative of the noise levels at the nearest receptors. Some of these locations were later removed because there were no receptors close to dredging activities or because noise levels at nearby receptors were continually below the Noise Performance Standard. In some other cases, noise monitors set up near the shoreline were relocated farther inland so that noise measurements were more representative of noise levels at nearby receptors.

In addition to the contractor's monitoring, the Oversight Team performed independent one-hour noise measurements during daytime and nighttime river operations.

Between May 15, 2009 and December 18, 2009 there were 85 exceedances reported. Eleven occurred in the daytime and 74 at nighttime. Aside from the installation/removal of the sheet pile containment system, a large portion of the recorded exceedances were attributable to river operations and the nearby noise monitor both being located relatively close to the shoreline. Often times, relocating the noise monitor closer to receptors, in order to obtain more representative measurements, eliminated the exceedances that were recorded closer to the river.

In addition to the exceedances, nine noise complaints related to river operations were reported. In all cases, there were no exceedances of the Noise Performance Standards recorded at the time that the complaints were received. In general, the community commented that the project was much quieter than expected.

M –Based on limited noise-related issues in Phase 1, noise monitoring during Phase 2 should be reduced from Phase 1 levels and conducted only at the start of operations or when operations change, as well as in response to noise complaints. Consideration should be given to limiting the noise monitoring to a complaint-based system in certain situations where receptors are not near dredging operations. EPA will discuss these situations with GE on a case-by-case basis. For further discussion, see the Technical Memorandum on Noise.

4.13.1.3 Odor Monitoring

During Phase 1, GE's Quality of Life Contractor conducted hydrogen sulfide (H2S) monitoring during river operations on an "as-needed" basis. There were no compliance-based H2S samples collected in Phase 1 because no odors were noted.

C – The Odor Performance Standard for the project includes two components. The first component is a standard for H_2S that applies if an odor described as H_2S is detected by workers or the public. The second component applies to odor complaints and requires that complaints be investigated and mitigated to protect the public from odors that unreasonably interfere with the comfortable enjoyment of life and property.

During Phase 1, there were no recorded exceedances of the H_2S standard and no odor complaints associated with river operations were received.

M – Based on Phase 1 experience with the Odor Performance Standard as it relates to river operations, no changes to the standard or protocol are recommended for Phase 2. H_2S monitoring should continue to be available if needed for Phase 2.

4.13.1.4 Light Monitoring

During Phase 1, GE's Quality of Life Contractor conducted light monitoring the first night each dredge barge was in operation and after relocating. As of December 18, 2009, GE's contractor had taken 133 light measurements from 39 different locations along the dredging corridor. From May 15, 2009 to December 18, 2009, there were three exceedances of the Light Performance Standard and three project-related light complaints along the dredge corridor.

C – The Light Performance Standard established for this project includes nighttime limits for rural and suburban residential areas, urban residential areas, and commercial/ industrial areas. The goal of the monitoring program was to measure the impact of nighttime dredging operations along the dredging corridor.

During Phase 1, 133 light measurements were recorded at 39 different locations along the dredging corridor. Light measurements were taken the first night of operation for each dredge barge and repeated whenever the dredge location was changed or when complaints were received from citizens.

In addition to the contractor's monitoring, the Oversight Team performed independent light monitoring during nighttime river operations on several occasions near the beginning of Phase 1 activities and did not record any exceedances of the Light Performance Standard.

Between May 15, 2009 and December 18, 2009, there were three recorded exceedances of the Light Performance Standard. These events occurred between July 20 and July 22 at CU 18. In each instance, the Residential Standard level (0.2 foot-candles within the dredging corridor) was exceeded and preventive measures were implemented on the dredge barge to reduce the amount of light impacting the nearby receptor. It should be noted that light monitoring where the three exceedances occurred was discontinued on July 23 at the resident's request.

Potential causes of these exceedances could be:

- Nighttime dredging operations occurring relatively close to the shoreline. In most cases, adjusting the angle of light sources on dredge barges reduced their impact on nearby residents.
- Use of spotlights onboard tugboats and other project vessels.
- Positioning multiple dredge barges within a single location, concentrating the amount of light measured at shore.

In addition to the reported exceedances, three light complaints related to river operations were received. Two of these complaints were related to the use of spotlights onboard project vessels and the proximity of the dredge barge to the shoreline. Relocating dredge barges away from shoreline areas during nighttime operations was implemented to limit the impact upon local residents. The third complaint was related to the use of recently installed lights at the Route 4 Staging area, the use of which were discontinued after the complaint was received.

M – Based on Phase 1 experience with the Light Performance Standard, as it relates to river operations, no change to the standard is recommended for Phase 2. Light monitoring should continue to occur at the start of operations, when locations change or if a complaint is received. It is also suggested that the use of spotlights onboard tugboats and other project vessels continue to be controlled to limit directing these lights towards homes or roadways, to the extent practicable. It is understood that the use of such equipment may be necessary in some situations to safely operate project vessels at night.

4.13.1.5 Navigation Monitoring

During Phase 1, GE's Dredging Contractor was to monitor vessel traffic to limit the impact of dredging activities on nearby residents and on private and commercial vessels that use the Champlain Canal. During Phase 1, four complaints associated with river operations were reported.

C – During Phase 1, GE's Dredging Contractor was to monitor project-related vessel movement to comply with the Navigation Performance Standard. Logs were maintained for each project vessel to document the vessel's movement while in operation. Aside from ensuring compliance with the Navigation Performance Standard, project vessels were also required to follow all applicable state and federal regulations pertaining to watercraft. The Navigation Performance Standard during Phase 1 included:

- Restricting access to work areas and providing safe passage in the navigational channel around these areas, including establishing temporary aids to navigation (lights, signs, etc.) to maintain safe and efficient vessel movement;
- Providing updates and information to the New York State Canal Corporation (NYSCC) and the U.S. Coast Guard (USCG);
- Providing a schedule of project activities to the public;
- Scheduling and management of river traffic;
- Coordinating lock usage with NYSCC.

The Work Support Marina allowed many of the project vessels to remain in the river without having to travel through locks. Project vessels were equipped with an Automated Identification System (AIS) transponder and tracked through the VTS. Vessel traffic control and coordination was maintained through radio communication between project vessels and the VTS. A weekly "Notice to Mariners" was issued by NYSCC based on information provided by GE.

During Phase 1, four complaints were received, largely related to excessive vessel speed. However, during this period, there were no deviations from navigation requirements and no instances where in-river project activities significantly affected navigation of commercial or recreational vessels within the dredge corridor.

M – Based on Phase 1 experience with the Navigational Performance Standard, no changes to the standard are recommended for Phase 2. However, further consideration needs to be given to having vessel captains be responsible for the wakes generated by their boats and controlling potential damage to shoreline or preventing unsafe situations for smaller vessels (see Section 4.11.1, *Adherence to Vessel Speed Limits and Control of Wakes)*.

4.13.2 Sediment Resuspension Monitoring

4.13.2.1 Inconsistent Data from the Automated Far-Field Sampling System

Water sampling data collected at the Thompson Island Dam (TID) automated far-field sampling station were found to have significant variability at times.

C – Samples taken from the TID automated far-field sampling station during periods of high in-river PCB concentrations were found to have higher variability than those taken when PCB levels in the river were low. One reason for this variability may be that microscopic PCB oil droplets or contaminated sediment may collect within the sampling device after periods of high in-river PCB concentrations, affecting the consistency of the data.

M – The current sampling SOP should be reviewed to determine if sampling procedures or the sampling system can be adjusted to increase the accuracy of results obtained. If necessary, additional decontamination procedures could be developed within the RAM QAPP to provide more consistent data. In addition, consideration should be given to other causes of sample variability.

4.13.2.2 Analytical Methods and Sample Turnaround Time

During the initial stages of Phase 1, samples collected from the automated far-field sampling stations were analyzed using the Rapid Aroclor Method, which may be unnecessary during Phase 2 of the project.

C – The modified EPA Method 508 was initially used in Phase 1 so that analytical sampling results could be obtained within a shorter turnaround time but was later changed to the modified Green Bay Method (mGBM). During Phase 2, the shorter turnaround time may not be needed if downriver water users in Waterford and Halfmoon continue to use water piped from Troy, NY, during upstream dredging operations. It is understood that the *Rapid Aroclor Method* use requires a dedicated instrument that has to be kept in calibration.

M – Water samples from the river should continue to be analyzed using the mGBM because the turnaround time should be sufficient to provide results within the necessary amount of time. If a shorter turnaround time is needed, water samples could be analyzed using the *Rapid Aroclor Method* on an “as-needed” basis. Because having an instrument ready for possible use to run the *Rapid Aroclor Method* can be costly, EPA and GE should discuss the need for this analysis in Phase 2.

4.14 Assessment of Interactions between Productivity and the Air Performance Standards

C – During Phase 1 work, the emission of PCBs into the air column in the dredging corridor resulted in exceedances of the Air Quality Performance Standard. Engineering controls proposed during the Phase 1 work, which were generally adjustments to the initially planned procedures to control air emissions, were employed as the project progressed to mitigate air exceedances. The goal of these adjustments was to mitigate the loss of PCBs to the air column and permit dredging operations to continue with minimal impact on productivity. For example, limiting the number of dredge barges operating simultaneously within portions of the river reduced air emissions in areas where significant PCB concentrations in the sediment were anticipated. When a dredge barge was moved to mitigate air emissions, it was usually relocated to other parts of the river and continued to operate with no significant impact on productivity.

Adding water to the hopper barges to cover sediment also reduced air emissions, allowing dredging to continue. This may have had a minor impact on the amount of sediment that could be loaded into the hopper barges and, therefore, may have resulted in a minor impact on productivity.

Similarly, layering lower PCB concentration sediment over higher PCB concentration sediment reduced air emissions and therefore allowed dredging in higher concentration sediment areas to continue. While there were minor delays associated with re-positioning hopper barges to accomplish this, these delays were overshadowed by other delays such as waiting for hopper barges.

The deployment and monitoring of containment systems, such as containment booms or absorbent materials, helped reduce air emissions and allowed dredging to continue. Some minor impact on productivity can be attributed to the use of containment booms and absorbent materials.

While some of the engineering controls may have had a minor impact on dredging productivity, as noted above, it should be noted that choosing not to employ these engineering controls would likely have resulted in an increase in the number of air exceedances experienced and may have led to possible shutdowns of the dredging operation and a greater loss in productivity.

M – Air emissions will continue to be given a high priority in Phase 2. It has been shown that the implementation of the engineering controls used in Phase 1 did not significantly reduce productivity but did reduce air emissions while allowing dredging to continue. Similarly, the likely impact on productivity is greater if engineering controls are not employed. Therefore, it is recommended that the use of these controls, as well as other controls developed as part of the design, be continued in Phase 2.

5.0 Facility Operations and Related Activities

5.1 Material Off-loading (Unloading Wharf Activities)

5.1.1 Double-Handling of Material

Double handling of dredge spoils at the Processing Facility reduces speed and efficiency. Double handling occurred on several occasions: when material in the barge was redistributed prior to off-loading, and when material was off-loaded directly to the Unloading Wharf and subsequently moved from the Unloading Wharf to the articulating end-dumps for transfer to the CMSA.

C – Redistribution and consolidation of material within the hopper barge being unloaded allowed the off-loading equipment (PC-1250) to remove larger amounts of material per bucket grab (i.e., 5 cubic yards versus 3 cubic yards). However, any gain in cycle time produced by the larger grabs was offset by the loss of time incurred during the consolidation of material within the hopper barge. Initially, the size-separation system was only able to handle buckets of material less than 3 cubic yards (because of loading issues, which are discussed below in Section 5.2.1, *Input of Material and Utilization of Size Separation System*), until August, when the system was adjusted to the point it could handle 5 cubic yards.

At certain times during direct off-loading operations, the PC-1250 would be unable to load material to an articulating end-dump and would therefore place the material on the Unloading Wharf. Once an end-dump was available, the PC-1250 would stop unloading material from the hopper barges and would begin placing material that had accumulated on the Unloading Wharf into the end-dumps.

M – As noted in Chapter III, Section 5.8, of the Phase 1 Evaluation Report, using two off-loading positions should improve the efficiency of the off-loading operation at the Unloading Wharf by increasing capacity when off-loading material and by providing greater flexibility to handle different types of material. If off-loading equipment were used in two positions, the following scenarios could be viable:

- One machine could directly off-load the hopper barges while the second machine could off-load and process material through the size separation system; and/or
- One machine could consolidate material within the barge while the second machine could off-load and process material through the size-separation system.

5.1.2 Containment-Related Issues

Containment systems in use at the off-loading area of the Unloading Wharf were at times inadequate and did not always prevent material from escaping the exclusion zone.

C – When off-loading dredged material with a high silt and clay content, a significant amount of material was unintentionally deposited between the barge and the trommel screen feed chute system. Oversight Team members observed that when material larger than the 1-foot by 1-foot grid spacing within the top tier of the trommel screen feed chute system was rejected to the off-loading area, small portions of the dredged material that had collected at the base of the system would splatter. At times, the existing containment system did not prevent splattered material from potentially entering the Champlain Canal. In certain instances, the height of the containment wall was not sufficient to prevent material from splashing over the top of the wall. In addition, "gaps" exist at the interface of the spill plate and the containment wall. The size of the existing spill plate also appears too small and at times limited the mobility of the PC-1250.

M – To prevent material from escaping the containment area, while continuing to use the existing containment system, improved cleanup procedures at the off-load area should be considered. An increase in cleaning frequency might minimize the build-up of material in the off-load area and reduce the likelihood of material splatter. However, safety considerations require that off-loading equipment stop operations while cleaning this area. An increase in cleaning frequency will result in increased downtime and decreased off-loading productivity. To limit the impact upon off-loading operations, cleaning could be scheduled around times when barges are changed out.

Alternatively, a redesign of the existing containment system might prevent material from escaping the containment area. One option for redesign would be the addition of a "wing" angled away from the off-loading area at the top of the containment wall. This modification would increase the area of the containment surface without impacting the current swing-radius of the PC-1250. Another option would be to modify the interface between the spill plate and the containment wall to create a seamless junction of the two containment systems, which would remove gaps that could allow material to escape the containment system. In addition, extending the length of the spill plate may allow more of the off-loading area along the Unloading Wharf to be protected and provide the PC-1250 more flexibility in its movement. This may further reduce the potential for any material escaping the containment zone, either by dropping from the PC-1250's bucket while transferring material or splattering while operating the trommel screen feed chute system. It should be noted that as each containment concern was brought up by EPA, GE took action to mitigate the issue.

5.1.3 Impact of Size-Separation System on Off-Loading Cycle

The PC-1250's cycle time while off-loading material to the size-separation system is faster than the cycle time of the trommel screen feed chute system.

C – The time necessary for the trommel screen feed chute system to properly load material into the trommel screen and return to its standby position is longer than the time needed for the PC-1250 to complete one transfer cycle. This results in the PC-1250 being idle for a period of time during each cycle while waiting for the trommel screen feed chute system to complete its cycle.

M – Consideration should be given to modifying or redesigning the trommel screen feed chute's operating system such that the cycle time is the same or less than the PC-1250's cycle time (see Section 5.2.2, *Design of the Trommel Screen Feed Chute System* and Chapter III, Section 3.4.3, of the Phase 1 Evaluation Report).

5.1.4 Hopper Barge Movement at Unloading Wharf

Off-loading was often delayed while the PC-1250 waited for the repositioning of a loaded hopper barge at the Unloading Wharf. The design called for hopper barges to be moved in and out of position by a line-haul system. This system failed immediately and was abandoned. The tugboat that was already permanently assigned to the wharf area moved the barges.

C – On average, 46 hours of lag time occurred each week during which the PC-1250 remained idle while a loaded hopper barge was brought into position at the Unloading Wharf[5]. While some of this downtime was attributable to planned maintenance activities, a significant portion resulted from moving hopper barges around at the Unloading Wharf (e.g., utilizing a single tugboat). It is understood that some lag time is unavoidable during off-loading activities; however, the goal should be to reduce lag time as much as possible.

M – Two possible options should be considered to further reduce downtime:

- Redesign and utilize the line-haul system. In conjunction with any modifications to the line-haul system itself, it may also be necessary to modify the hopper barges to allow a barge to be tied off either to the line-haul system and/or to the Unloading Wharf. By implementing this modification to the line-haul system, it would be possible to move one or more barges independently rather than attempting to reposition multiple barges at the same time.
- Increase the number of tugboats dedicated to the Unloading Wharf. This would allow simultaneous re-positioning of multiple barges.

5.1.5 Dewatering-Related Issues

Removal of excess water from loaded hopper barges resulted in downtime as the PC-1250 waited for the dewatering operations to be completed.

C – The amount of water within a hopper barge increased the time it took to dewater the barges, sometimes resulting in temporary suspension of the unloading operations. It is understood that the amount of excess water within the hopper barges was intentional in order to keep dredged material covered with a thin layer of water before unloading and was intended to limit the amount of PCBs released into the air column.

[5] Data is located in Table "Barge Data 20091029" found in Appendix P of the Phase 1 Data Compilation Report provided by GE to EPA. Calculation does not include the five-week "ramp up" period and assumes work was performed on a 24 hours per day, 6 days per week basis and does not include downtime due to holidays.

Off-loading operations were halted sometimes because the pumps were being used for the dewatering operation. These pumps often had difficulties when pumping water with high solids content; as the solids content increased, the pumping rate decreased. As the water elevation in the hopper barge decreased in relation to the pump elevation, the pumping rate decreased, further increasing the time it took to dewater the hopper barge.

M – To increase the dewatering rate, consideration could be given to increasing the number and types of pumps used in the dewatering process. In addition, installation of a storage (holding) tank similar to the sediment slurry tank dedicated to the dewatering operation would allow dewatering to occur at a higher rate without affecting the capacity of the size separation system.

Alternatively, modifications could be made inside the hopper barges to prevent the solids from impacting the capacity of the dewatering pumps. A filtration system composed of screens of the desired opening size and a supporting steel structure could be installed at the bow and stern of the barges. This would provide an area for water with a lower percentage of solids to collect so that it could easily be removed by the dewatering system. Pumps could also be attached to a long-reach excavator so they could be relocated quickly inside the barge. It should be noted that GE tested several different type pumps in an attempt to improve water removal. GE has indicated to EPA that some of the pumps tested did not work well enough to be implemented in Phase 1.

5.1.6 Discharge of Contaminated Water to Storm Water Storage Basin

The northern hopper barge dewatering pump at the Unloading Wharf discharged water to the waterfront storm water storage basin.

C – To place less strain on the size-separation system, the contractor began discharging contaminated water to the waterfront storm water storage basin, resulting in the accumulation of contaminated material in the basin. This measure was requested by GE in late July as an innovative approach to improve productivity. EPA accepted this approach.

M – The installation of a holding tank dedicated to the dewatering operations would eliminate the need to discharge water and contaminated material to the storm water detention basin. Water could be pumped directly to the size-separation system and eliminate the need to discharge to the storm water detention basin. EPA expects the storm water basin to be returned to its original function for Phase 2 operations.

5.2 Material Processing (Size-Separation System)

5.2.1 Input of Material and Utilization of Size-Separation System

At times, the flow of material through the size- separation system (e.g., trommel screen, 1/4-inch intermediate shaker screen, hydro-cyclones, etc.) was restricted.

C – Rapid loading of the size-separation system with material would sometimes overload the component that was targeting that size material for removal. This situation occurred with finer-grained sands and silts, resulting in overloaded shaker screens at the hydro-cyclones and overflow of the weirs at the gravity thickener. This did have a significant impact on the water treatment plant. To prevent this from occurring, hopper barges containing this type of material were loaded into the trommel screen feed chute system slowly, allowing more continuous loading of the size-separation system. While this minimized problems with system overload, it increased off-load cycle time and reduced productivity of the off-loading operations.

M – Consideration should be given to attempting to load the size-separation system with a mixture of material so that an individual size-separation component is not overloaded. The addition of a second size-separation system would relieve the burden experienced by a single system (see Section 5.2.3, *Lack of Redundancy in the Size-Separation System)*. Alternatively, the trommel screen feed chute system could be redesigned using vibratory hoppers to allow for a more continuous flow of material into the remaining components of the size separation system (see Section 5.2.2 below, *Design of the Trommel Screen Feed Chute System*).

5.2.2 Design of the Trommel Screen Feed Chute System

5.2.2.1 Impacts on Off-loading Cycle Time

The cycle time of the trommel screen feed chute system was slower than the cycle time of the PC-1250 unloading material from the hopper barges.

C – This was due, in part, to the time it took to raise and lower the upper and lower tiers of the trommel screen feed chute system. Consideration should be given to evaluating the mechanics of the trommel screen feed chute system to determine if modifications or different methods of gross size-separation could be implemented that would minimize, or possibly eliminate, any delay in the unloading cycle time of the PC-1250.

M – More rapid loading of material into the size-separation system might be accomplished by replacing the two tiers of the trommel screen feed chute system with two separate vibrating hoppers. The top tier could be replaced by an enlarged shaker screen that permits material smaller than the 1-foot by 1-foot grid spacing to continue on to the lower tier. The supporting frame of the top tier could remain attached to hydraulic lifts, allowing the top tier to be raised when necessary to remove any large debris that may become lodged within the grid.

The bottom tier of the system could be replaced with a fixed vibrating hopper. The top tier would be angled away from the trommel screen, discharging to the same location that it does currently, while the bottom tier would be angled towards the mouth of the trommel screen, allowing loading of material into the trommel screen. This system might allow a more rapid, continuous flow of material into the size-separation system and eliminate the delays associated with the trommel screen feed chute system's slow cycle time.

5.2.2.2 Design of the Top Tier

The current design of the top tier of the trommel screen feed chute system consists of a series of standard "beams" at right angles to one another, creating the desired 1-foot by 1-foot screen.

C – The existing 1-foot by 1-foot "beam" array in the top tier of the trommel screen feed chute system creates excess surface area, causing smaller material to bridge across the 1-foot by 1-foot opening. As the top tier is raised, a majority of this material is discharged to the Unloading Wharf instead of continuing through to the trommel screen. Depending on the type of material being processed, this can result in the deposition of significant amounts of material in the off-loading area.

M – A narrower "bar" array that creates less surface area within the top tier of the trommel screen feed chute system would permit more material to continue through to the trommel screen and the remaining portions of the size-separation system. The "bar" array would continue to screen out the desired material such as large cobbles, boulders, and woody debris.

5.2.3 Lack of Redundancy in the Size-Separation System

A lack of redundancy in the size-separation system sometimes resulted in shutdown of the entire system when an individual component failed.

C – At various times during Phase 1, the size-separation system was completely shut down because one component of the system (PC-1250, dewatering pumps, trommel screen feed chute, trommel screen, 1/4-inch intermediate shaker screen, hydro-cyclones, etc.) failed. For example, the size-separation system was shut down when the trommel screen feed chute's hydraulic sensor systems were not working, when the rotation or water system to the trommel screen was not functioning, and whenever the 1/4-inch intermediate shaker screen or gravity thickener would overflow. Because there is minimal redundancy within the size-separation system, the entire system would shut down. The PC-1250 also broke down, causing a brief delay. The amount of downtime associated with each system failure varied.

M – Addition of a second size-separation system would allow off-loading and size separation to continue at the Unloading Wharf while repairs are being made to the first system. The current components of the size-separation system that should be considered most critical for providing redundancy are the trommel screen feed chute, trommel screen, and gravity thickener. If available space for a redundant system at the Unloading Wharf is a concern, construction of a second gravity thickener (see Section 5.2.5.2, *Issues Related to the Processing of Fine Material – Gravity Thickener, below*), in conjunction with the suggested design changes to the trommel screen feed chute system (see Section 5.2.2, *Design of the Trommel Screen Feed Chute System, above*), may be more feasible.

It is understood that the equipment is on a routine maintenance schedule and spare parts are on-hand or readily available. However, without redundancy in the system, in particular the offloading/loading PC-1250, there is potential for delay that could impact the project. Also it should be noted that equipment in Phase 1 was new and each successive year of operation will increase the potential for breakdown even with consideration of a rigorous maintenance program. Redundancy can help overcome the potential loss of time due to equipment breakdown.

5.2.4 Issues Related to Processing Clay

The trommel screen feed chute system and trommel screen had a difficult time processing material containing a high percentage of clay. This type of material sometimes had to be processed multiple times, significantly reducing off-load productivity.

C – Large quantities of high-content clay material were routinely rejected by the trommel screen feed chute system (resulting in the previously mentioned containment issues at the off-loading area) or were minimally processed by the trommel screen, creating clay "balls." Large piles of wet material would accumulate after running through the trommel screen, which then would need to be re-run through the system multiple times. When this happened, no new material would be off-loaded by the PC-1250, reducing off-loading productivity.

M – Consideration should be given to using the PC-1250 bucket to break up clay material, and water may need to be added to create a slurry. This could allow the material to be processed by the trommel screen. Alternatively, consideration should be given to dedicating a location for the mixture of additives (e.g., lime) to solidify clay at the Unloading Wharf or CMSA to prepare clay "balls" for off-site shipping (see Chapter III, Section 5.8, of the Phase 1 Evaluation Report).

Some clay will need to be processed in Phase 2 and an approach will need to be developed to handle this material. Technology and approaches for handling clay are readily available and implementable.

5.2.5 Issues Related to the Processing of Fine Material

5.2.5.1 Size-Separation System

The bottom tier of the trommel screen feed chute system is narrower than the top tier, resulting in the overflow of the bottom tier whenever wet, silty material was unloaded.

C – When the PC-1250 off-loaded material that was primarily water and silt, material would spill over the sides of the bottom tier because the bottom tier of the trommel screen feed chute was narrower than the top tier. This wet material would accumulate at the bottom of the trommel screen feed chute system and produce the containment issues discussed in Section 5.1.2,*Containment-Related Issues*.

M – Along with consideration of the redesign of the trommel screen feed chute system, as outlined in Section 5.2.2, *Design of the Trommel Screen Feed Chute System*, the bottom tier may need to be enlarged or other adjustment made to prevent any material spillage. This modification would further reduce the containment issues present at the off-loading area.

5.2.5.2 Gravity Thickener

When a significant amount of fine material was processed through the size-separation system, the gravity thickener would sometimes overflow.

C – Even with the addition of flocculants and coagulants, the high percentage of fines present in the process water would not settle out, resulting in a significant amount of fine sediment flowing over the weirs in the gravity thickener.

M – The addition of a second gravity thickener would double the capacity and allow the retention time within each unit to increase, giving the fine material longer to flocculate and settle. Alternatively, clay could be solidified or fed slowly through the system.

5.2.6 Issues Related to the Processing of Coarse Material

When significant amounts of coarse material were being processed through the size-separation system, blockages in the piping system would occur.

C – When the PC-1250 off-loaded coarse material to the size-separation system in buckets larger than about three cubic yards, blockages would begin to occur in the hoppers underneath the trommel screen. These blockages were partially attributable to the rapid loading of coarse material to the size-separation system; however, the 90^{o} bends within the piping system that transferred material from the trommel screen to the 1/4-inch intermediate shaker screen system also contributed to the blockages.

M – GE has indicated to EPA that these 90^{o} pipe bends were removed during plant commissioning.

Consideration should also be given to modifying the tapered bottom section of the trommel screen to limit clogging by using a standard rectangular tank at the bottom of the trommel screen and removing the tapered section. GE has indicated that reconfiguration of the bottom of the trommel may not improve this situation.

5.3 Material Handling

5.3.1 Coarse Material Staging Area (CMSA)

Coarse material stored at the CMSA was not covered or minimal covering was done.

C – This allowed the material to remain exposed, increasing the potential for PCB air and dust emissions. It is understood that the amount of material ultimately stockpiled at the CMSA was greater than expected, due to transportation issues. The potential for air emissions also is greater because fine material, which contains greater concentrations of PCBs, is intermixed with coarse material (which was not expected or planned for in the design). Currently, the Phase 1 piles at the CMSA are being covered with a mixture of organics, bentonite clay, and plaster (known as ConCover 180).

M – Improved containment of the material at the CMSA to minimize potential emissions could be achieved by implementing various options, including the following:

- Using tarps to cover material expected to be stockpiled at the CMSA should be evaluated. However, due to the potential for the piles to become large, it may be difficult to properly cover the material with tarps alone, which could hinder the efficient consolidation and management of material within the CMSA.
- The effectiveness of spray-on covers to control air emissions should be evaluated. Spray-on covers applied periodically would allow the contractor to continue managing the material within the CMSA while minimizing potential emissions from previously deposited materials.
- Using additional coarse staging areas, potentially locating the additional storage areas between the CMSA and the filter cake storage area (FCSA) should be considered. Constructing additional containment buildings similar to those being used for filter cake storage should be considered. Containment buildings are expected to provide an appropriate containment system while continuing to allow efficient material management and consolidation.

Resolving the landfill issues will minimize the need for the measures described above.

5.3.2 Filter Cake Storage Area (FCSA)

No issues relating to the storage of filter cake material at the FCSA were encountered.

5.4 Transportation

No issues relating to rail transportation of material from the Ft. Edward Processing Facility to the Waste Control Specialist's (WCS) Disposal Facility were encountered. Issues of cleaning and covering rail cars were resolved during Phase 1.

5.5 Material Disposal

Challenges encountered during material unloading at the WCS Disposal Facility reduced timely shipping of material off-site, causing material to be stockpiled at the Processing Facility.

C – Following receipt of loaded railcars at the WCS Disposal Facility, improper unloading resulted in railcars potentially becoming contaminated. This required negotiations between WCS, GE, and EPA Regions 2 and 6 to determine the procedure for their return. In addition, a slope failure at the WCS Disposal Facility required attention before more material could be unloaded. Both of these challenges led to delays in subsequent railcar shipment and to material being stockpiled at the Processing Facility.

M – Consideration should be given to requiring the use of a "tipper" car system at the WCS Disposal Facility to ensure that contaminated material is efficiently and properly unloaded. The use of a second disposal facility or a different facility altogether should be evaluated so that material can be continually shipped from the Processing Facility. GE should visit the disposal facility(s) on a regular basis to identify potential problems with transportation and disposal (see Chapter III, Section 5.9, of the Phase 1 Evaluation Report).

5.6 Water Treatment

No issues directly related to the operation of the water treatment plant were observed.

C – In certain circumstances, various treatment trains within the plant had to be unexpectedly shutdown and backwashed. However, these issues arose because of the challenges presented by the gravity thickener overflow and are not directly related to the operation of the water treatment plant (see Section 5.2.5.2, *Issues Related to the Processing of Fine Material – Gravity Thickener*).

5.7 Quality of Life Monitoring[6]

5.7.1 Air Monitoring

During Phase 1, GE's Quality of Life Contractor conducted continuous 24-hour air monitoring during processing operations. As of December 18, 2009, GE's contractor had collected approximately 600 air samples from nine different locations around the Processing Facility. During the period from May 15, 2009 to December 18, 2009, 19 exceedances of the Residential Standard level were reported (also see the Technical Memorandum on Air).

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[6] Data located in Attachment E of the Monthly Progress Reports, found in Appendix F, the Monthly Complaint Summary, found in Appendix X, and raw data, found in Appendix V, of the Phase 1 Data Compilation Report provided by GE to EPA.

C – During Phase 1, GE's contractor conducted background air monitoring at the perimeter of the Processing Facility. This was used to establish the background PCB concentration within the air column. Once off-loading operations began at the Processing Facility, GE's contractor was to conduct continuous 24-hour air monitoring around the perimeter of the facility. The goal of this monitoring was to measure the potential release of PCBs to the air column. This monitoring was performed at both upwind and downwind locations (when prevailing wind directions could be established). In addition to the four permanent high-volume air samplers in place at the Processing Facility, additional low-volume air samplers were used across from the Unloading Wharf at the Wedgewood Par 3 Golf Course property.

Between May 15, 2009 and December 18, 2009, 19 exceedances of the Residential Standard level (0.11 $\mu g/m^3$) were reported. The maximum PCB concentration reported was 0.3283 $\mu g/m^3$, with an average exceedance level of 0.163 $\mu g/m^3$. For the 166-day dredging season less than 4% of the total number of samples collected to demonstrate compliance exceeded the standard.

Primary causes of these exceedances include:

- Accumulation of sediment along the Unloading Wharf and CMSA,
- Material remaining uncovered at the CMSA, and
- Staging hopper barges at the Unloading Wharf that contained sediment or debris with high concentrations of PCBs. In particular, extended periods of staging due to limitations in off-loading and processing increased the potential for air emissions.

In the early stages of Phase 1, the sampling locations across from the wharf at the golf course were adjusted to more suitable locations following consultation with NYSDEC and NYSDOH.

M – No changes to the current sampling procedure at the Processing Facility are recommended. The location of the air samplers provided representative measurements of PCBs within the air column around the perimeter of the Processing Facility. Instead, various forms of mitigation could be implemented to reduce the amount of PCBs released into the air column. In general, these measures could include:

- Evaluating material handling at the CMSA and along the Unloading Wharf, with the goal of limiting the amount of sediment exposed to the air column;
- More regular clean-up procedures to limit the amount of sediment collecting in areas along the Unloading Wharf, Main Haul Road, and the CMSA;
- Giving priority to hopper barges containing sediments and/or debris with high concentrations of PCBs;
- Reducing the period of the time hopper barges are staged at the Unloading Wharf, to the extent practicable.

For further discussion, see the Technical Memorandum on Air.

5.7.2 Noise Monitoring

During Phase 1, GE’s Quality of Life Contractor conducted continuous 24-hour noise monitoring at the Processing Facility. As of December 18, 2009 GE’s contractor had gathered approximately 14,500 one-hour noise measurements from three different locations around the perimeter of the Processing Facility. From May 15, 2009 to December 18, 2009, 18 exceedances of the short-term Noise Performance Standard, several exceedances of the long-term Noise Performance Standard, and 18 complaints associated with the Processing Facility were noted (also see the Technical Memorandum on Noise).

C – During Phase 1, sound measurements were recorded at three different locations around the perimeter of the Processing Facility. A two-week study at the start-up of the Processing Facility determined the noise levels during daily operations. In addition, noise measurements were recorded during the initial operation of each piece of equipment at the Processing Facility.

Noise was monitored in the vicinity of the Processing Facility to assess compliance with the Noise Performance Standard. The goal of this monitoring program was to measure the noise levels at nearby receptors while the Processing Facility was operating. Sound levels were measured along the southern perimeter of the Processing Facility and at two residential receptor locations on the east side of the Champlain Canal.

In addition to the contractor’s monitoring, the Oversight Team independently made one-hour noise measurements during daytime and nighttime Processing Facility operations on several occasions near the beginning of Phase 1 activities. No exceedances of the Noise Performance Standard were noted during Oversight Team monitoring.

Between May 15, 2009 and December 18, 2009, 18 exceedances of the short-term and several exceedances of the long-term Noise Performance Standards were noted. The method used to calculate the number of exceedances of the long-term Noise Performance Standard is discussed in the Technical Memorandum on Noise.

In addition, 18 noise complaints related to operations at the Processing Facility were received. During this period, complaint-based measurement were made, with the resulting hourly value (A-weighted decibels [dBA]) being below the Noise Performance Standard control and standard criteria.

M – Based on Phase 1 experience with the Noise Performance Standard, as it relates to the Processing Facility, no changes to the standard for the Processing Facility area are recommended for Phase 2.

For further discussion, see the Technical Memorandum on Noise.

5.7.3 Odor Monitoring

During Phase 1, GE's Quality of Life Contractor conducted H2S monitoring during Processing Facility operations as-needed. During Phase 1, there were no exceedances of the Odor Performance Standard and five odor complaints associated with Processing Facility operations were reported.

C – The Odor Performance Standard for the project includes two components. The first component is a standard for H_2S which applies if an odor described as H_2S is detected by workers or the public. The second component applies to odor complaints and requires that complaints be investigated and mitigated to protect the public from odors that unreasonably interfere with the comfortable enjoyment of life and property.

During Phase 1 there were no exceedances of the H_2S standard. There were five odor complaints received associated with the Processing Facility. In each case, the odor complaints were investigated and determined not to be project-related.

M – Based on Phase 1 experience with the Odor Performance Standard, as it relates to the Processing Facility, no changes to the standard are recommended for Phase 2.

5.7.4 Light Monitoring

During Phase 1, GE's Quality of Life Contractor conducted light monitoring during the initial night of Processing Facility operations and when nighttime activities changed. As of December 18, 2009, GE's contractor had taken 60 light measurements from five different locations around the perimeter of the Processing Facility. From May 15, 2009 to December 18, 2009, no exceedances of Light Performance Standard and one complaint associated with the Processing Facility were reported.

C – The Light Performance Standard established for this project includes nighttime limits for rural and suburban residential areas, urban residential areas, and commercial/ industrial areas. The goal of the monitoring program was to measure the impact of nighttime Processing Facility operations on nearby residents.

During Phase 1, light measurements were recorded at five locations around the perimeter of the Processing Facility. Light measurements were taken the first night of activity at the Processing Facility and when nighttime lighting conditions were changed.

In addition to the contractor's monitoring, the Oversight Team performed independent light measurements during nighttime Processing Facility operations on several occasions near the beginning of Phase 1 activities and did not record any exceedances of the Light Performance Standard.

Between May 15, 2009 and December 18, 2009, there were no exceedances of the Light Performance Standard at the Processing Facility.

In addition, there was one complaint-based monitoring event for light during Phase 1. The complaint related to the brightness of temporary lights at the wharf. The lights were adjusted to focus downward toward the work areas and the complaint was resolved.

M – Based on Phase 1 experience with the Lighting Performance Standard as it relates to the Processing Facility, no changes to the standard are recommended for Phase 2.

6.0 Miscellaneous Observations

6.1 Data Sharing

6.1.1 Data Distribution

Data distribution and timing can improve for Phase 2.

C – The communication protocol for information-sharing and distribution between parties during Phase 1 needs improvement. At times during Phase 1, EPA did not have data in hand with sufficient lead time to review and respond quickly. In addition, federal and state agencies and consulting firms may also be evaluating data. Therefore, data with sufficient lead time to provide input to the EPA Oversight Team is needed.

M – A protocol should be established that would allow approved individuals to be promptly added to data distribution lists. Data should be provided in all appropriate formats to individuals with a legitimate need, as identified by EPA. It may be necessary to assign a primary GE contact who would be responsible for making changes to the data distribution list, in a timely manner, as requested by EPA.

In addition, a central electronic data repository accessible to Oversight Team members that contains all project-related data should be established. Consideration should be given to using an FTP site or other secure website where data could be posted by GE as it is received, to improve data consistency and accuracy.

A meeting prior to the start of Phase 2 with those who will be processing and analyzing data will be needed. The purpose of this meeting would be to improve data-sharing and identify the roles and responsibilities of each of the agencies and consultants involved.

6.2 Safety Issues

6.2.1 Work near Low-Head Dams

During Phase 2, some in-river operations will be near low-head dams, areas known to present significant safety risks.

C – Low-head dams in the Hudson River have been the site of a number of fatalities over the years when boats were swept over them.

During Phase 2, dredging, backfilling, and habitat reconstruction near the upstream side of a number of the dams located on the upper Hudson River are scheduled to take place.

M – Guidelines developed for previous work should be revisited and developed to address safety-related concerns, such as requiring safety staff to verify that work must be performed from a boat, identifying minimum boat equipment (e.g., multiple anchors or spuds), and identifying minimum quantities of reserve fuel to be carried. Consideration also should be given to the power of the vessels working above the dam to ensure they can move with sufficient thrust against currents and to the use of protective cables or other controls above these dams to help in the event a vessel losses power. In addition, dedicated safety personnel should continually monitor when activities are occurring near any low-head dam.

6.2.2 Transportation via Crew Boats

Embarking and disembarking from crew boats at dredge barges poses a potential safety hazard. Often an access ladder was not available at an appropriate location, requiring personnel to step up more than 12 inches onto a dredge barge or onto tires used as bumpers to access the dredge deck.

C – Each dredge barge was equipped with an access ladder to allow personnel boarding. Often the ladder was located toward the front of the dredge barge, close to the excavator and generally within the swing radius of the boom. Often crew boats would load or off-load passengers toward the rear of the dredge barge, away from the excavator and the ladder.

M – Embarking and disembarking should take place only at the access ladder. Ladders should be repositioned to the rear of the dredge barge, away from the excavator, to improve safe access.

7.0 References

Anchor QEA. November 2009. "Phase 1 Data Compilation, Hudson River PCBs Superfund Site." Prepared for General Electric Company.

Anchor QEA. January 2010. "Supplement to Phase 1 Data Compilation, Hudson River PCBs Superfund Site." Prepared for General Electric Company.

General Electric Company. January 2010a. "December 2009, Monthly Progress Report, Pursuant to Consent Decree Civil Action No. 1:05-CV-1270, for Hudson River PCBs Superfund Site."

General Electric Company. January 2010b. "Re: Hudson River PCBs Superfund Site – Consent Decree (Civil Action No. 1:05-CV-1270), Summary of Citizen Complaints – December 2009." Letter to United States Environmental Protection Agency, Region 2.

The Louis Berger Group, Inc. January 2010. "Draft Hudson River PCBs Superfund Site EPA Phase 1 Evaluation Report." Prepared for the United States Environmental Protection Agency, Region 2.

A

Noise Technical Memorandum

HUDSON RIVER PCB SUPERFUND SITE
PHASE 1 NOISE REVIEW
TECHNICAL MEMORANDUM
MARCH 2010

At the request of the U.S. Environmental Protection Agency (EPA), Ecology and Environment, Inc. (E & E) evaluated the noise levels measured by General Electric (GE) contractors during the 2009 Phase 1 activities at the Hudson River PCBs Superfund Site. The noise levels measured during the first phase of dredging were used to demonstrate compliance with the performance standards. Further, the data gathered will enable EPA to determine whether adjustments to operations or monitoring requirements are needed for Phase 2. EPA will provide GE with an opportunity to discuss the changes that EPA believes are appropriate, if any, to the Phase 1 Quality of Life Performance Standards (QoLPS) before EPA makes a decision regarding such changes.

This technical memorandum presents the results of the noise evaluation, compares those results with the QoLPS established for the project, and presents recommendations to further reduce noise impacts during Phase 2. In addition, a discussion of the noise modeling performed before Phase 1 activities began is included to provide a comparison of measured noise levels to those predicted by noise modeling. This evaluation of predicted versus measured noise levels is based on noise measurement data received from GE for the time period beginning May 15, 2009 through December 18, 2009. In general, as noted by local officials and the community, the project was much quieter than originally expected.

Dredging Operations

Noise Modeling

Noise modeling was conducted by Epsilon Associates, Inc., before Phase 1 dredging, backfilling, and Processing Facility operations began in order to predict the noise levels that would result from those operations and identify any areas where noise mitigation may be necessary. The modeling approach and complete results are presented in the *Hudson River PCBs Superfund Site Phase 1 Final Design Report*, Attachment J – Noise Impact Assessment (Epsilon Associates, Inc. March 21, 2006).

Noise modeling was conducted for a typical dredging setup, which included the following equipment:

- Tugboat
- Work boat
- Mechanical dredge
- Survey or support crew boats
- Light towers
- Portable generator
- High solids pump

Noise calculations were based on the model described in the *Special Report: Highway Construction Noise: Measurement, Prediction, and Mitigation* (U.S. Department of Transportation 1976). The model conservatively assumed that all sources would be operating simultaneously and that they would all be the same distance from a given receptor. Reference sound-level data for equipment were collected from the literature, actual dredging operations at other sites, and potential equipment vendors.

The modeled sound levels for unmitigated dredging operations at various distances are presented in Table 1.

Table 1 Modeled Sound Levels for Dredging Operations

Distance (Feet)	Sound Level (dBA)
35	80
50	77
60	75
100	70
150	67
200	65
250	62

Source: Epsilon Associates, Inc. March 21, 2006.

Key:
dBA = A-weighted decibels

Sound-Level Measurements

To assess compliance with the Noise Performance Standards during Phase 1 dredging and backfilling operations, noise measurement stations were established at fixed locations around each of the eighteen certification units (CUs). Figures 1 and 2 identify the locations of the fixed noise measurement stations established for the dredging and backfilling operations.

Continuous sound-level measurements, including hourly determinations of A-weighted equivalent sound level (L_{eq}) and the tenth percentile of A-weighted decibels (L90), were taken in the vicinity of dredging and backfilling operations, during installation and removal of the containment systems, and during sediment transport. The hourly average sound levels for each dredging operation residential measurement station are presented on Figures 3 through 81 at the back of this report. These figures graphically depict the sound levels for daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) operations at each of the residential measurement stations during Phase 1. The hourly average sound levels for each dredging operation commercial measurement station are presented in Figures 82 through 86.

Quality of Life Performance Standards Exceedances

The QoLPS limits for short-term operations are presented below. These limits apply to facility construction, work support marina operations, dredging, and backfilling activities:

- Residential Standard (maximum hourly average): Daytime (7:00 a.m. to 10:00 p.m.) = 80 dBA

- Residential Standard (maximum hourly average): nighttime (10:00 p.m. to 7:00 a.m.) = 65 dBA

- Commercial/Industrial Standard (maximum hourly average) anytime = 80 dBA

The average hourly noise levels measured at residential noise measurement stations around the CUs were generally below the QoLPS hourly average (L_{eq}) limits of 80 dBA (daytime) and 65 dBA (nighttime). However, the daytime residential limit was exceeded at a measurement station on 11 occasions, and the nighttime residential limit was exceeded on 74 occasions. Table 2 presents the number of exceedances of the QoLPS limits recorded at each of the measurement stations during Phase 1. It should be noted that the number of exceedances differ slightly from the number contained in the GE report because GE merged some exceedances into "exceedance events." The highest residential hourly average level measured during the daytime was 89.3 dBA, which exceeds the QoLPS by 9.3 decibels (dB). During the hours that the daytime QoLPS was exceeded, it was exceeded by an average of 4.5 dB. The highest residential hourly average level measured during the nighttime was 85.6 dBA, which exceeds the QoLPS by 20.6 dB. During the hours that the nighttime QoLPS was exceeded, it was exceeded by an average of 2.9 dB. Not all of the exceedances were a result of noise generated by project activities. Investigation by GE indicated other noise sources such as freight trains, vehicle traffic, and refuse trucks.

The average hourly noise levels measured at commercial noise measurement stations around the CUs were below the QoLPS hourly average (L_{eq}) limit of 80 dBA.

<u>Noise Complaints</u>

During the period beginning May 15, 2009 through December 18, 2009, nine noise complaints about the dredging operation were registered by the public, as reported by GE in the *Phase 1 Data Compilation Hudson River PCBs Superfund Site*, Appendix X, GE Monthly Complaint Summary (Anchor QEA November 2009). One complaint was related to noise during shift change near the Route 4 support property, and eight were related to on-river dredging operations. In all nine instances it was determined that the QoLPS for noise was not exceeded at the time and location of the complaint. However, GE adjusted operations as practicable in order to mitigate noise levels based on citizen complaints. Shift change was moved from the Route 4 support property to the work support marina, and dredging operations were moved away from the shoreline to the extent possible during nighttime operations.

Sediment Processing Facility

<u>Modeling</u>

Site-wide noise modeling was performed for the Processing Facility using the equipment listed below:

<u>Barge Unloading/Waterfront Area</u>

- Tugboat
- Unloading crane

Table 2 Summary of Hourly Average Noise Exceedances within Dredging Corridor

Monitoring Location	Location Name	Total Number of Measurements Recorded	Exceedances of Residential Nighttime (10 p.m. - 7 a.m.) Standard (65 dBA maximum hourly average)	Exceedances of Residential Daytime (7 a.m. - 10 p.m.) Standard (80 dBA maximum hourly average)	Exceedances of Commercial/ Industrial Standard (80 dBA maximum hourly average)
DRC-C1941-RR-00080	Rogers Island	18	0	0	NA
DRC-C1944-UR-00040	Rogers Island	225	5	0	NA
DRC-C1944-UR-00065	CU 1 North East Rogers Island	3,291	6	0	NA
DRC-E1943-UR-00038	CU 1 North East Rogers Island	1,172	7	1	NA
DRC-E1944-UR-00023	CU 1 East Bank	112	3	0	NA
DRC-E1944-UR-00042	CU 1 Rogers Island	253	3	0	NA
DRC-C1940-RR-00050	CU 2 Rogers Island	40	0	0	NA
DRC-C1940-RR-00069	CU 2 Rogers Island	318	0	0	NA
DRC-C1941-RR-00064	CU 2 Rogers Island - Old Fort St	122	0	0	NA
DRC-C1941-RR-00084	CU 2 Rogers Island	50	0	0	NA
DRC-E1940-CI-00024	CU 2 East Bank	819	NA	NA	0
DRC-E1941-UR-00036	CU 2 Old Fort St	37	2	0	NA
DRC-E1941-UR-00040	CU 2 East Bank	1625	0	0	NA
DRC-C1939-RR-00047	CU 3 Rogers Island	56	3	0	NA
DRC-E1939-CI-00067	CU 3 EAST	1,104	NA	NA	0
DRC-C1937-RR-00100	CU 4 Rogers Island	111	0	0	NA
DRC-C1944-RR-00106	CU 5 Rogers Island	1,061	17	3	NA
DRC-C1944-RR-00121	CU 5 Rogers Island	106	0	0	NA
DRC-W1944-RR-00008	CU 5 West Bank	242	0	0	NA
DRC-C1943-UR-00087	CU 6 Rogers Island	2,598	11	3	NA
DRC-W1943-RR-00027	CU 6 Rogers Island	216	0	0	NA
DRC-W1942-RR-00041	CU 7 Rogers Island	52	0	0	NA
DRC-W1942-RR-00051	CU 7 West Bank	2,094	7	0	NA
DRC-C1940-RR-00146	CU 8 Rogers Island	80	0	0	NA
DRC-C1942-RR-00126	CU 8 Rogers Island	85	0	0	NA

Table 2 Summary of Hourly Average Noise Exceedances within Dredging Corridor

Monitoring Location	Location Name	Total Number of Measurements Recorded	Exceedances of Residential Nighttime (10 p.m. - 7 a.m.) Standard (65 dBA maximum hourly average)	Exceedances of Residential Daytime (7 a.m. - 10 p.m.) Standard (80 dBA maximum hourly average)	Exceedances of Commercial/ Industrial Standard (80 dBA maximum hourly average)
DRC-C1940-RR-00056	CU 9 Rogers Island	26	0	0	NA
DRC-C1941-RR-00129	CU 9 Rogers Island	310	0	0	NA
DRC-W1940-RR-00021	CU 9 West Bank	25	1	0	NA
DRC-W1940-RR-00049	CU 9 West Bank	230	0	0	NA
DRC-W1940-RR-00067	CU 9 West Bank	204	2	0	NA
DRC-C1939-RR-00088	CU 10 Rogers Island	48	0	0	NA
DRC-W1939-RR-00010	CU 10 West Bank	37	0	0	NA
DRC-C1938-RR-00094	CU 11 Rogers Island	37	0	0	NA
DRC-W1938-RR-00043	CU 11 West Bank	37	0	0	NA
DRC-W1937-CI-00039	CU 12 South Rogers Island	51	NA	NA	0
DRC-W1935-RR-00035	CU 13 West Bank	17	0	0	NA
DRC-W1936-RR-00037	CU 13 West Bank	25	0	0	NA
DRC-E1933-RR-00022	CU 15 East Bank	25	0	0	NA
DRC-W1932-CI-00039	CU 15 West Bank	15	NA	NA	0
DRC-C1902-RR-00068	CU 17 Griffin Island	437	0	0	NA
DRC-E1901-RR-00057	CU 17 East Giffin Island	966	0	0	NA
DRC-E1902-RR-00009	CU 17 East Griffin Island Area	27	0	0	NA
DRC-C1901-RR-00066	CU-18 Griffin Island	2,399	0	0	NA
DRC-E1900-RR-00033	CU 18 East Griffin Island Area	24	0	0	NA
DRC-E1901-RR-00023	CU 18	217	0	0	NA
DRC-E1901-RR-00036	CU-18 McDonald Fuel	2,622	7	4	NA
	Totals	**23,666**	**74**	**11**	**0**

- Large front-end loader
- Off-road haul truck

Size Separation Area

- Large front-end loaders
- Off-road haul trucks
- Rotary trommel screen
- Rotary trommel water feed pumps
- Sediment slurry tank water feed pumps
- Hydrocyclone systems
- Hydrocyclone feed pumps
- Vibratory dewatering screens
- Hydrocyclone wet well pumps

Thickening, Dewatering, and Water Treatment Area

- Filter press feed pumps
- Filter press system air compressor
- Roll-off box (filter cake) transport trucks

Staging and Load-out Area

- Locomotive switcher idling
- Locomotive switcher moving
- Large front-end loaders
- Large air compressors
- Off-road haul trucks

Noise modeling of major noise sources in the Processing Facility was conducted using CadnaA noise modeling software developed by Datakustik GmbH. Estimated noise level data for the major project noise sources were obtained from the literature, actual operations at other sites, and potential equipment vendors. The CadnaA model simulates the outdoor three-dimensional propagation of sound from each noise source and accounts for sound wave divergence, atmospheric and ground sound absorption, and sound attenuation due to interceding barriers and topography based on the ISO 9613 standard. No shielding credit from on-site structures was taken in the model setup. The model was run using standard meteorological conditions of 58 ^{o}F and 50% relative humidity.

In the model the equipment at the Processing Facility was assumed to operate continuously during the course of any given hour, and the tugboat was assumed to operate for 10 minutes within any given hour. Noise levels for other intermittently operating equipment were developed using equivalency factors and utilization factors referenced in the literature (U.S. Department of Transportation 1976).

Haul truck noise was calculated using the Federal Highway Administration's Traffic Noise Model (TNM). These noise levels were added to the noise levels calculated for stationary sources to account for all major sources of noise at the Processing Facility.
The predicted noise levels at these locations resulting from the operation of the sediment Processing Facility are presented in Table 3.

Table 3 Modeled Sound Levels for the Sediment Processing Facility

Location	L_{eq} Sound Level (dBA)	L_{dn} Sound Level (dBA)
South property line	75.4	81.5
Golf course residence across from wharf area	65.8	71.8
Golf course across from wharf area	70.6	76.6

Key:
L_{eq} = A-weighted equivalent sound level
L_{dn} = day-night 24-hour average (based on hourly averages)

Sound-Level Measurements

Noise measurements for the sediment Processing Facility were taken between the facility and the nearest receptors. One measurement station was located along the southern perimeter of the Processing Facility and two measurement stations were located east of the Champlain Canal, on the golf course near the Processing Facility. The locations of the measurement stations are indicated on Figure 87. Continuous measurement of sound, with hourly determinations of the A-weighted equivalent sound level (L_{eq}) and the tenth percentile of A-weighted decibels (L90), was performed at the measurement stations.

Two QoLPS were established for long-term noise experienced by residential receptors due to operation of the Processing Facility. The first is a day-night 24-hour average (L_{dn}) (based on hourly averages) not to exceed 65 dBA. The L_{dn} was calculated by averaging the hourly average L_{eq} sound levels, with 10 dBA added to noise levels measured during the hours from 10:00 p.m. to 7:00 a.m. The L_{dn} is calculated using the following formula:

$$L_{dn} = 10\log\left[\frac{1}{24}\left(\left(15x10^{lde/10}\right)+\left(9x10^{(\ln e+10)/10}\right)\right)\right]$$

where:

L_{dn} = Day-night sound level
L_{de} = average hourly daytime L_{eq} sound level (dBA)
L_{ne} = average hourly nighttime L_{eq} sound level (dBA)

Under the second QoLPS, the average hourly L_{eq} sound level at a residence cannot exceed the short-term L_{eq} limit of 80 dBA during daytime or the short-term L_{eq} limit of 65 dBA during nighttime (10:00 p.m. to 7:00 a.m.).

The day-night average (L_{dn}) sound levels are presented on Figures 88 through 90, and the hourly average sound levels for each of the Processing Facility measurement stations are presented on Figures 91 through 96. On these figures, the sound levels are depicted graphically for daytime

(7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) operations at each of the measurement stations during Phase 1.

Quality of Life Performance Standards Exceedances

The L_{dn} levels calculated using the measurement station hourly average levels were compared with the QoLPS limit of L_{dn} 65 dBA. Table 4 presents the number of days that the L_{dn} limit of 65 dBA was exceeded at the Processing Facility measurement stations.

Table 4 Summary of L_{dn} Noise Exceedances at the Sediment Processing Facility

Location ID	Location Name	Number of Measurement Days	Number of Exceedances
PFF-PERI-RR-00003	South property line	198	1
PFX-E1943-RR-01324	Golf course residence	200	57
PFX-E1943-RR-01384	Golf course across from wharf	195	45

The L_{dn} day-night average exceeded the long-term Noise Performance Standard on 103 occasions. The highest L_{dn} exceedance level measured was 68.4 dBA at the golf course residence, which exceeds the QoLPS by 3.4 dB. On average, the L_{dn} exceedance level was above the QoLPS criteria by 0.6 dB at the south property line and 1.0 dB at both monitoring locations at the golf course.

The hourly average noise levels measured at the Processing Facility noise measurement stations were generally below the QoLPS hourly average (L_{eq}) limits of 80 dBA daytime and 65 dBA nighttime. However, the nighttime level was exceeded at the measurement stations on 18 occasions. Table 5 presents the number of short-term exceedances for each of the Processing Facility measurement stations during Phase 1.

The highest residential hourly average level measured during the nighttime was 68.2 dBA, which exceeds the QoLPS by 3.2 dB. During the hours that the nighttime QoLPS was exceeded, it was exceeded by an average of 1.2 dB.

Noise Complaints

During the period beginning May 15, 2009 through December 18, 2009, 18 noise complaints associated with the Processing Facility were registered by the public as reported by GE (Anchor QEA, LLC November 2009). In all eighteen instances, it was determined that the QoLPS for noise was not exceeded at the time and location of the complaint. It should be noted that the majority of complaints associated with the Processing Facility originated from the nearest residential receptor located south of the facility. Mitigation measures were employed in response to the noise complaints related to the Processing Facility and included installing modified backup alarms on new equipment and modifying a truck route within the facility to reduce vehicular noise.

Pile Driving

Sheet piling was used at CU 18 as a stable and safe resuspension control measure.

Table 5 Summary of Hourly Average Noise Exceedances at the Sediment Processing Facility

Monitoring Location	Location Name	Total Number of Measurements Recorded	Exceedances of Residential Nighttime (10 p.m. - 7 a.m.) Standard (65 dBA maximum hourly average)	Exceedances of Residential Daytime (7 a.m. - 10 p.m.) Standard (80 dBA maximum hourly average)	Exceedances of Commercial/Industrial Standard (80 dBA maximum hourly average)
PFF-PERI-RR-00003	South property line	4,867	1	0	NA
PFX-E1943-RR-01324	Golf Course residence	4,854	12	0	NA
PFX-E1943-RR-01384	Golf Course across from wharf	4,876	5	0	NA
	Totals	**14,597**	**18**	**0**	**NA**

Modeling

Two pile-driving methods—vibratory pile driving and impact pile driving—were modeled prior to beginning Phase 1 activities. Sound level estimates for the installation of sheet piling were calculated using the same screening-level model used to evaluate dredging operation noise (U.S. Department of Transportation 1976). A noise emission level of 96 dBA at 50 feet was used in the calculations for sheet piling installation using a vibratory hammer. It was assumed that the vibratory hammer would operate for only 20 minutes per hour during the sheet piling installation, which equals a usage factor of 0.33. A noise emission level of 101 dBA at 50 feet was used in the calculations for sheet piling installation using an impact hammer, and a 0.33 usage factor also was used. Table 6 presents the estimated sound levels calculated for the sheet piling installation.

Table 6 Modeled Sound Levels for Sheet Piling Installation

Vibratory Pile Driving		Impact Pile Driving	
Distance (feet)	Sound Level (dBA)	Distance (feet)	Sound Level (dBA)
100	85	100	90
150	82	200	84
180	80	300	81
200	79	325	80
250	77	400	78
300	76	500	76
325	75	575	75
350	74	650	74

Sound-Level Measurements

Noise measurements were taken during pile-driving operations at fixed locations around CU 18. Figure 2 shows the locations of the fixed noise measurement stations, including CU 18.

Continuous measurement of sound, with hourly determinations of A-weighted equivalent sound level (L_{eq}) and the tenth percentile of A-weighted decibels (L90), was performed in the vicinity of pile-driving operations. The noise measurement stations nearest to the pile-driving operation were stations DRC-E1901-RR-00023 and DRC-E1901-RR-00036. The hourly average sound levels at these measurement stations are presented on Figures 97 through 101. On these figures, the sound levels are depicted graphically for daytime (7:00 a.m. to10:00 p.m.) during days when pile-driving was in progress. Vibratory pile driving was conducted at these locations during the noise measurement periods, and in some cases dredging operations were occurring simultaneously in the vicinity. The daytime residential limit was exceeded at a measurement station on four occasions during pile-driving operations.

Quality of Life Performance Standards Exceedances

The QoLPS for pile-driving operations is the short-term daytime residential noise standard (maximum hourly average) of 80 dBA. The noise levels were generally below this limit; however, the standard was exceeded on the following occasions during pile-driving operations:

- June 20, 2009, from 1:00 p.m. to 2:00 p.m.
- June 24, 2009, from 9:00 a.m. to 10:00 a.m.

Table 7 shows the number of exceedances for each of the sheet piling installation measurement stations during Phase 1.

Table 7 Summary of Hourly Average Noise Exceedances for Sheet Piling Installation

Monitoring Location	Location Name	Total Number of Measurements Recorded	Exceedances of Residential Daytime (7 a.m. - 10 p.m.) Standard (80 dBA maximum hourly average)[1]
DRC-E1901-RR-00057	CU 17 East Giffin Island	376	0
DRC-C1902-RR-00068	CU 17 Griffin Island	179	0
DRC-E1901-RR-00036	CU-18 McDonald Fuel	113	4
DRC-E1900-RR-00033	CU 18 East Griffin Island Area	13	0
DRC-E1901-RR-00023	CU 18	158	0
	Totals	**839**	**4**

Note:
[1] Sheet pile installation occurred during daytime hours only

The highest residential hourly average level measured during the daytime was 88.1 dBA, which exceeds the QoLPS by 8.1 dB. During the hours that the daytime QoLPS was exceeded, it was exceeded by an average of 5.1 dB.

Summary

The levels measured during Phase 1 were generally lower than the levels predicted by the noise modeling for dredging, backfilling, and pile-driving. The levels that were recorded at the Processing Facility were consistent with those that were predicted by the noise modeling.

During Phase 1 dredging, backfilling, and pile-driving, the QoLPS hourly average limits for short-term operations were exceeded 11 times during daytime and 74 times during nighttime. The QoLPS hourly average limits were exceeded during operation of the Processing Facility 18 times during the nighttime and at no time during daytime; however, additional noise control measures may be necessary at the Processing Facility in order to reduce exceedances above the L_{dn} day-night limit of 65 dBA for the next phase of operation.

References

Anchor QEA, LLC. November 2009. *Phase 1 Data Compilation Hudson River PCBs Superfund Site*, Appendix X, GE Monthly Complaint Summary.

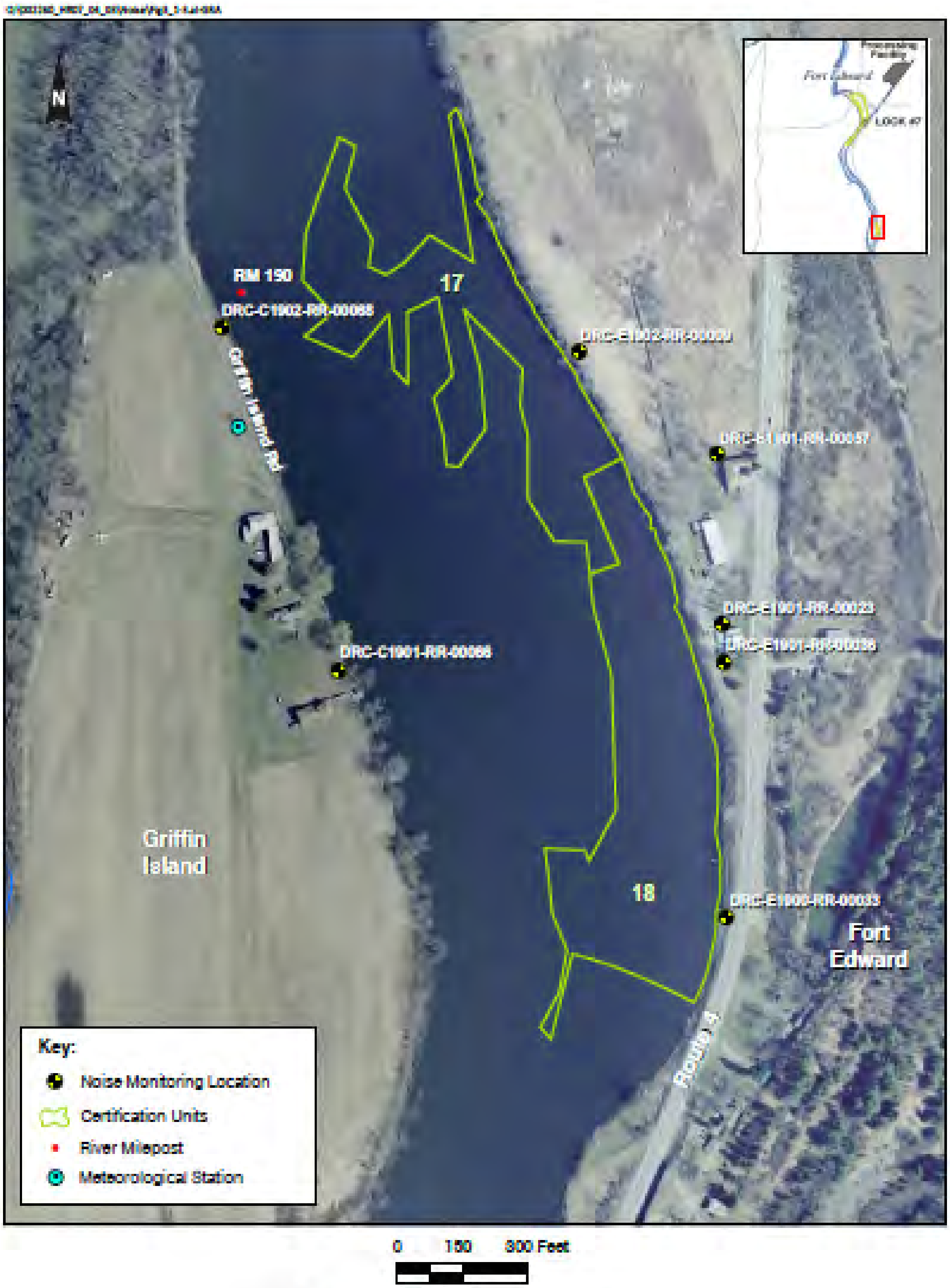
Epsilon Associates, Inc. March 21, 2006. *Hudson River PCBs Superfund Site Phase 1 Final Design Report*, Attachment J – Noise Impact Assessment.

U.S. Department of Transportation. 1976. Federal Highway Administration, *Special Report: Highway Construction Noise: Measurement, Prediction, and Mitigation.*

Figure 1

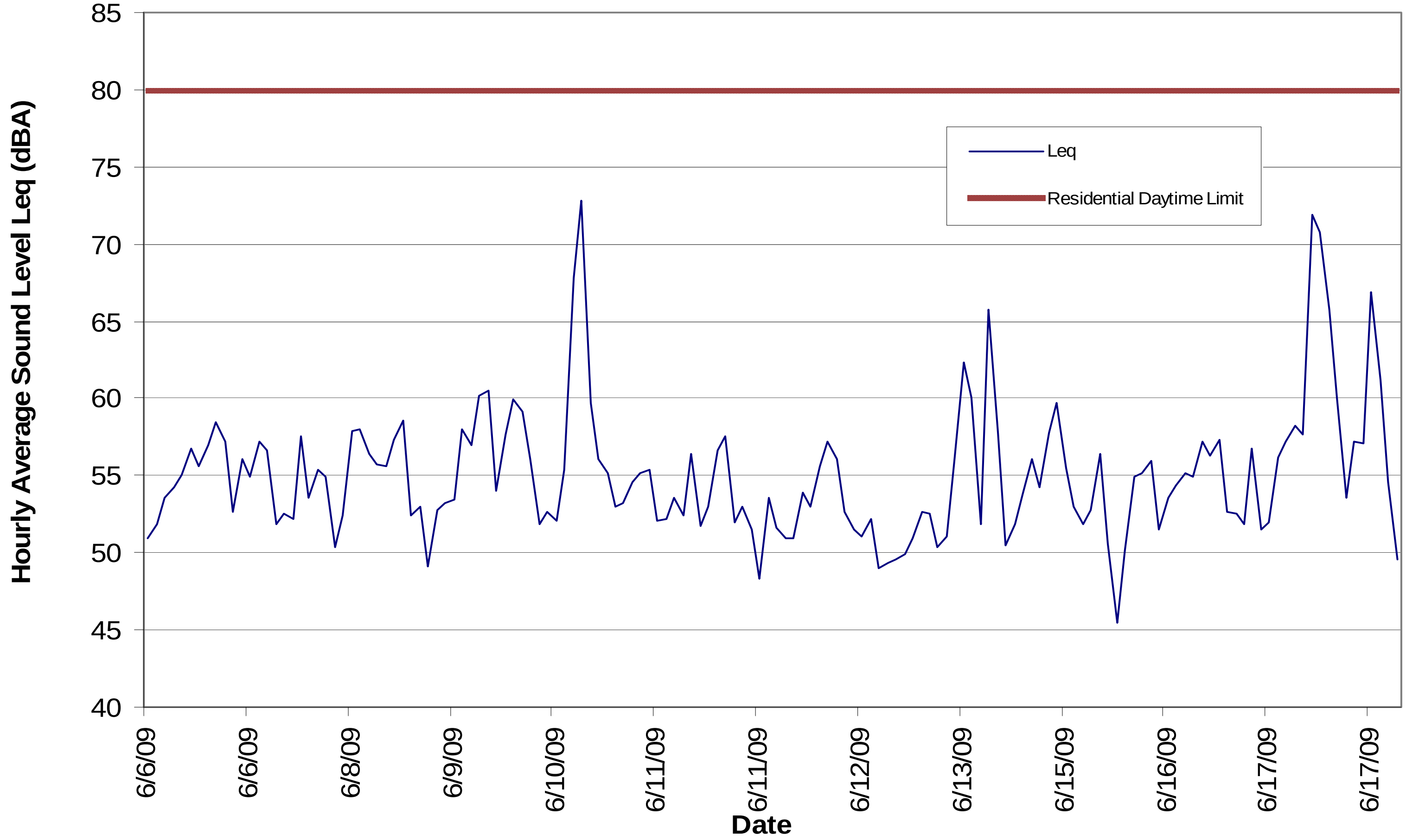
Noise Monitoring for Phase 1 Dredging

Figure 2



Noise Monitoring for Phase 1 Dredging

Figure 3
Location DRC-E1944-UR-00042
CU 1 Rogers Island Daytime



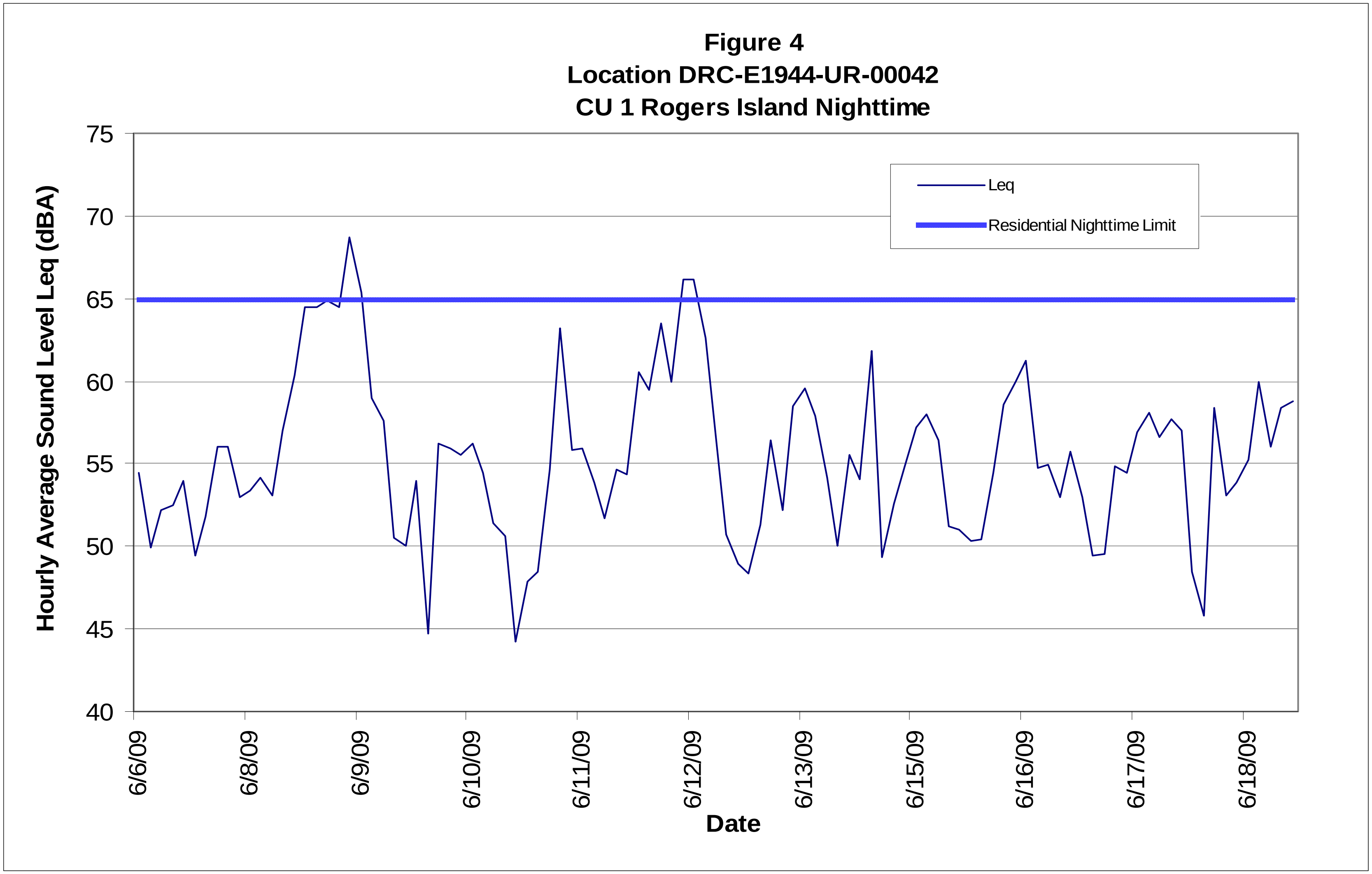


Figure 4
Location DRC-E1944-UR-00042
CU 1 Rogers Island Nighttime
Hourly Average Sound Level Leq (dBA)
75
70
65
60
55
50
45
40
Leq
Residential Nighttime Limit
6/6/09
6/8/09
6/9/09
6/10/09
6/11/09
6/12/09
6/13/09
6/15/09
6/16/09
6/17/09
6/18/09
Date

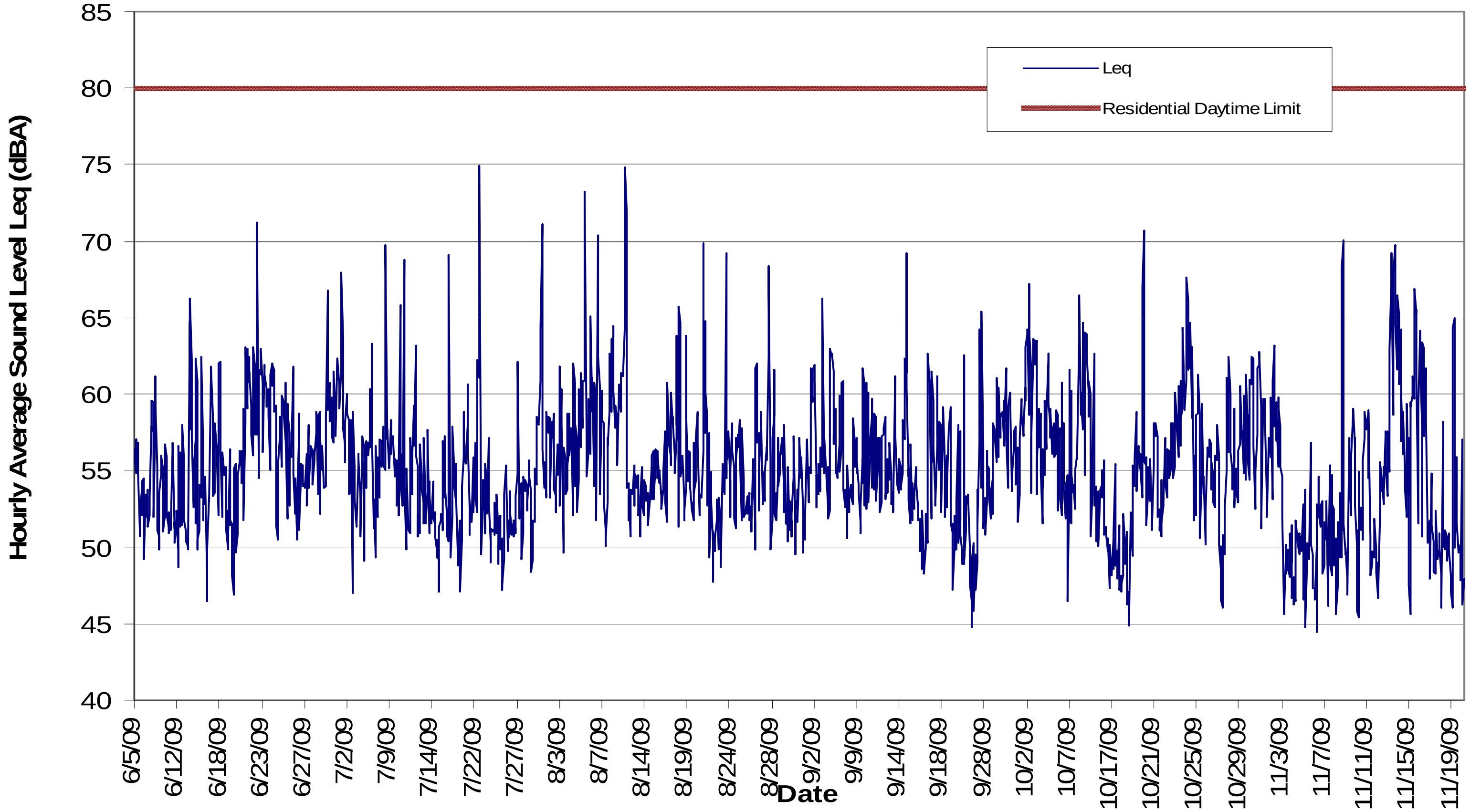
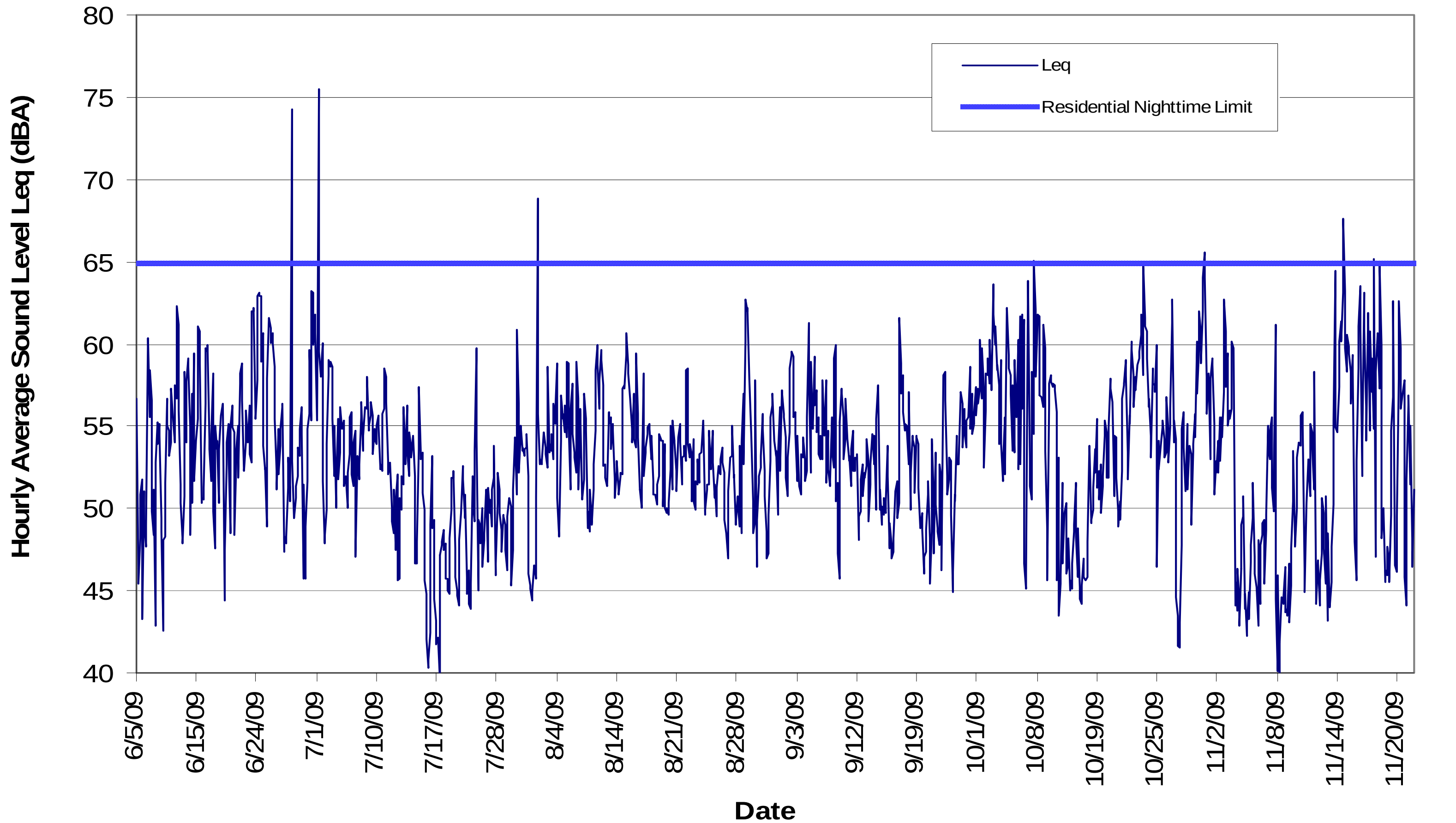


Figure 5
Location DRC-C1944-UR-00065
CU 1 Northeast Rogers Island Daytime

Figure 6
Location DRC-C1944-UR-00065
CU 1 Northeast Rogers Island Nighttime



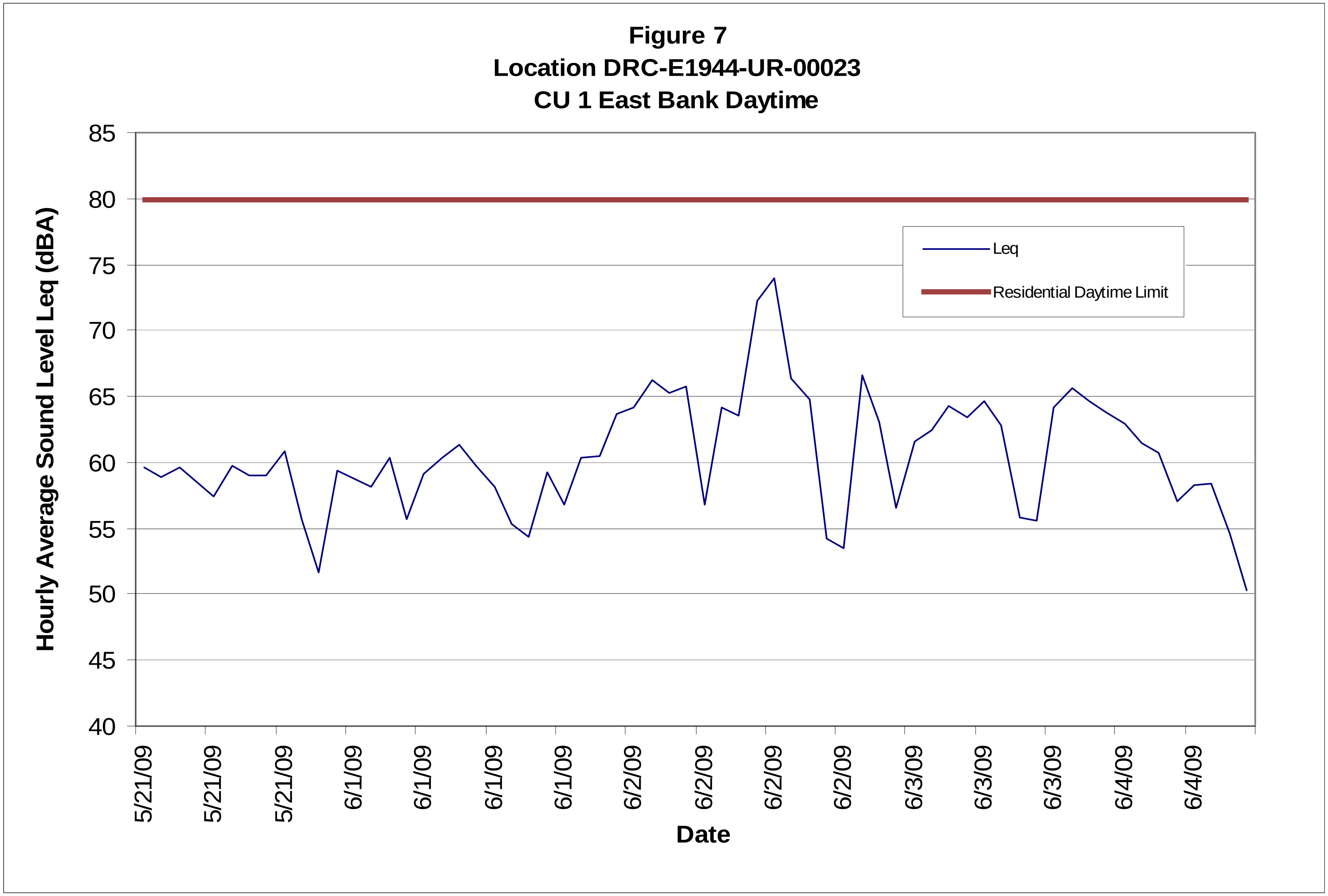


Figure 7
Location DRC-E1944-UR-00023
CU 1 East Bank Daytime
Hourly Average Sound Level Leq (dBA)
85
80
75
70
65
60
55
50
45
40
Leq
Residential Daytime Limit
5/21/09
5/21/09
5/21/09
6/1/09
6/1/09
6/1/09
6/1/09
6/2/09
6/2/09
6/2/09
6/2/09
6/3/09
6/3/09
6/3/09
6/4/09
6/4/09
Date

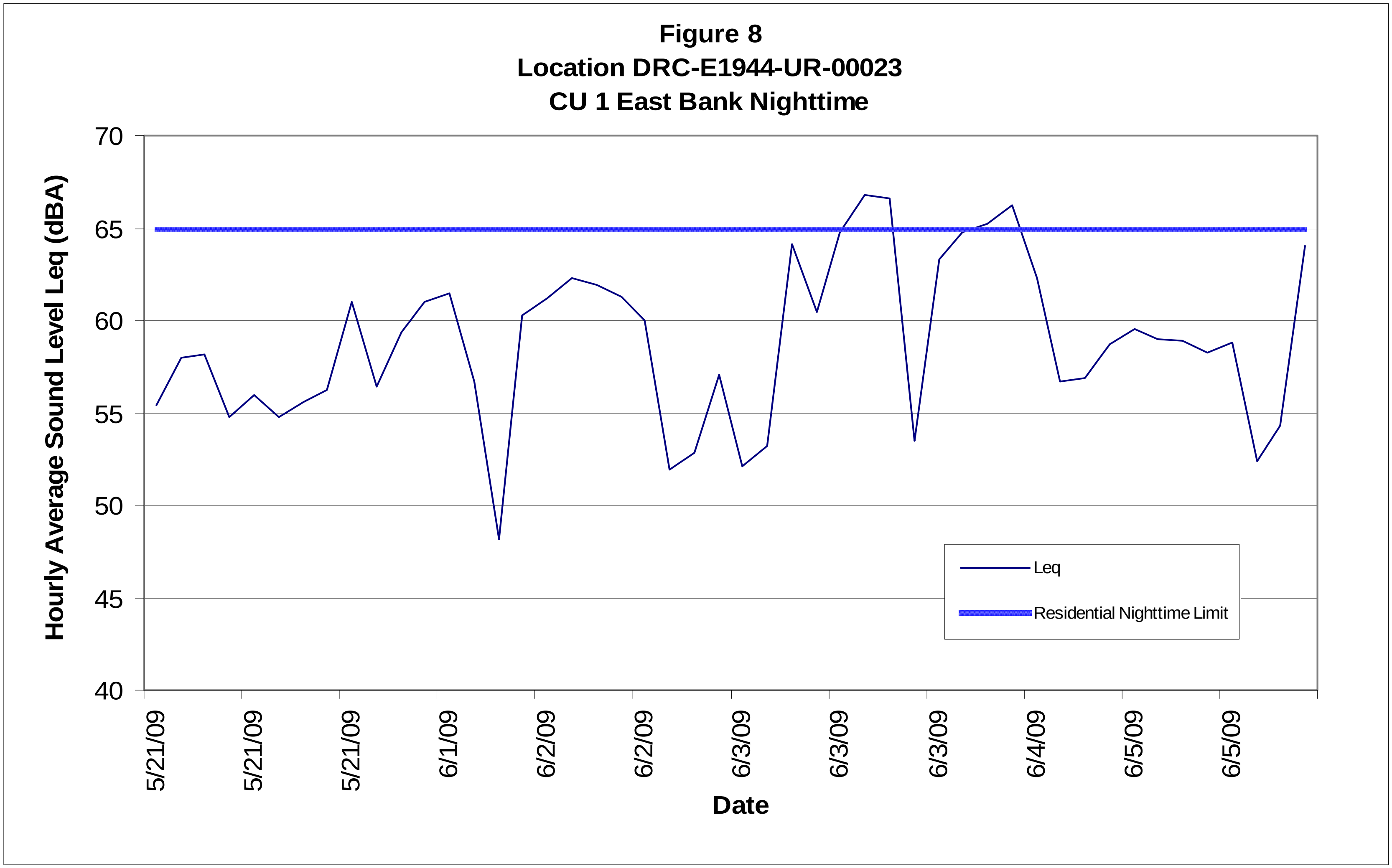


Figure 8
Location DRC-E1944-UR-00023
CU 1 East Bank Nighttime
Hourly Average Sound Level Leq (dBA)
70
65
60
55
50
45
40
5/21/09
5/21/09
5/21/09
6/1/09
6/2/09
6/2/09
6/3/09
6/3/09
6/3/09
6/4/09
6/5/09
6/5/09
Date
Leq
Residential Nighttime Limit

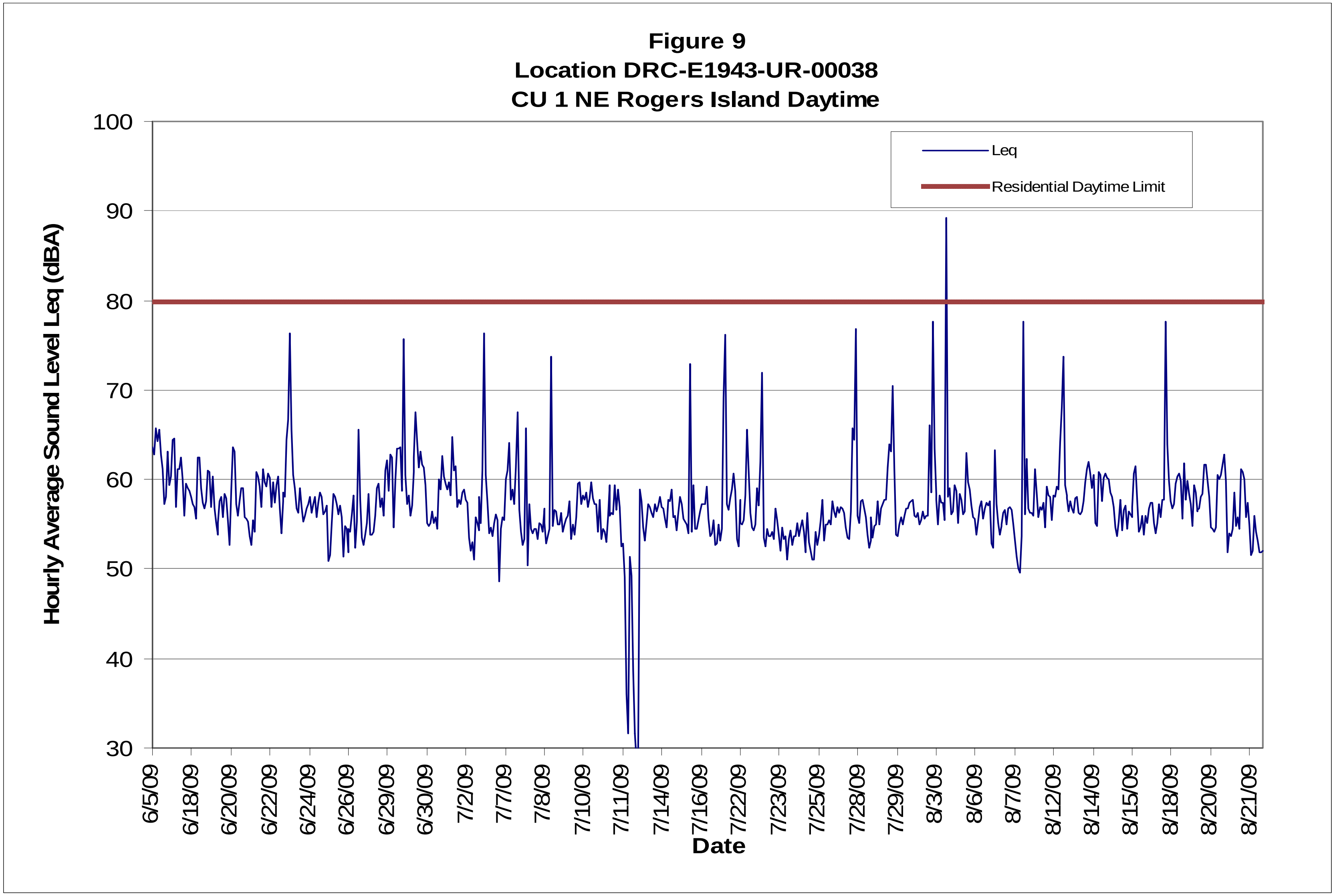


Figure 9
Location DRC-E1943-UR-00038
CU 1 NE Rogers Island Daytime
Leq
Residential Daytime Limit
Hourly Average Sound Level Leq (dBA)
100
90
80
70
60
50
40
30
6/5/09
6/18/09
6/20/09
6/22/09
6/24/09
6/26/09
6/29/09
6/30/09
7/2/09
7/7/09
7/8/09
7/10/09
7/11/09
7/14/09
7/16/09
7/22/09
7/23/09
7/25/09
7/28/09
7/29/09
8/3/09
8/6/09
8/7/09
8/12/09
8/14/09
8/15/09
8/18/09
8/20/09
8/21/09
Date

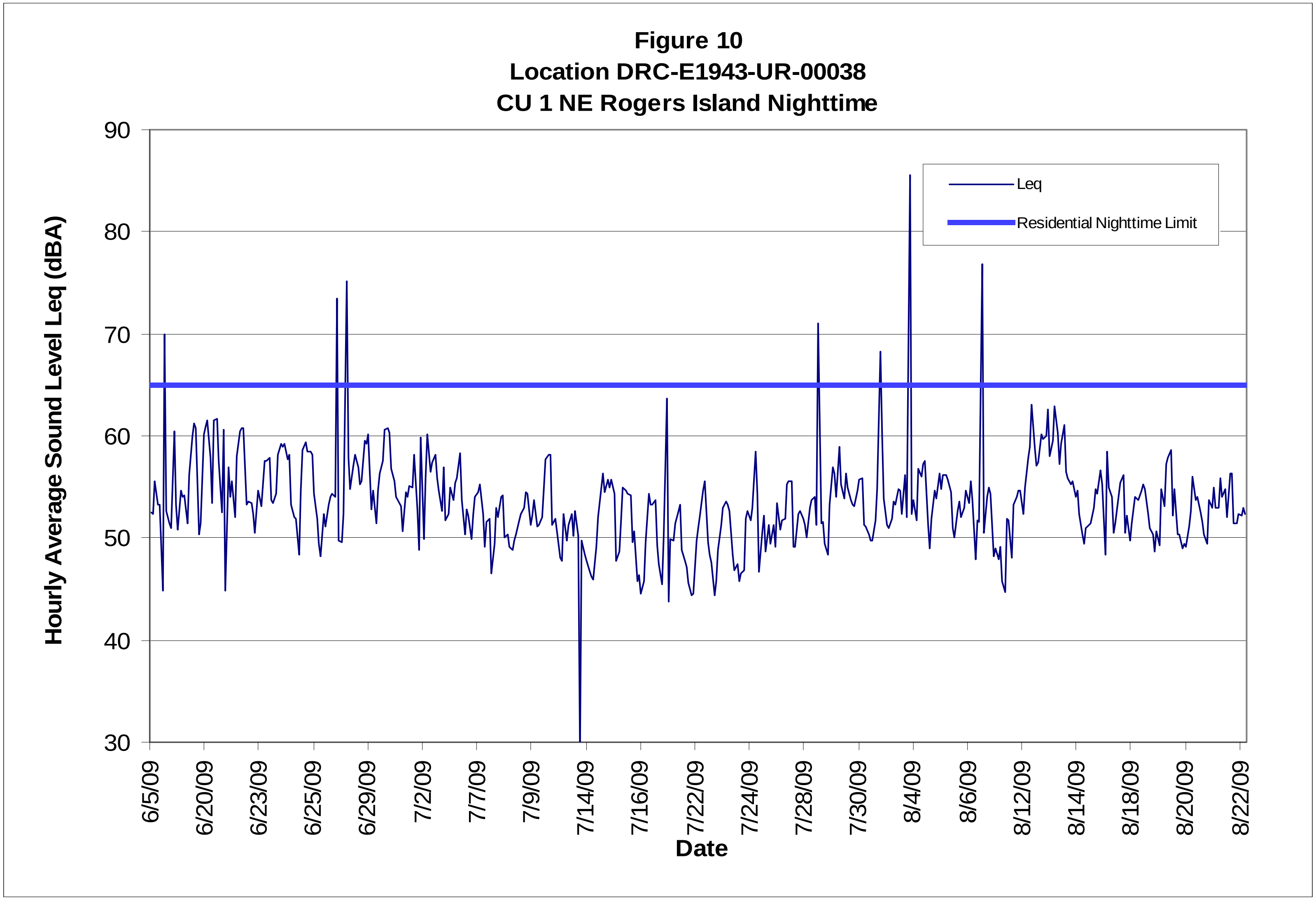


Figure 10
Location DRC-E1943-UR-00038
CU 1 NE Rogers Island Nighttime
Hourly Average Sound Level Leq (dBA)
90
80
70
60
50
40
30
Leq
Residential Nighttime Limit
6/5/09
6/20/09
6/23/09
6/25/09
6/29/09
7/2/09
7/7/09
7/9/09
7/14/09
7/16/09
7/22/09
7/24/09
7/28/09
7/30/09
8/4/09
8/6/09
8/12/09
8/14/09
8/18/09
8/20/09
8/22/09
Date

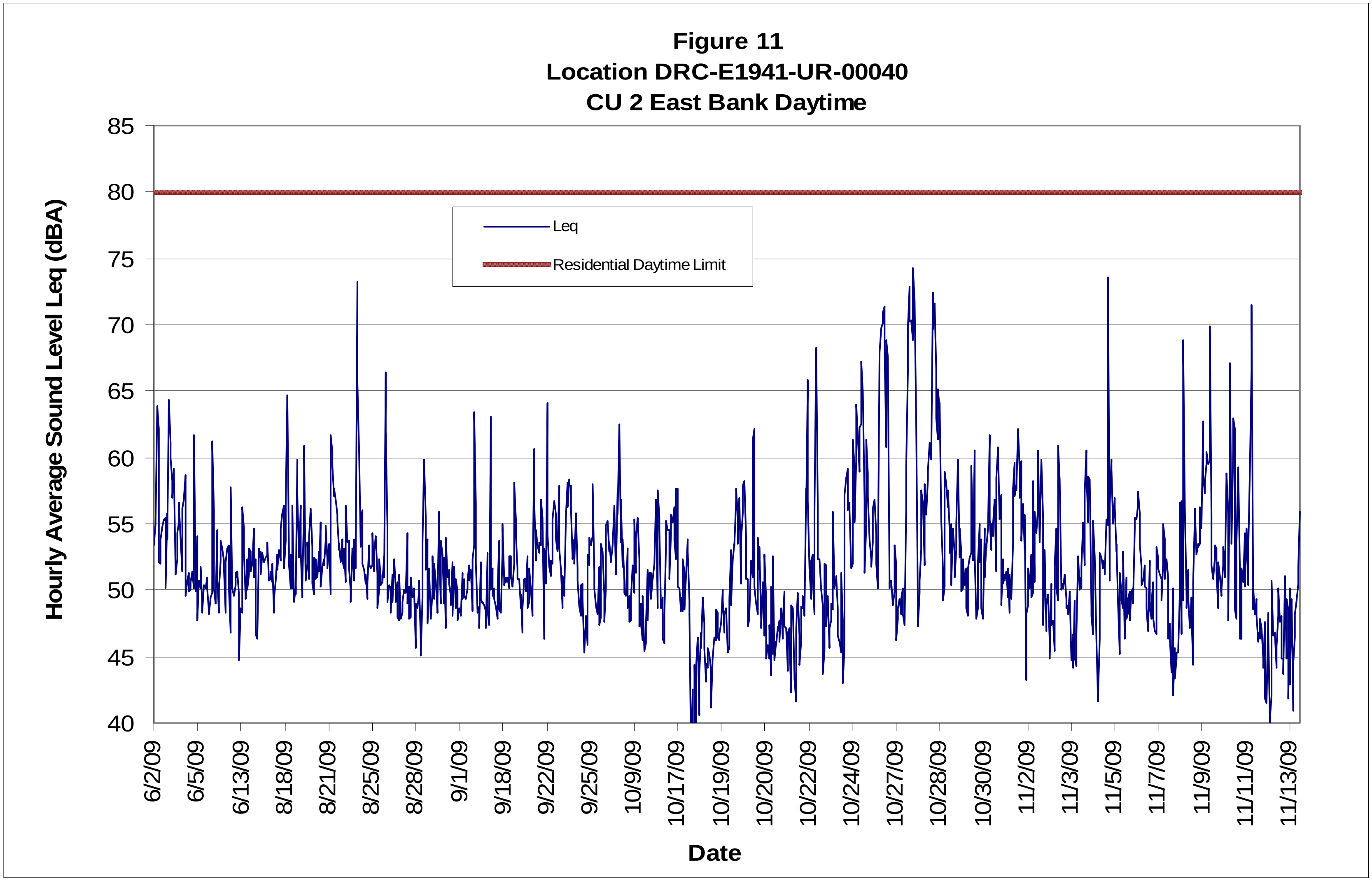
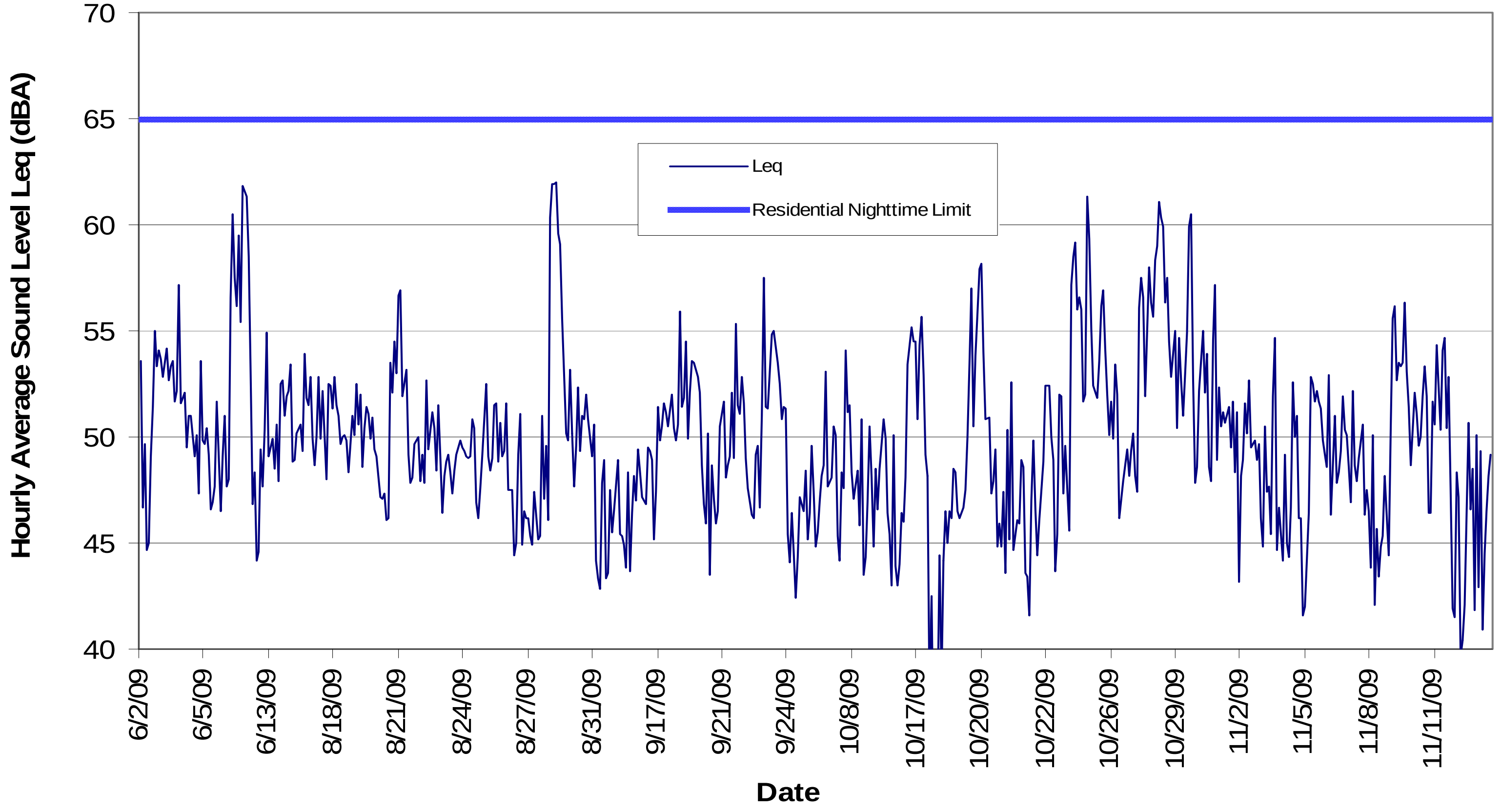


Figure 11
Location DRC-E1941-UR-00040
CU 2 East Bank Daytime

Figure 12
Location DRC-E1941-UR-00040
CU 2 East Bank Nighttime



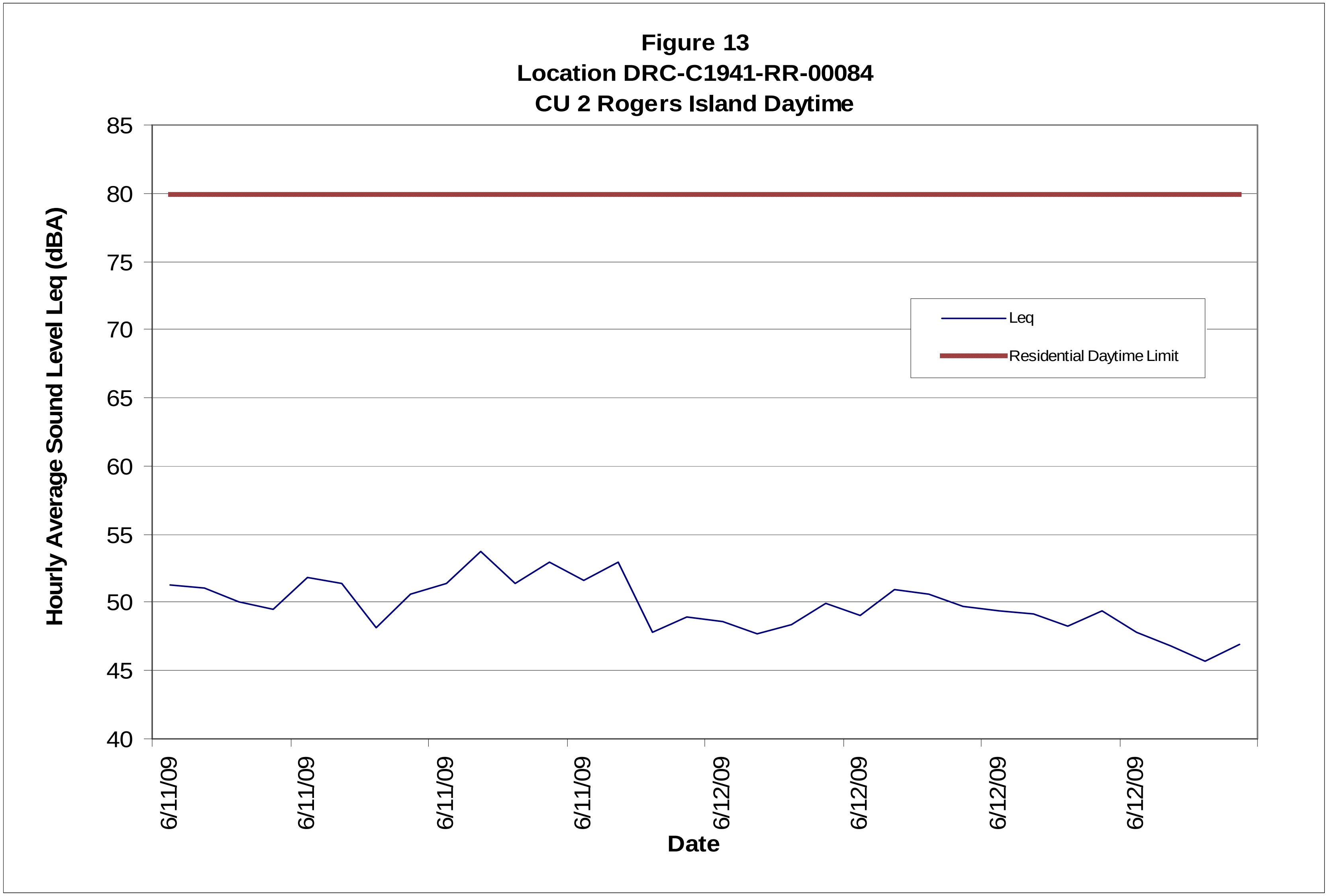


Figure 13
Location DRC-C1941-RR-00084
CU 2 Rogers Island Daytime
Hourly Average Sound Level Leq (dBA)
85
80
75
70
65
60
55
50
45
40
Leq
Residential Daytime Limit
6/11/09
6/11/09
6/11/09
6/11/09
6/12/09
6/12/09
6/12/09
6/12/09
Date

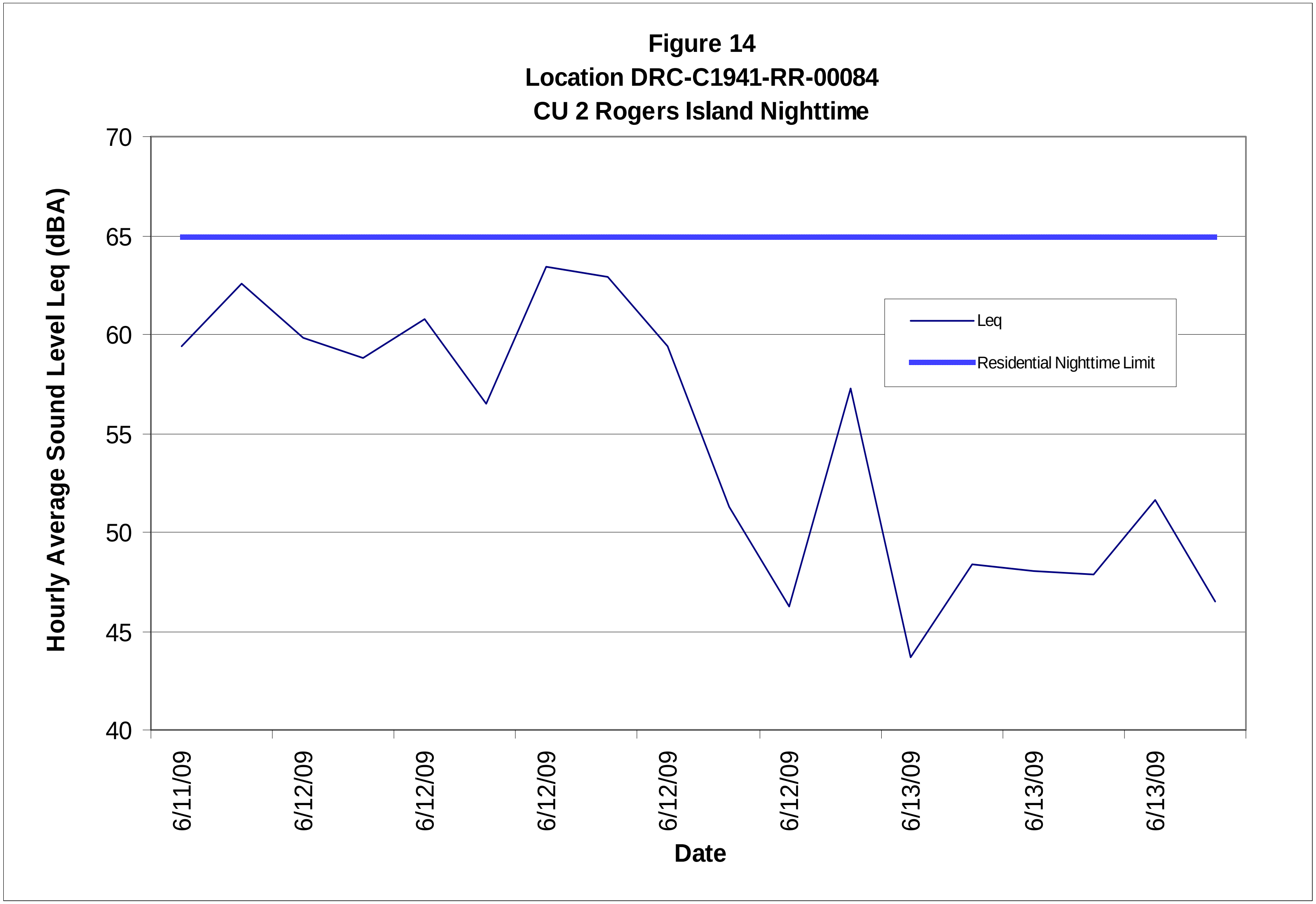


Figure 14
Location DRC-C1941-RR-00084
CU 2 Rogers Island Nighttime
Hourly Average Sound Level Leq (dBA)
70
65
60
55
50
45
40
Leq
Residential Nighttime Limit
6/11/09
6/12/09
6/12/09
6/12/09
6/12/09
6/12/09
6/13/09
6/13/09
6/13/09
Date

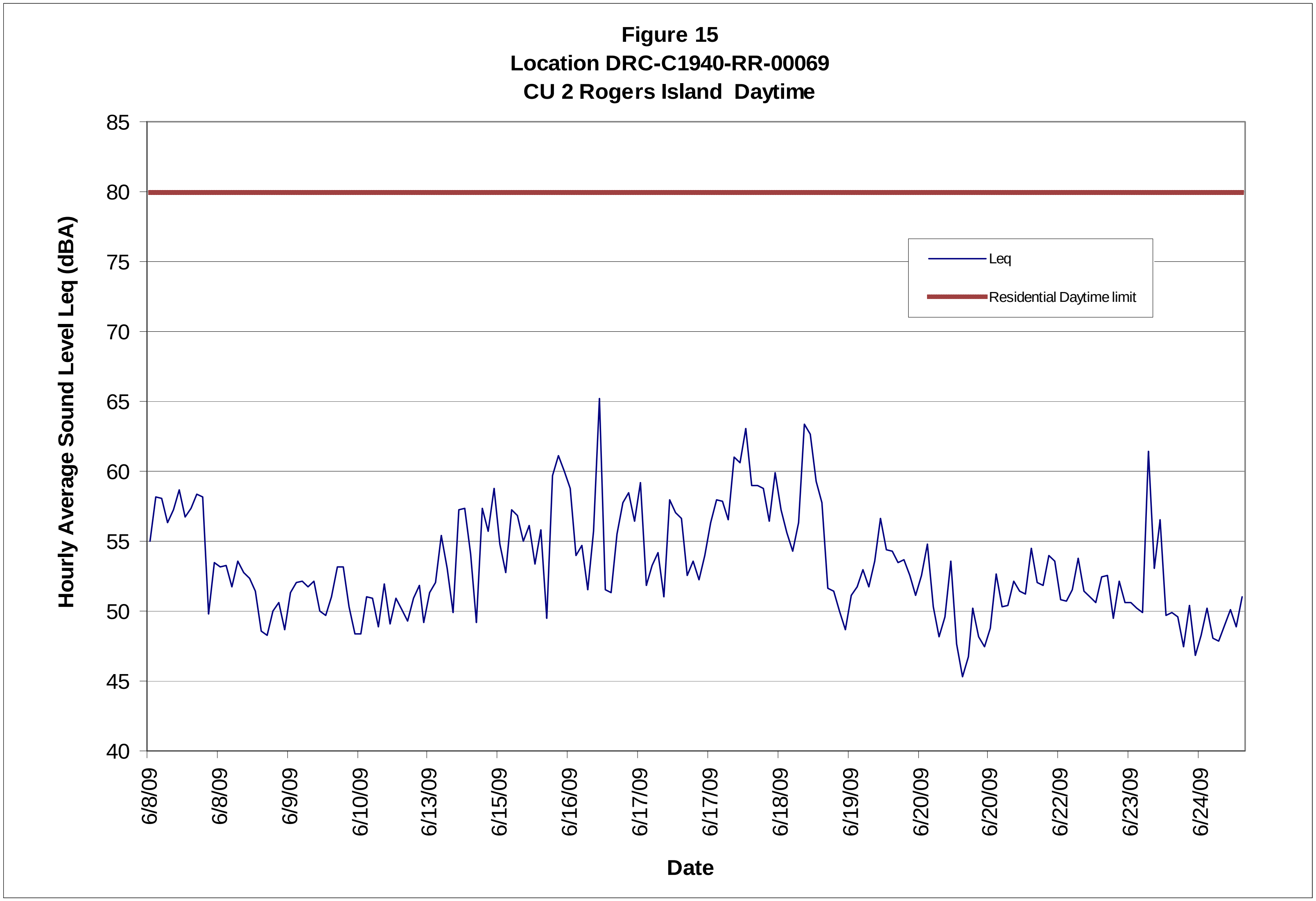


Figure 15
Location DRC-C1940-RR-00069
CU 2 Rogers Island Daytime
Hourly Average Sound Level Leq (dBA)
85
80
75
70
65
60
55
50
45
40
Leq
Residential Daytime limit
6/8/09
6/8/09
6/9/09
6/10/09
6/13/09
6/15/09
6/16/09
6/17/09
6/17/09
6/18/09
6/19/09
6/20/09
6/20/09
6/22/09
6/23/09
6/24/09
Date

Figure 16
Location DRC-C1940-RR-00069
CU 2 Rogers Island Nighttime

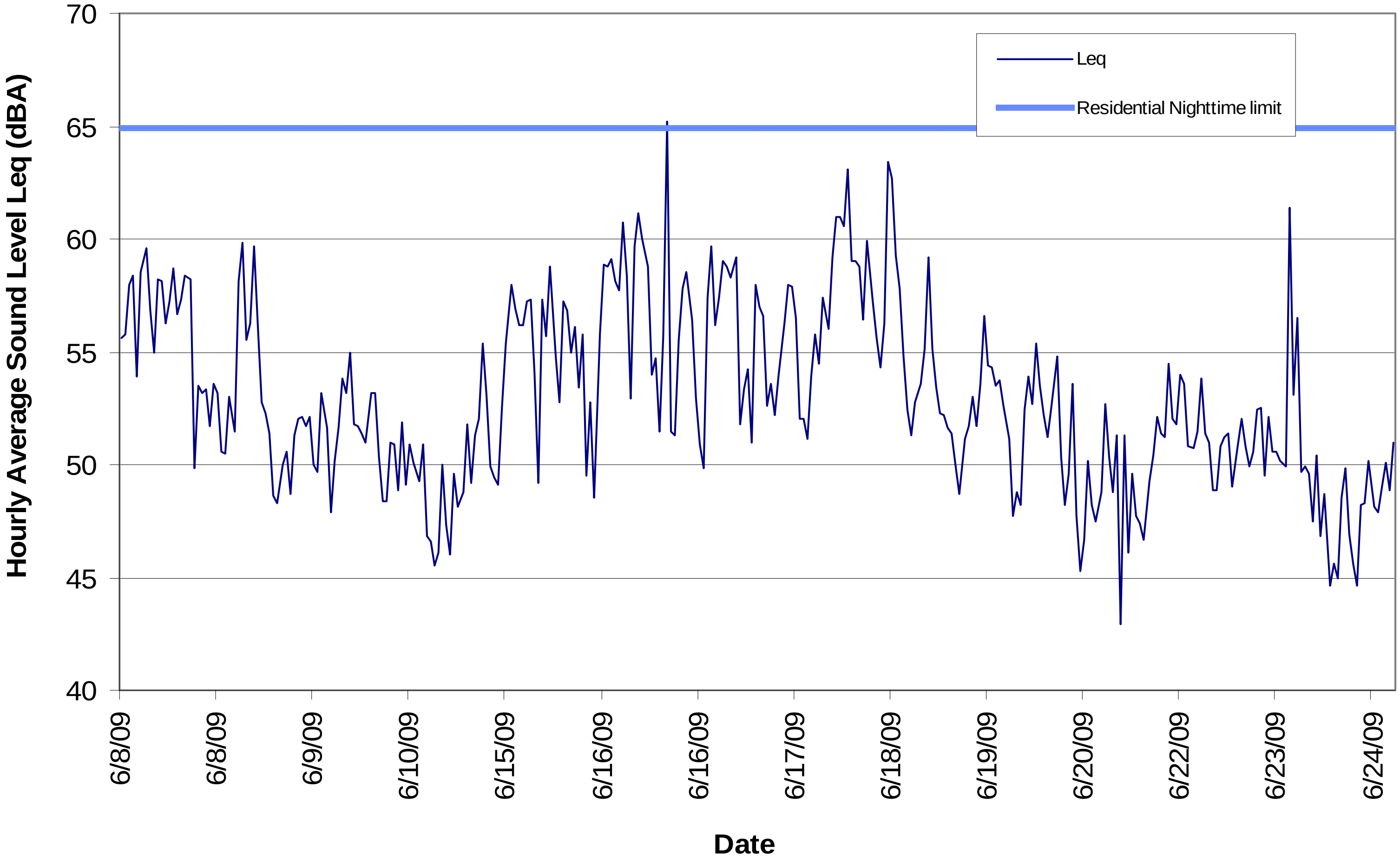


Figure 17
Location DRC-E1941-UR-00036
CU 2 Old Fort Street Daytime

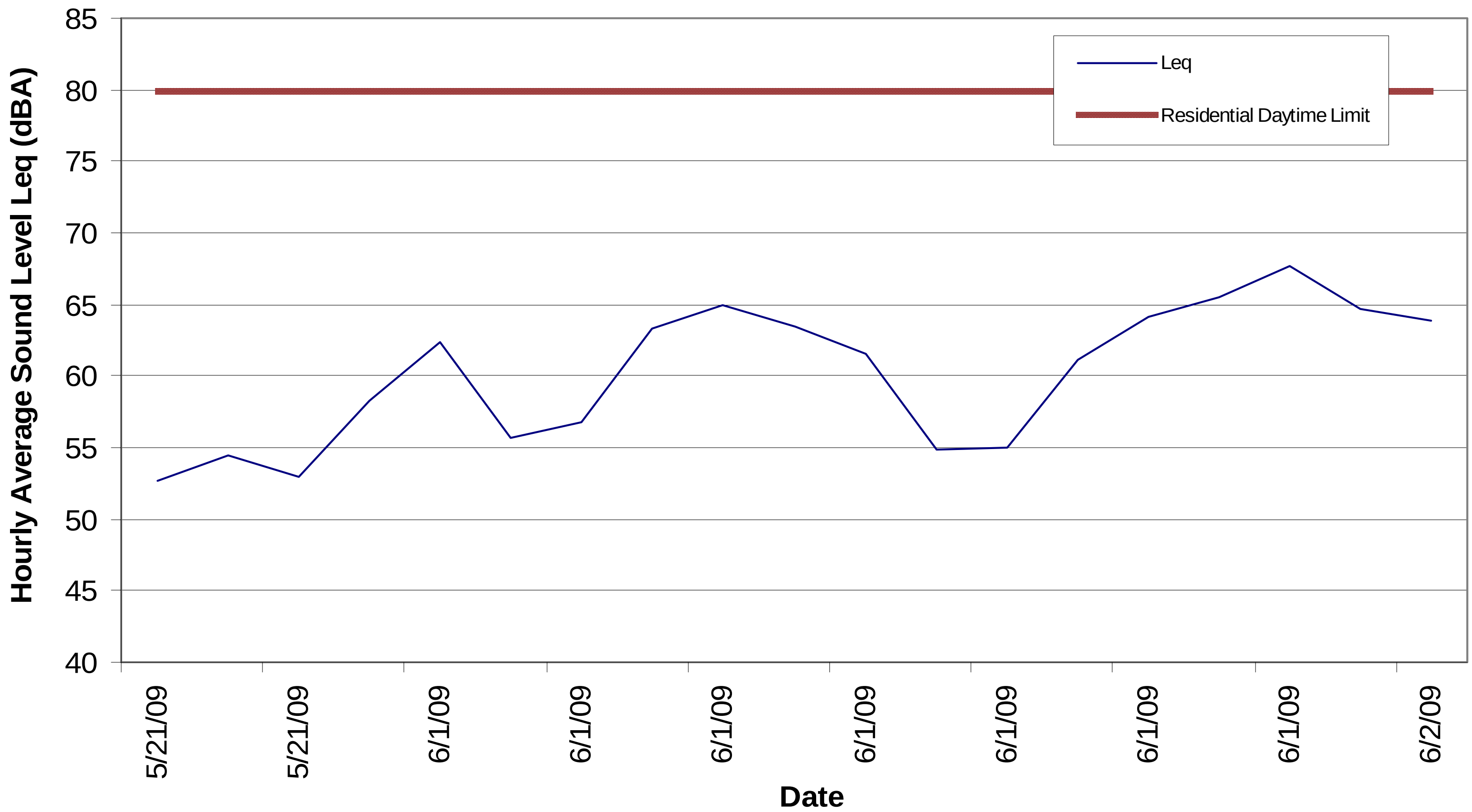


Figure 18
Location DRC-E1941-UR-00036
CU 2 Old Fort Street Nighttime

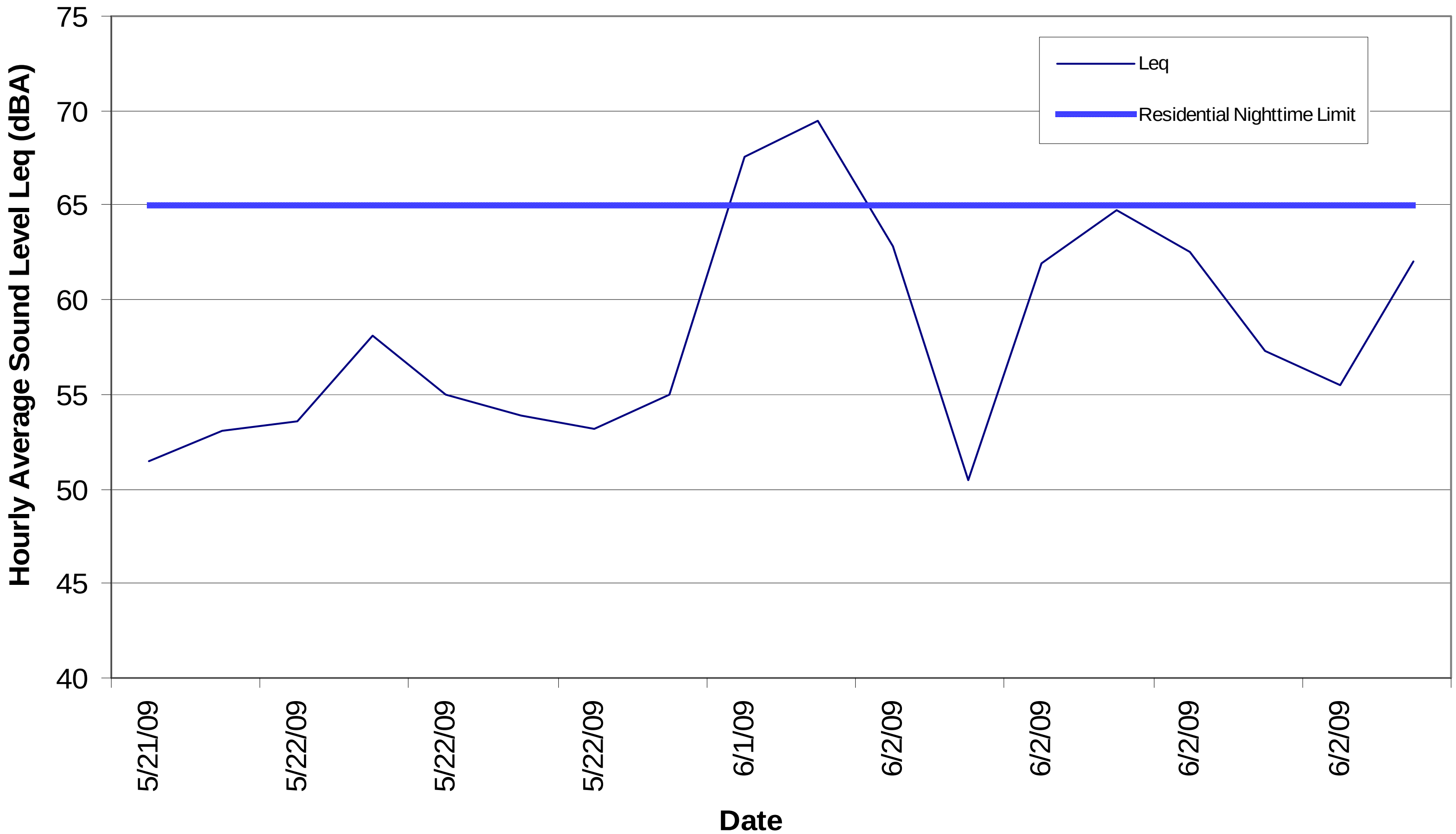
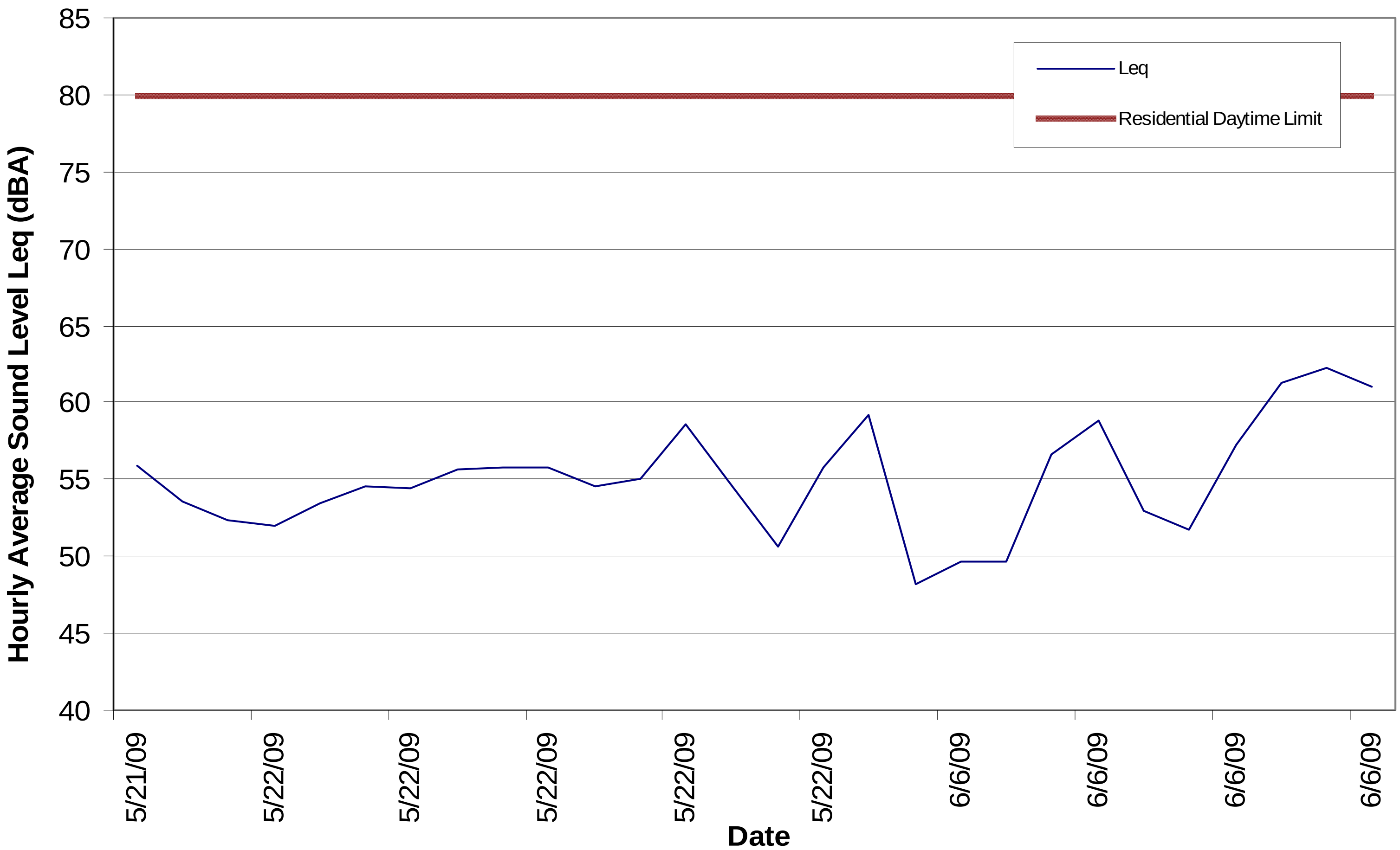


Figure 19
Location DRC-C1940-RR-00050
CU 2 Rogers Island Daytime



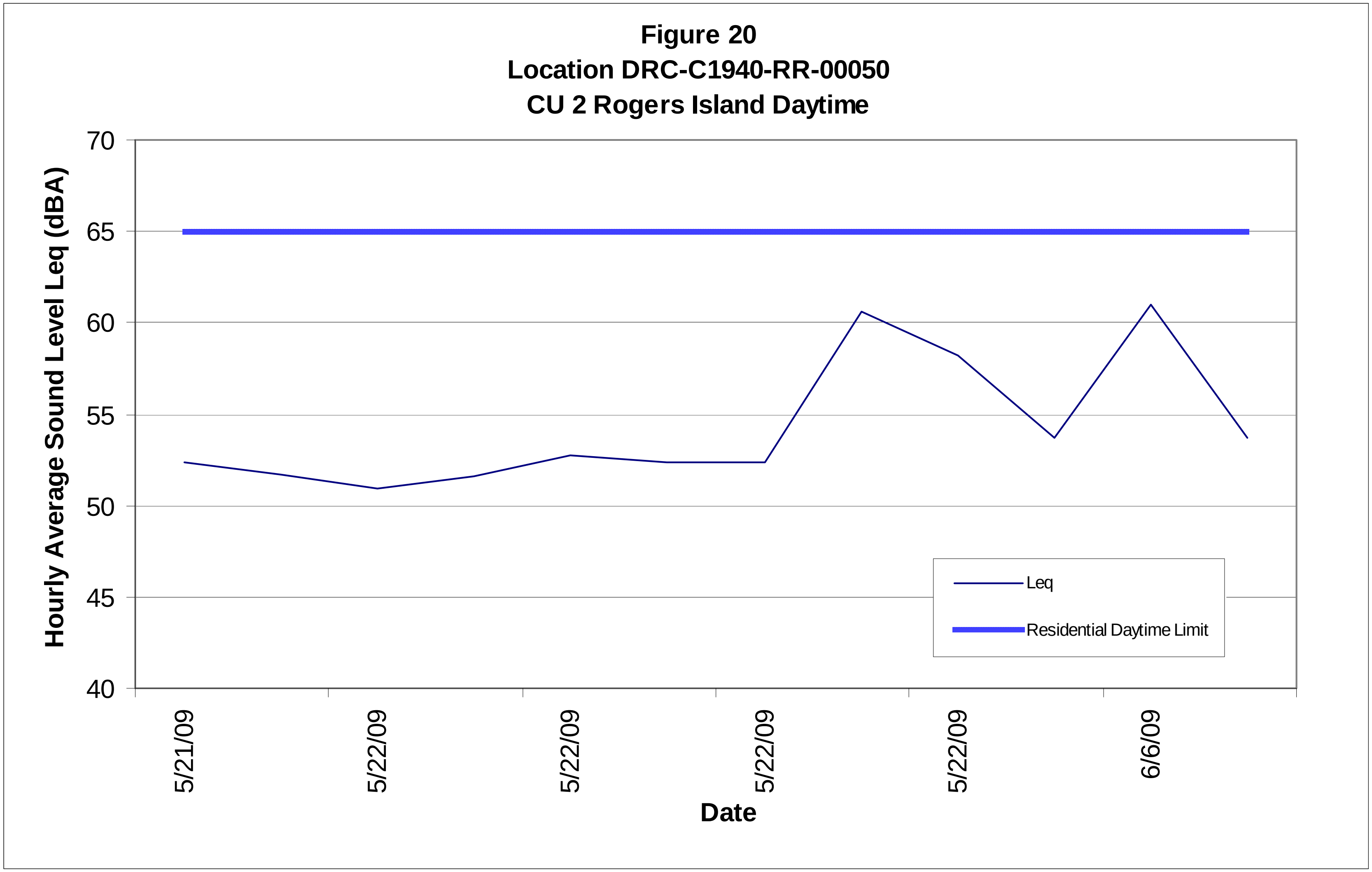
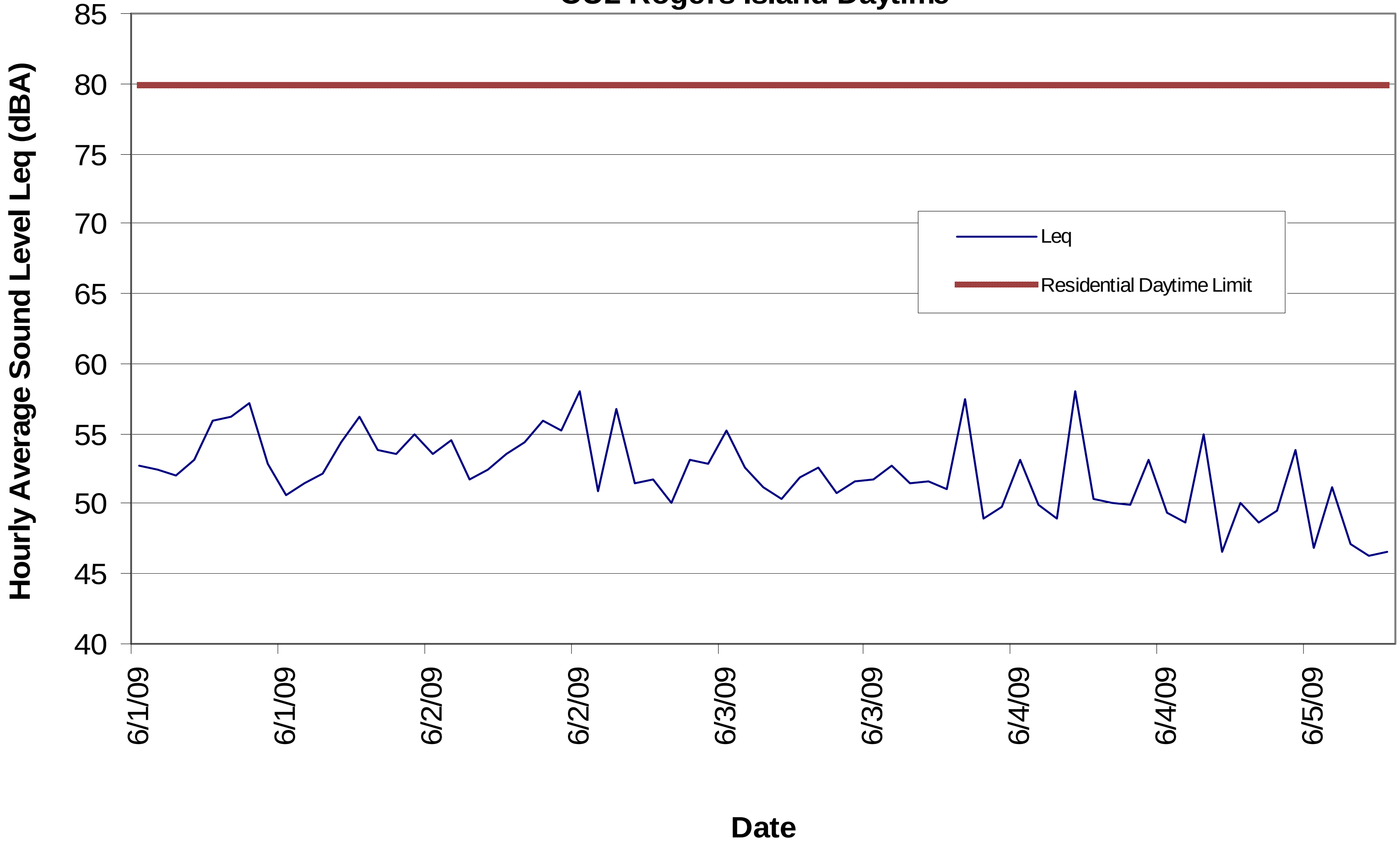


Figure 20
Location DRC-C1940-RR-00050
CU 2 Rogers Island Daytime
Hourly Average Sound Level Leq (dBA)
70
65
60
55
50
45
40
Leq
Residential Daytime Limit
5/21/09
5/22/09
5/22/09
5/22/09
5/22/09
6/6/09
Date

Figure 21
Location DRC-C1941-RR-00064
CU2 Rogers Island Daytime



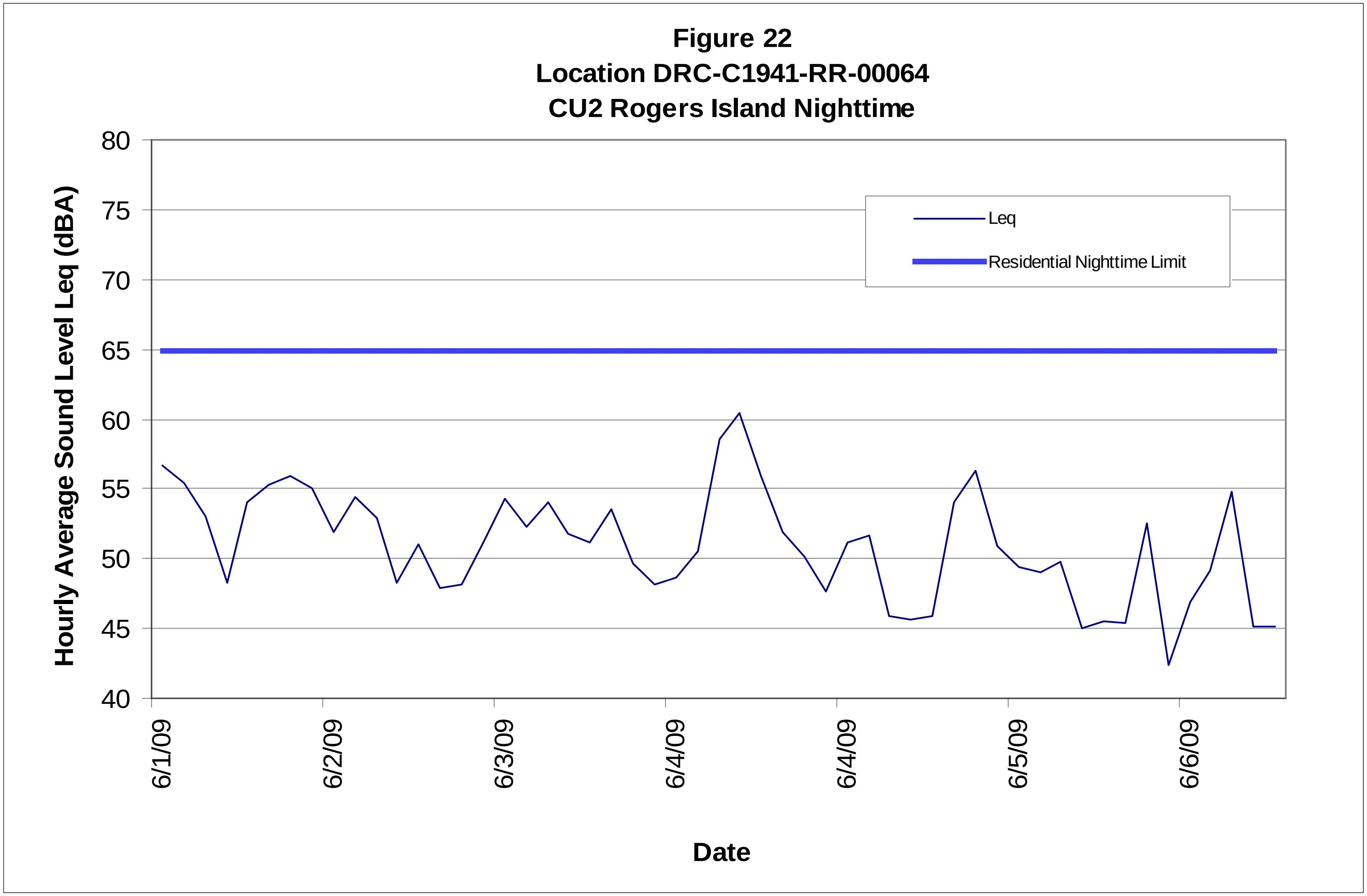
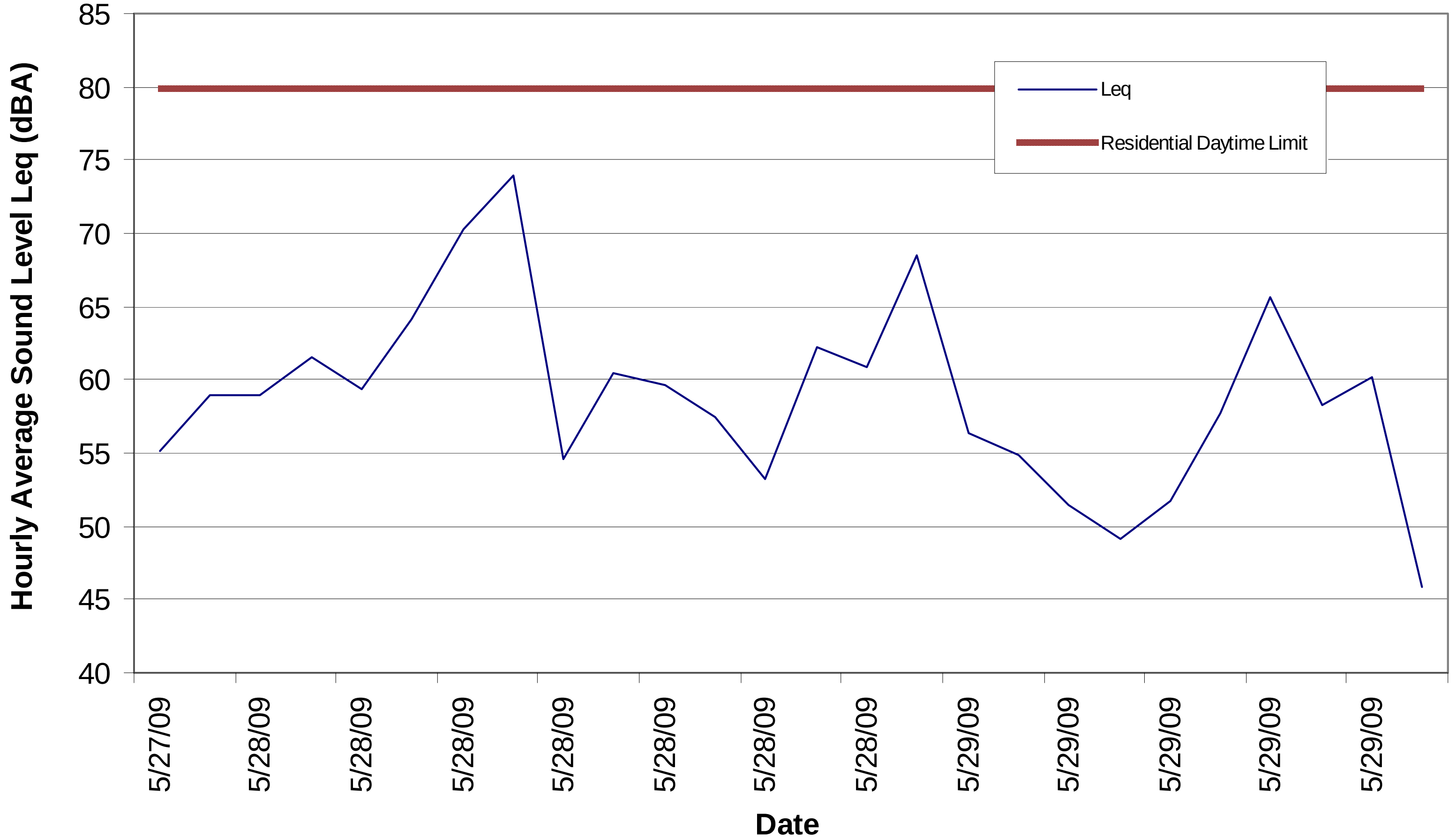


Figure 22
Location DRC-C1941-RR-00064
CU2 Rogers Island Nighttime

Figure 23
Location DRC-C1939-RR-00047
CU 3 Rogers Island Daytime



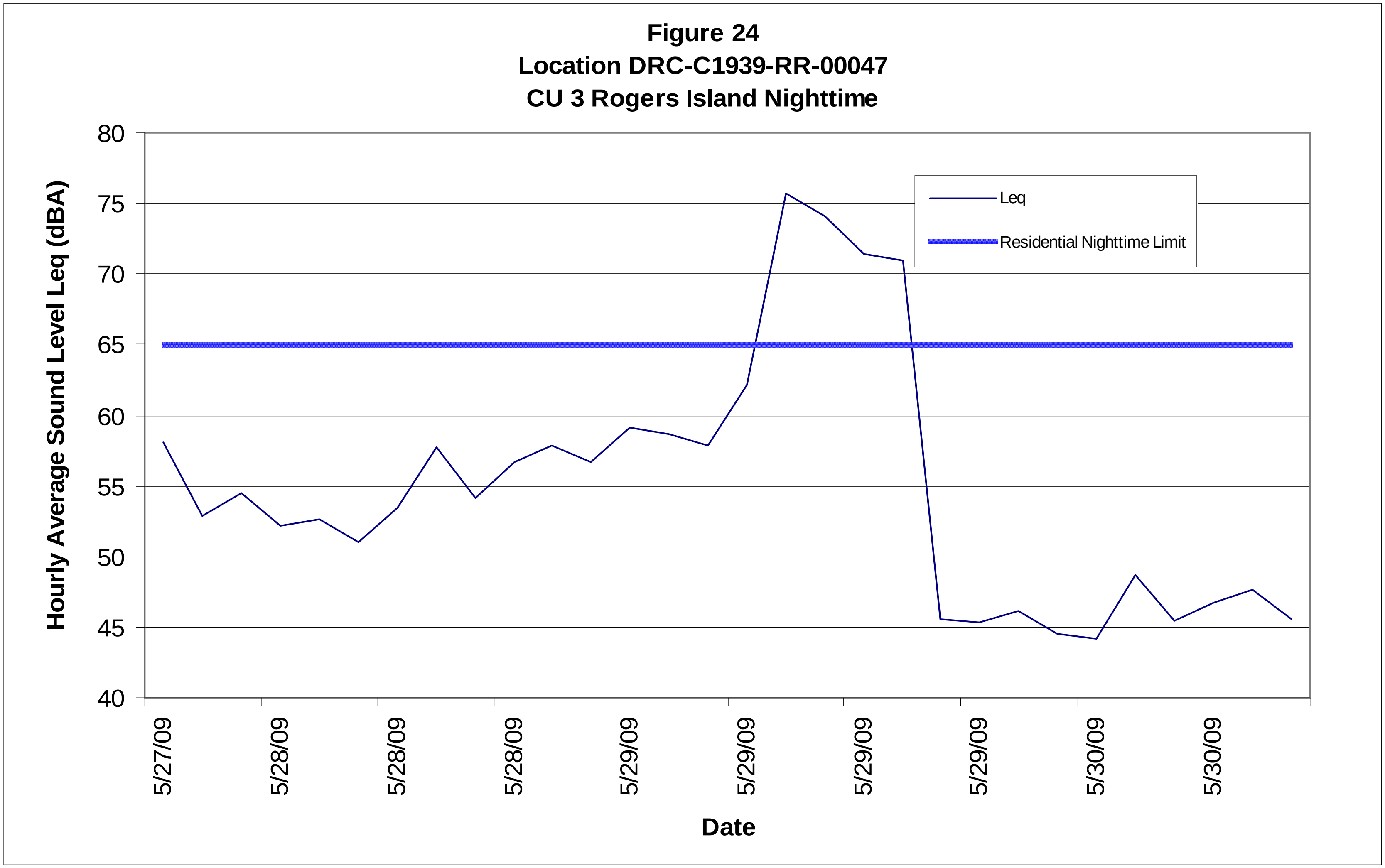


Figure 24
Location DRC-C1939-RR-00047
CU 3 Rogers Island Nighttime
Hourly Average Sound Level Leq (dBA)
80
75
70
65
60
55
50
45
40
Leq
Residential Nighttime Limit
5/27/09
5/28/09
5/28/09
5/28/09
5/29/09
5/29/09
5/29/09
5/29/09
5/30/09
5/30/09
Date

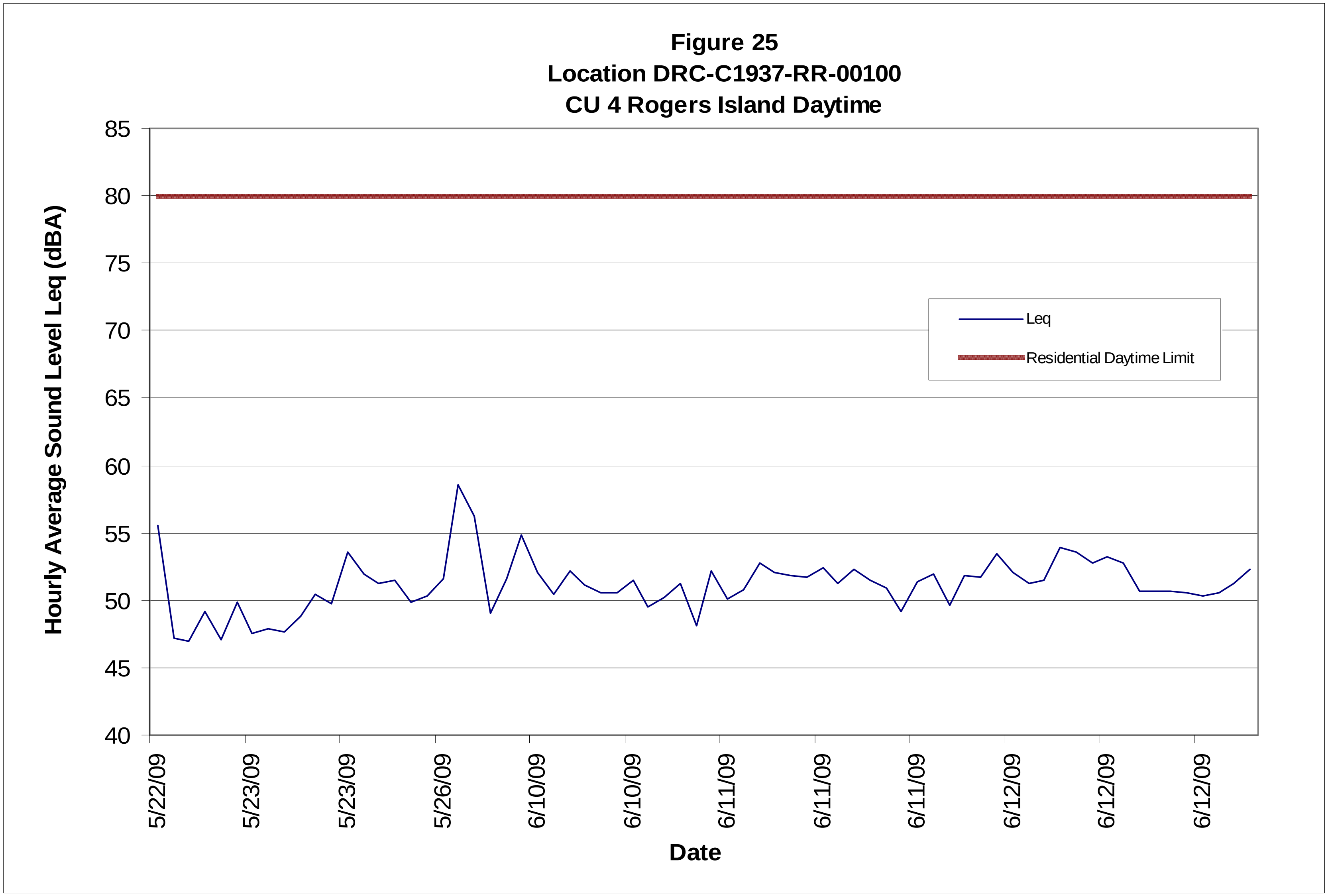


Figure 25
Location DRC-C1937-RR-00100
CU 4 Rogers Island Daytime

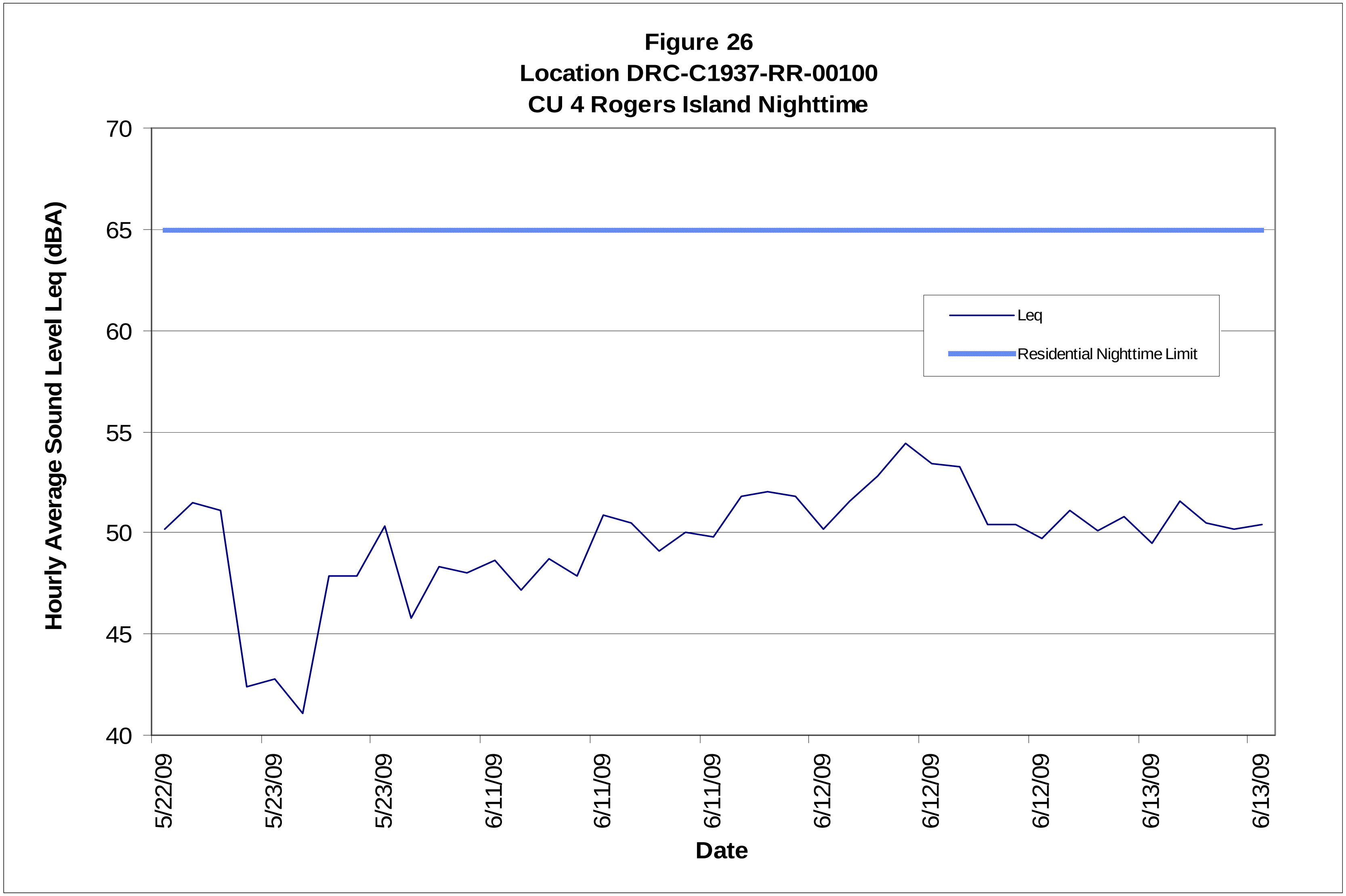


Figure 26
Location DRC-C1937-RR-00100
CU 4 Rogers Island Nighttime

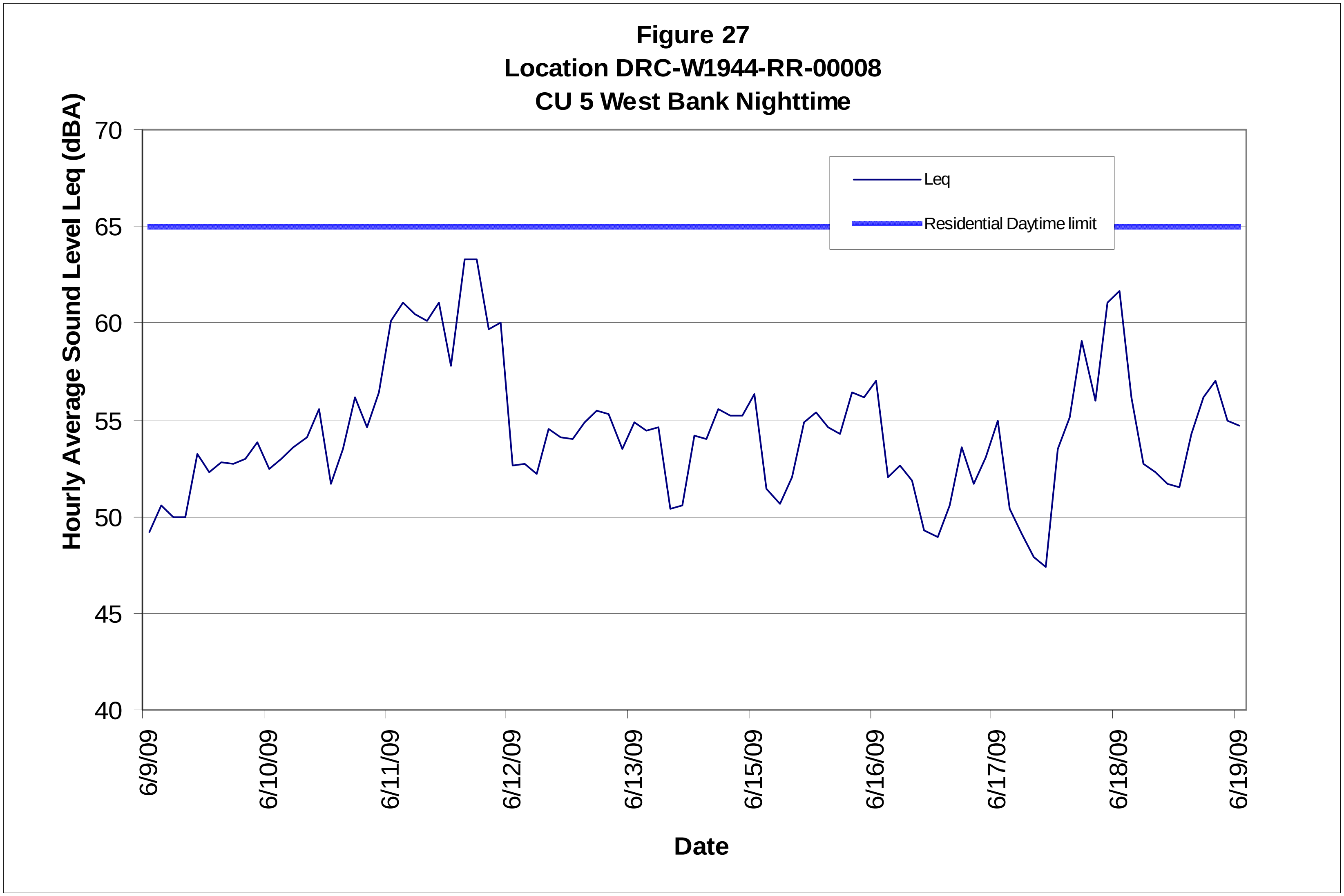
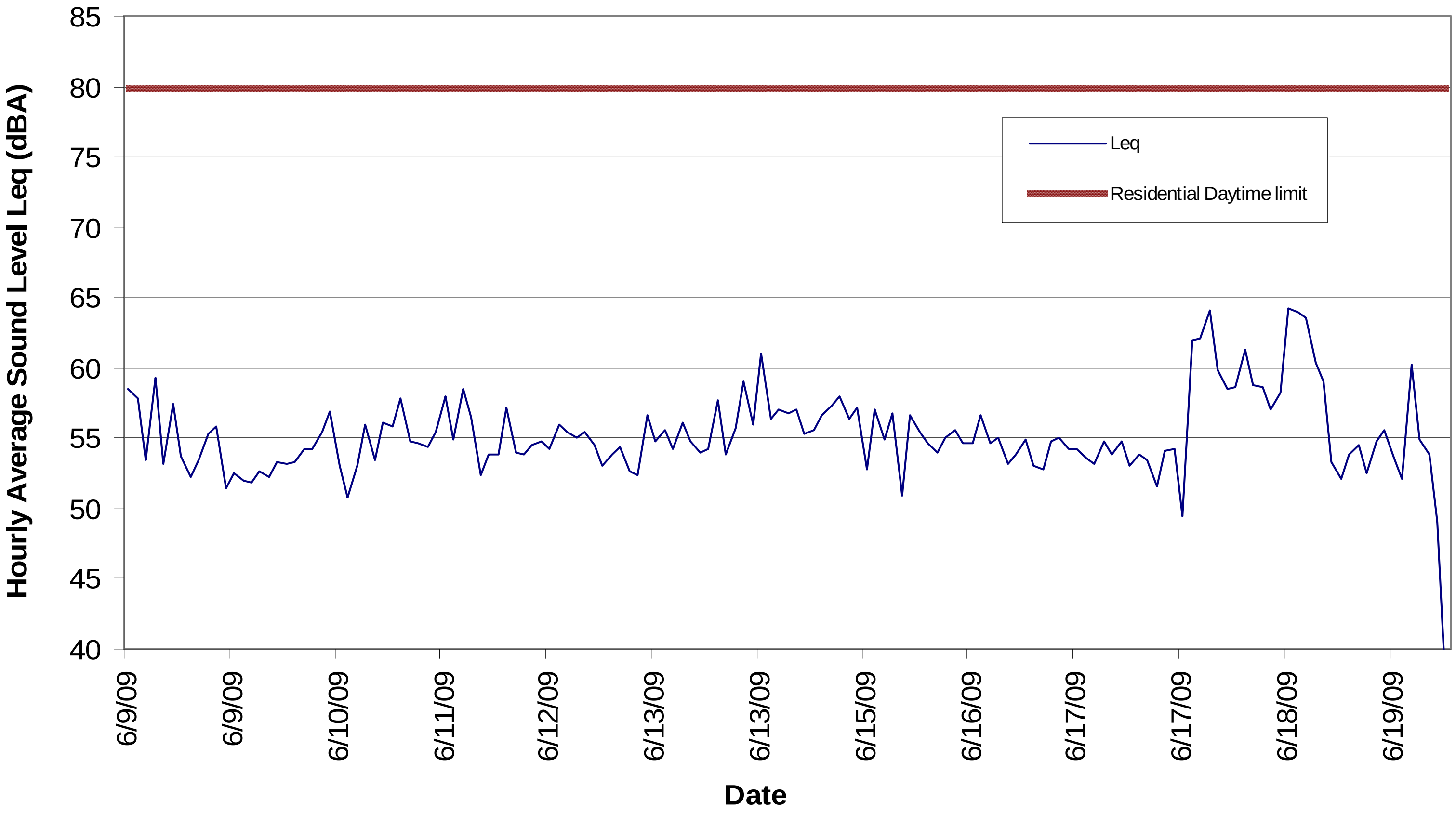


Figure 27
Location DRC-W1944-RR-00008
CU 5 West Bank Nighttime
Hourly Average Sound Level Leq (dBA)
70
65
60
55
50
45
40
Leq
Residential Daytime limit
6/9/09
6/10/09
6/11/09
6/12/09
6/13/09
6/15/09
6/16/09
6/17/09
6/18/09
6/19/09
Date

Figure 28
Location DRC-W1944-RR-00008
CU 5 West Bank Daytime



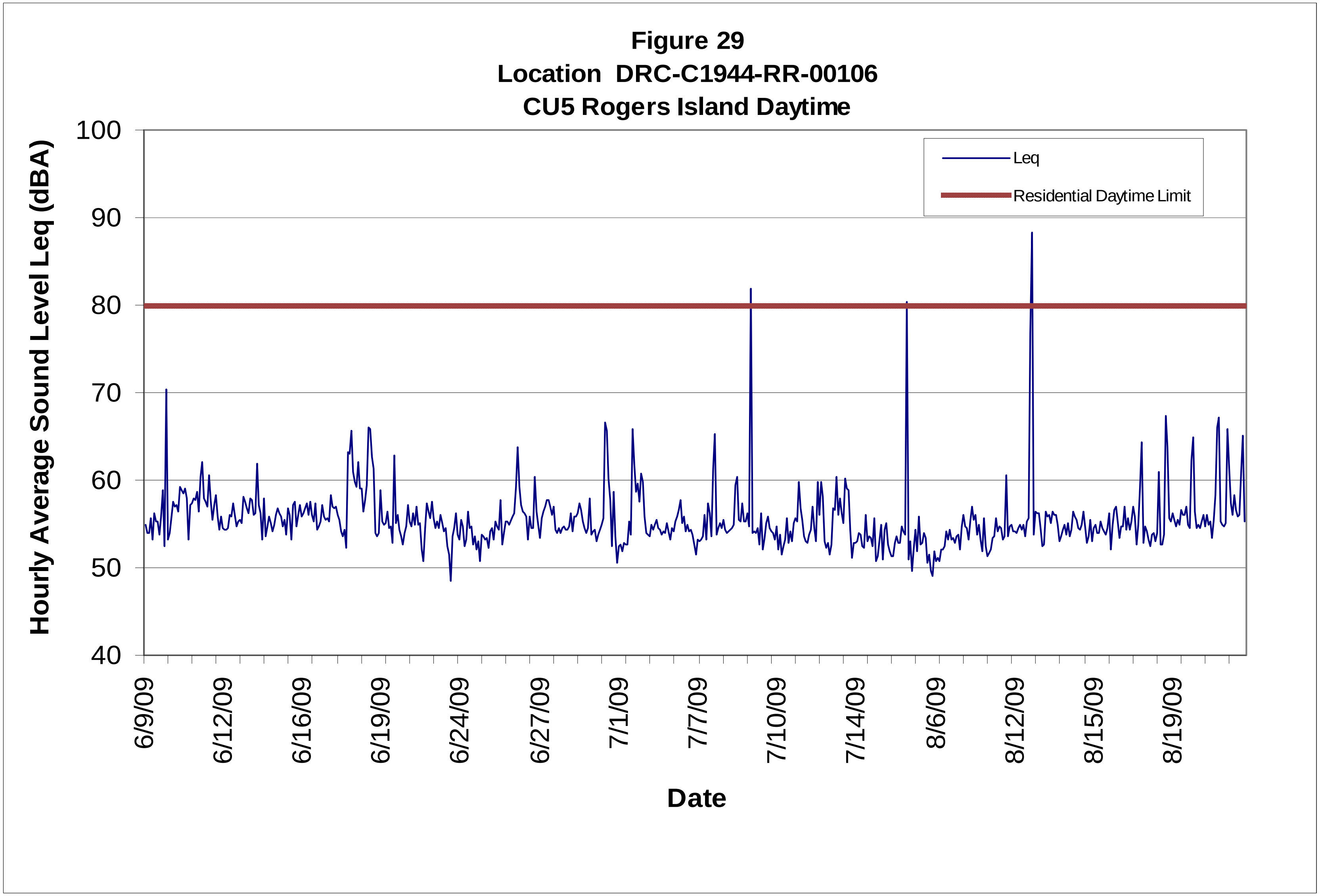


Figure 29
Location DRC-C1944-RR-00106
CU5 Rogers Island Daytime
Hourly Average Sound Level Leq (dBA)
100
90
80
70
60
50
40
Leq
Residential Daytime Limit
6/9/09
6/12/09
6/16/09
6/19/09
6/24/09
6/27/09
7/1/09
7/7/09
7/10/09
7/14/09
8/6/09
8/12/09
8/15/09
8/19/09
Date

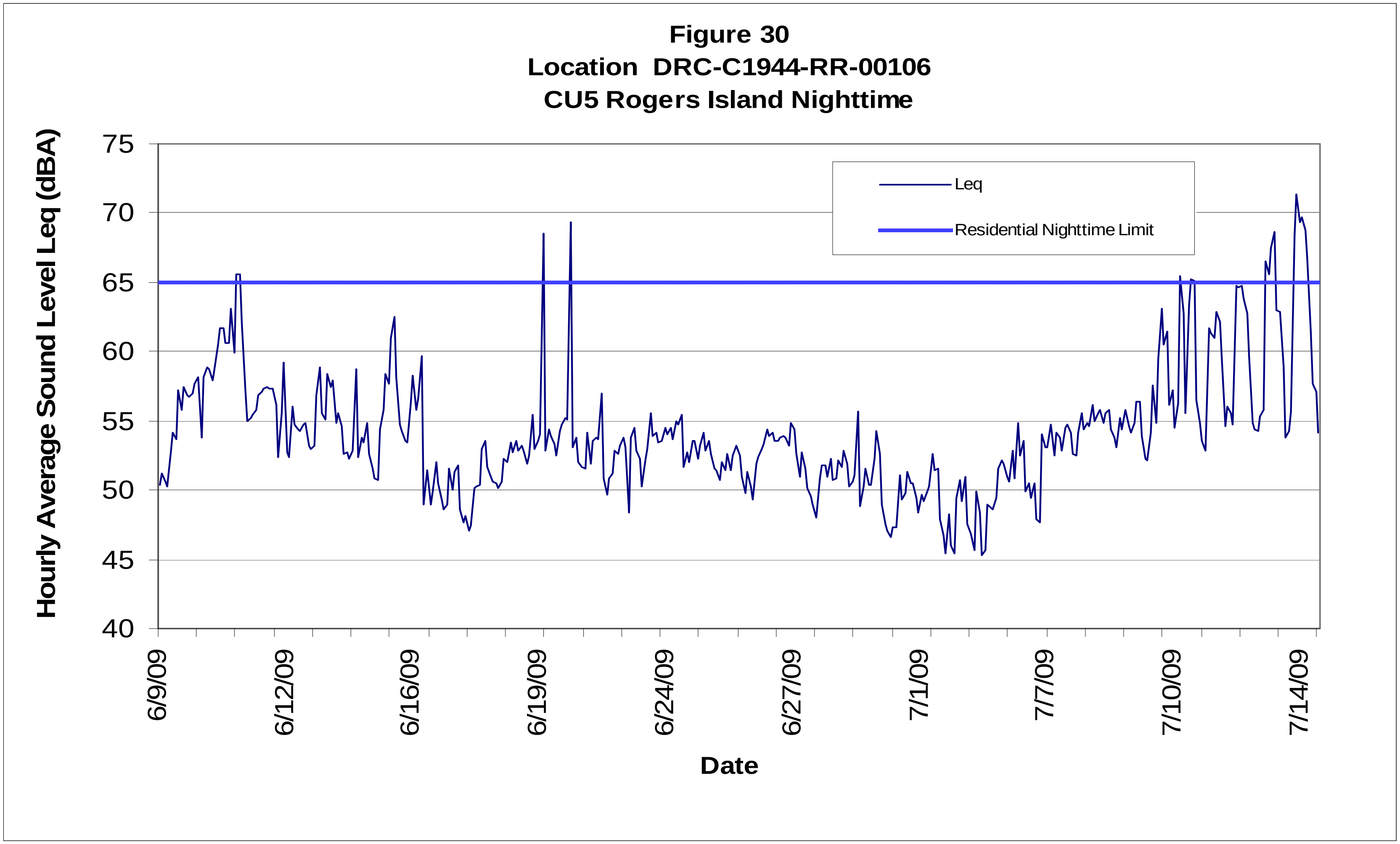


Figure 30
Location DRC-C1944-RR-00106
CU5 Rogers Island Nighttime
Hourly Average Sound Level Leq (dBA)
75
70
65
60
55
50
45
40
Leq
Residential Nighttime Limit
6/9/09
6/12/09
6/16/09
6/19/09
6/24/09
6/27/09
7/1/09
7/7/09
7/10/09
7/14/09
Date

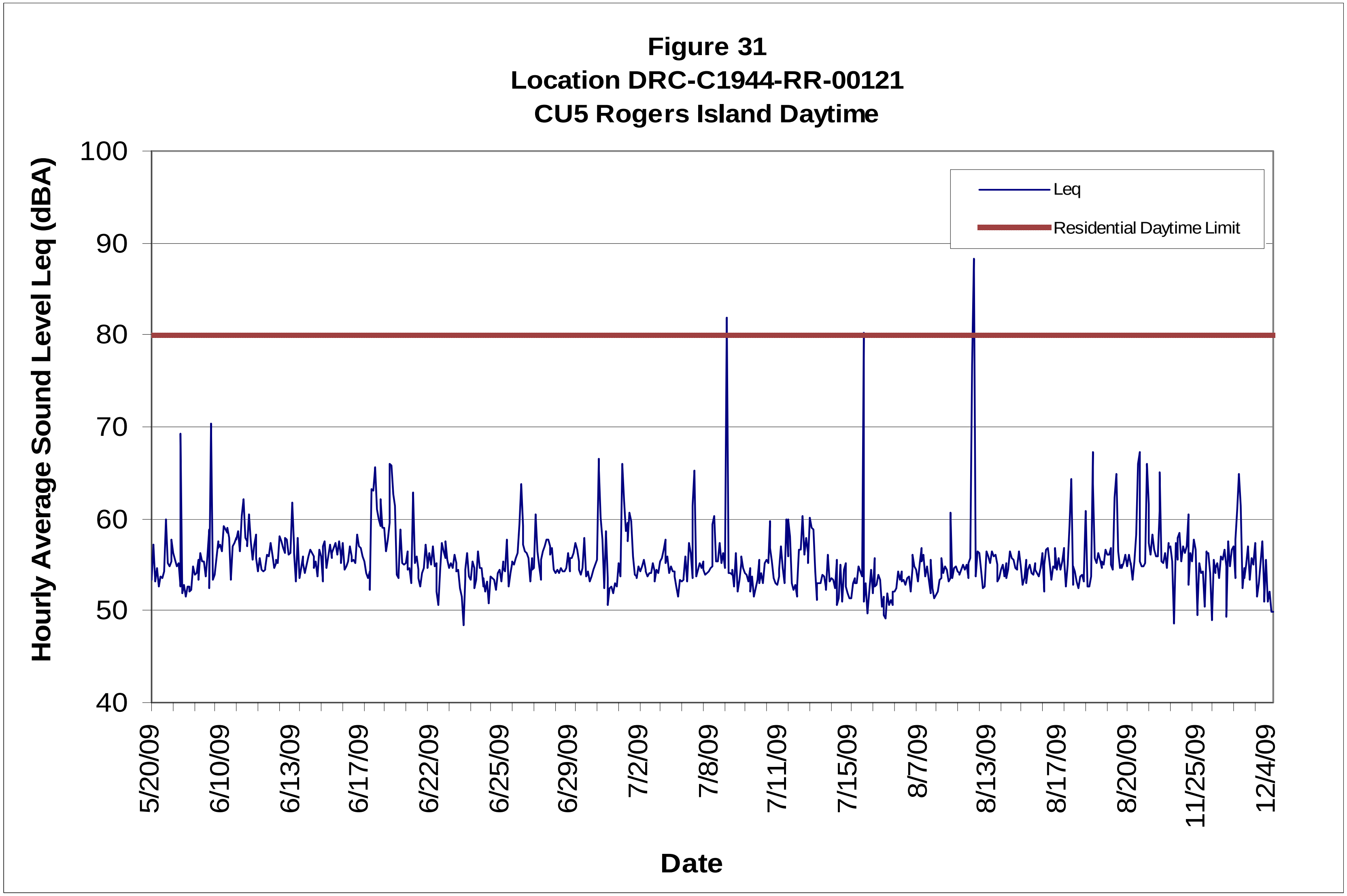


Figure 31
Location DRC-C1944-RR-00121
CU5 Rogers Island Daytime
Hourly Average Sound Level Leq (dBA)
100
90
80
70
60
50
40
Leq
Residential Daytime Limit
5/20/09
6/10/09
6/13/09
6/17/09
6/22/09
6/25/09
6/29/09
7/2/09
7/8/09
7/11/09
7/15/09
8/7/09
8/13/09
8/17/09
8/20/09
11/25/09
12/4/09
Date

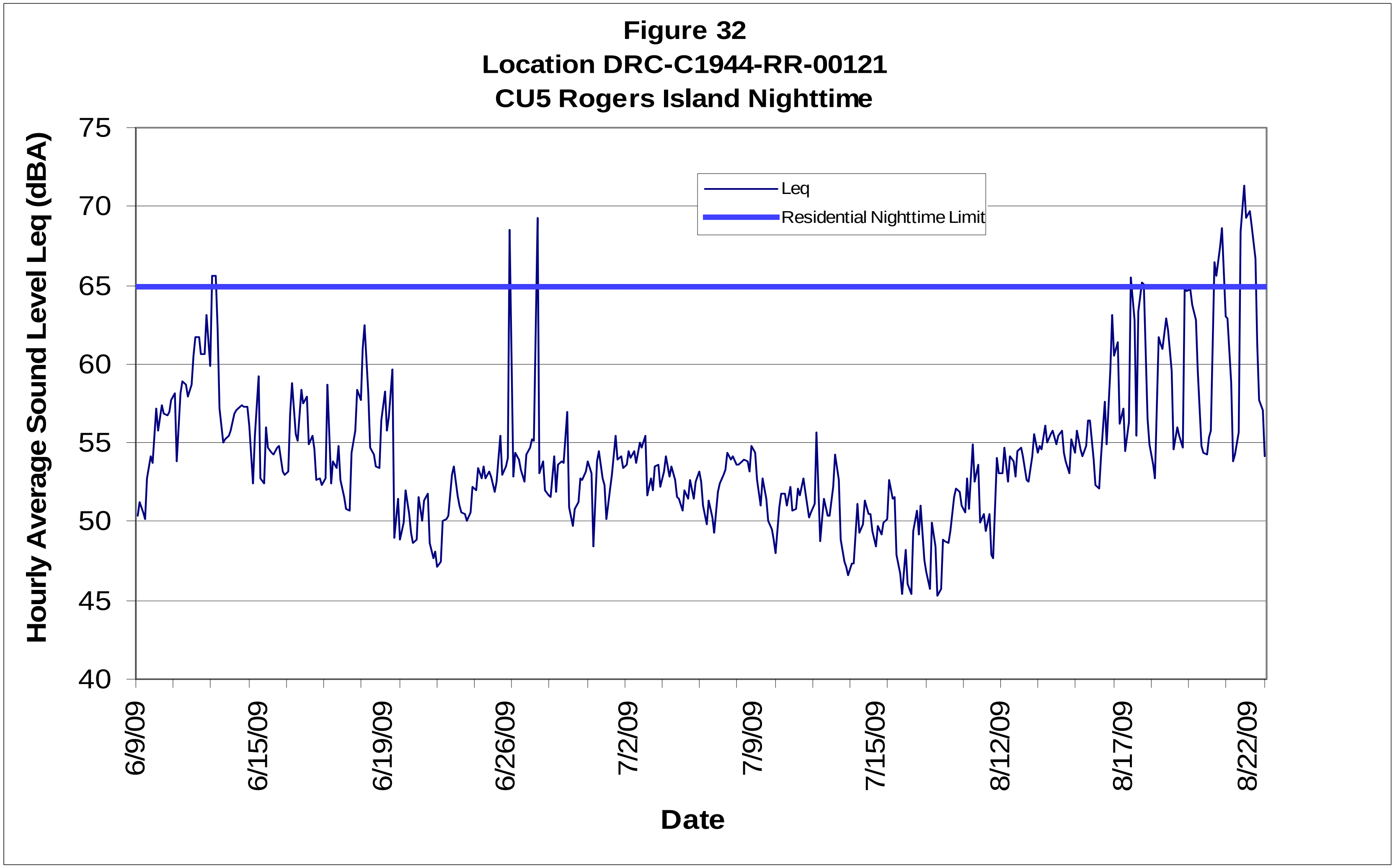


Figure 32
Location DRC-C1944-RR-00121
CU5 Rogers Island Nighttime
Hourly Average Sound Level Leq (dBA)
75
70
65
60
55
50
45
40
Leq
Residential Nighttime Limit
6/9/09
6/15/09
6/19/09
6/26/09
7/2/09
7/9/09
7/15/09
8/12/09
8/17/09
8/22/09
Date

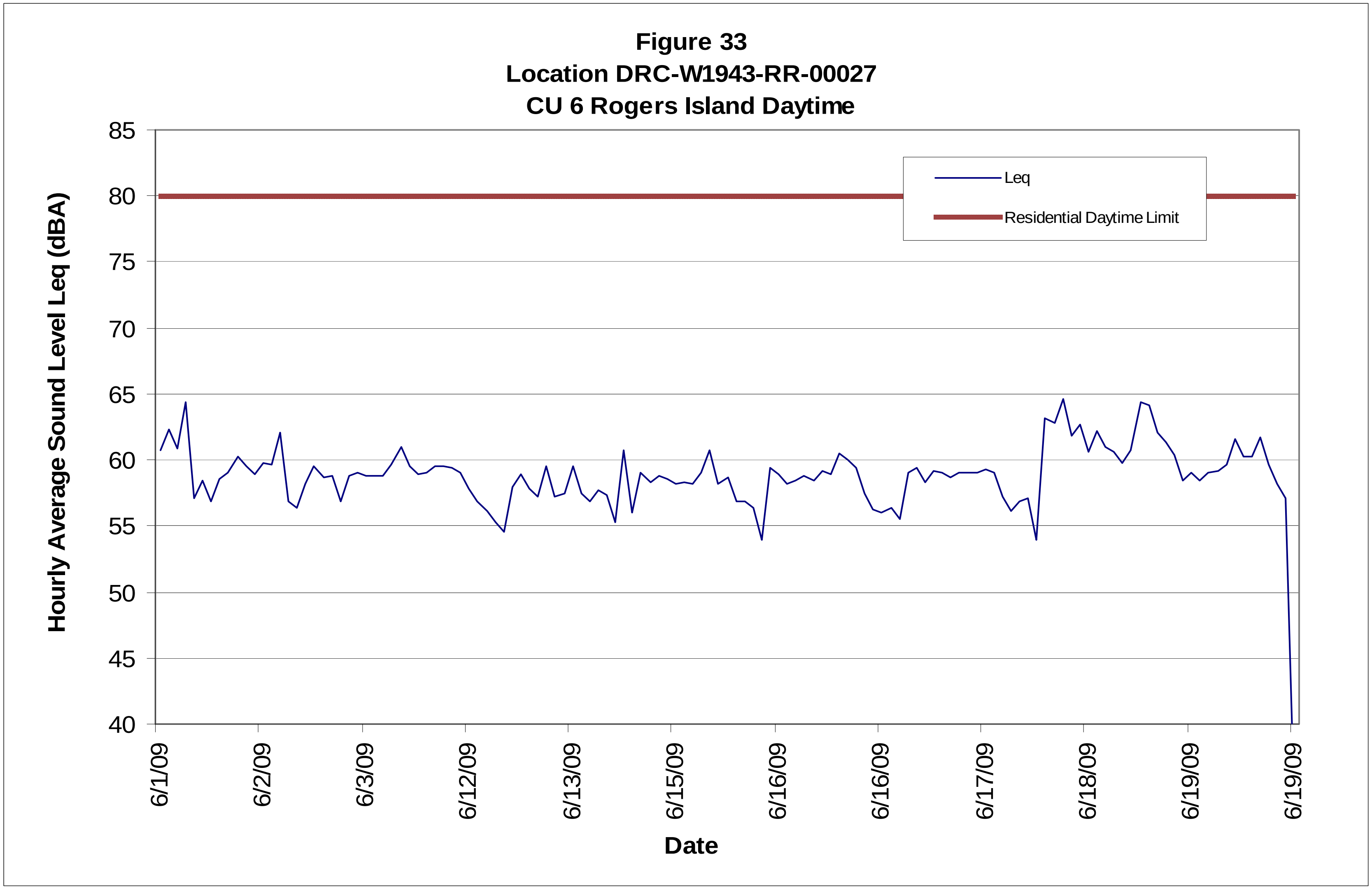


Figure 33
Location DRC-W1943-RR-00027
CU 6 Rogers Island Daytime
Hourly Average Sound Level Leq (dBA)
85
80
75
70
65
60
55
50
45
40
Leq
Residential Daytime Limit
6/1/09
6/2/09
6/3/09
6/12/09
6/13/09
6/15/09
6/16/09
6/16/09
6/17/09
6/18/09
6/19/09
6/19/09
Date

Figure 34
Location DRC-W1943-RR-00027
CU 6 Rogers Island Nighttime

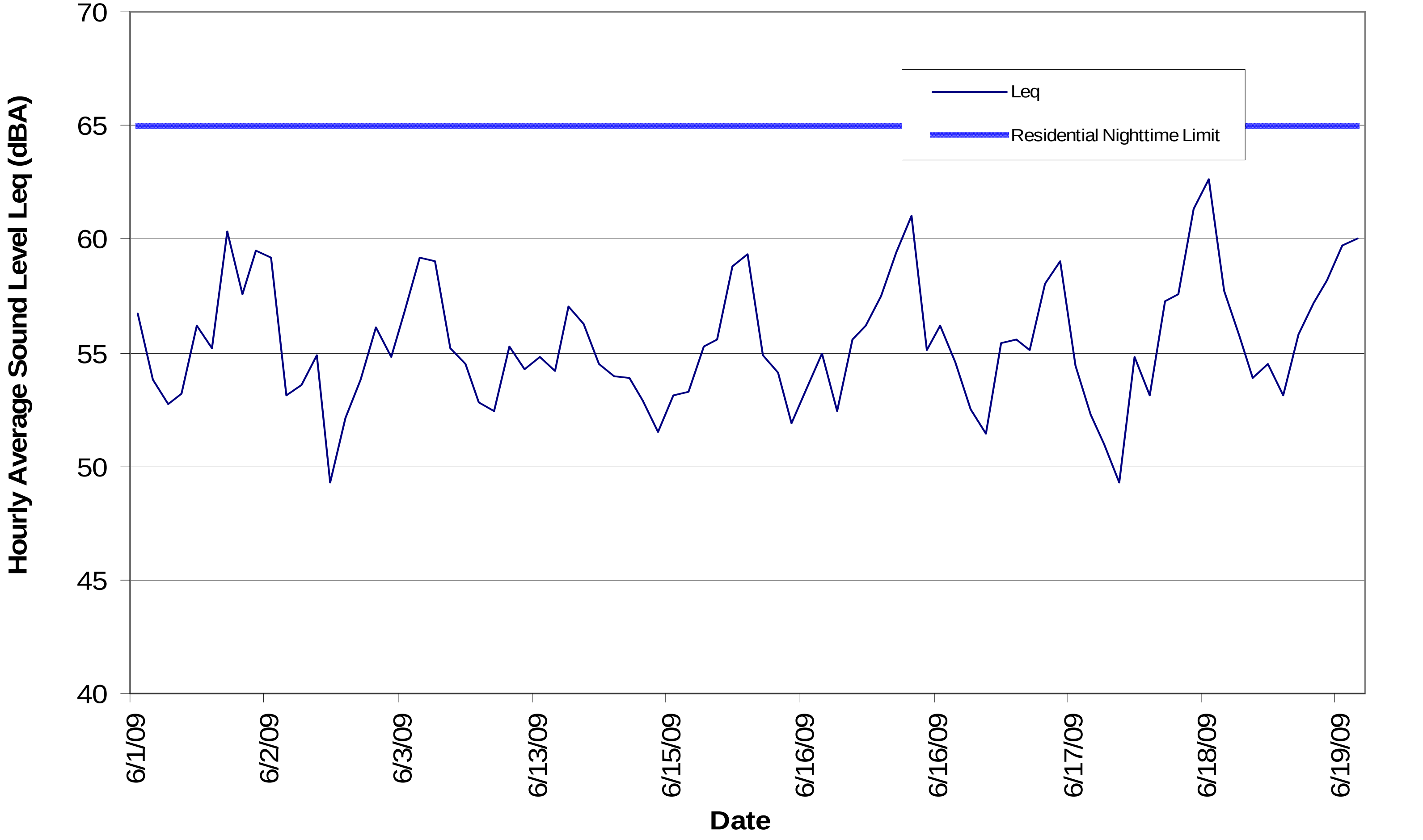


Figure 35
Location DRC-C1943-UR-00087
CU 6 Rogers Island Daytime

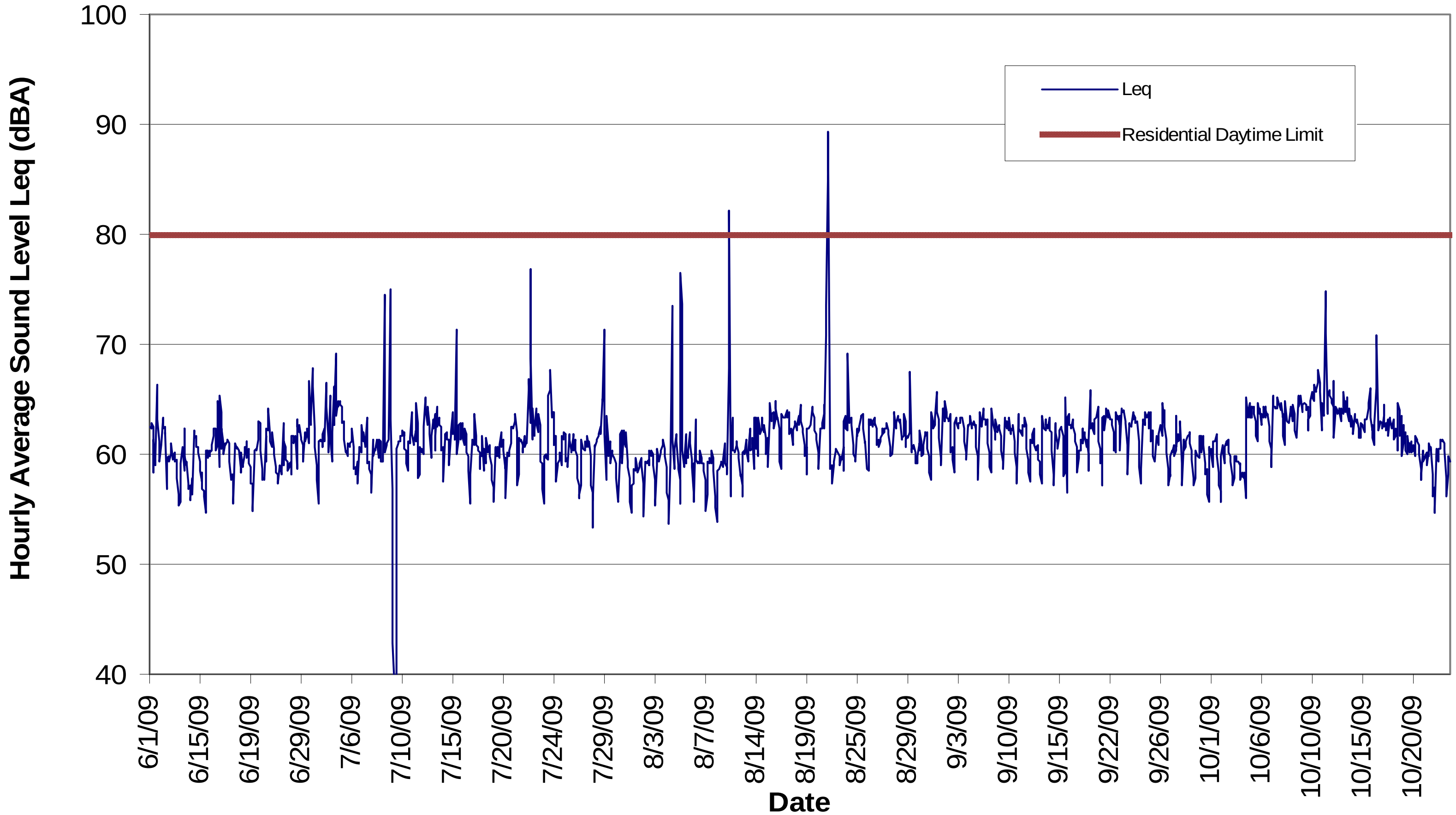
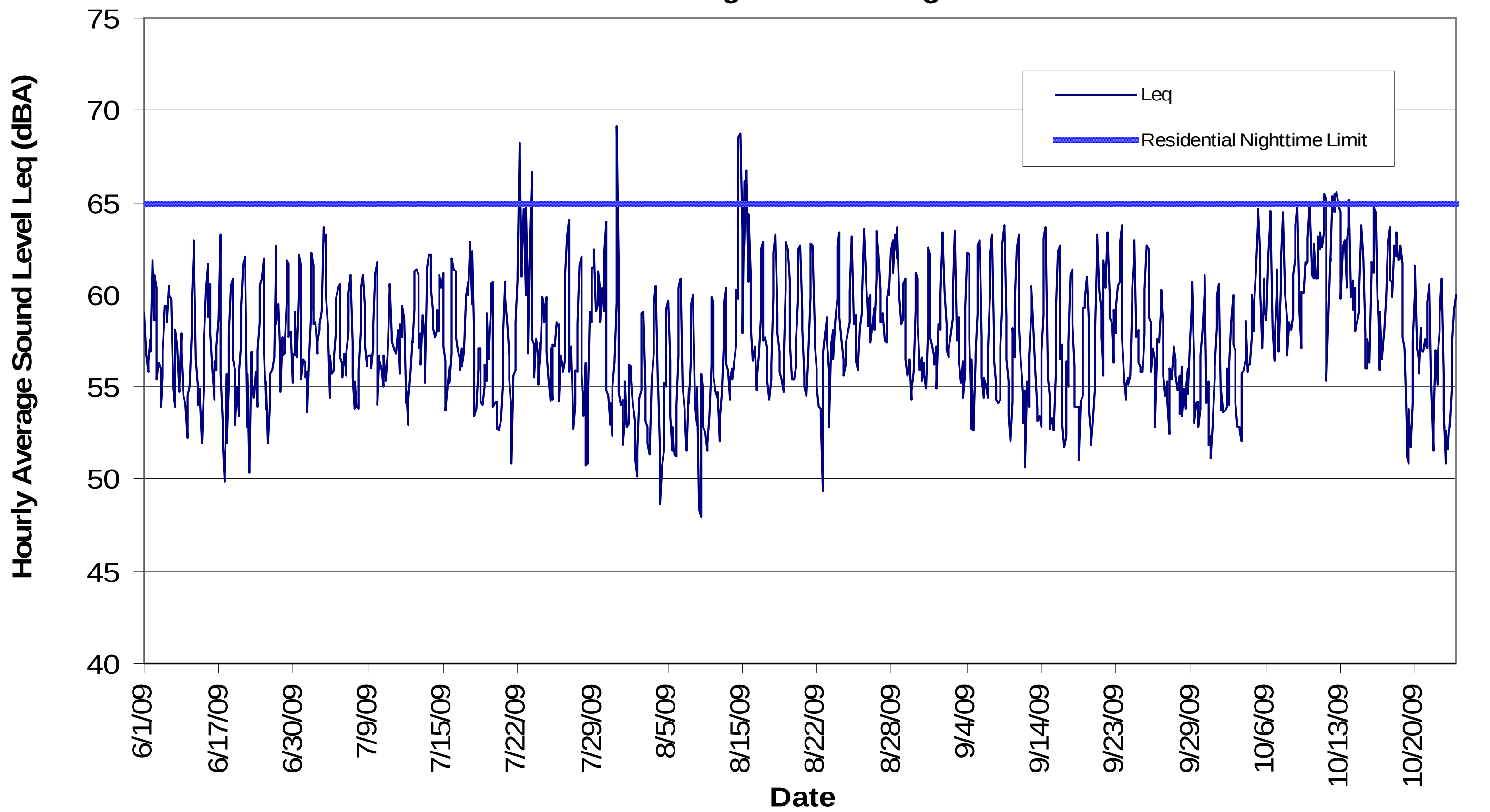


Figure 36
Location DRC-C1943-UR-00087
CU 6 Rogers Island Nighttime



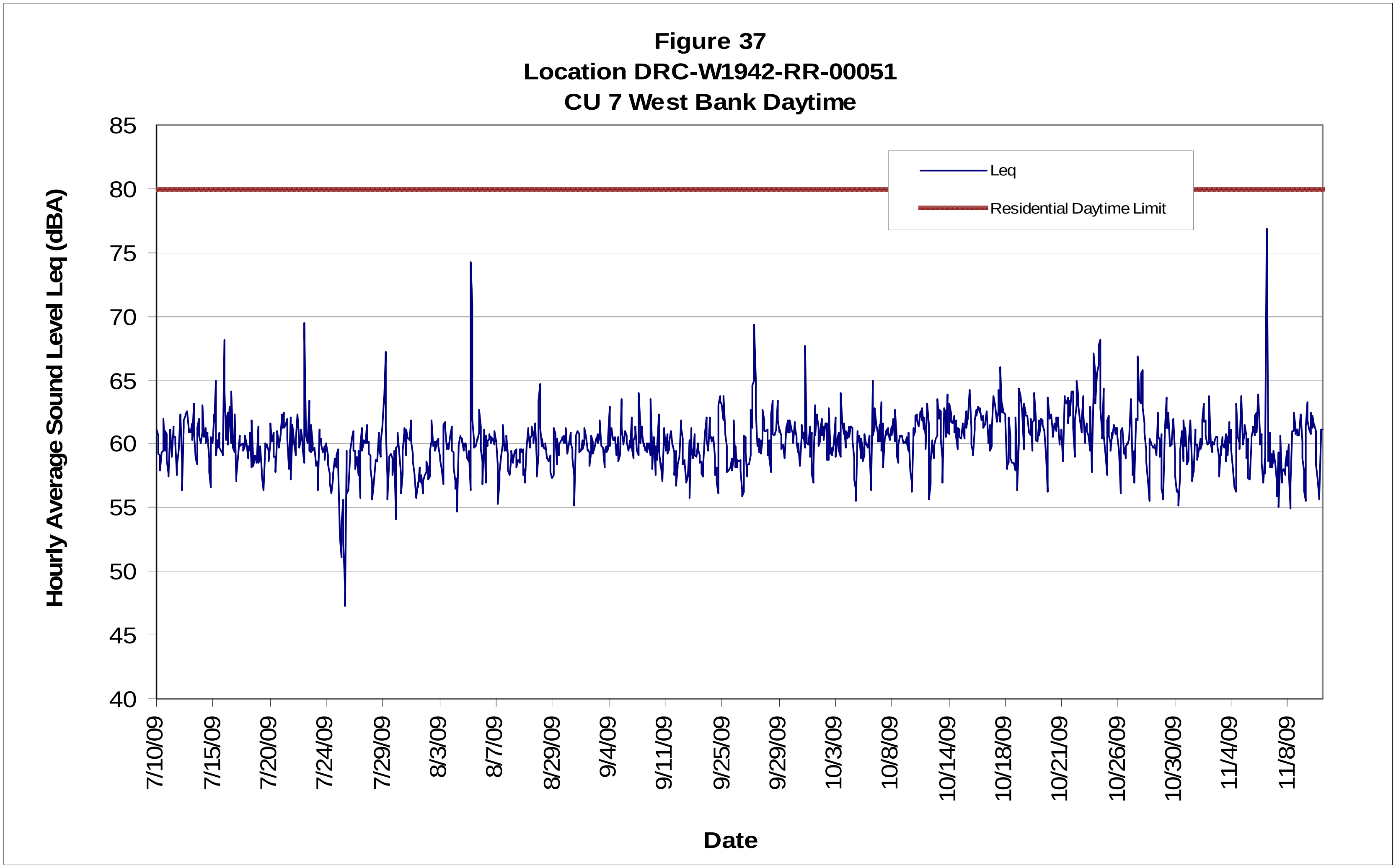
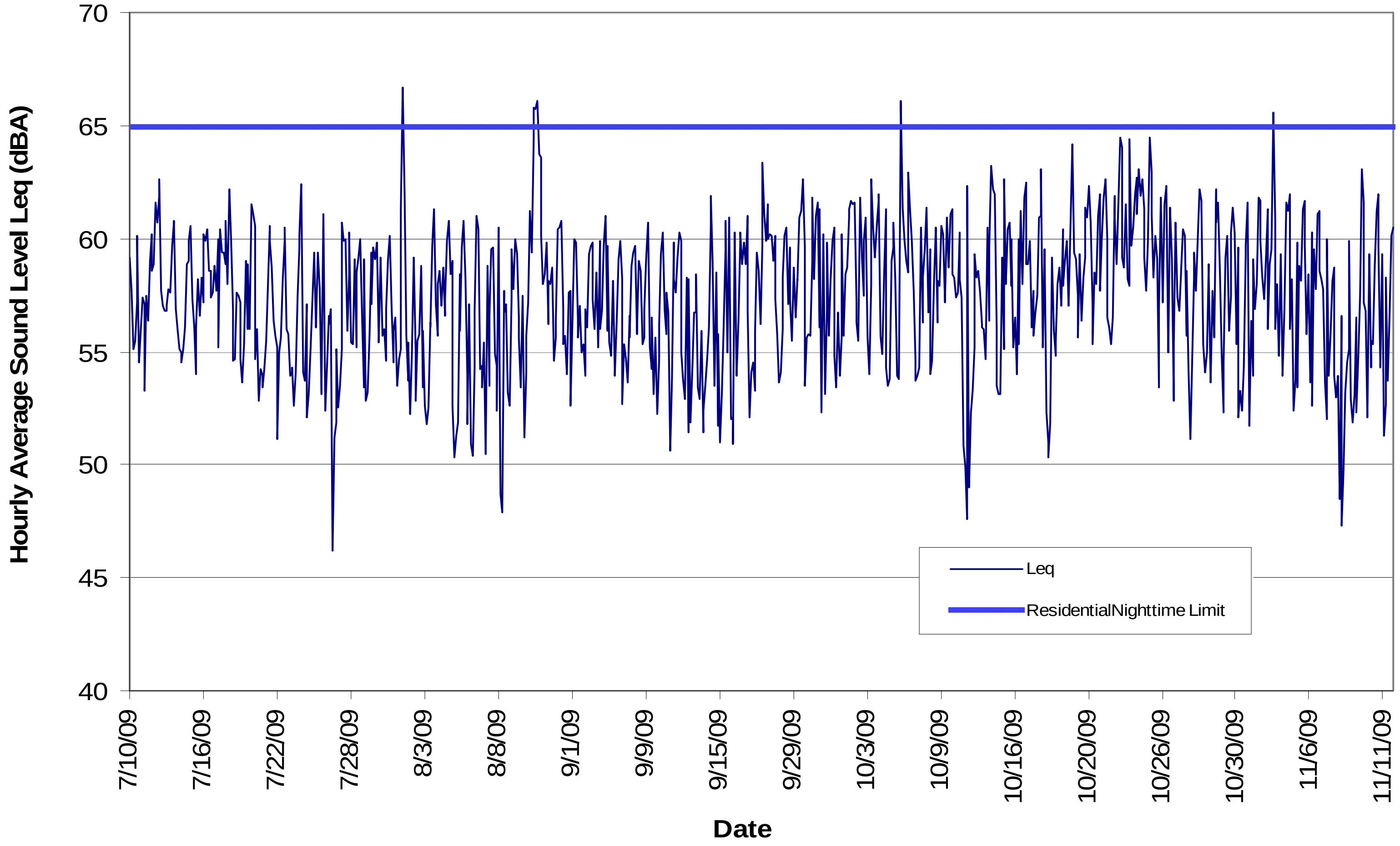


Figure 37
Location DRC-W1942-RR-00051
CU 7 West Bank Daytime

Figure 38
Location DRC-W1942-RR-00051
CU 7 West Bank Nighttime



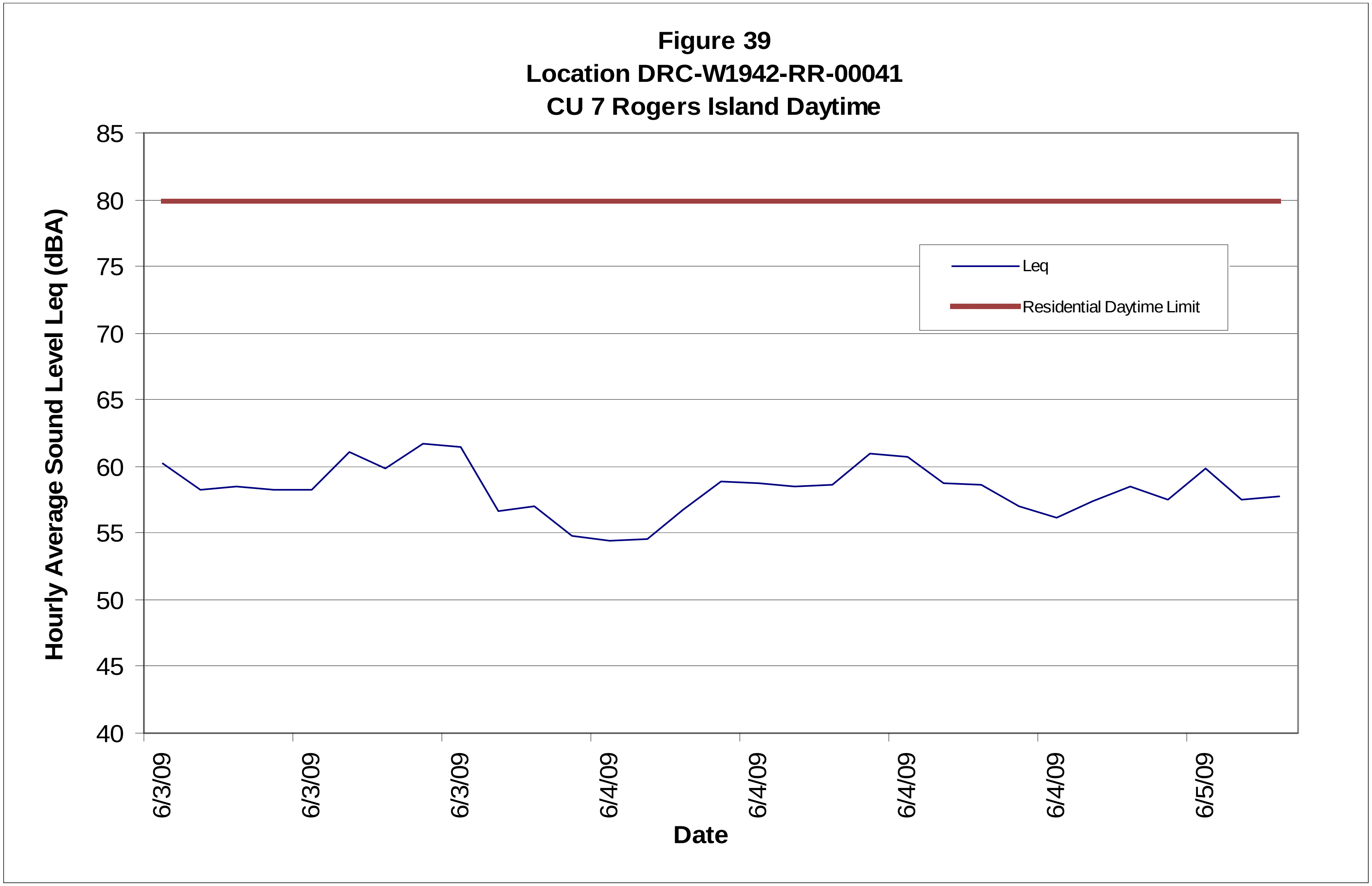


Figure 39
Location DRC-W1942-RR-00041
CU 7 Rogers Island Daytime
Hourly Average Sound Level Leq (dBA)
85
80
75
70
65
60
55
50
45
40
Leq
Residential Daytime Limit
6/3/09
6/3/09
6/3/09
6/4/09
6/4/09
6/4/09
6/4/09
6/5/09
Date

Figure 40
Location DRC-W1942-RR-00041
CU 7 Rogers Island Nighttime

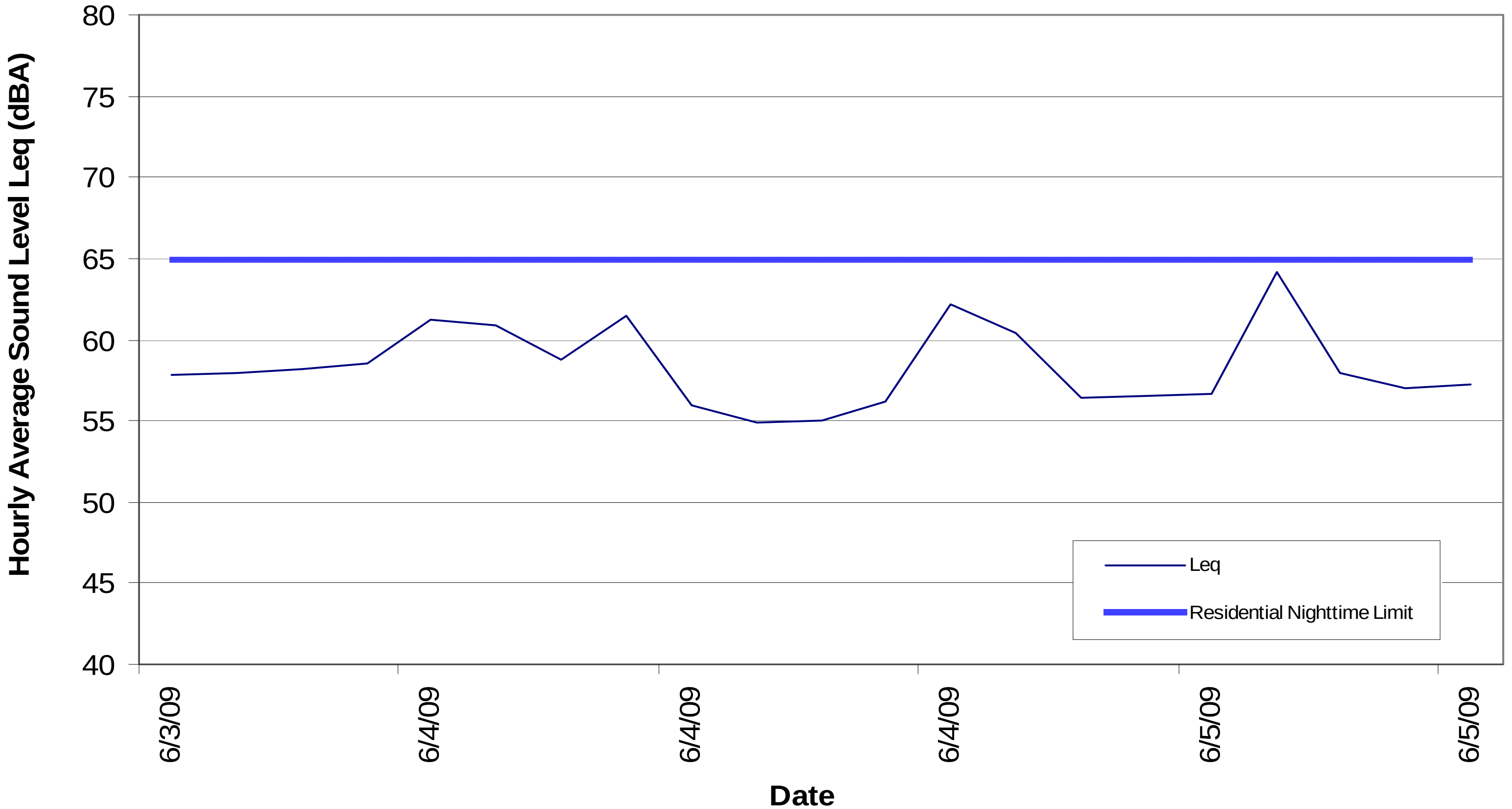


Figure 41
Location DRC-C1940-RR-00146
CU 8 Rogers Island Daytime

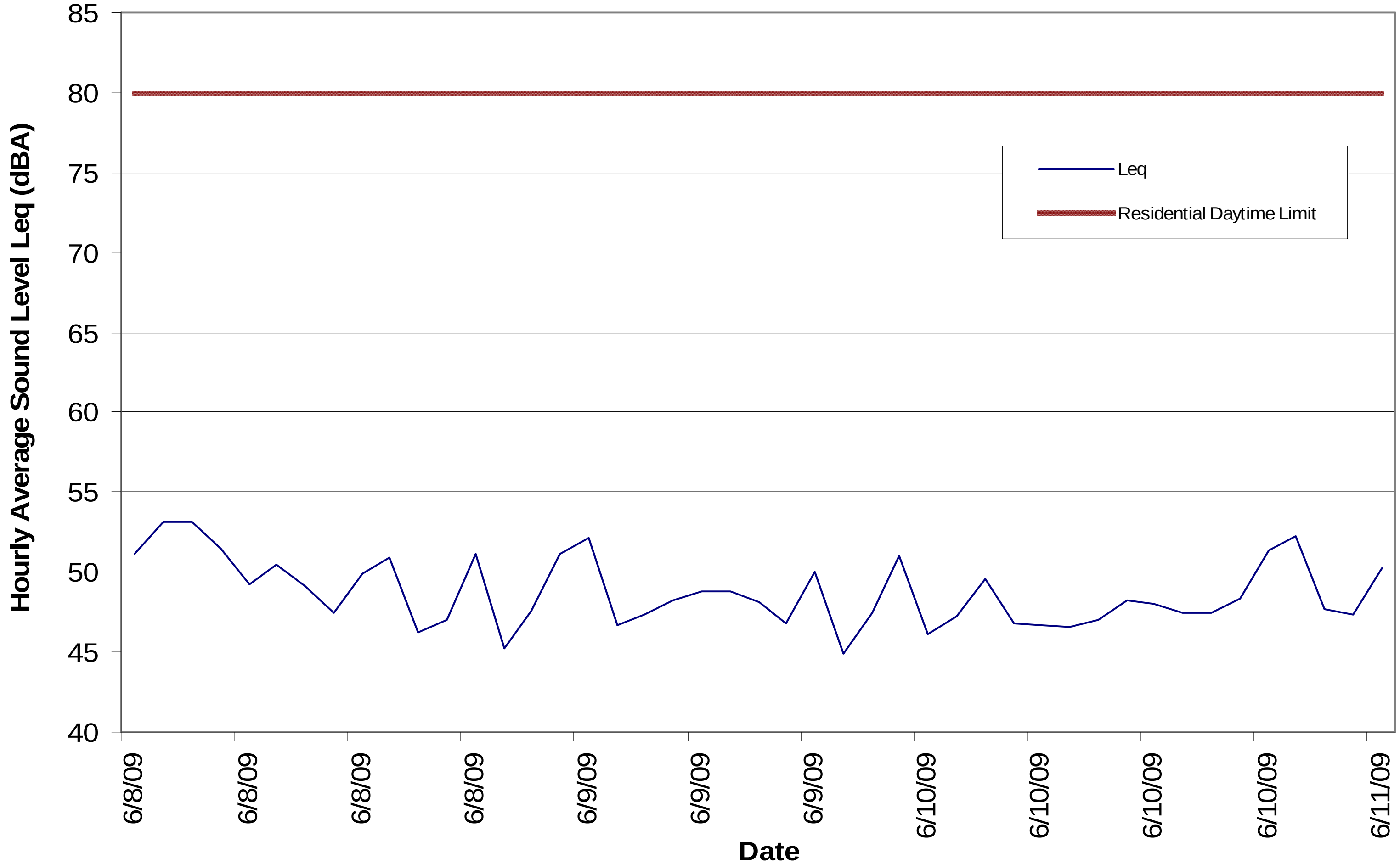


Figure 42
Location DRC-C1940-RR-00146
CU 8 Rogers Island Nighttime

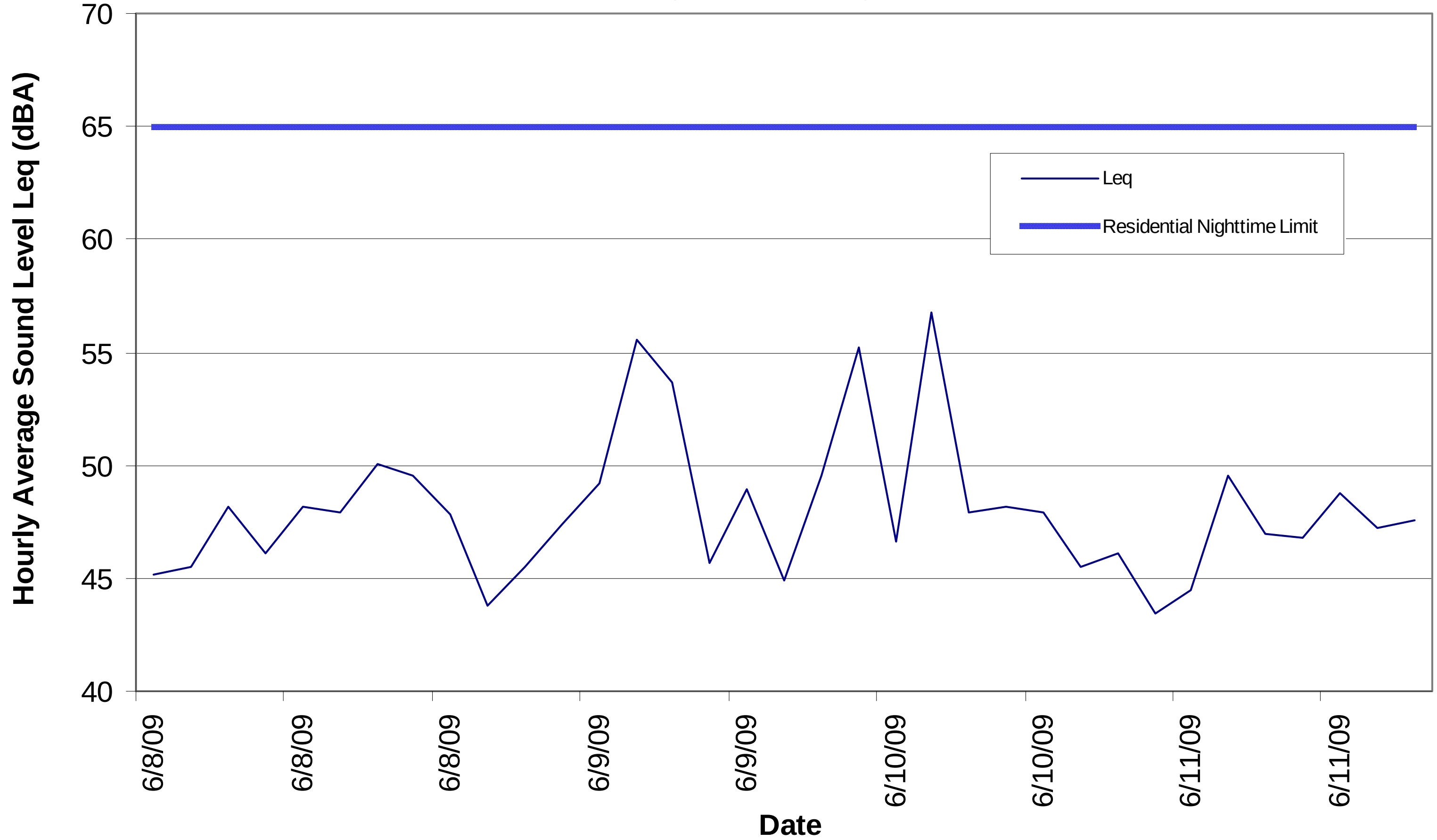


Figure 43
Location DRC-C1942-RR-00126
CU9 Rogers Island Daytime

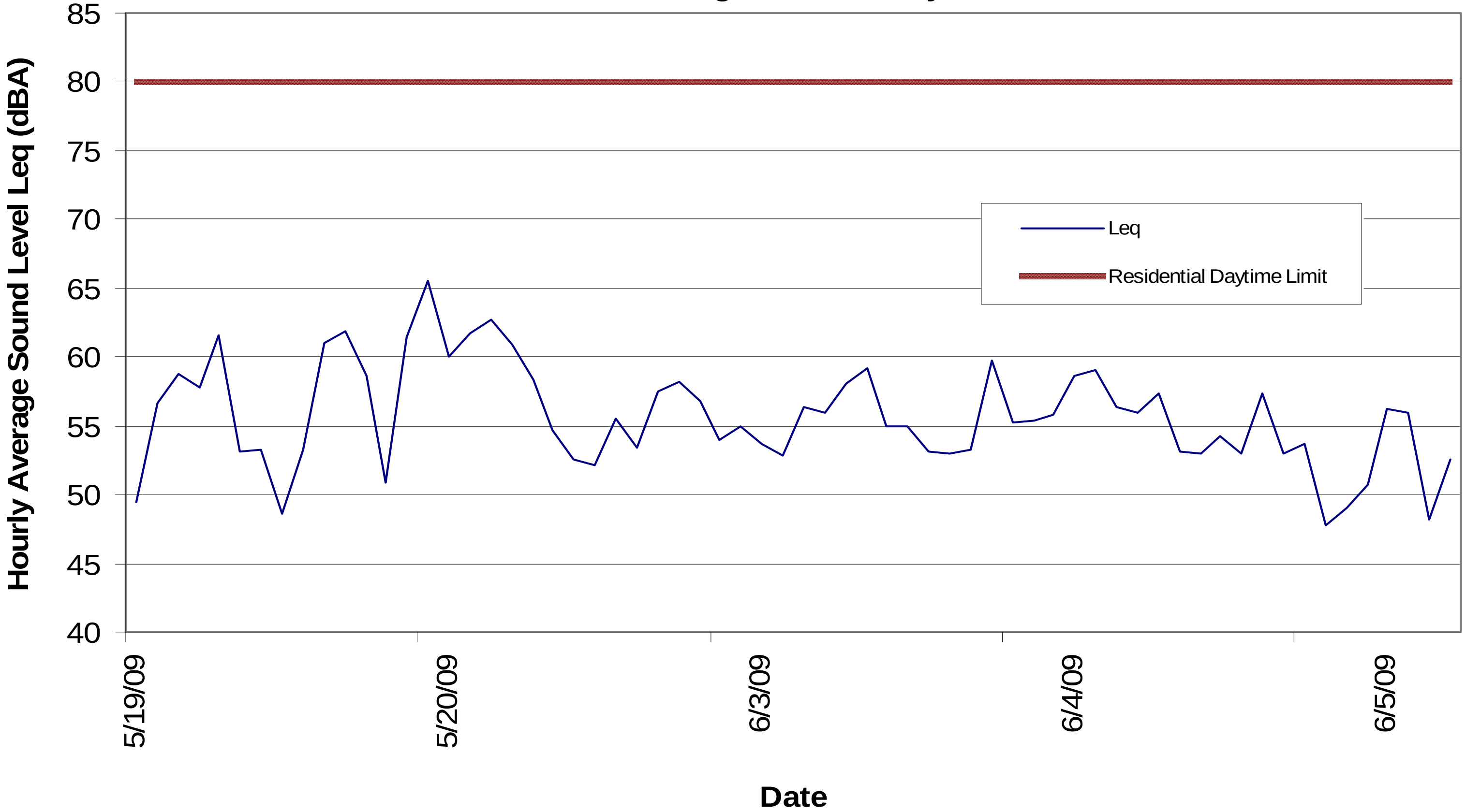
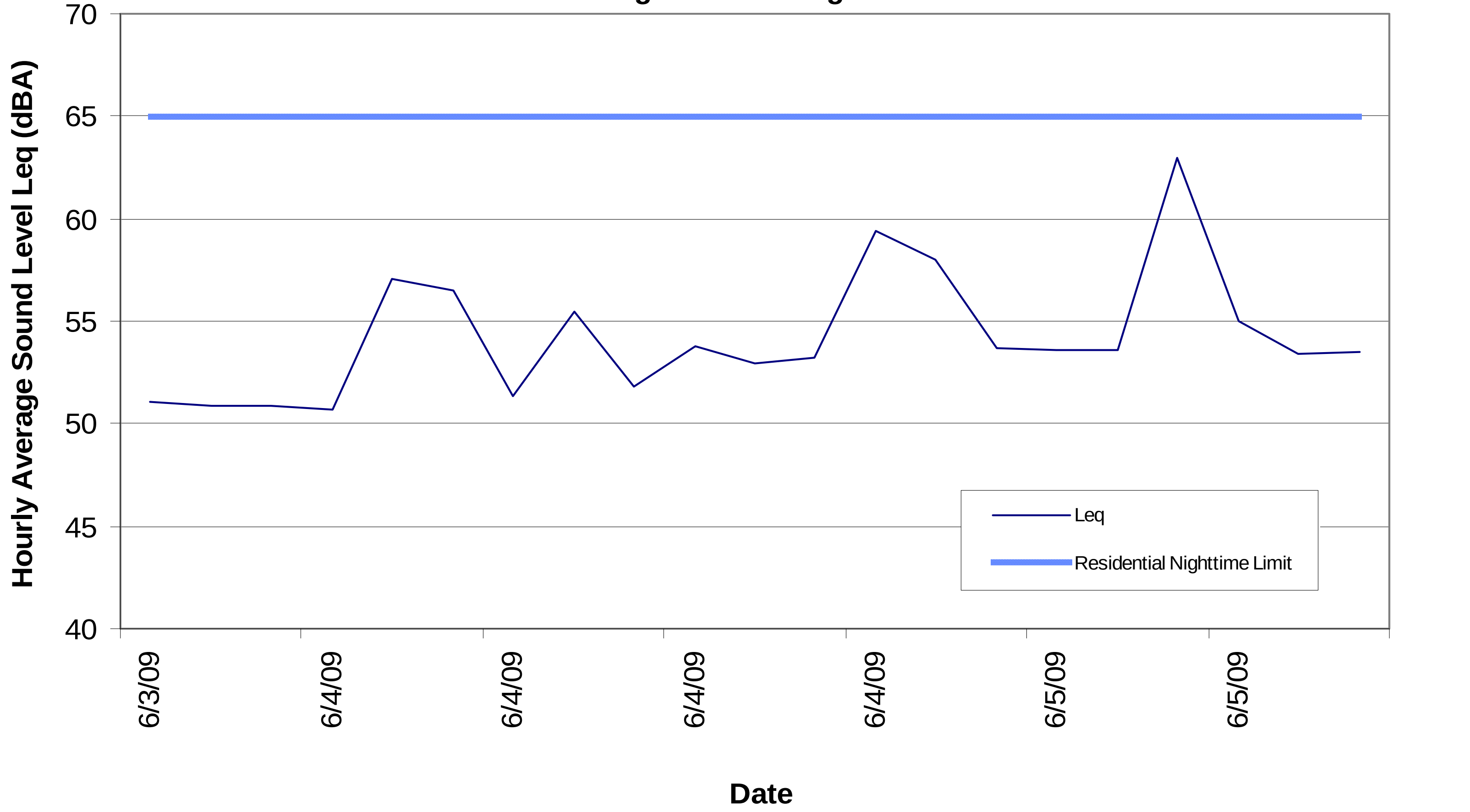


Figure 44
Location DRC-C1942-RR-00126
CU9 Rogers Island Nighttime



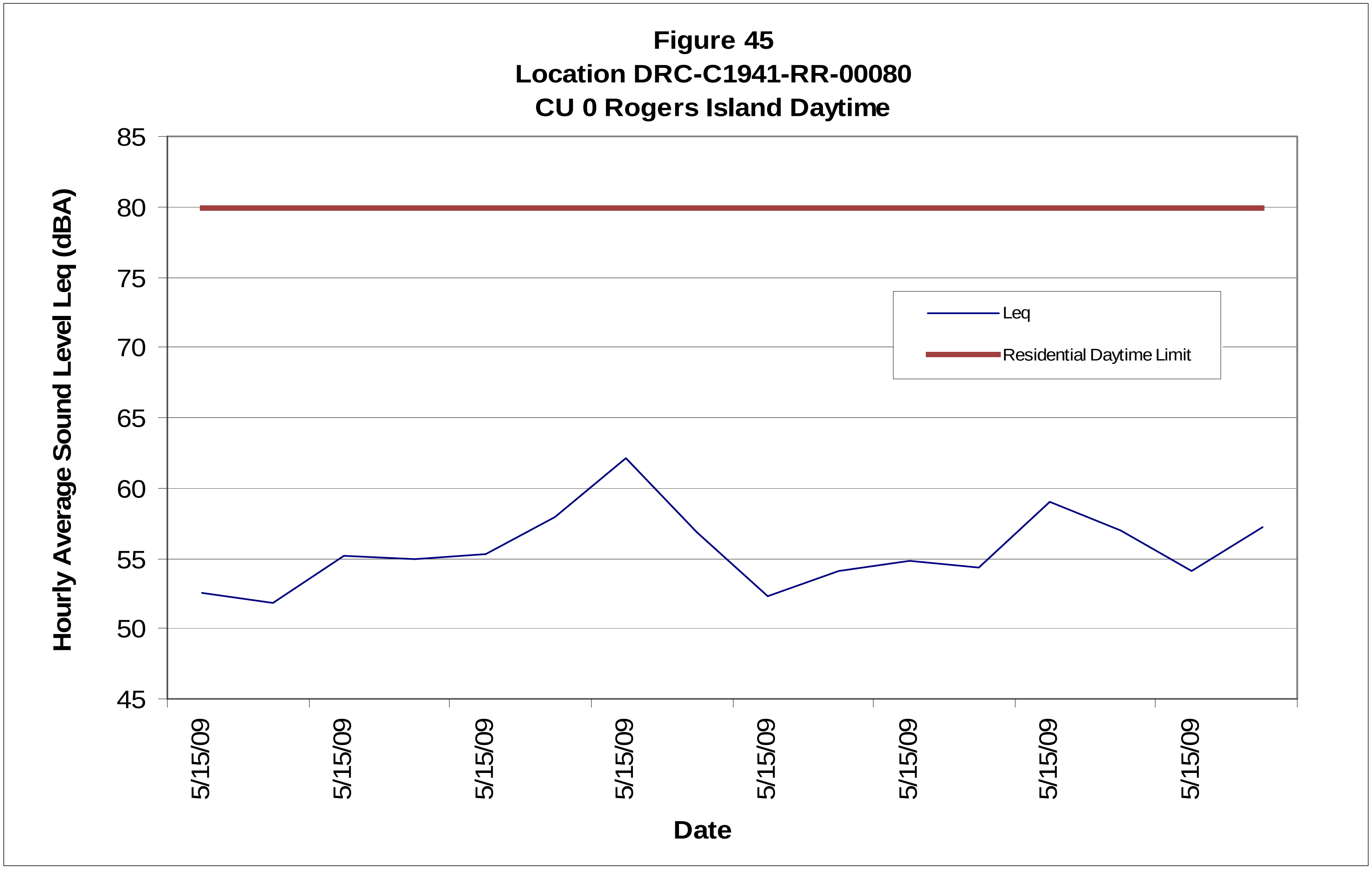
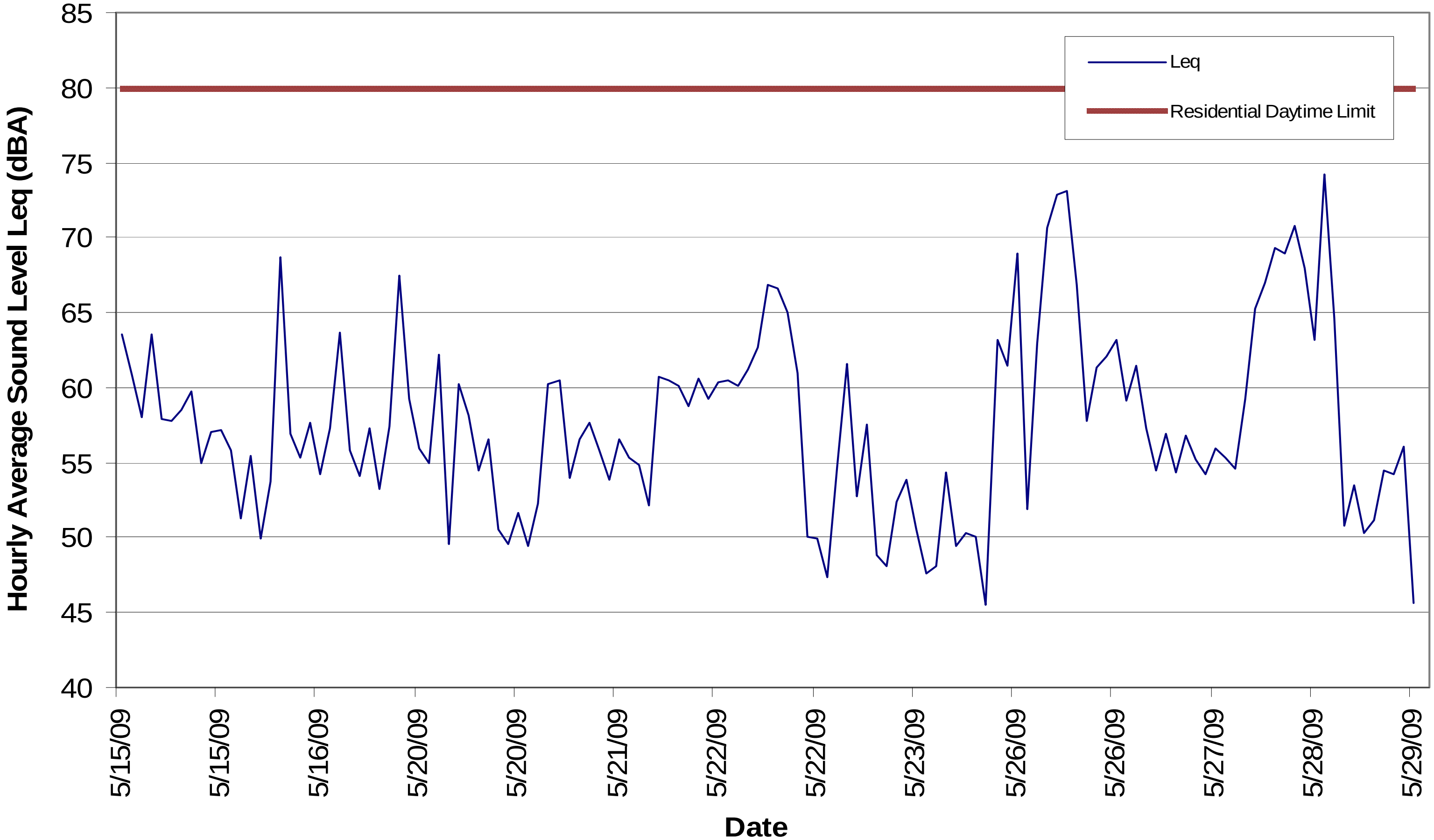


Figure 45
Location DRC-C1941-RR-00080
CU 0 Rogers Island Daytime
Hourly Average Sound Level Leq (dBA)
85
80
75
70
65
60
55
50
45
Leq
Residential Daytime Limit
5/15/09
5/15/09
5/15/09
5/15/09
5/15/09
5/15/09
5/15/09
5/15/09
Date

Figure 46
Location DRC-W1940-RR-00067
CU 9 West Bank Daytime



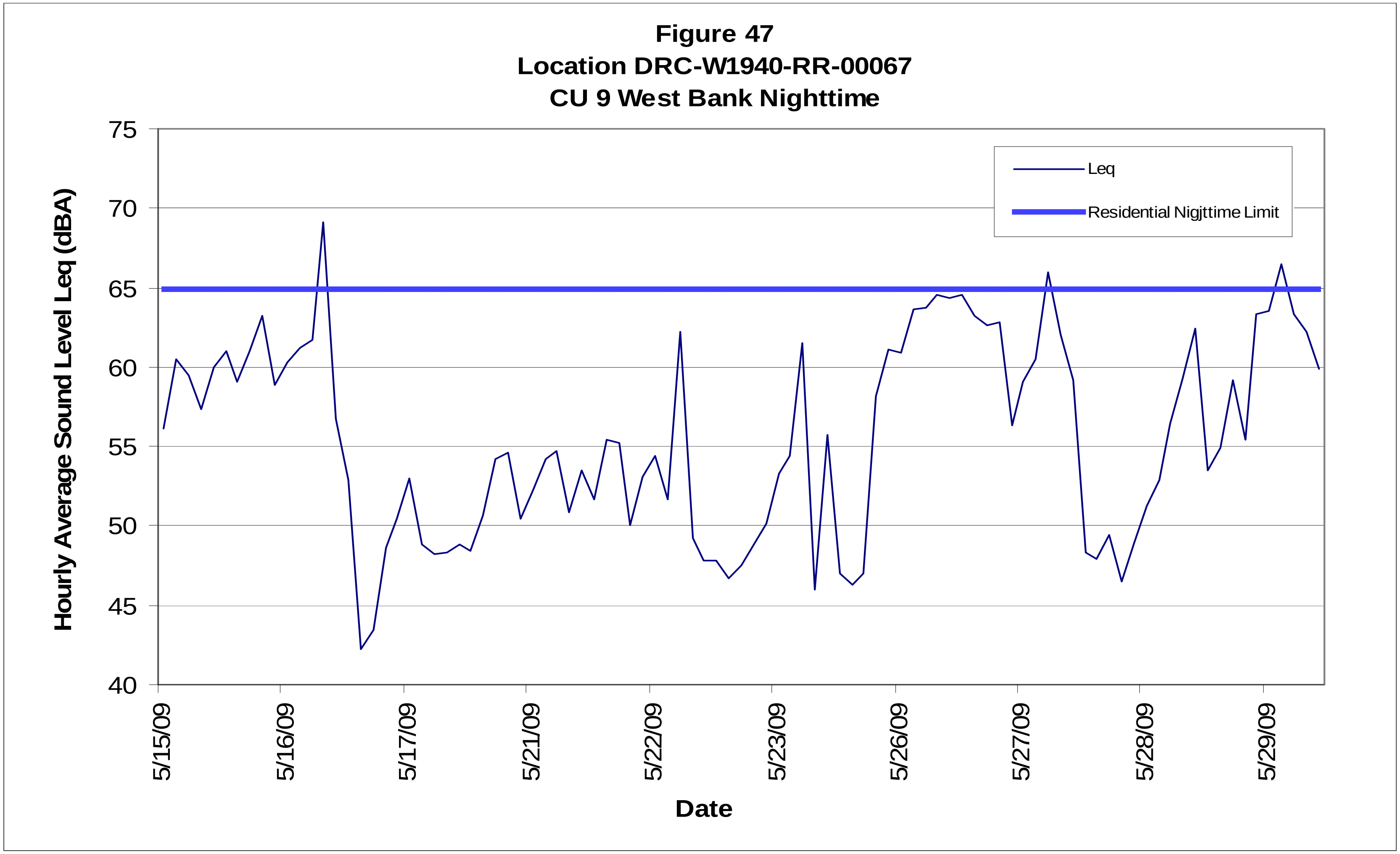


Figure 47
Location DRC-W1940-RR-00067
CU 9 West Bank Nighttime
Leq
Residential Nigjttime Limit
Hourly Average Sound Level Leq (dBA)
75
70
65
60
55
50
45
40
5/15/09
5/16/09
5/17/09
5/21/09
5/22/09
5/23/09
5/26/09
5/27/09
5/28/09
5/29/09
Date

Figure 48
Location DRC-W1940-RR-00049
CU 9 West Bank Daytime

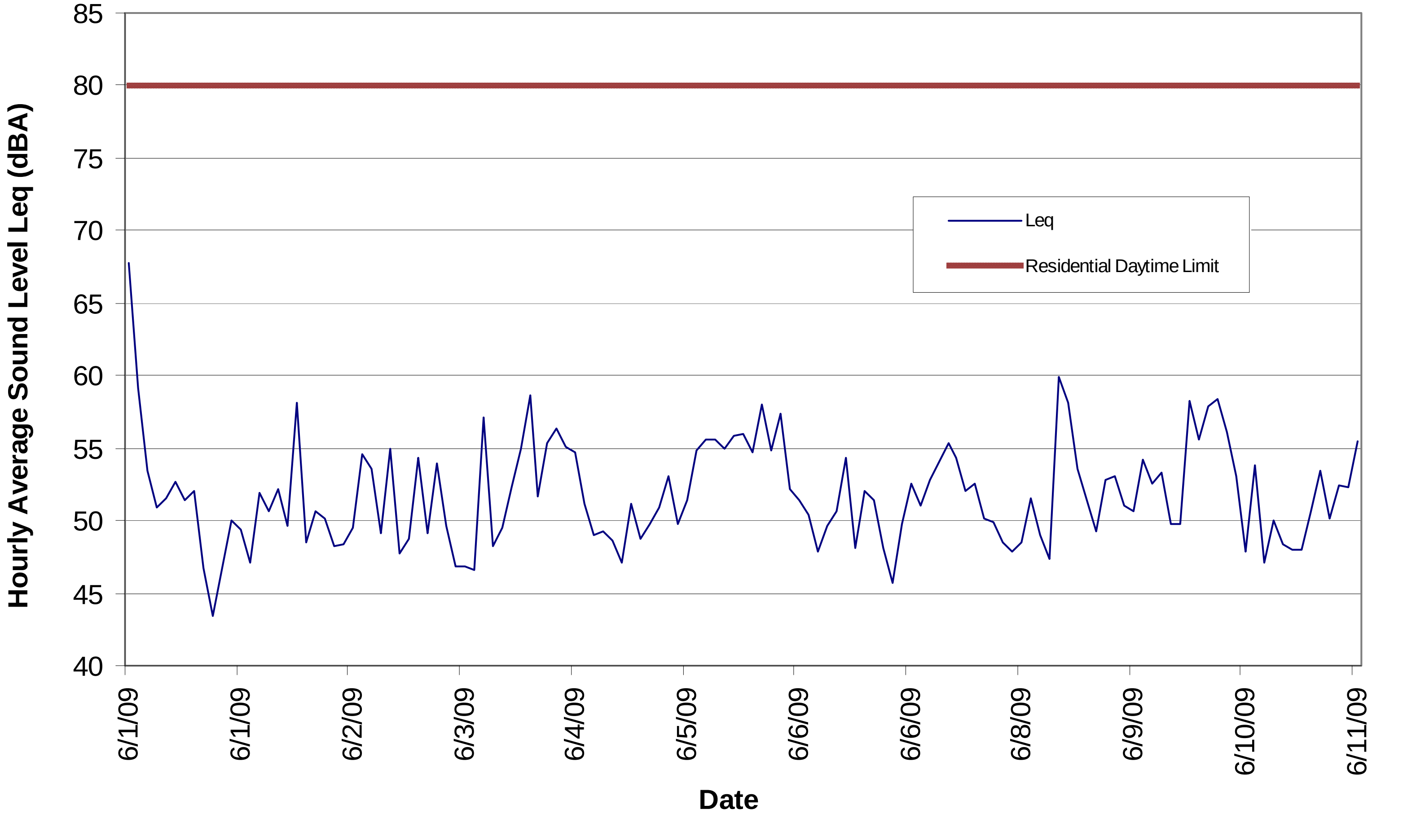


Figure 49
Location DRC-W1940-RR-00049
CU 9 West Bank Nighttime

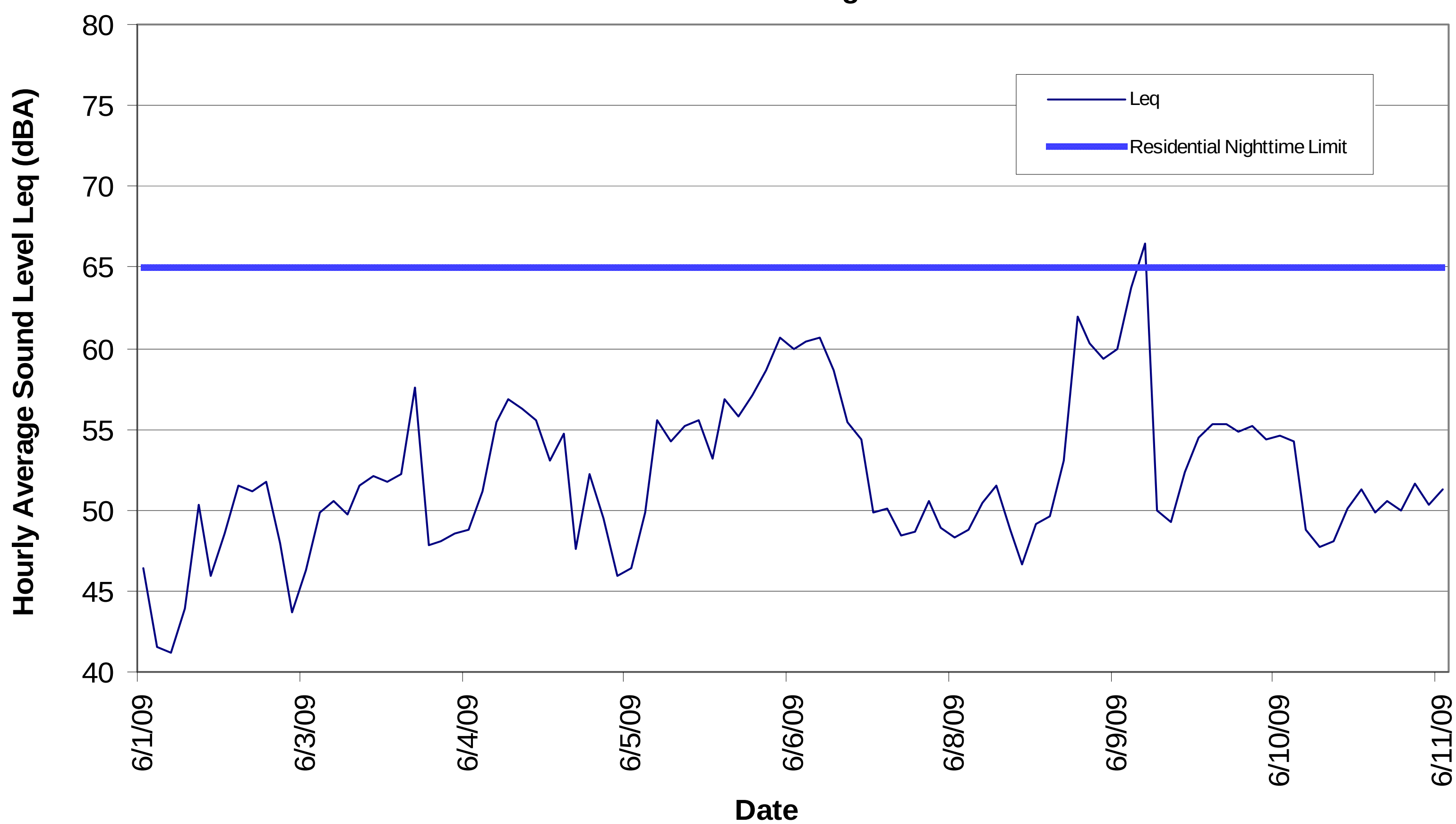
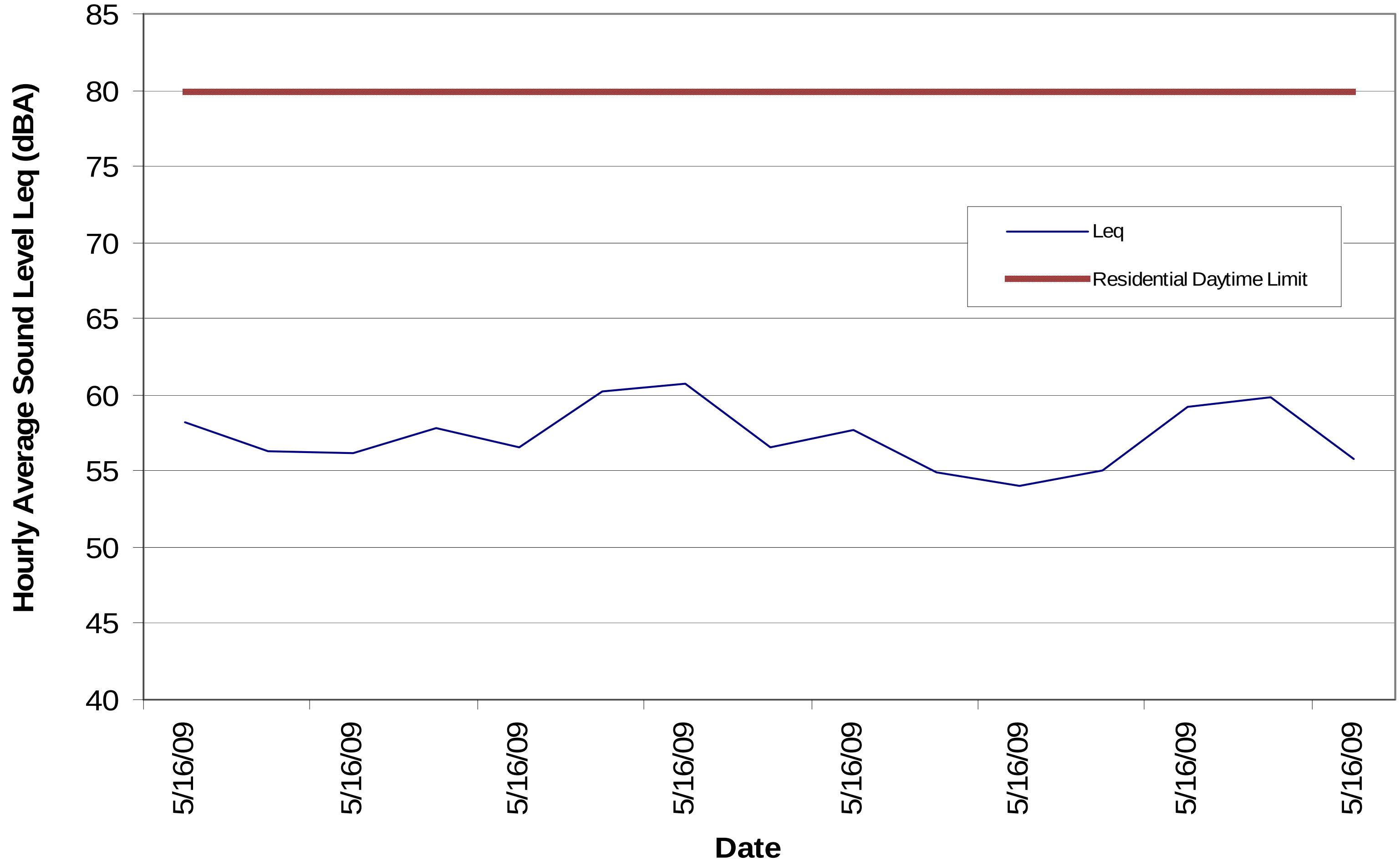


Figure 50
Location DRC-C1940-RR-00056
CU 9 Rogers Island Daytime



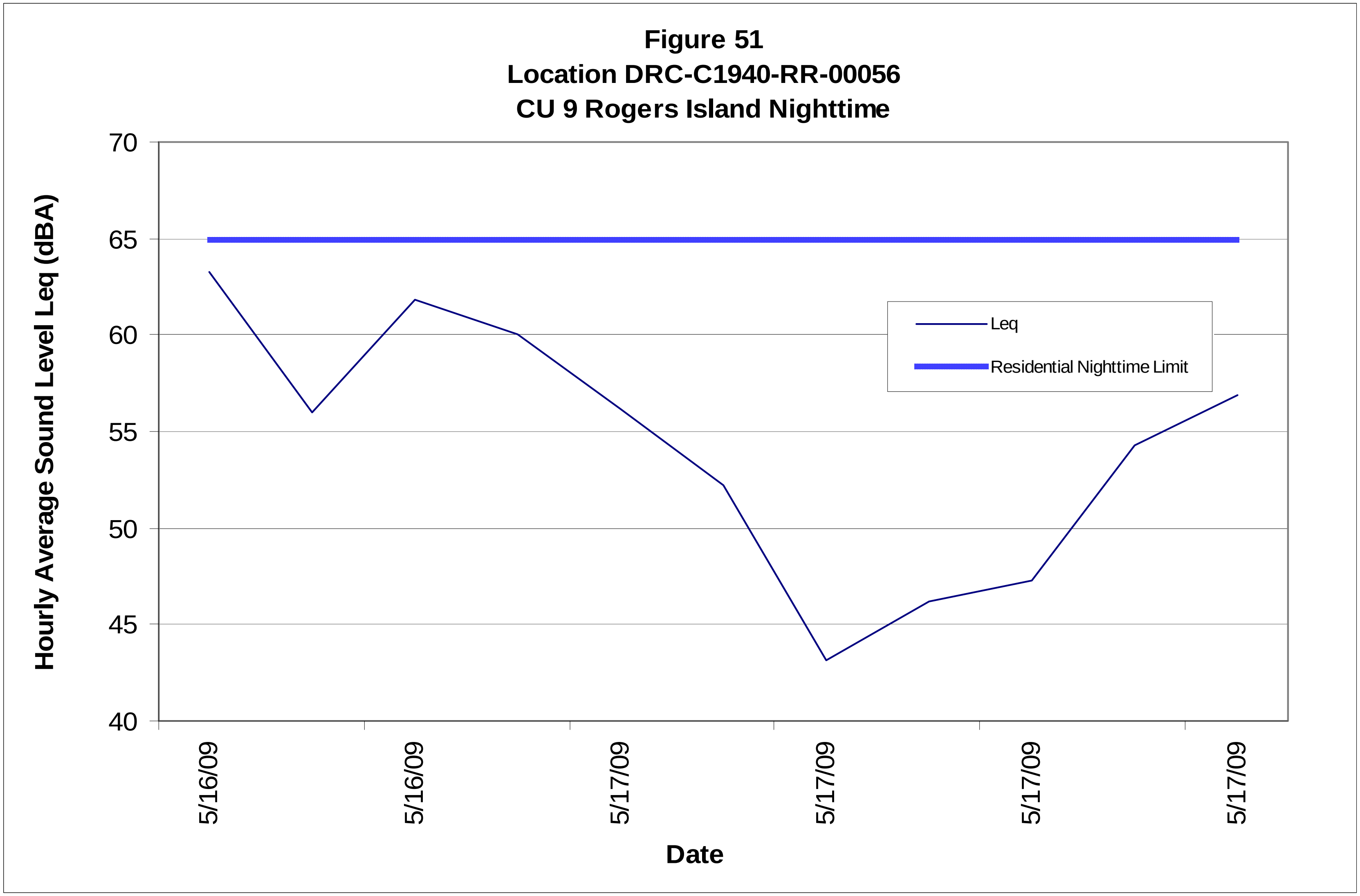


Figure 51
Location DRC-C1940-RR-00056
CU 9 Rogers Island Nighttime
Hourly Average Sound Level Leq (dBA)
70
65
60
55
50
45
40
Leq
Residential Nighttime Limit
5/16/09
5/16/09
5/17/09
5/17/09
5/17/09
5/17/09
Date

Figure 52
Location DRC-C1941-RR-00129
CU9 Rogers Island Daytime

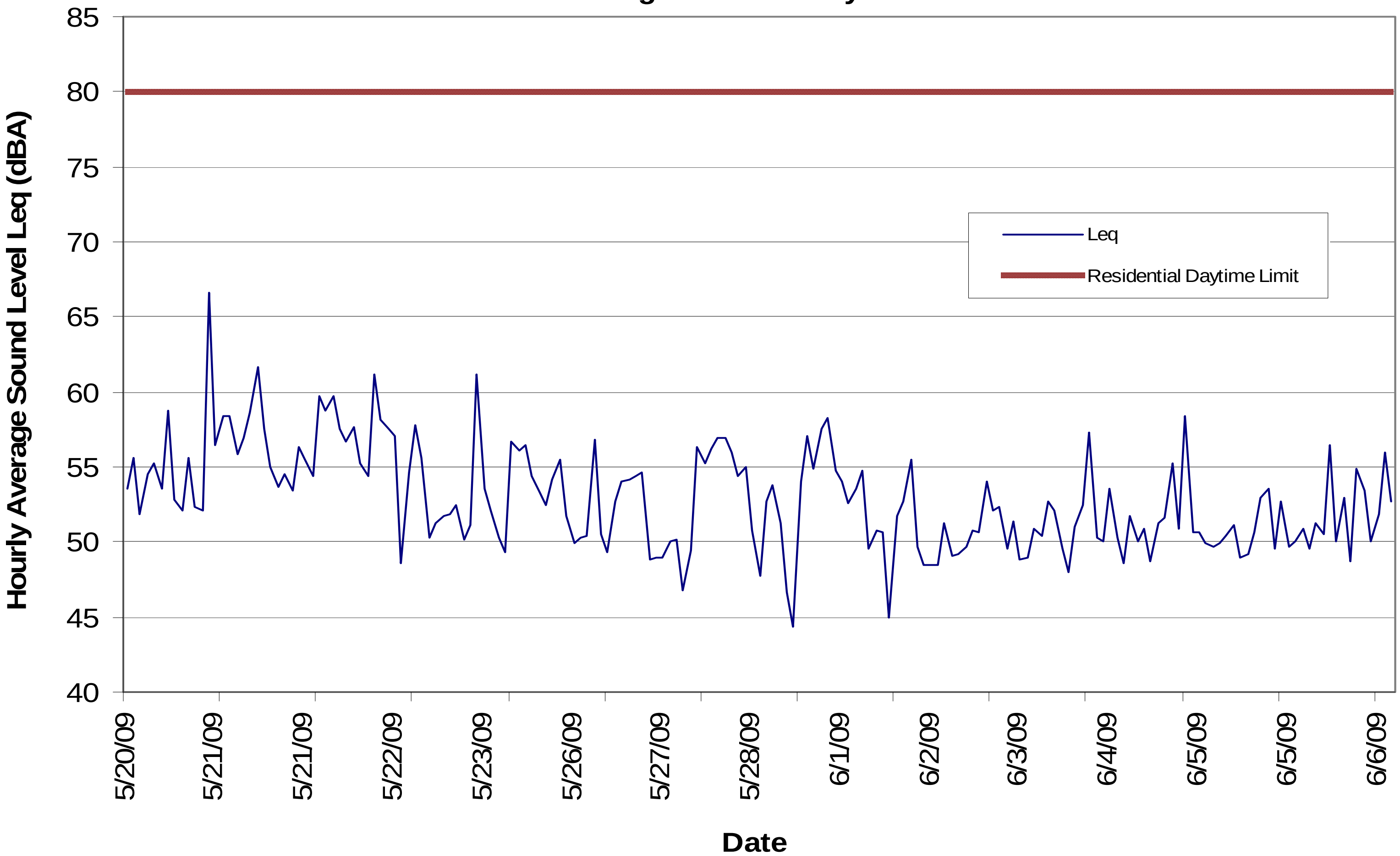


Figure 53
Location DRC-C1941-RR-00129
CU9 Rogers Island Nighttime

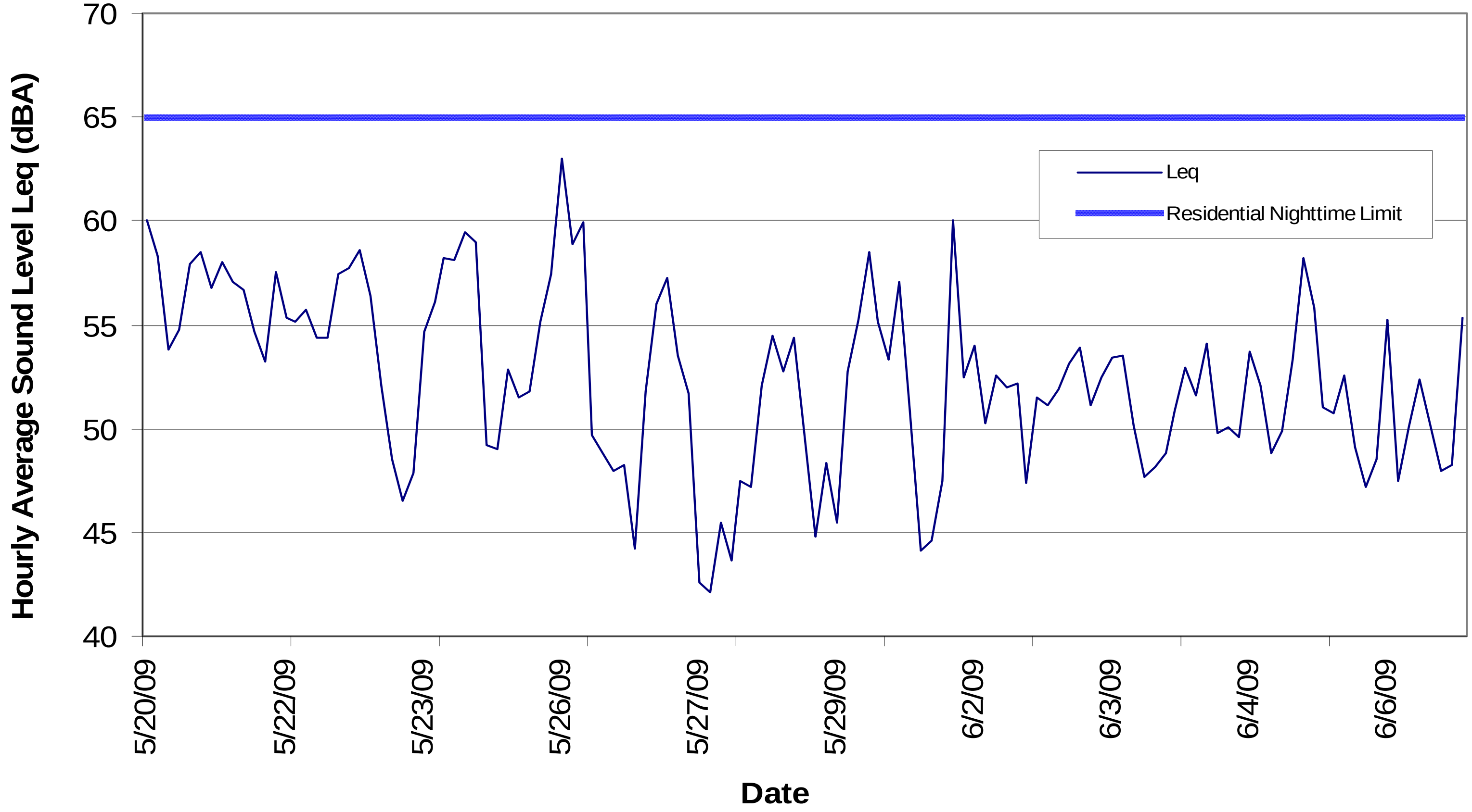


Figure 54
Location DRC-W1939-RR-00010
CU 10 West Bank Daytime

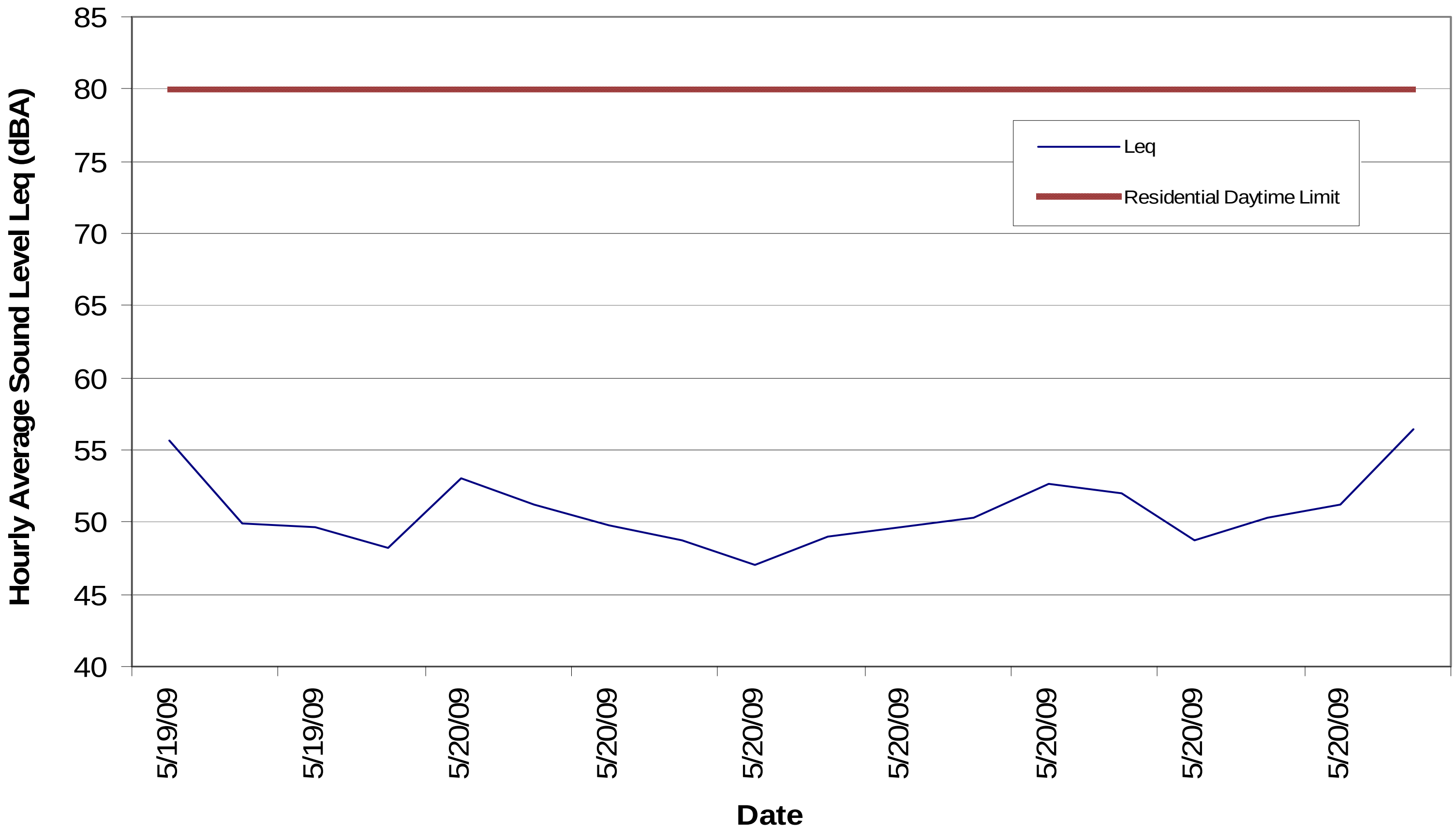
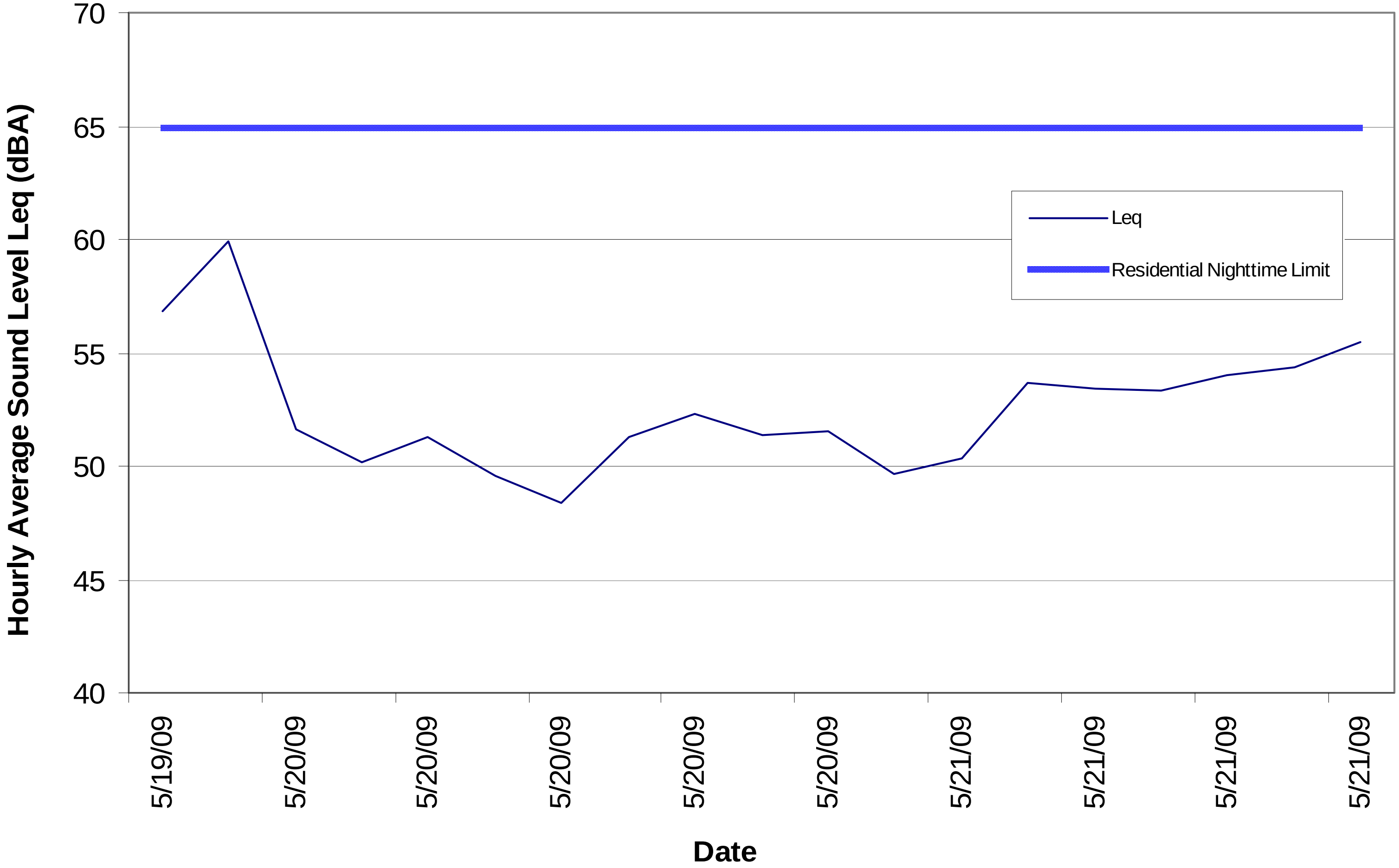


Figure 55
Location DRC-W1939-RR-00010
CU 10 West Bank Nighttime



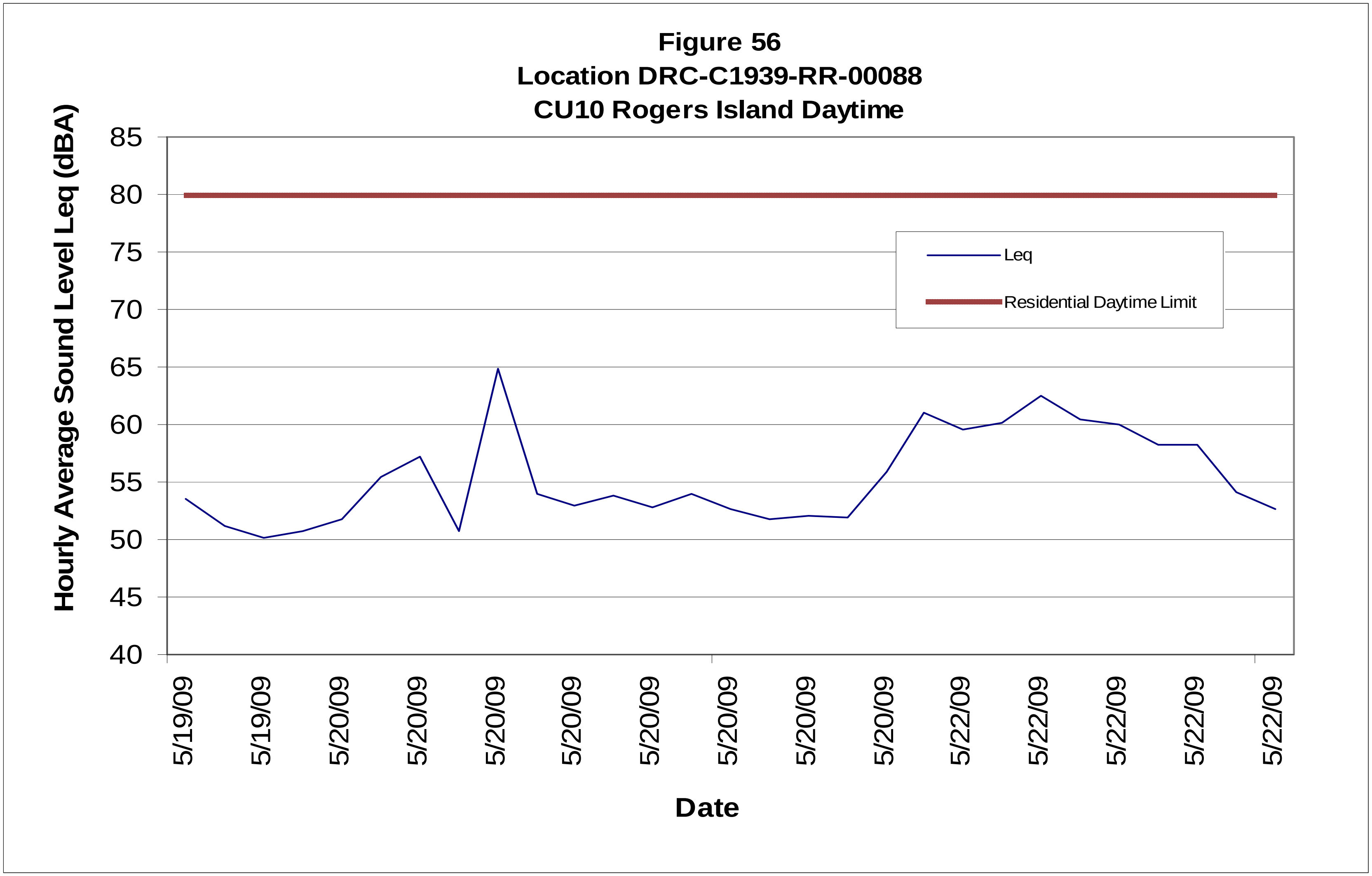


Figure 56
Location DRC-C1939-RR-00088
CU10 Rogers Island Daytime
Hourly Average Sound Level Leq (dBA)
85
80
75
70
65
60
55
50
45
40
Leq
Residential Daytime Limit
5/19/09
5/19/09
5/20/09
5/20/09
5/20/09
5/20/09
5/20/09
5/20/09
5/20/09
5/20/09
5/22/09
5/22/09
5/22/09
5/22/09
5/22/09
Date

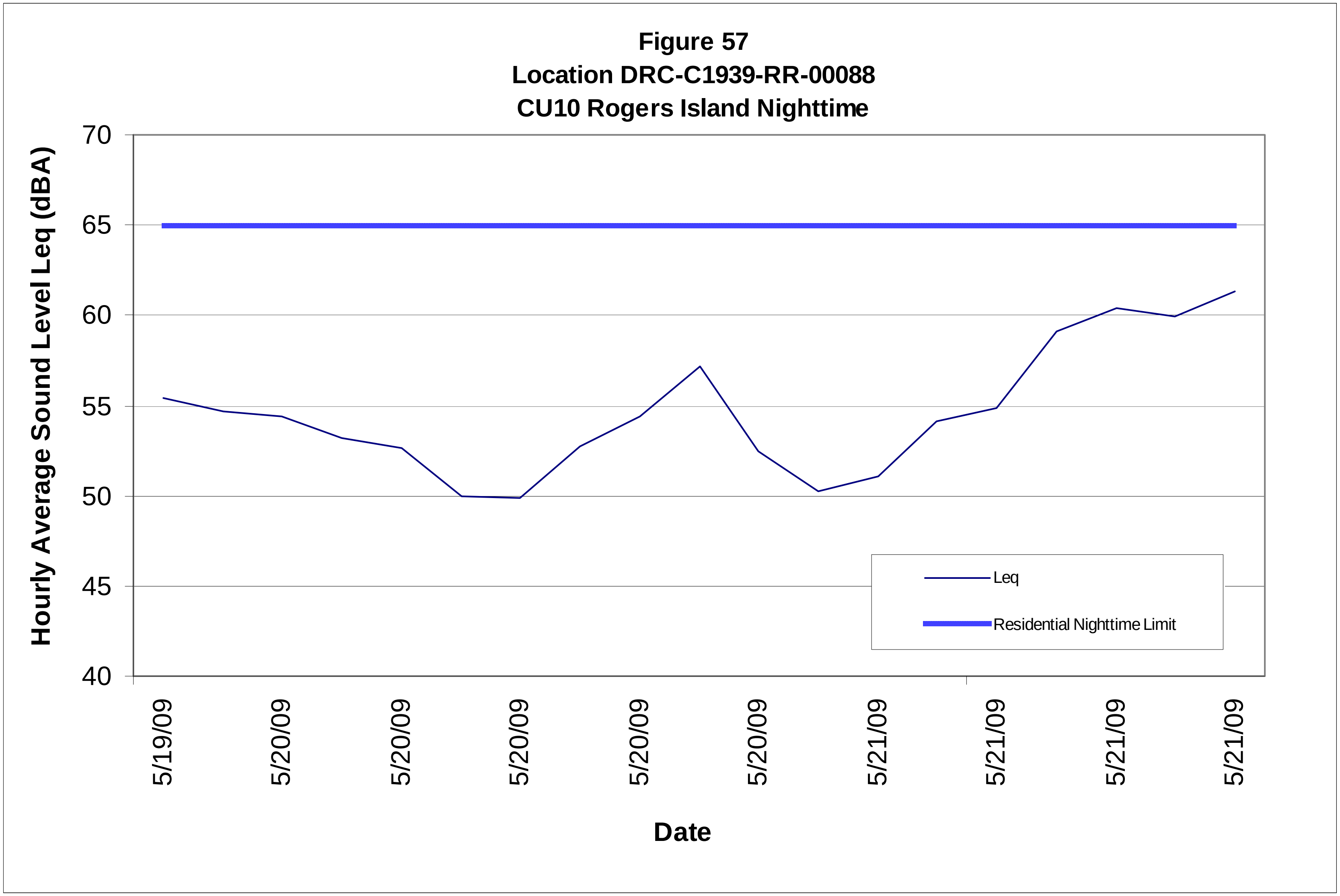


Figure 57
Location DRC-C1939-RR-00088
CU10 Rogers Island Nighttime
Hourly Average Sound Level Leq (dBA)
70
65
60
55
50
45
40
5/19/09
5/20/09
5/20/09
5/20/09
5/20/09
5/20/09
5/21/09
5/21/09
5/21/09
5/21/09
Date
Leq
Residential Nighttime Limit

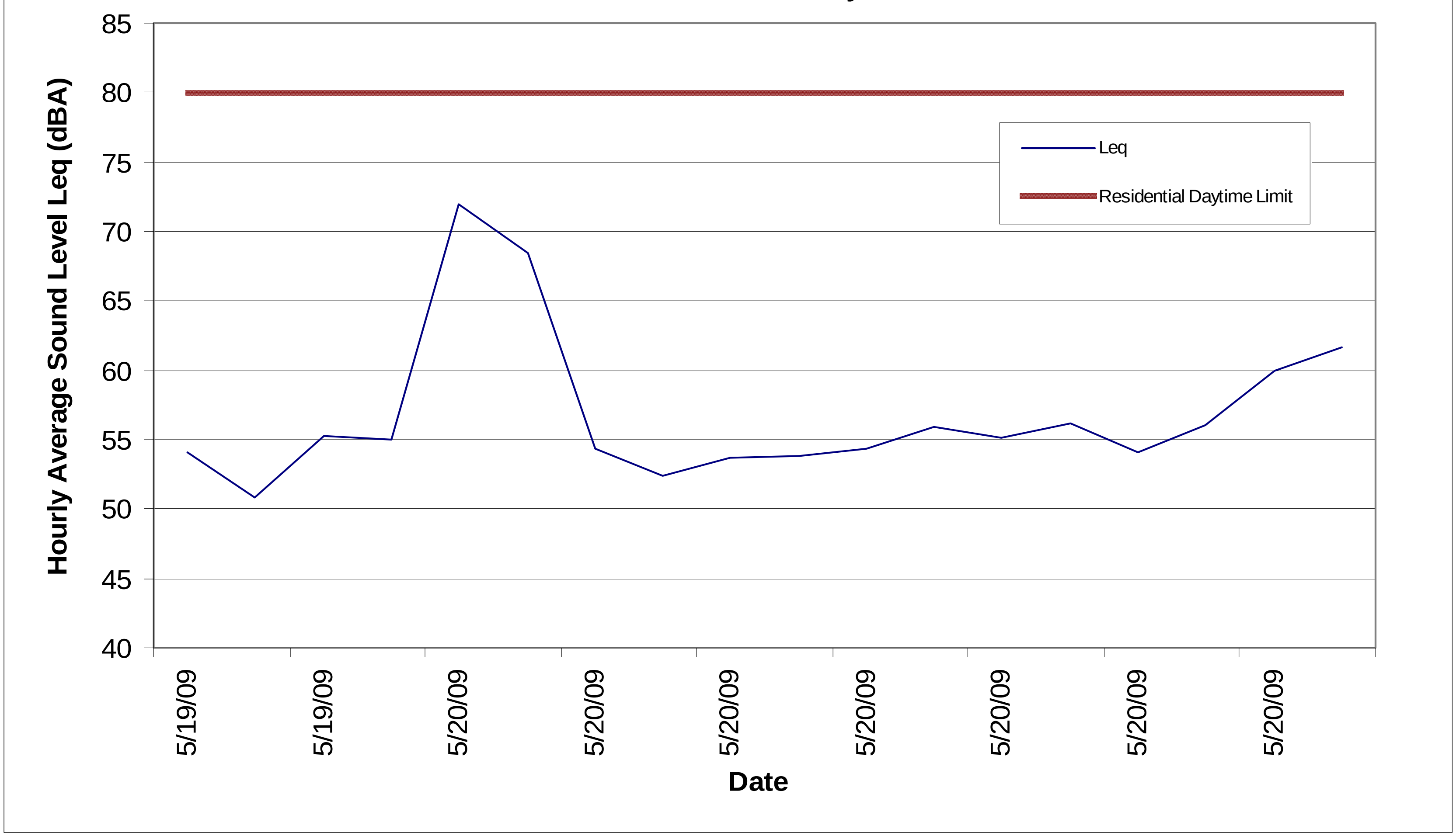


Figure 58
Location DRC-W1938-RR-00043
CU 11 West Bank Daytime

Figure 59
Location DRC-W1938-RR-00043
CU 11 West Bank Nighttime

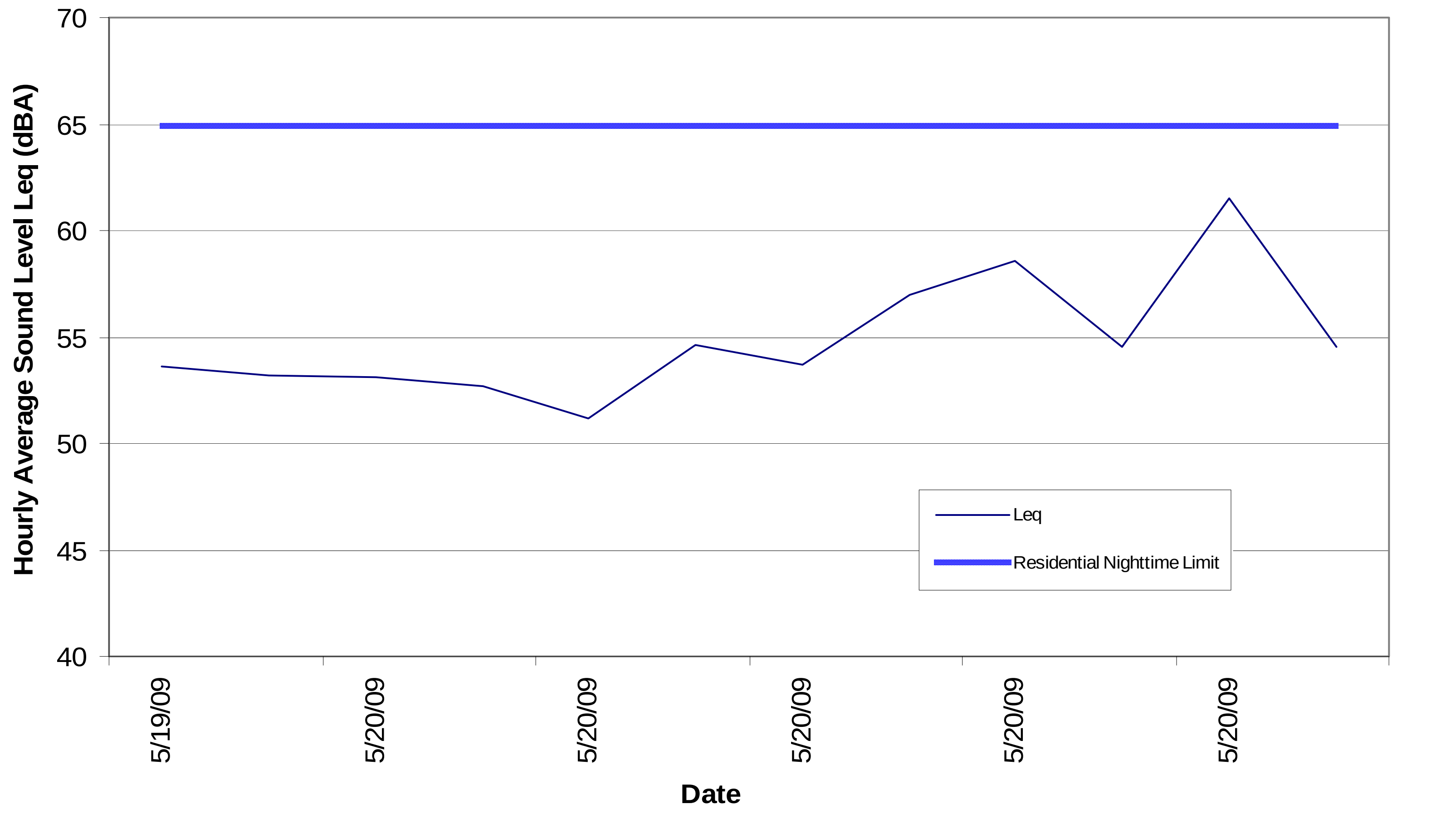
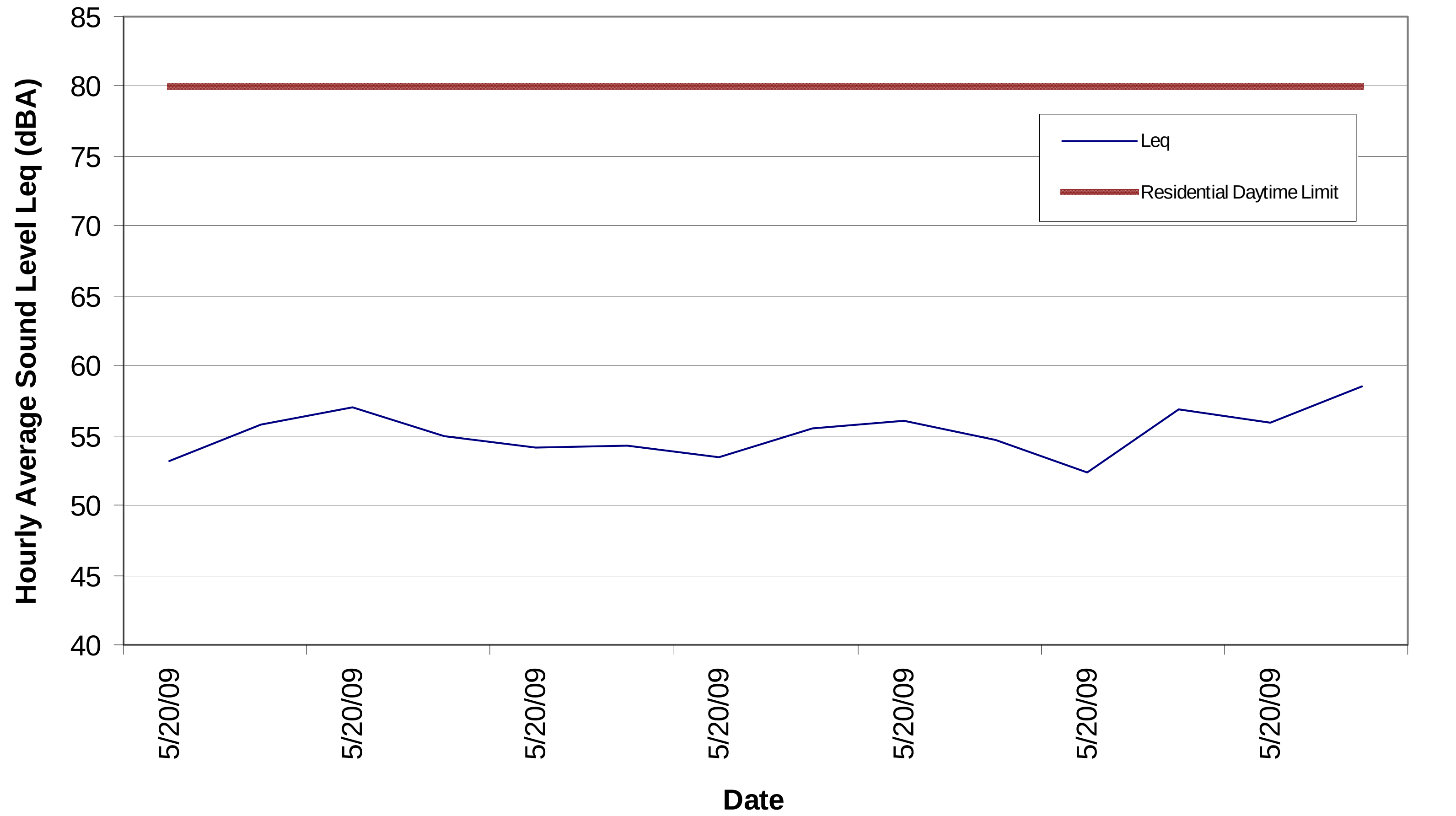


Figure 60
Location DRC-C1938-RR-00094
CU 11 Rogers Island Daytime



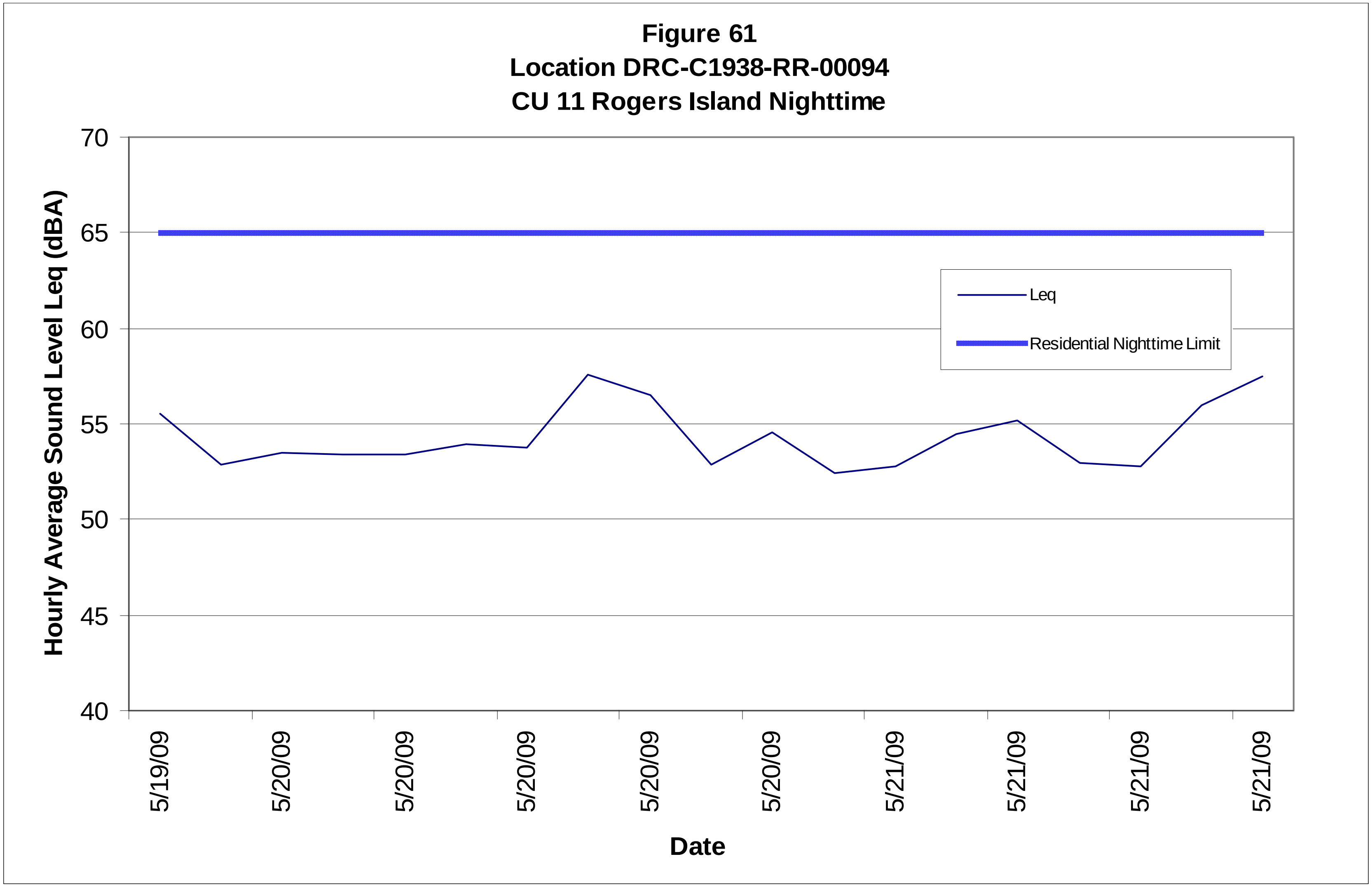


Figure 61
Location DRC-C1938-RR-00094
CU 11 Rogers Island Nighttime
Hourly Average Sound Level Leq (dBA)
70
65
60
55
50
45
40
Leq
Residential Nighttime Limit
5/19/09
5/20/09
5/20/09
5/20/09
5/20/09
5/20/09
5/21/09
5/21/09
5/21/09
5/21/09
Date

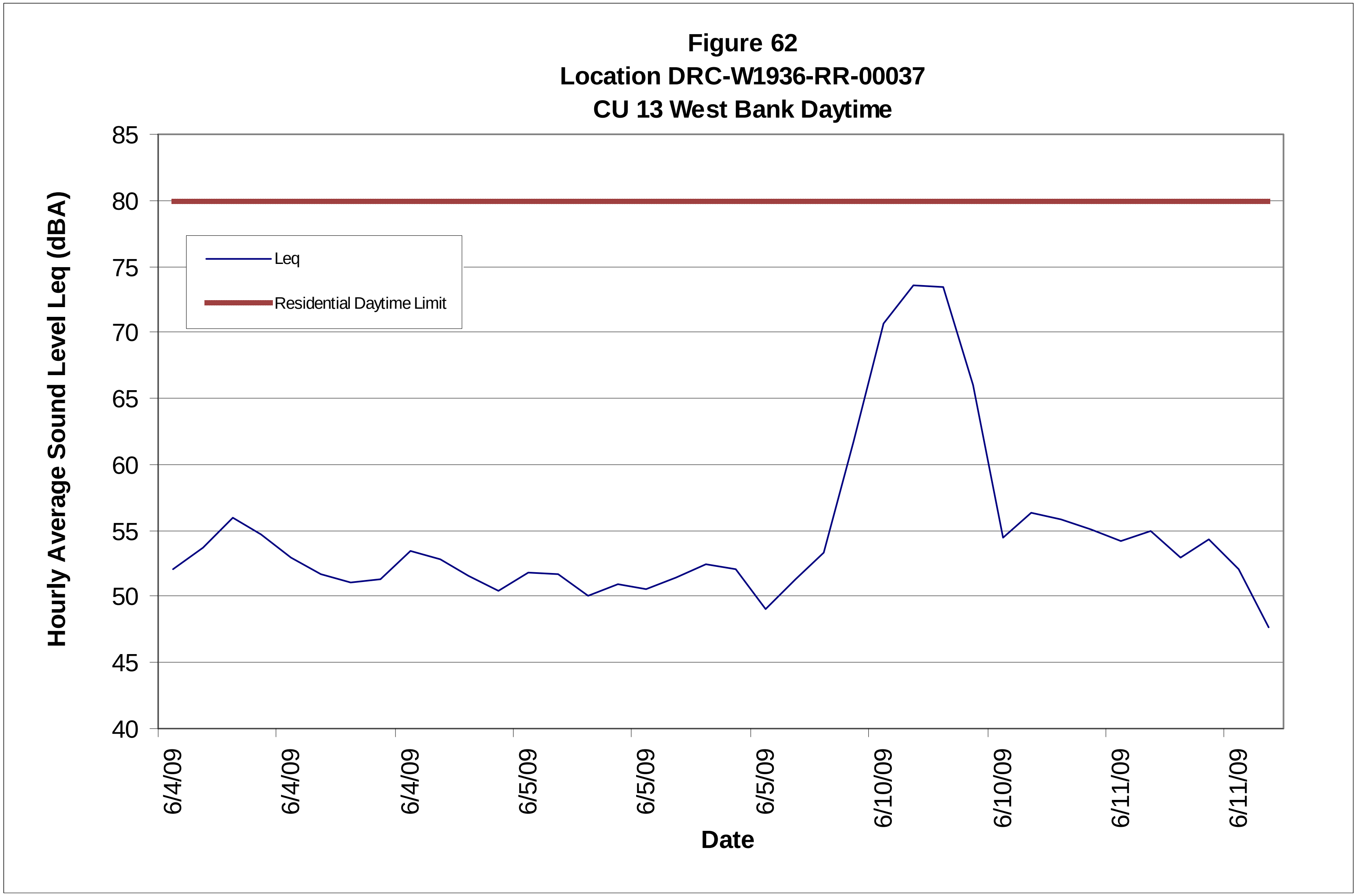


Figure 62
Location DRC-W1936-RR-00037
CU 13 West Bank Daytime
Hourly Average Sound Level Leq (dBA)
85
80
75
70
65
60
55
50
45
40
Leq
Residential Daytime Limit
6/4/09
6/4/09
6/4/09
6/5/09
6/5/09
6/5/09
6/10/09
6/10/09
6/11/09
6/11/09
Date

Figure 63
Location DRC-W1935-RR-00035
CU 13 West Bank Daytime

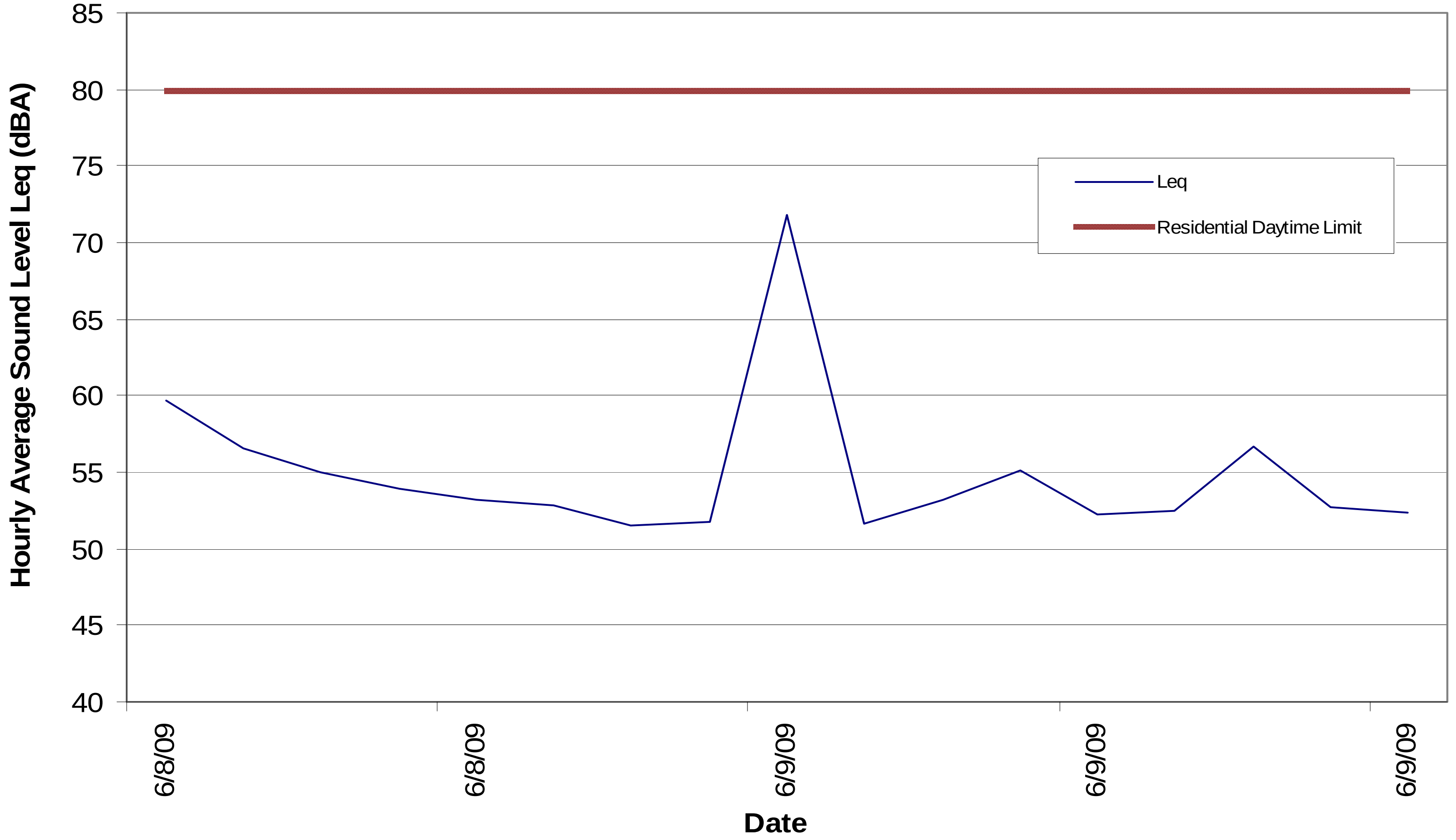


Figure 64
Location DRC-E1933-RR-00022
East Bank Daytime

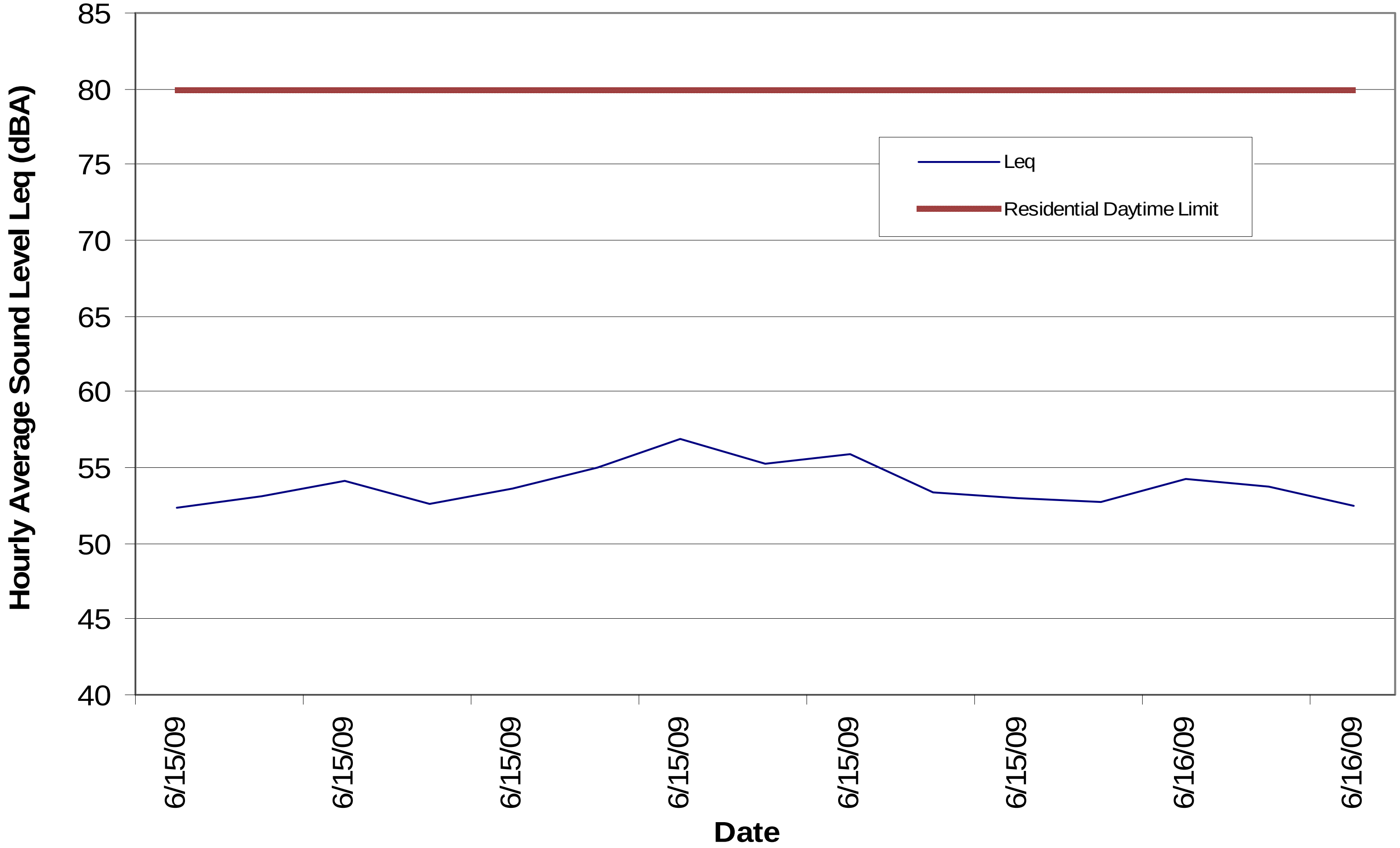


Figure 65
Location DRC-E1933-RR-00022
East Bank Nighttime

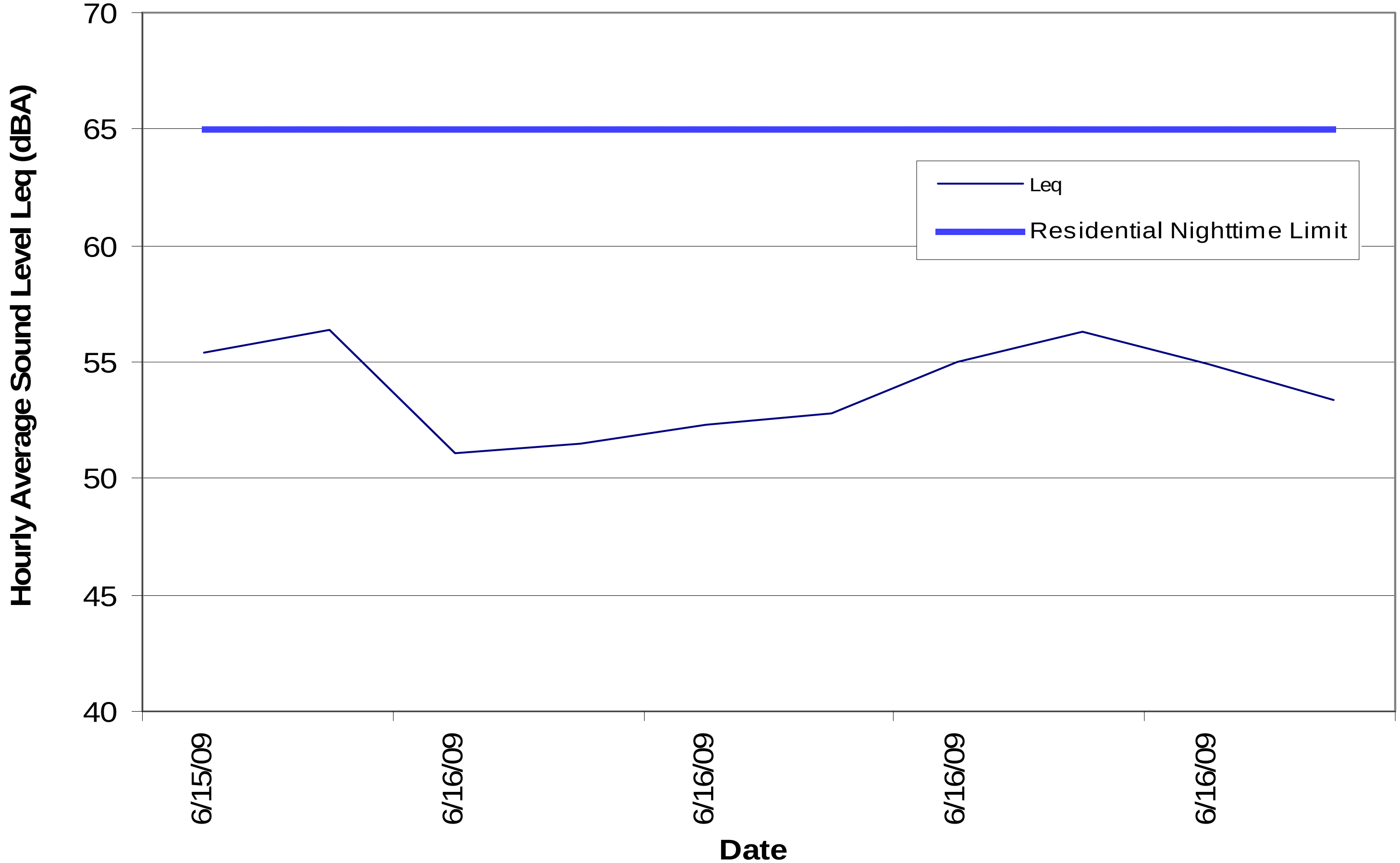
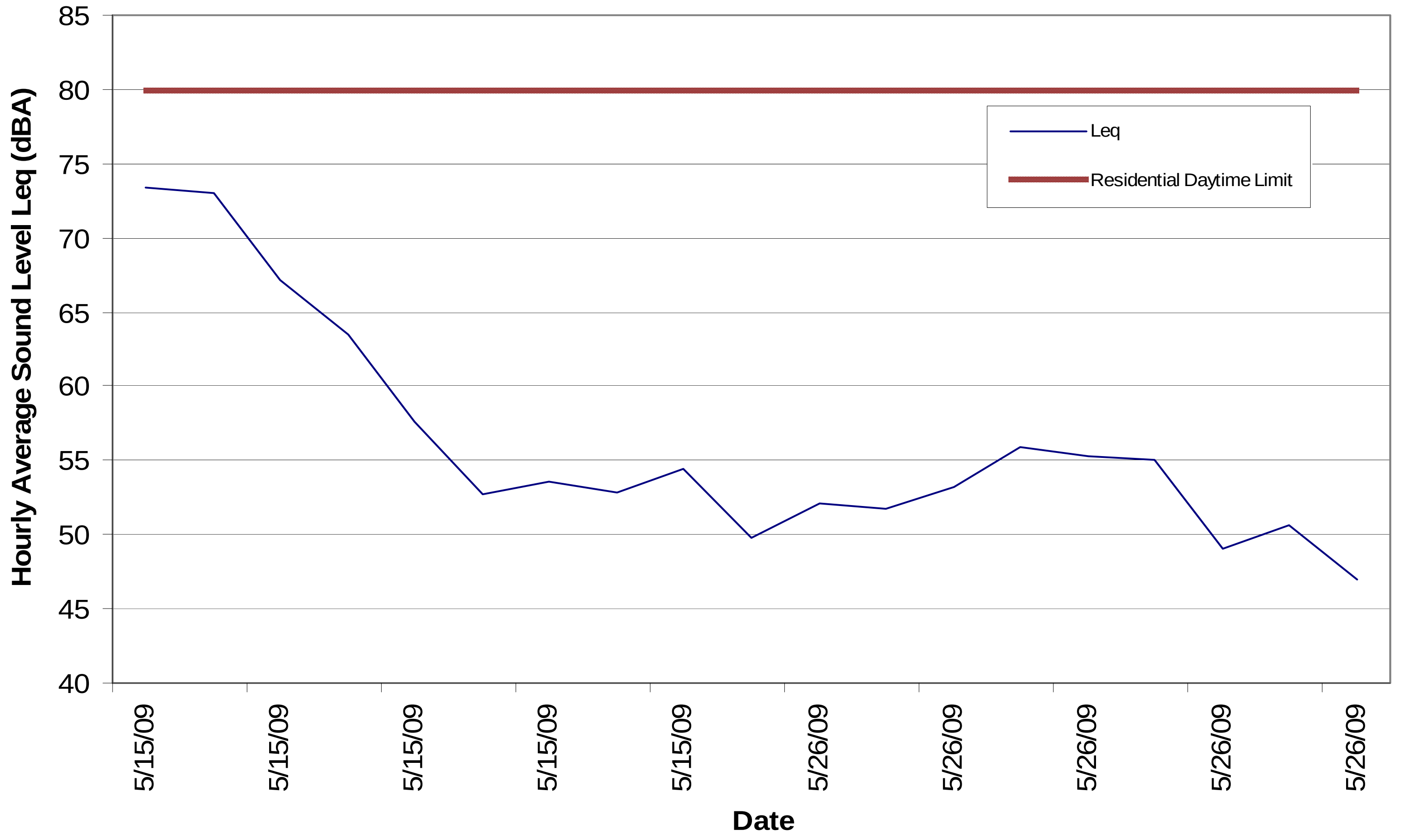


Figure 66
Location DRC-C1901-RR-00066
CU 17 East Griffin Island Daytime



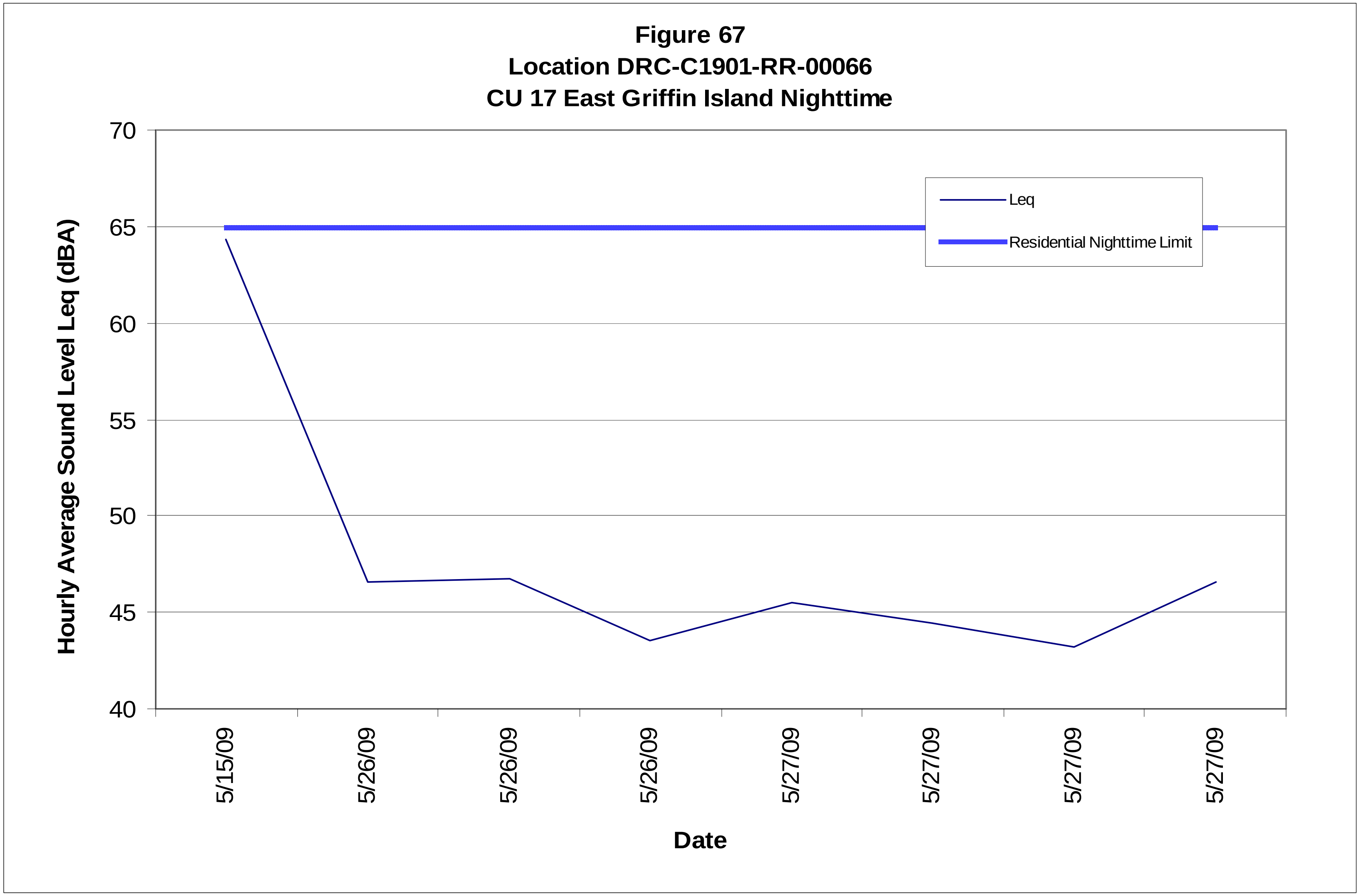
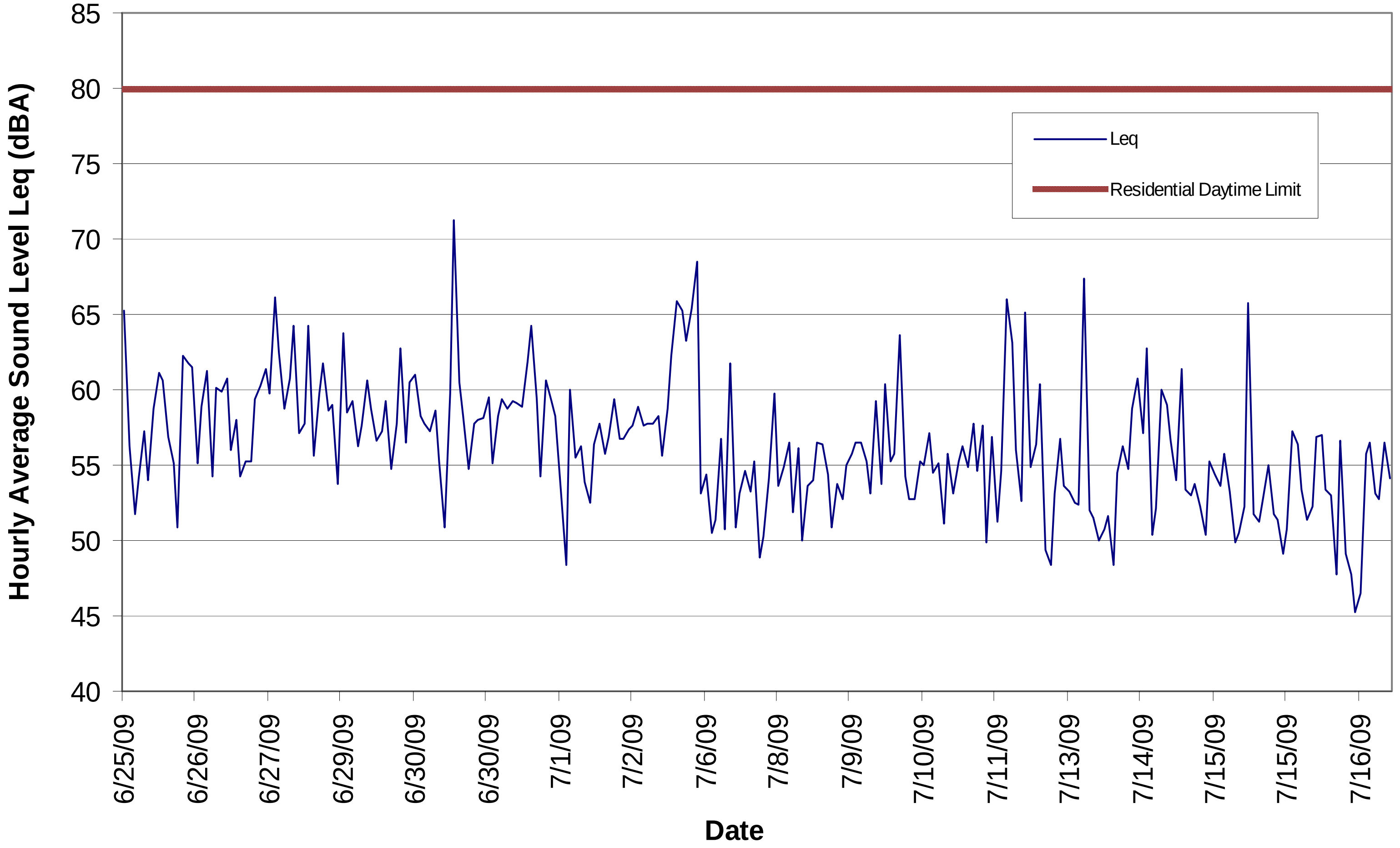


Figure 67
Location DRC-C1901-RR-00066
CU 17 East Griffin Island Nighttime
Hourly Average Sound Level Leq (dBA)
70
65
60
55
50
45
40
Leq
Residential Nighttime Limit
5/15/09
5/26/09
5/26/09
5/26/09
5/27/09
5/27/09
5/27/09
5/27/09
Date

Figure 68
Location DRC-C1902-RR-00068
CU 17 Griffin Island Daytime



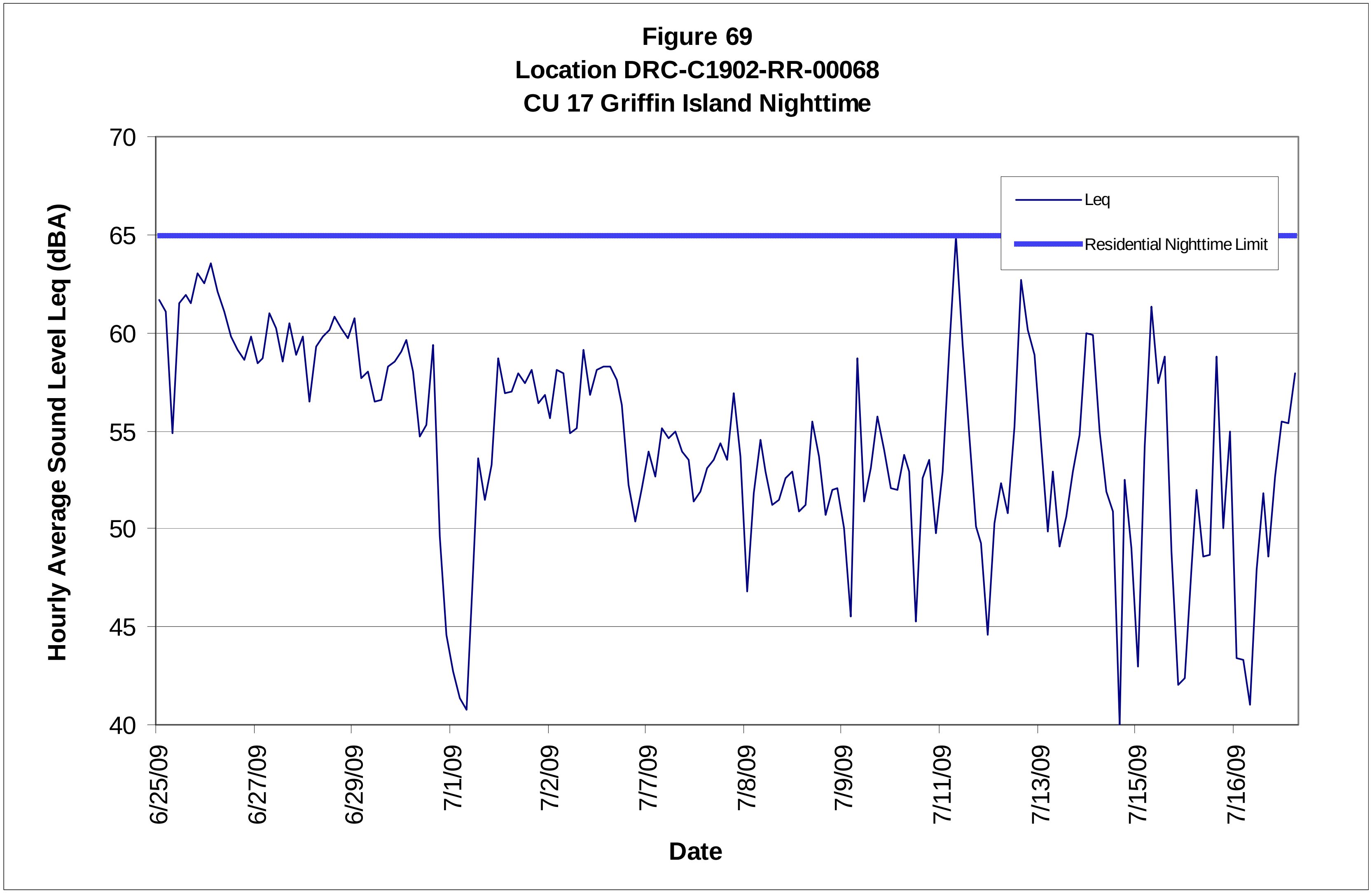


Figure 69
Location DRC-C1902-RR-00068
CU 17 Griffin Island Nighttime
Hourly Average Sound Level Leq (dBA)
70
65
60
55
50
45
40
Leq
Residential Nighttime Limit
6/25/09
6/27/09
6/29/09
7/1/09
7/2/09
7/7/09
7/8/09
7/9/09
7/11/09
7/13/09
7/15/09
7/16/09
Date

Figure 70
Location DRC-E1901-RR-00057
CU 17 East Griffin Island Daytime

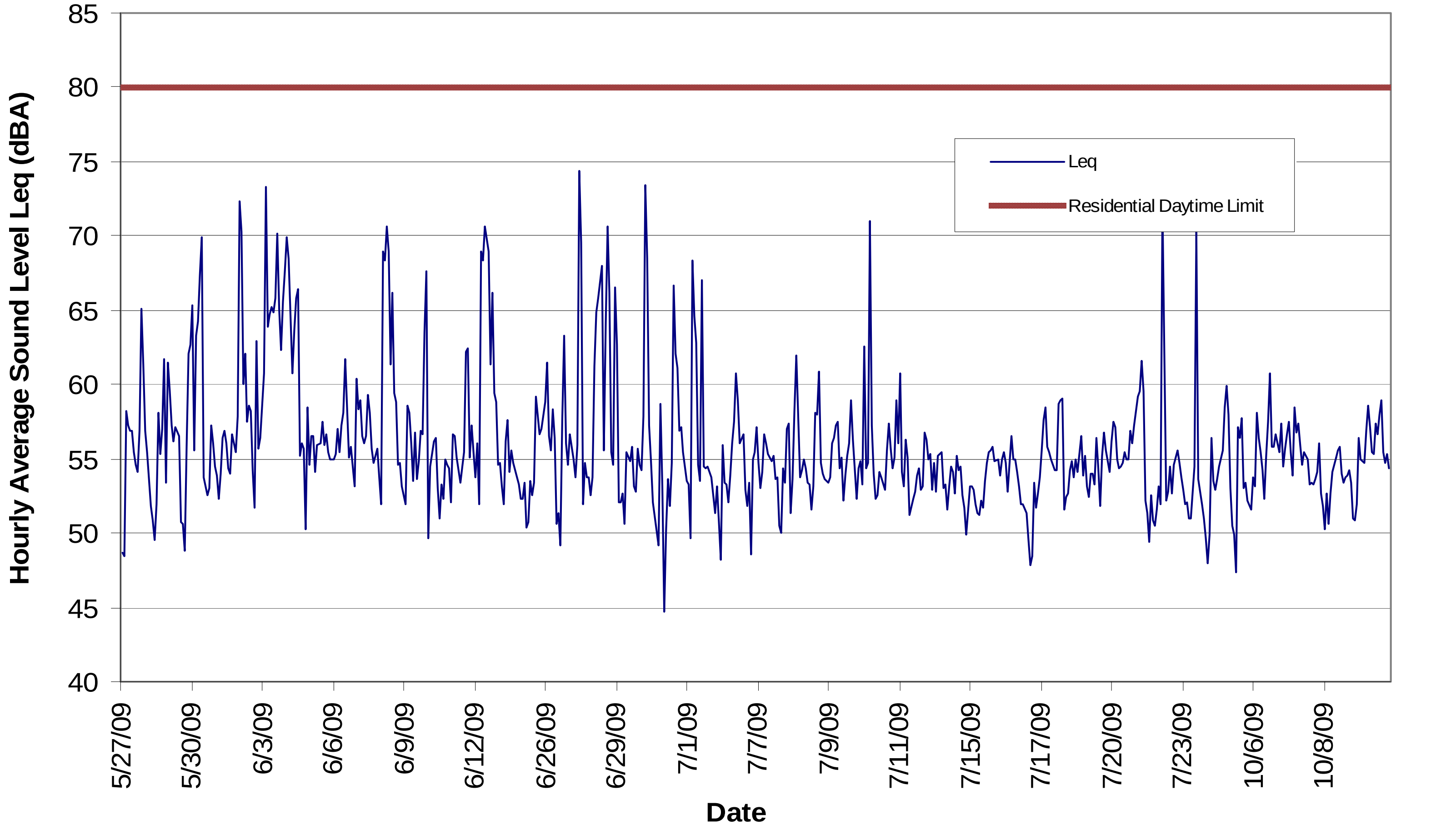


Figure 71
Location DRC-E1901-RR-00057
CU 17 East Griffin Island Nighttime

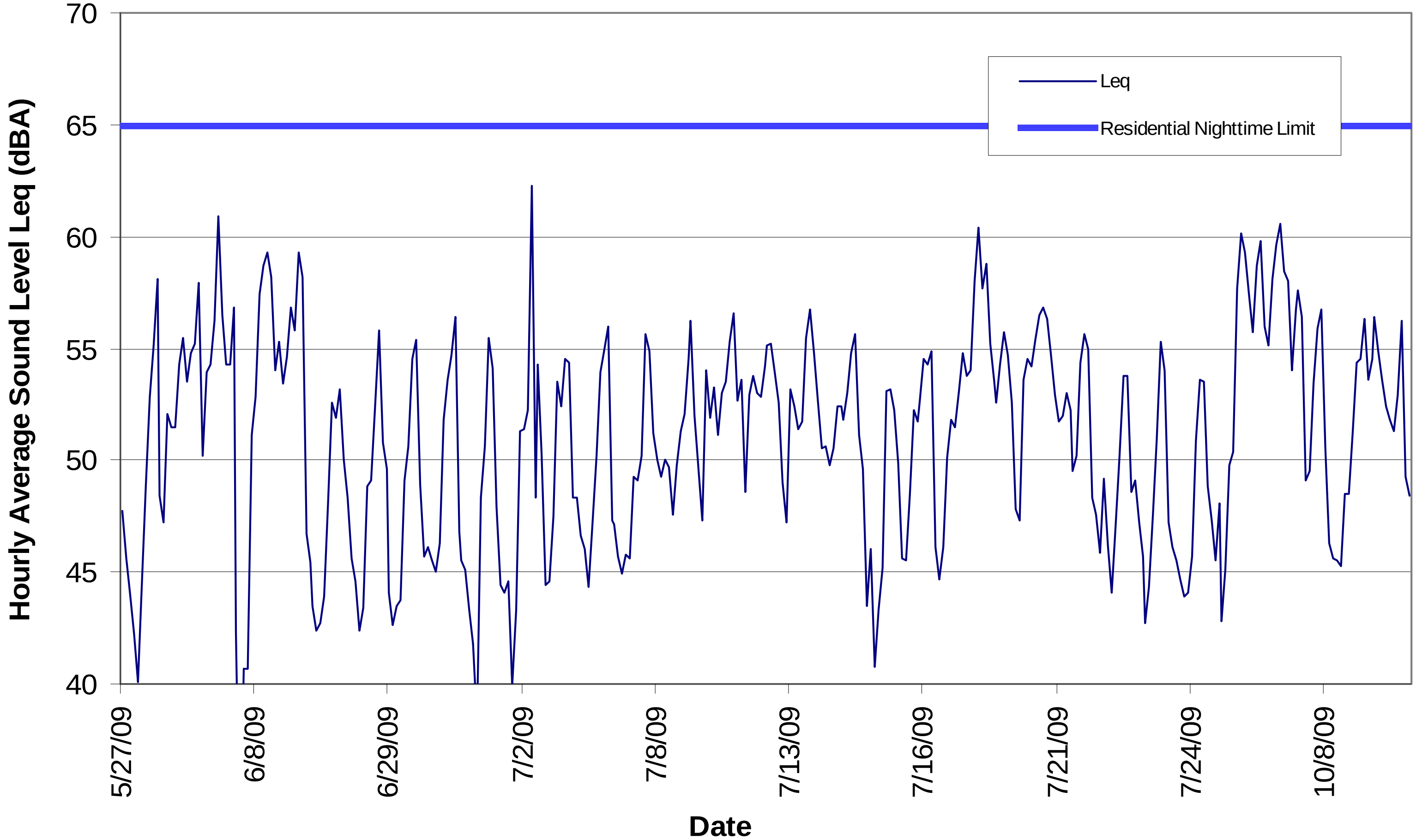


Figure 72
Location DRC-E1901-RR-00023
CU 18 Daytime

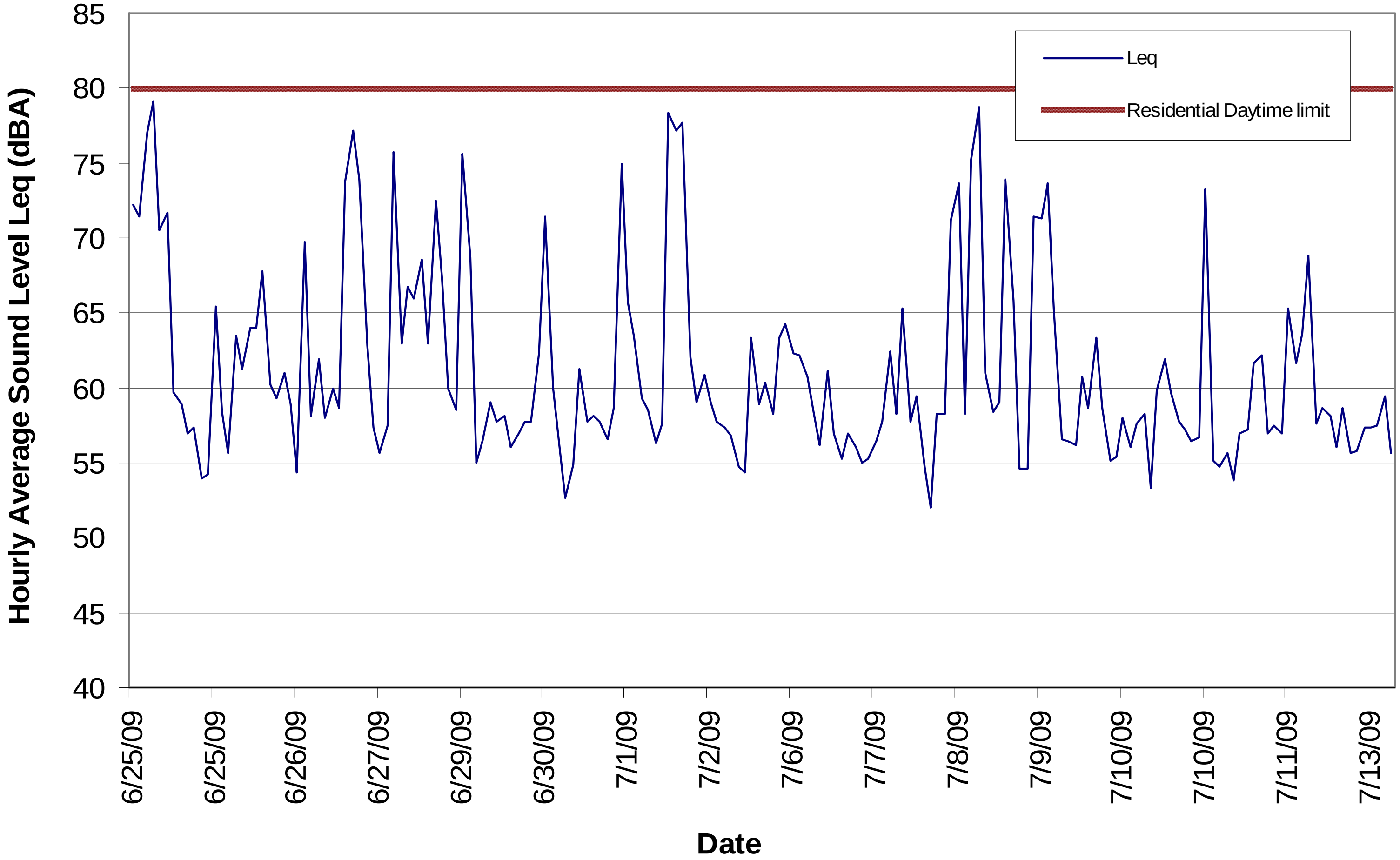


Figure 73
Location DRC-E1901-RR-00023
CU 18 Nighttime

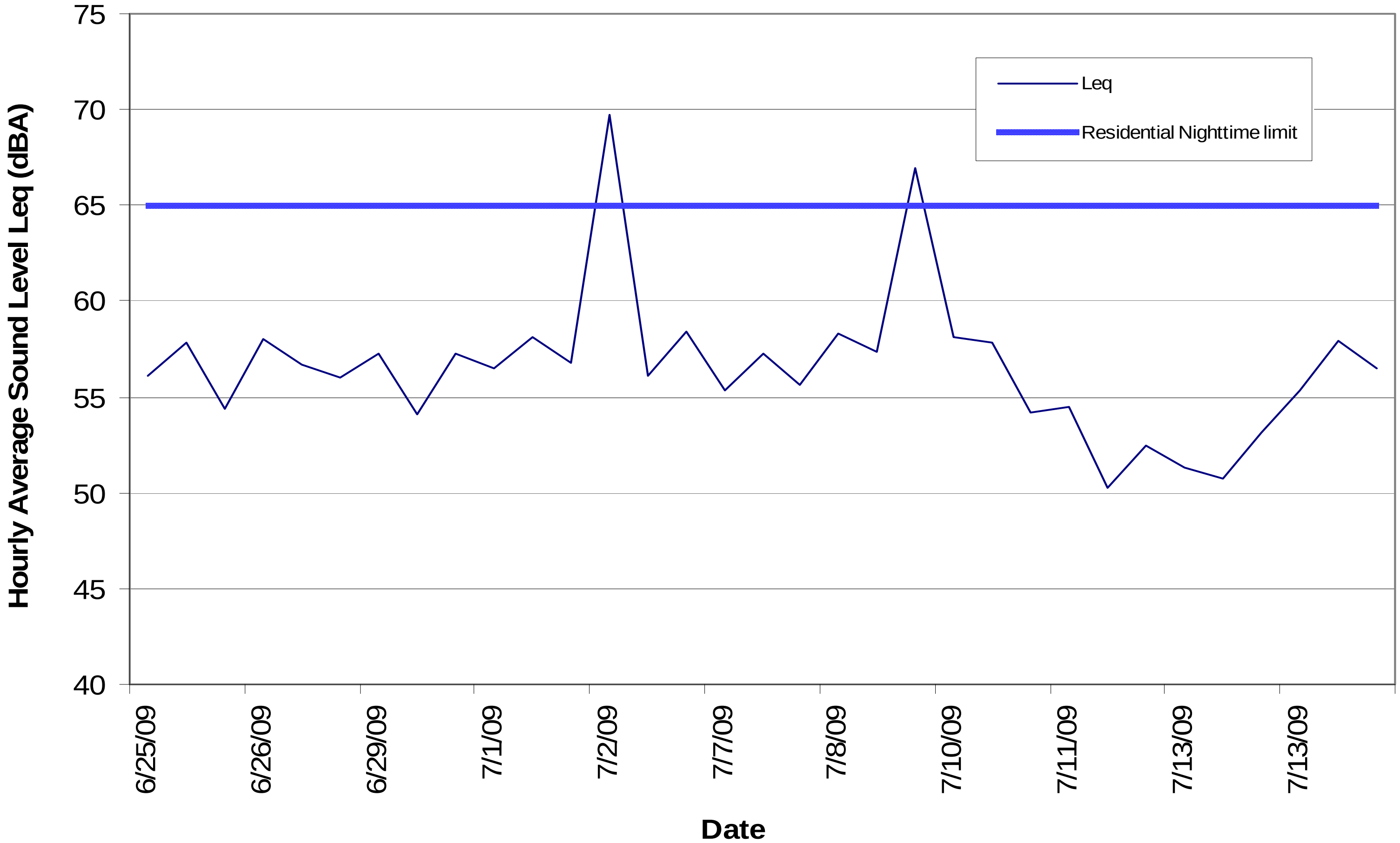


Figure 74
Location DRC-E1900-RR-00033
CU 18 East Griffin Island Daytime

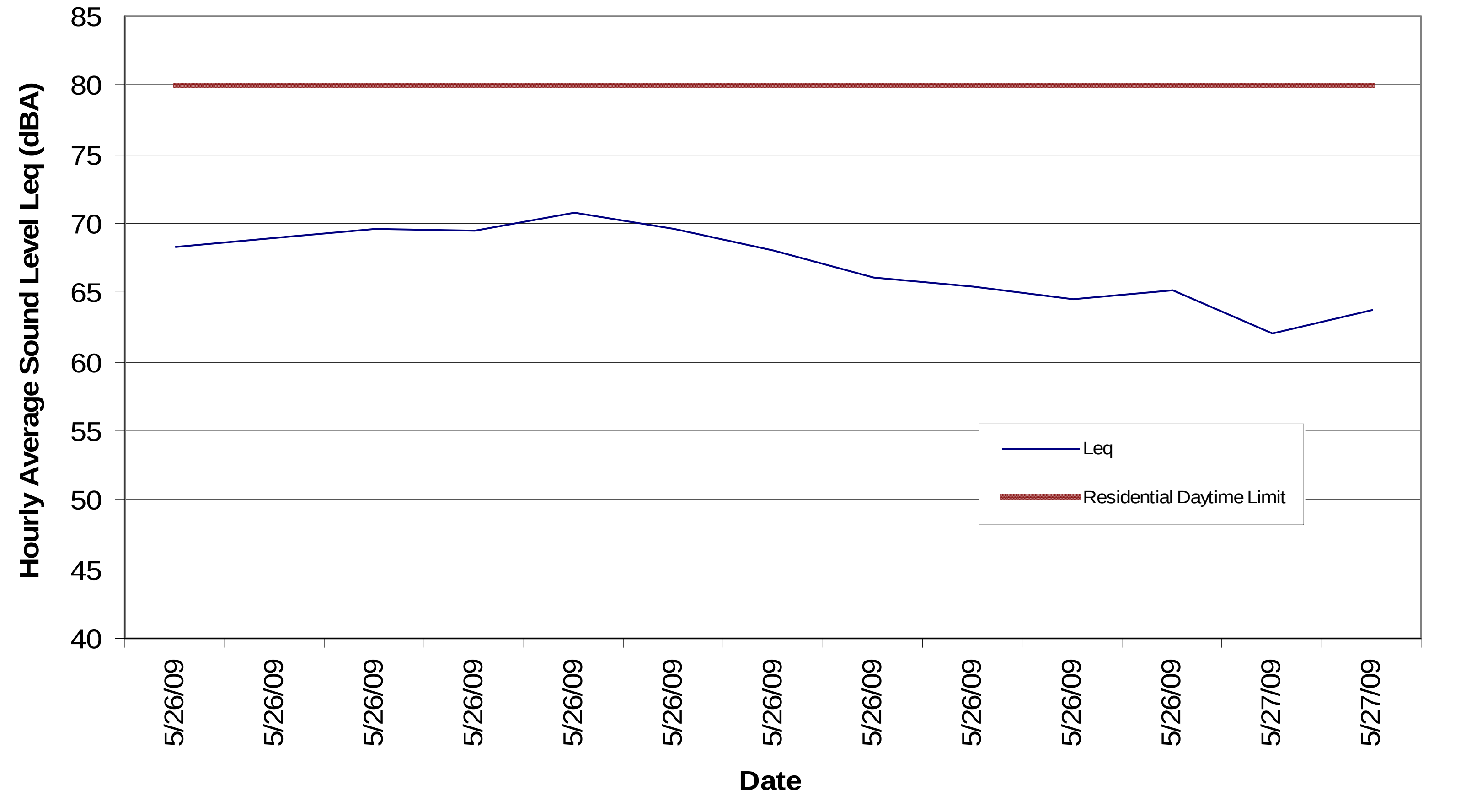
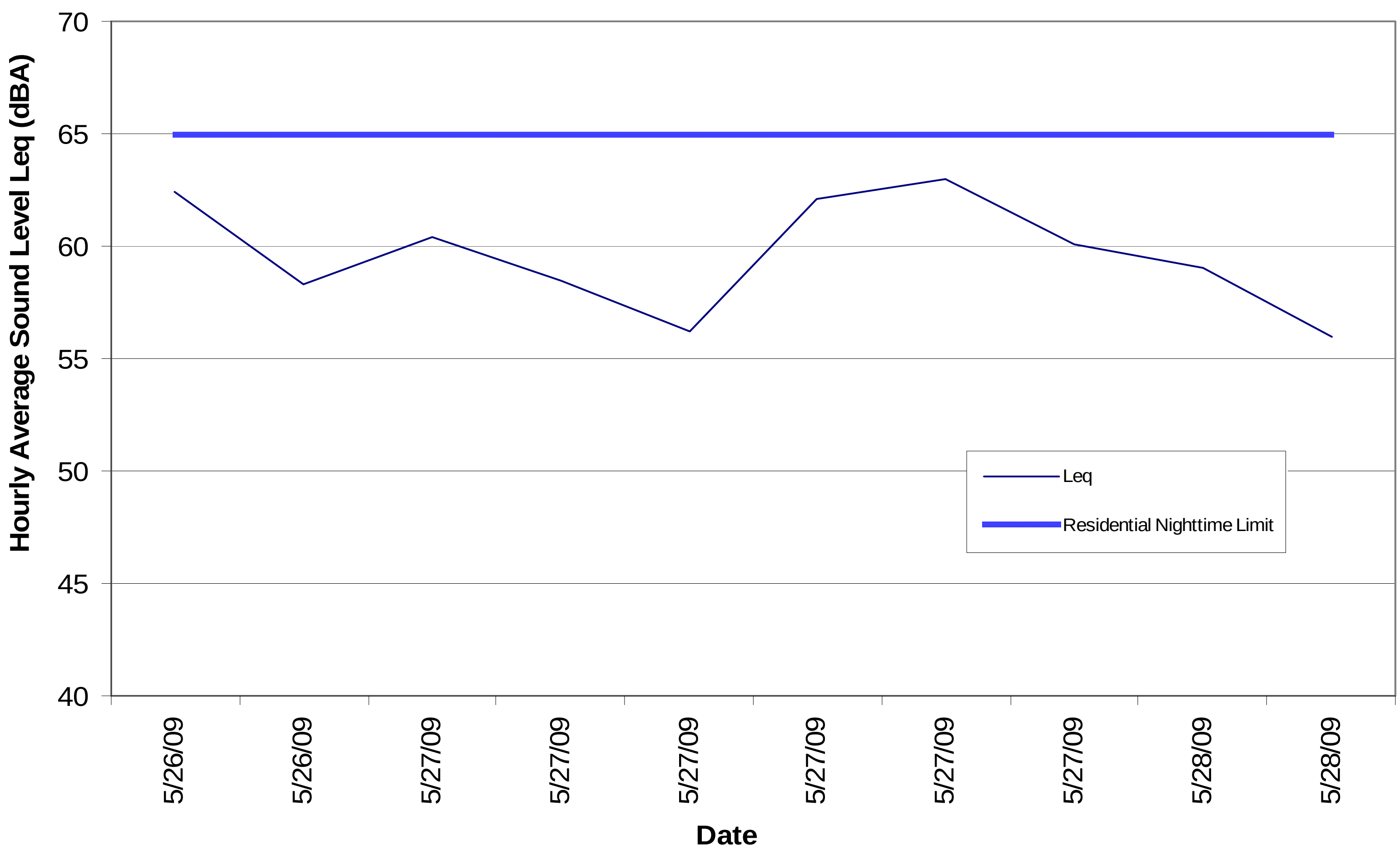


Figure 75
Location DRC-E1900-RR-00033
CU 18 East Griffin Island Nighttime



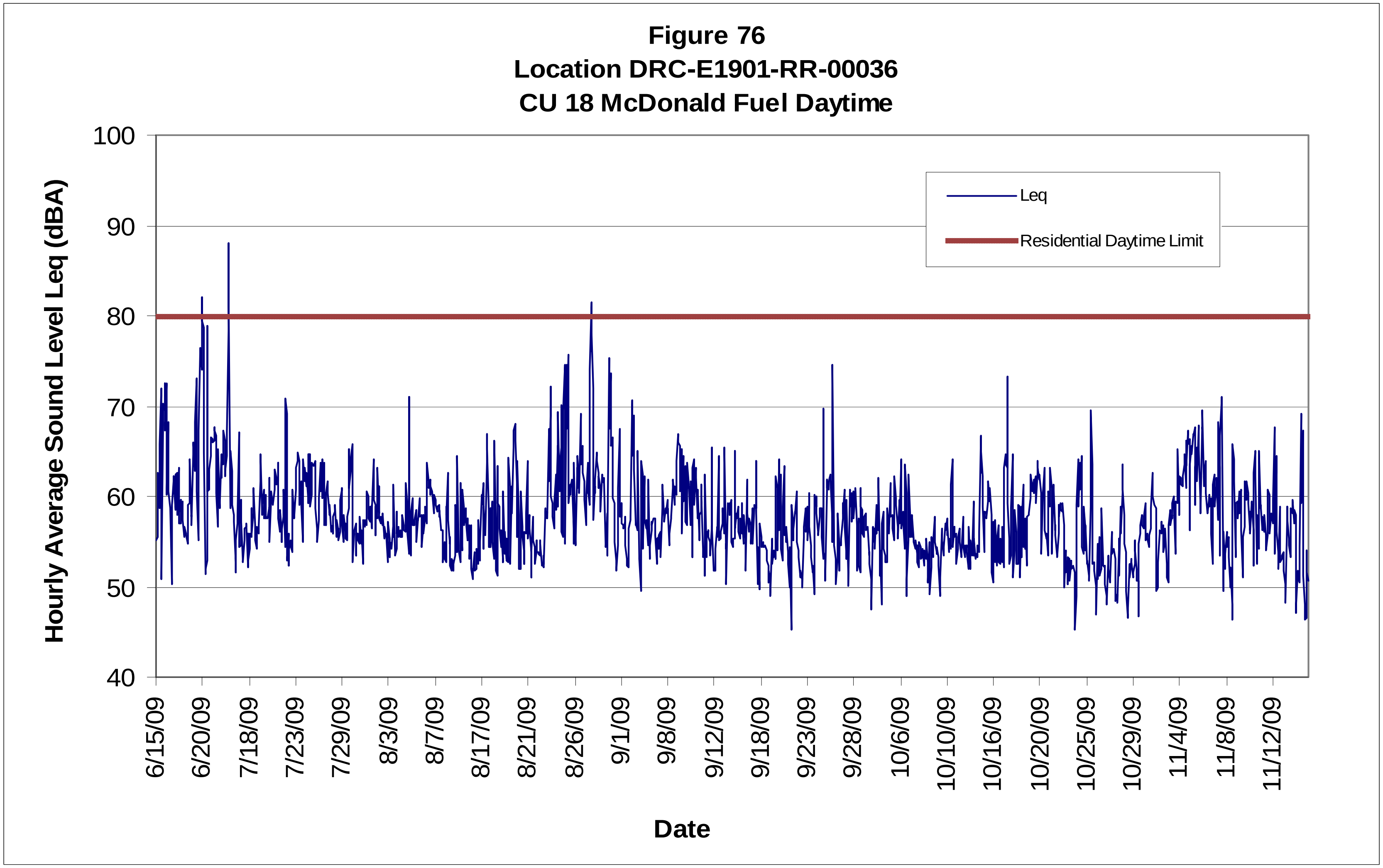


Figure 76
Location DRC-E1901-RR-00036
CU 18 McDonald Fuel Daytime
Hourly Average Sound Level Leq (dBA)
100
90
80
70
60
50
40
Leq
Residential Daytime Limit
6/15/09
6/20/09
7/18/09
7/23/09
7/29/09
8/3/09
8/7/09
8/17/09
8/21/09
8/26/09
9/1/09
9/8/09
9/12/09
9/18/09
9/23/09
9/28/09
10/6/09
10/10/09
10/16/09
10/20/09
10/25/09
10/29/09
11/4/09
11/8/09
11/12/09
Date

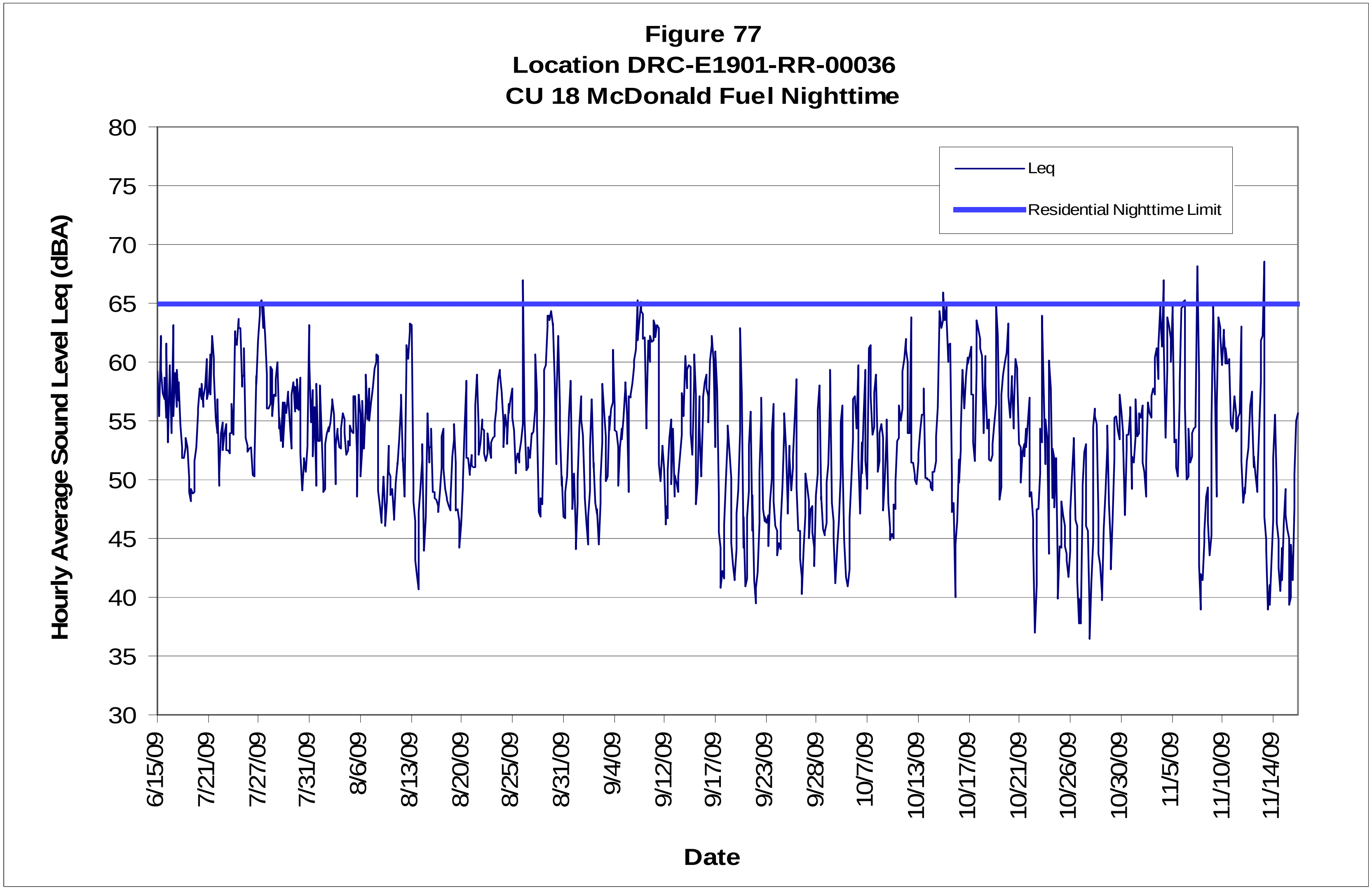


Figure 77
Location DRC-E1901-RR-00036
CU 18 McDonald Fuel Nighttime
Hourly Average Sound Level Leq (dBA)
80
75
70
65
60
55
50
45
40
35
30
Leq
Residential Nighttime Limit
6/15/09
7/21/09
7/27/09
7/31/09
8/6/09
8/13/09
8/20/09
8/25/09
8/31/09
9/4/09
9/12/09
9/17/09
9/23/09
9/28/09
10/7/09
10/13/09
10/17/09
10/21/09
10/26/09
10/30/09
11/5/09
11/10/09
11/14/09
Date

Figure 78
Location DRC-C1901-RR-00066
CU 18 Griffin Island Daytime

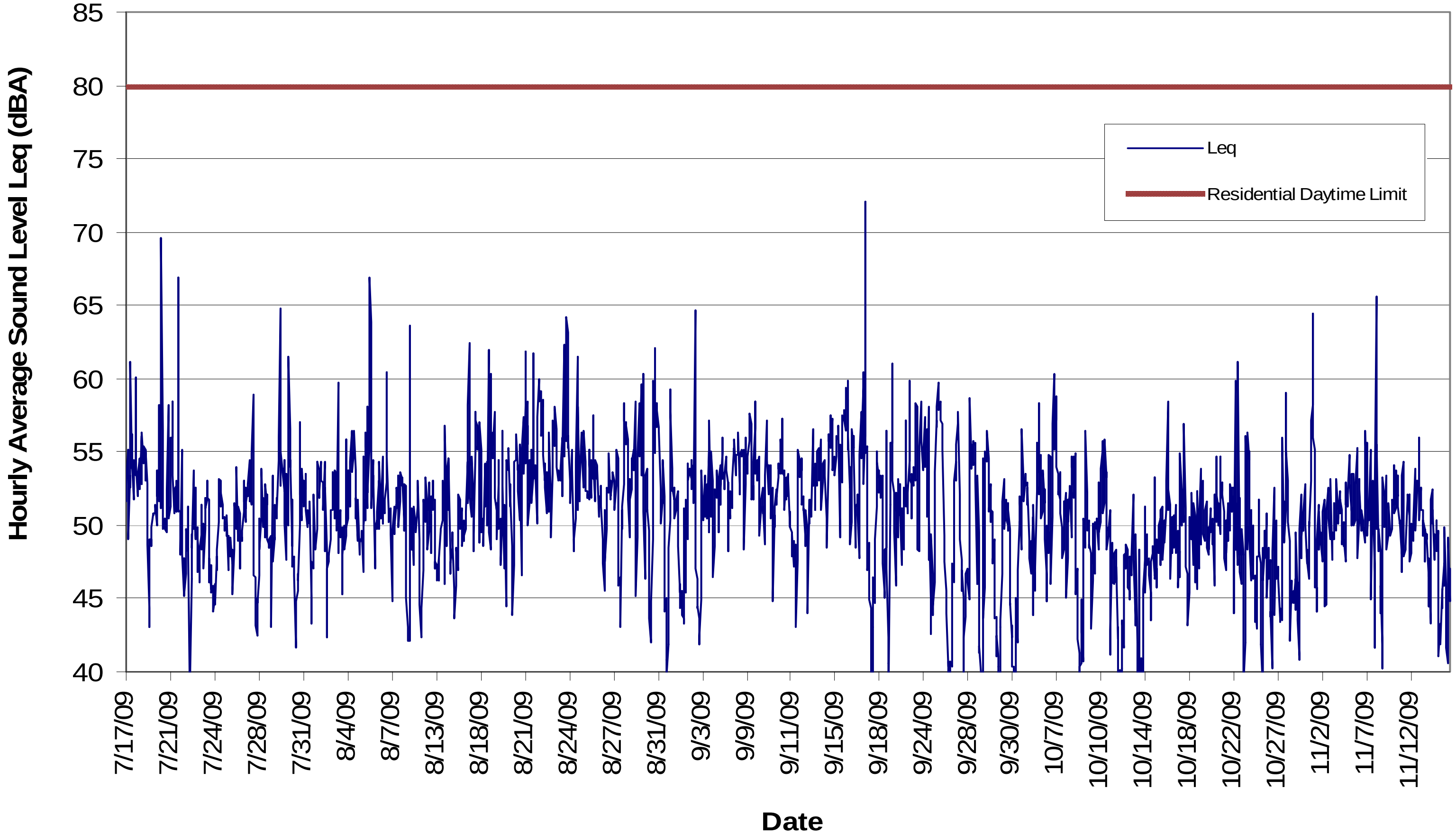


Figure 79
Location DRC-C1901-RR-00066
CU 18 Griffin Island Nighttime

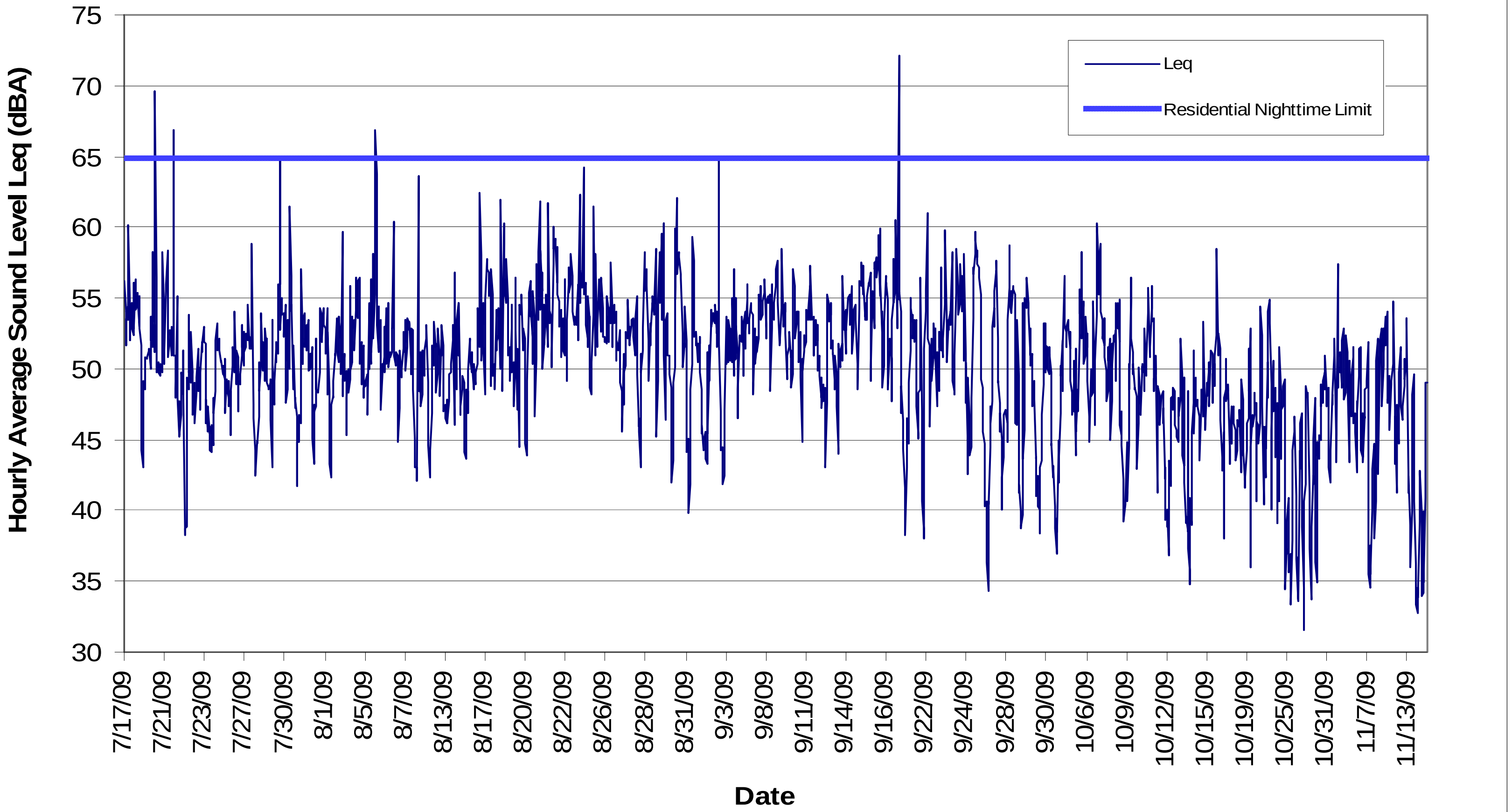


Figure 80
Location DRC-C1944-UR-00040
Rogers Island Daytime

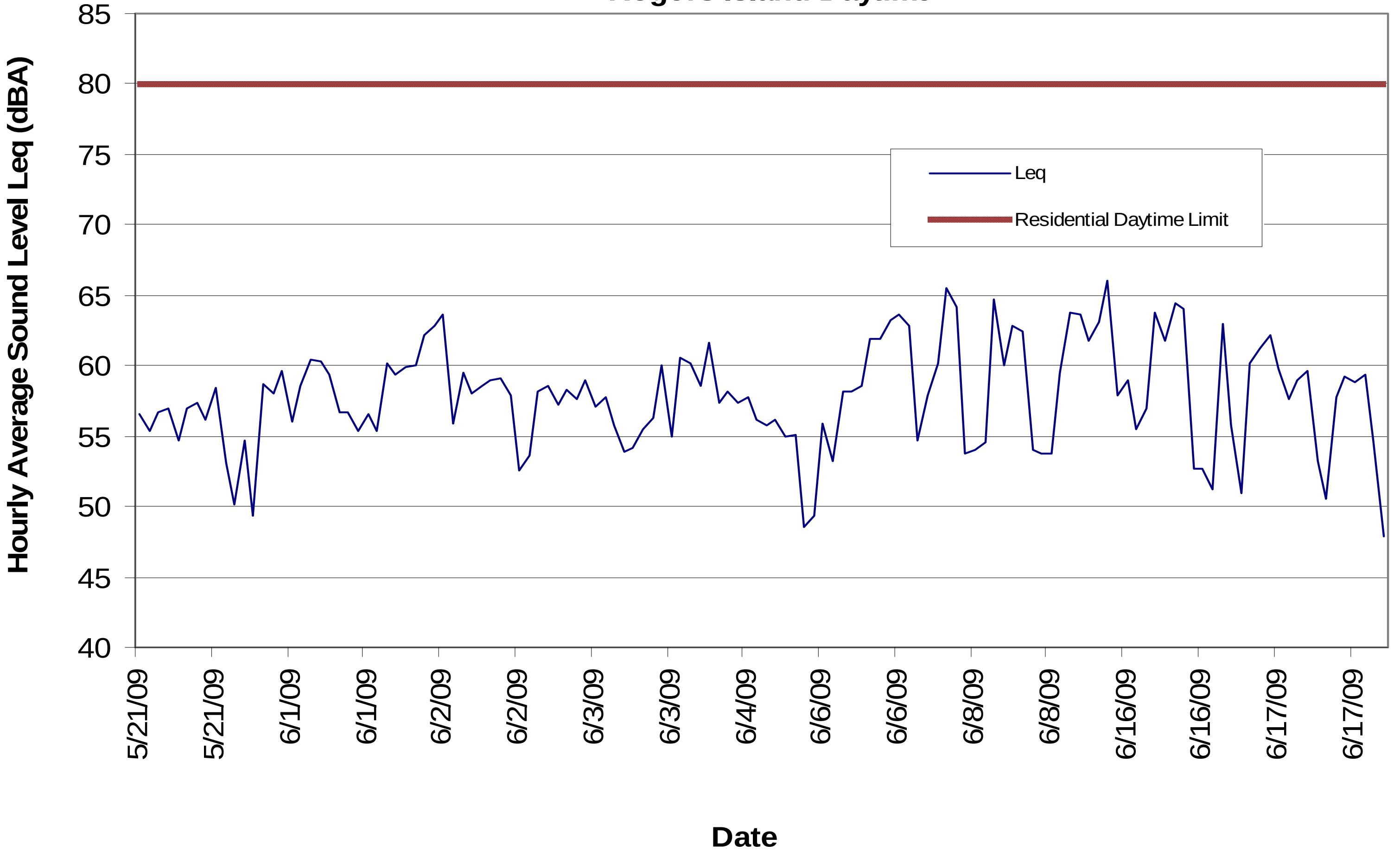


Figure 81
Location DRC-C1944-UR-00040
Rogers Island Nighttime

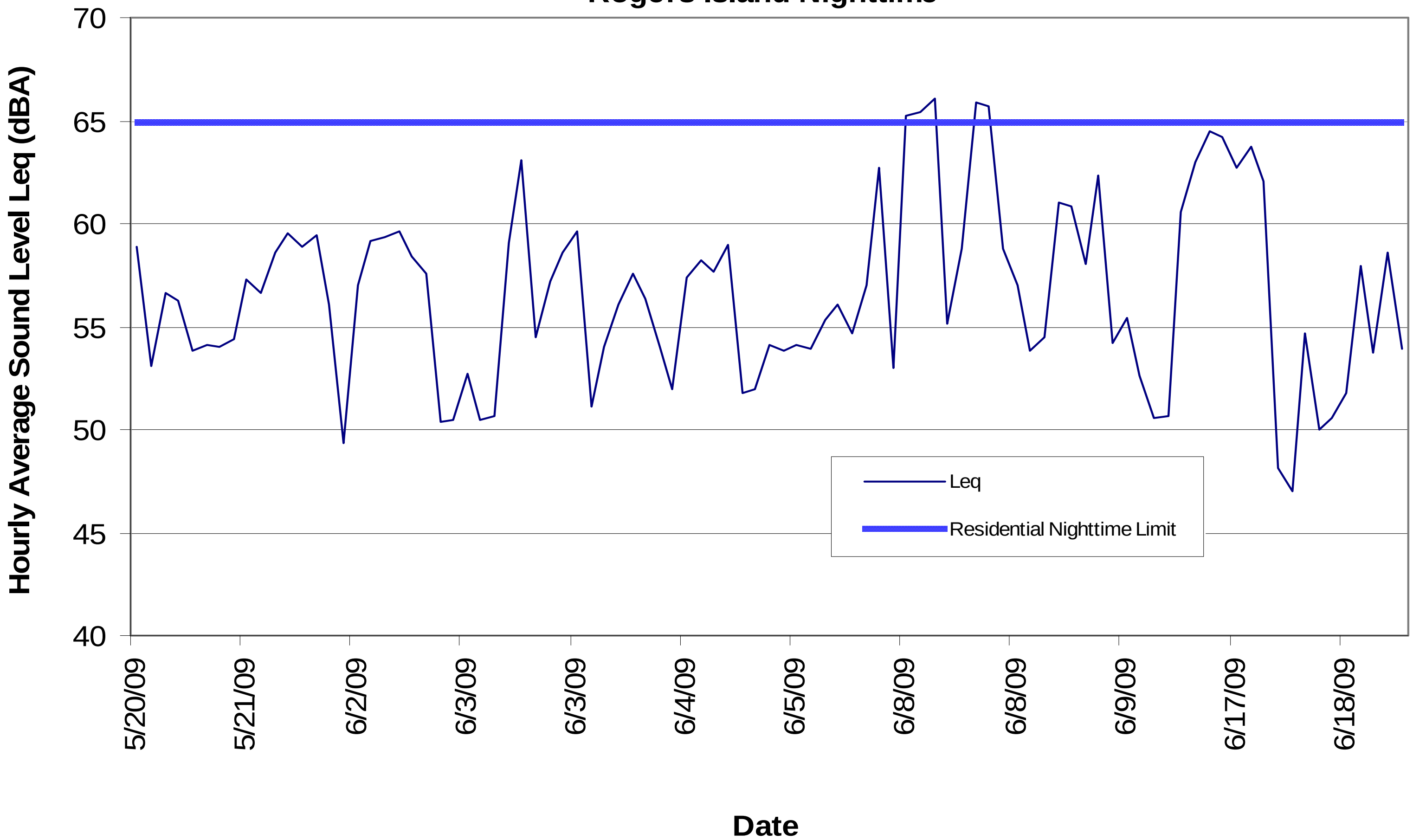


Figure 82
Location DRC-W1937-CI-00039
CU 12 South Rogers Island Commercial/Industrial

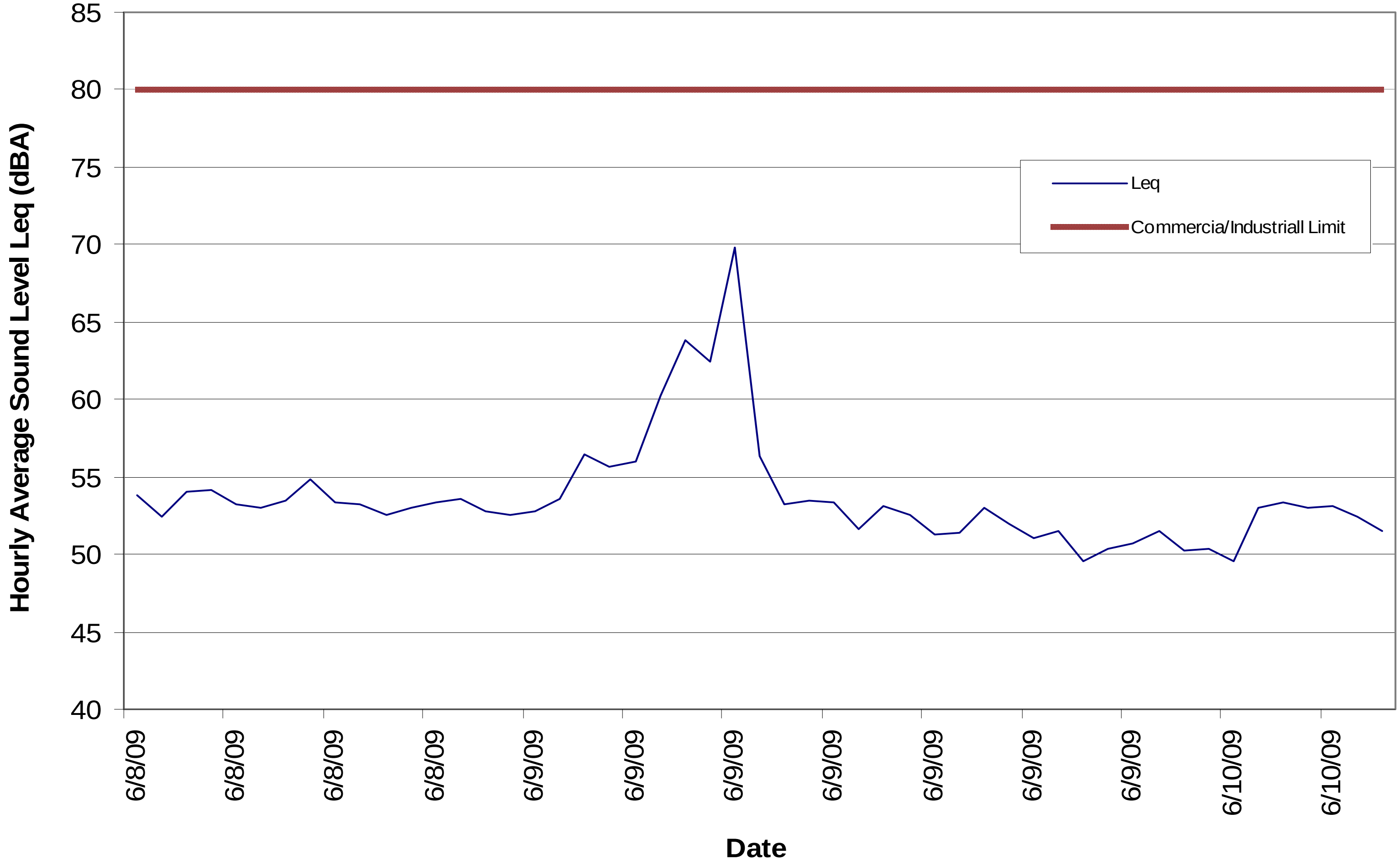
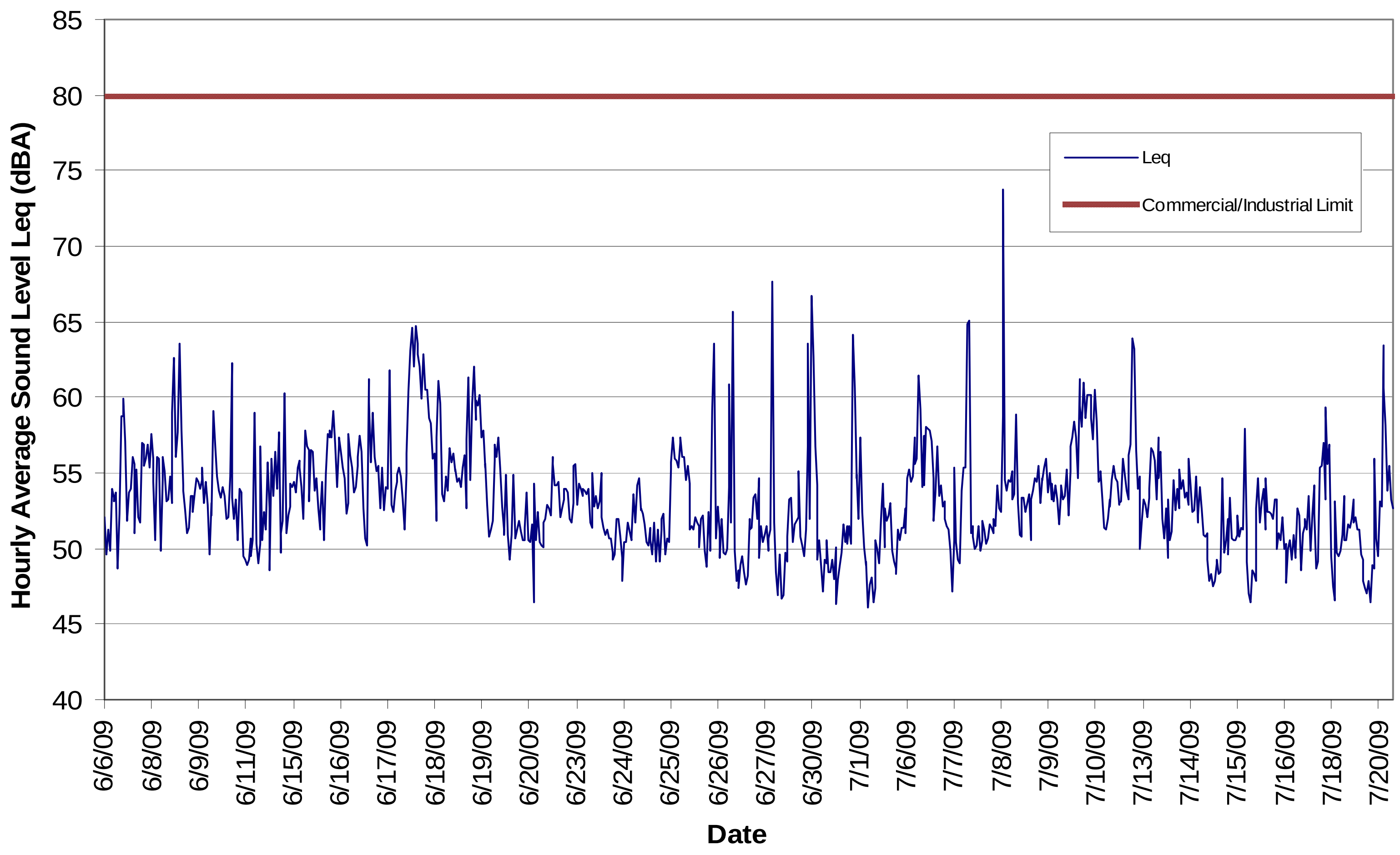


Figure 83
Location DRC-E1940-CI-00024
CU 2 East Bank Commercial/Industrial



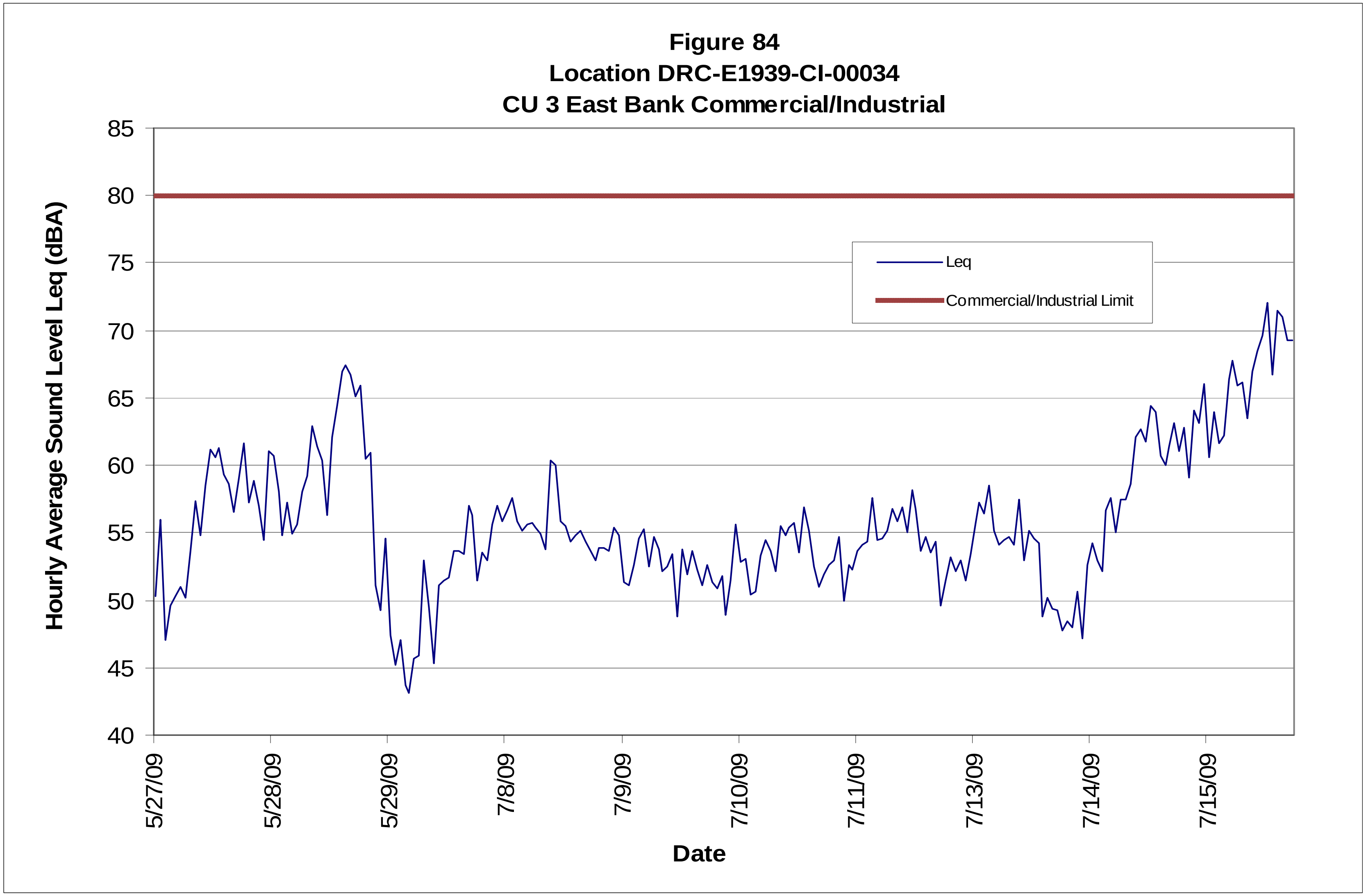


Figure 84
Location DRC-E1939-CI-00034
CU 3 East Bank Commercial/Industrial
Hourly Average Sound Level Leq (dBA)
85
80
75
70
65
60
55
50
45
40
Leq
Commercial/Industrial Limit
5/27/09
5/28/09
5/29/09
7/8/09
7/9/09
7/10/09
7/11/09
7/13/09
7/14/09
7/15/09
Date

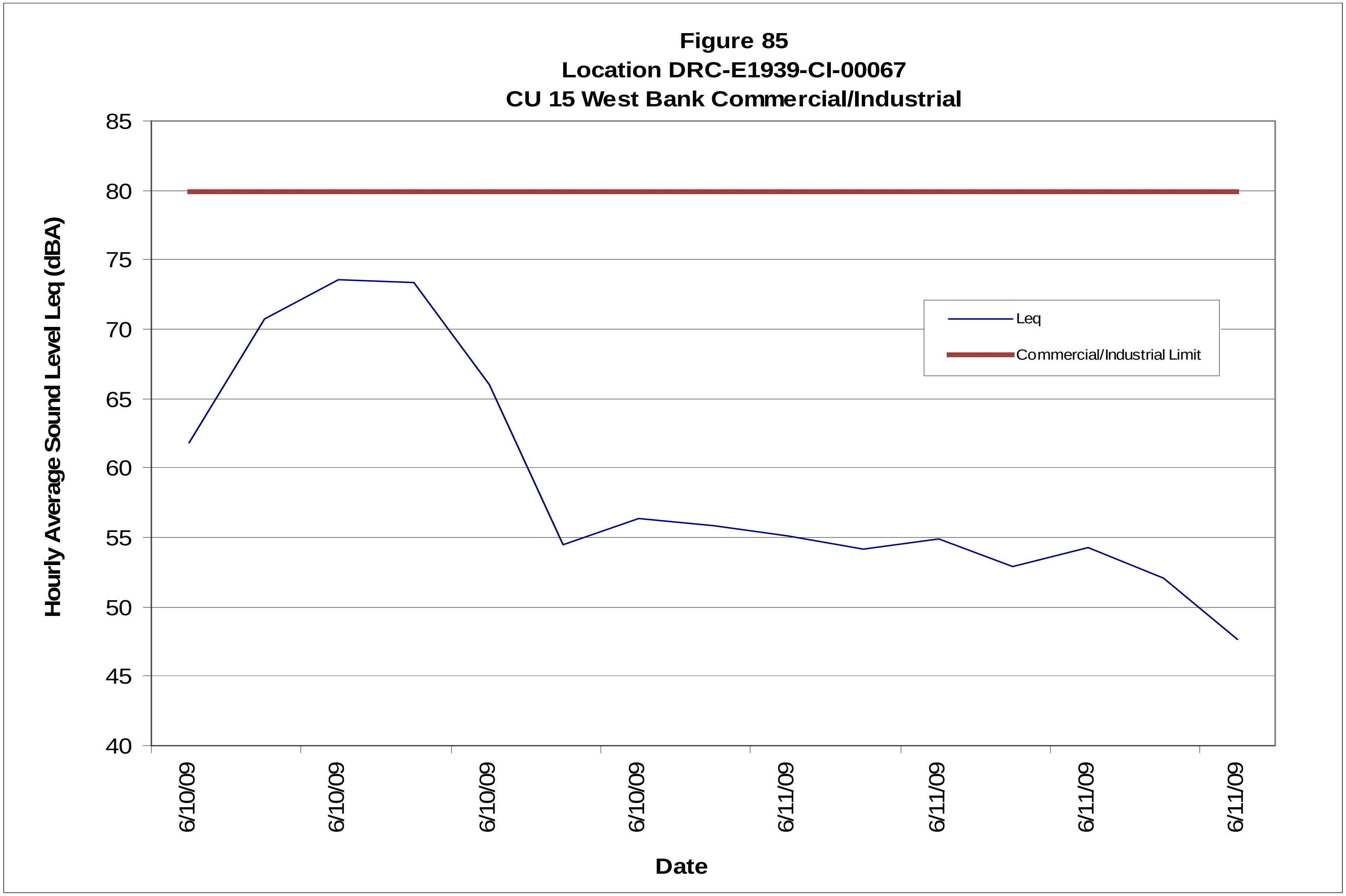


Figure 85
Location DRC-E1939-CI-00067
CU 15 West Bank Commercial/Industrial

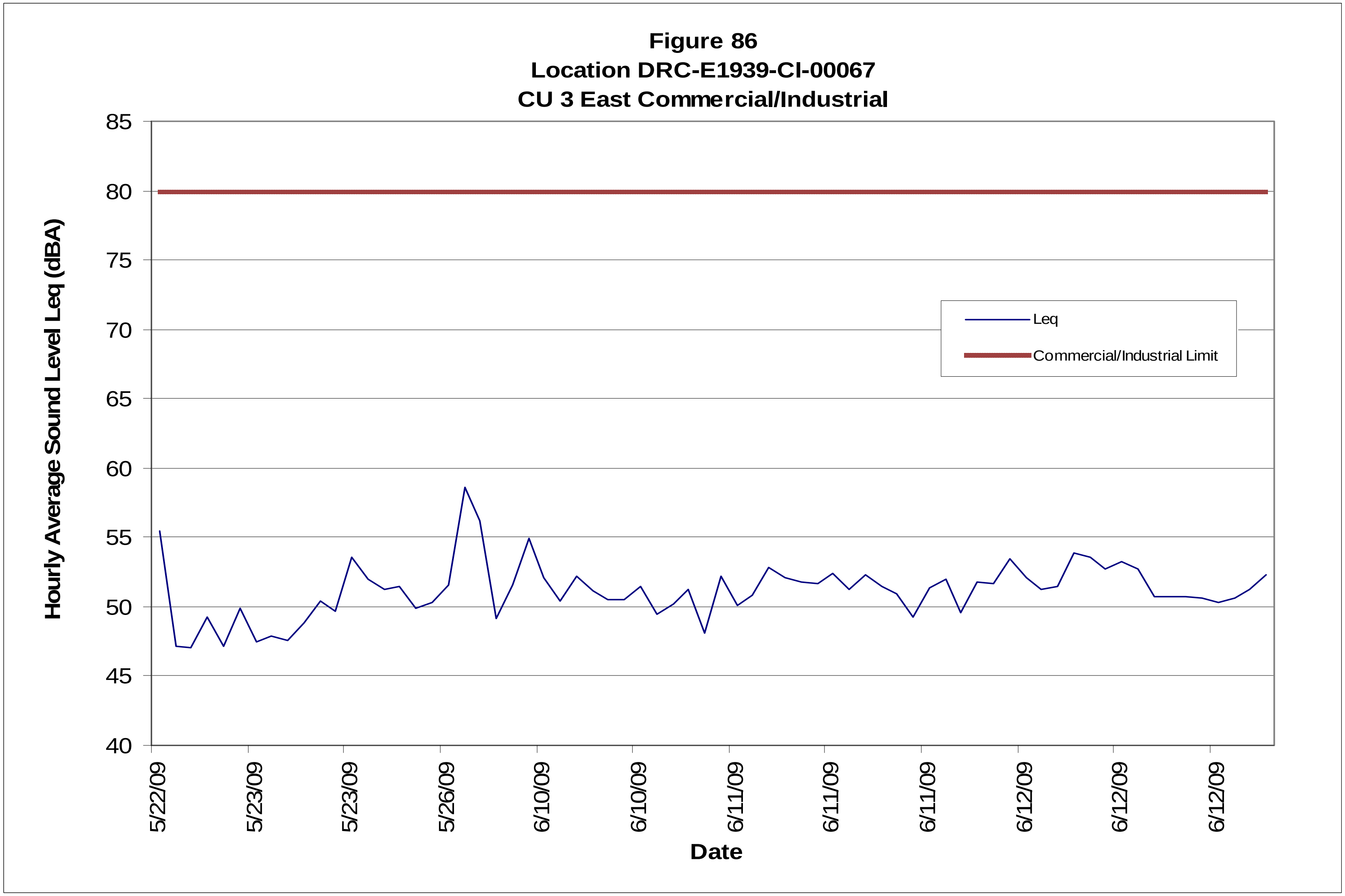


Figure 86
Location DRC-E1939-CI-00067
CU 3 East Commercial/Industrial
Hourly Average Sound Level Leq (dBA)
85
80
75
70
65
60
55
50
45
40
Leq
Commercial/Industrial Limit
5/22/09
5/23/09
5/23/09
5/26/09
6/10/09
6/10/09
6/11/09
6/11/09
6/11/09
6/12/09
6/12/09
6/12/09
Date

Figure 87

Sediment Processing Facility Noise Monitoring for Phase 1 Dredging

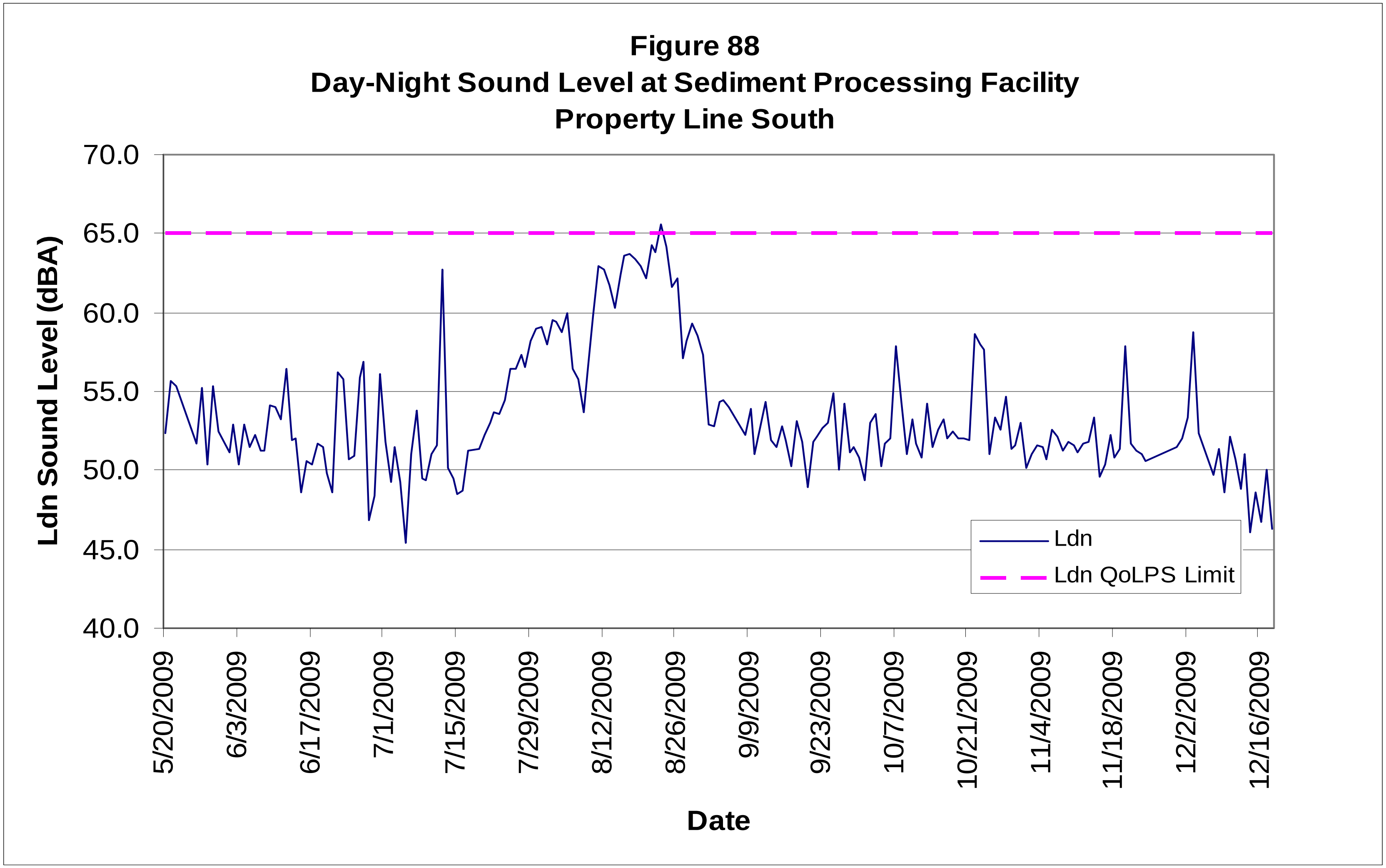
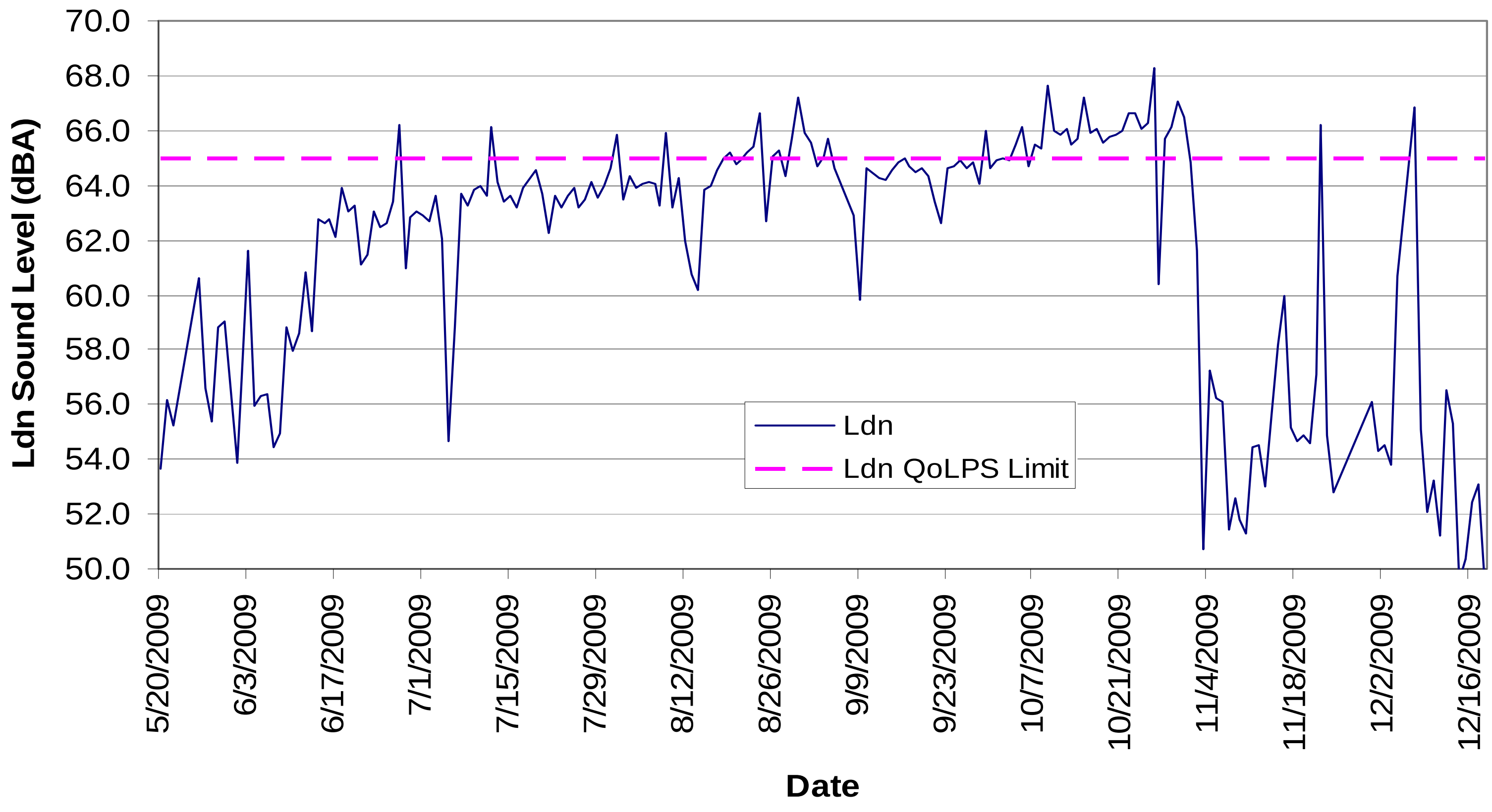


Figure 88
Day-Night Sound Level at Sediment Processing Facility
Property Line South
Ldn Sound Level (dBA)
70.0
65.0
60.0
55.0
50.0
45.0
40.0
5/20/2009
6/3/2009
6/17/2009
7/1/2009
7/15/2009
7/29/2009
8/12/2009
8/26/2009
9/9/2009
9/23/2009
10/7/2009
10/21/2009
11/4/2009
11/18/2009
12/2/2009
12/16/2009
Date
Ldn
Ldn QoLPS Limit

Figure 89
Day-Night Sound Level atSediment Processing Facility
Golf Course



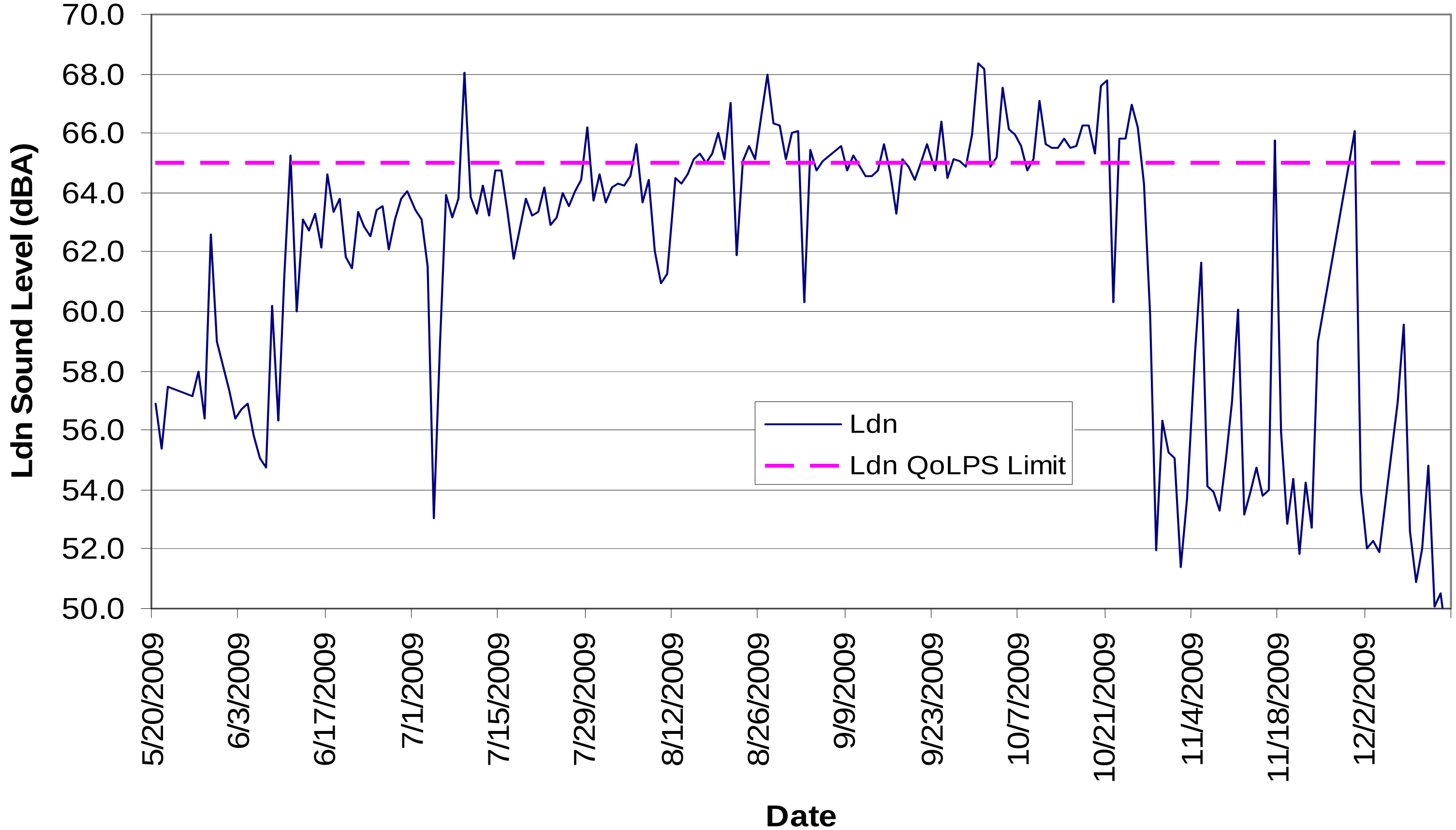


Figure 90
Day-Night Sound Level at Sediment Processing Facility
Golf Course Residence

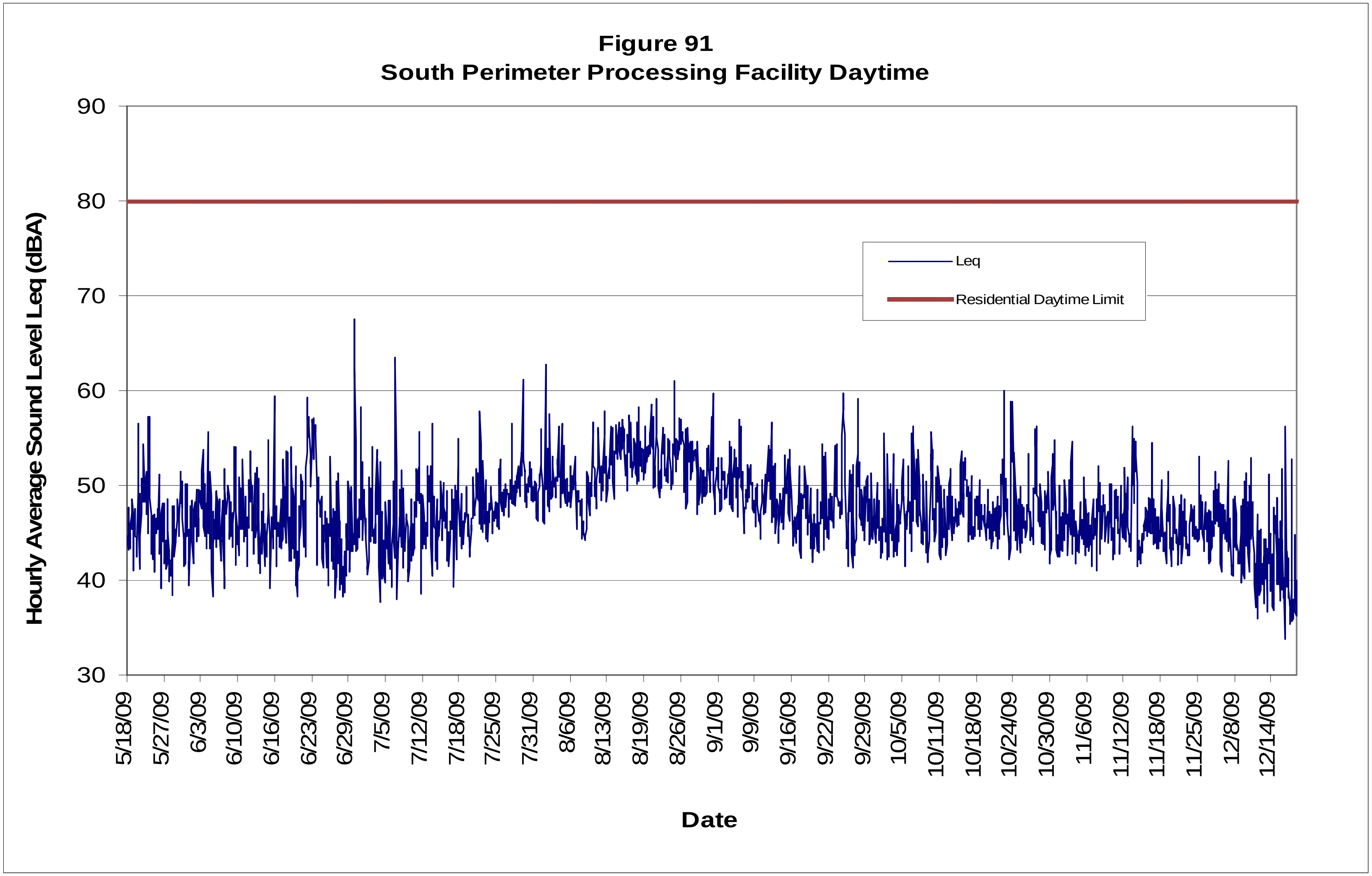


Figure 91
South Perimeter Processing Facility Daytime
Hourly Average Sound Level Leq (dBA)
90
80
70
60
50
40
30
Leq
Residential Daytime Limit
5/18/09
5/27/09
6/3/09
6/10/09
6/16/09
6/23/09
6/29/09
7/5/09
7/12/09
7/18/09
7/25/09
7/31/09
8/6/09
8/13/09
8/19/09
8/26/09
9/1/09
9/9/09
9/16/09
9/22/09
9/29/09
10/5/09
10/11/09
10/18/09
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11/12/09
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11/25/09
12/8/09
12/14/09
Date

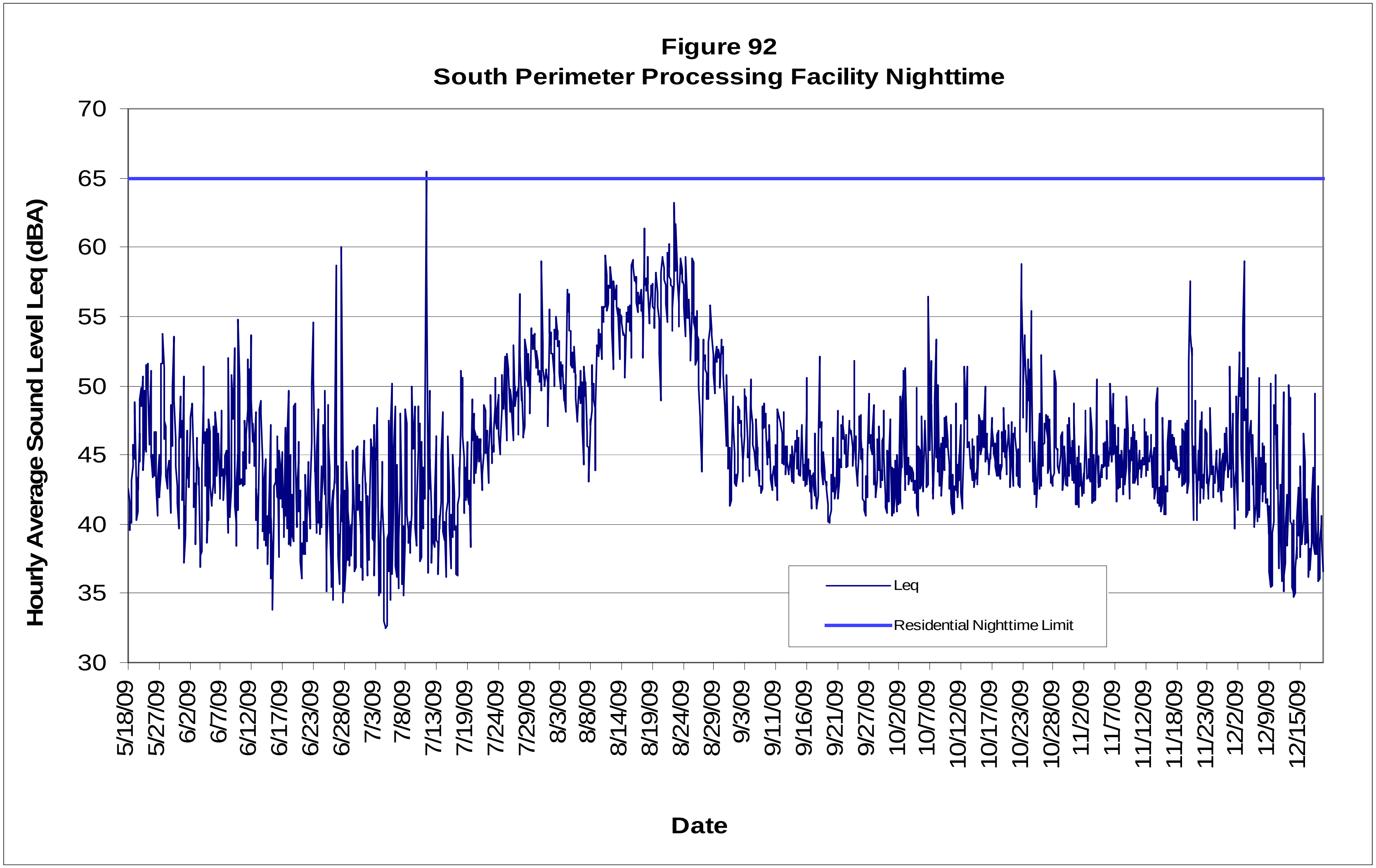

Figure 92
South Perimeter Processing Facility Nighttime

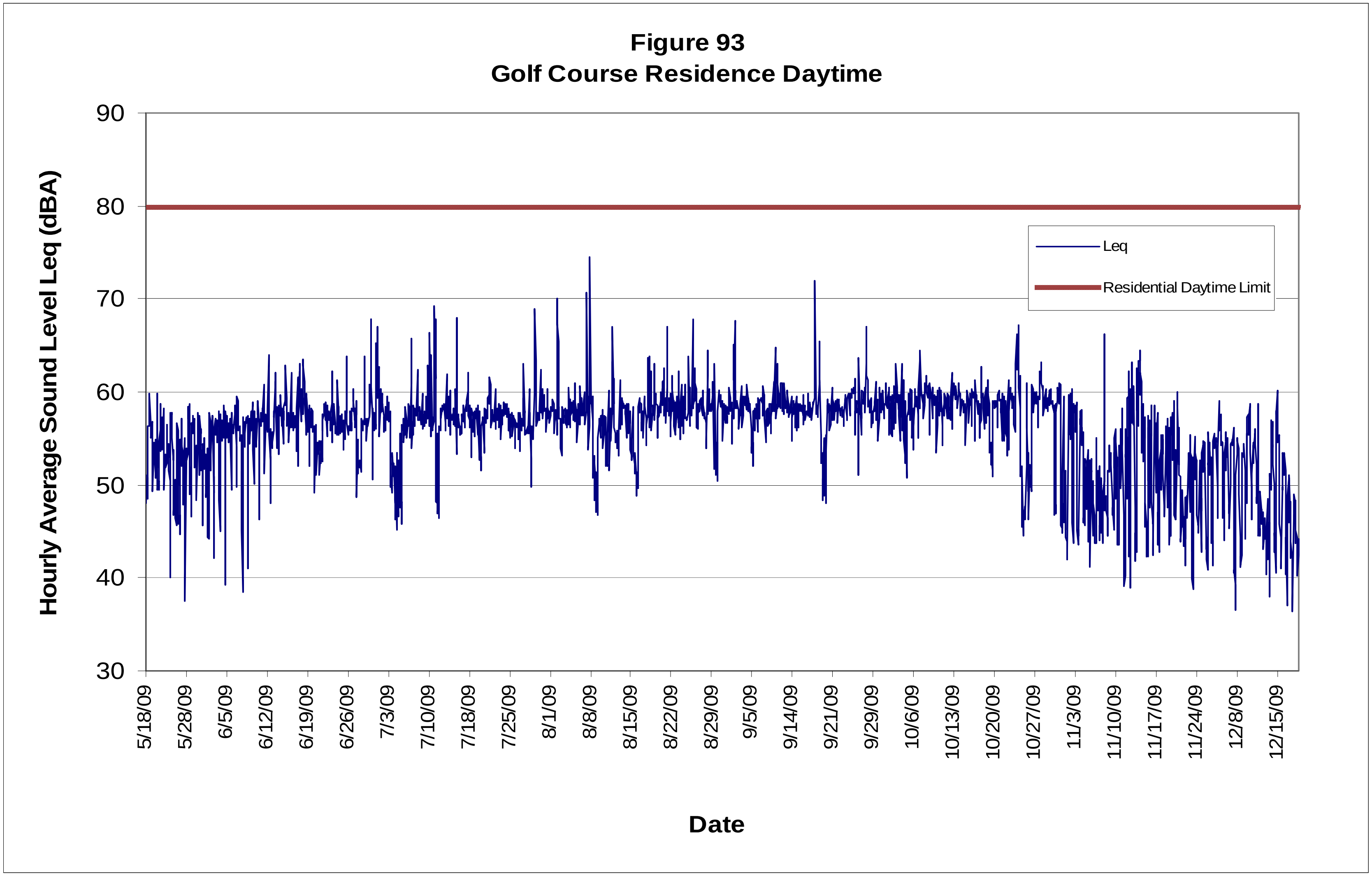
Figure 93
Golf Course Residence Daytime
Hourly Average Sound Level Leq (dBA)
90
80
70
60
50
40
30
Leq
Residential Daytime Limit
5/18/09
5/28/09
6/5/09
6/12/09
6/19/09
6/26/09
7/3/09
7/10/09
7/18/09
7/25/09
8/1/09
8/8/09
8/15/09
8/22/09
8/29/09
9/5/09
9/14/09
9/21/09
9/29/09
10/6/09
10/13/09
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12/8/09
12/15/09
Date

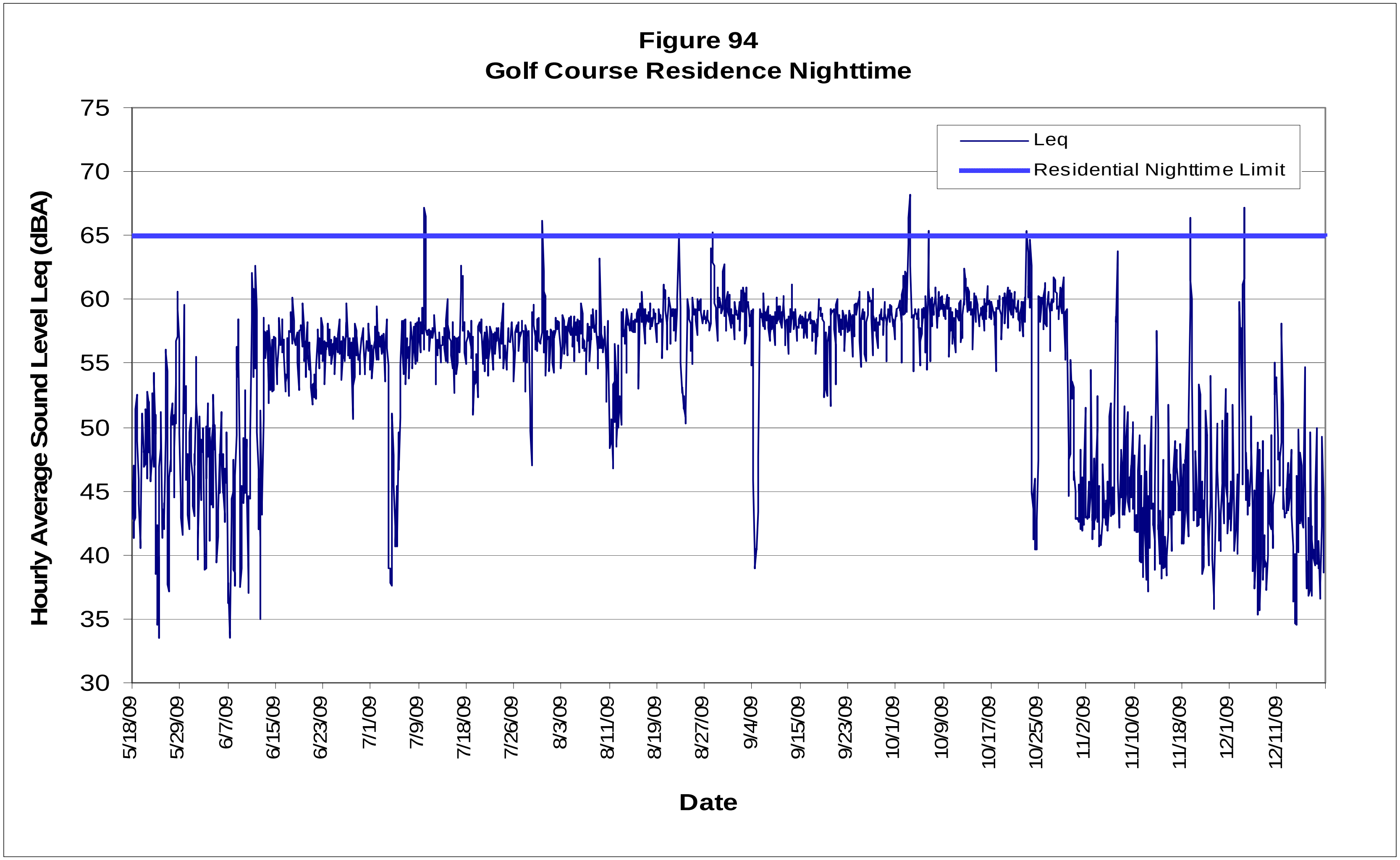

Figure 94
Golf Course Residence Nighttime
Hourly Average Sound Level Leq (dBA)
75
70
65
60
55
50
45
40
35
30
Leq
Residential Nighttime Limit
5/18/09
5/29/09
6/7/09
6/15/09
6/23/09
7/1/09
7/9/09
7/18/09
7/26/09
8/3/09
8/11/09
8/19/09
8/27/09
9/4/09
9/15/09
9/23/09
10/1/09
10/9/09
10/17/09
10/25/09
11/2/09
11/10/09
11/18/09
12/1/09
12/11/09
Date

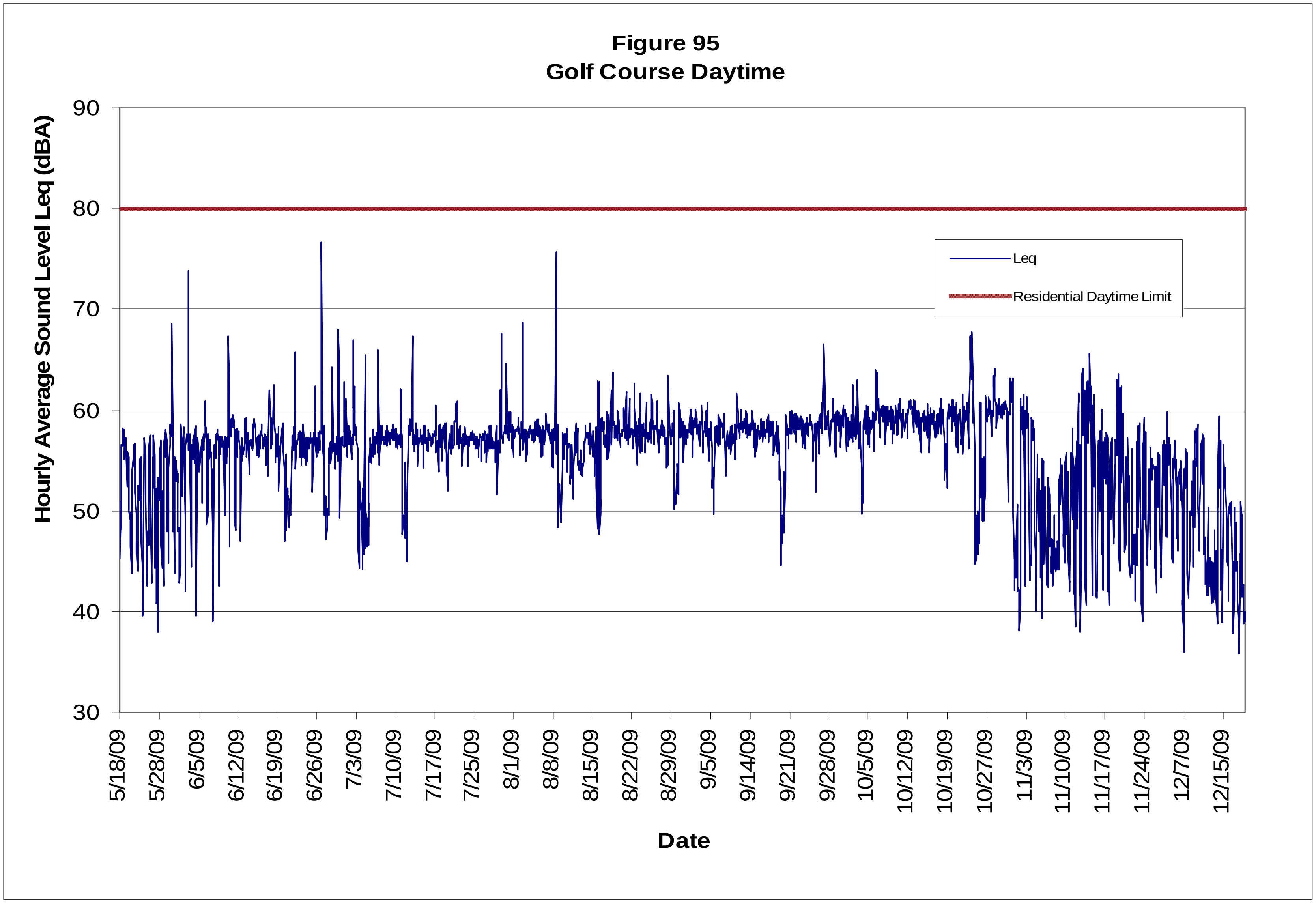
Figure 95
Golf Course Daytime
Hourly Average Sound Level Leq (dBA)
90
80
70
60
50
40
30
Leq
Residential Daytime Limit
5/18/09
5/28/09
6/5/09
6/12/09
6/19/09
6/26/09
7/3/09
7/10/09
7/17/09
7/25/09
8/1/09
8/8/09
8/15/09
8/22/09
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9/5/09
9/14/09
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9/28/09
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12/7/09
12/15/09
Date

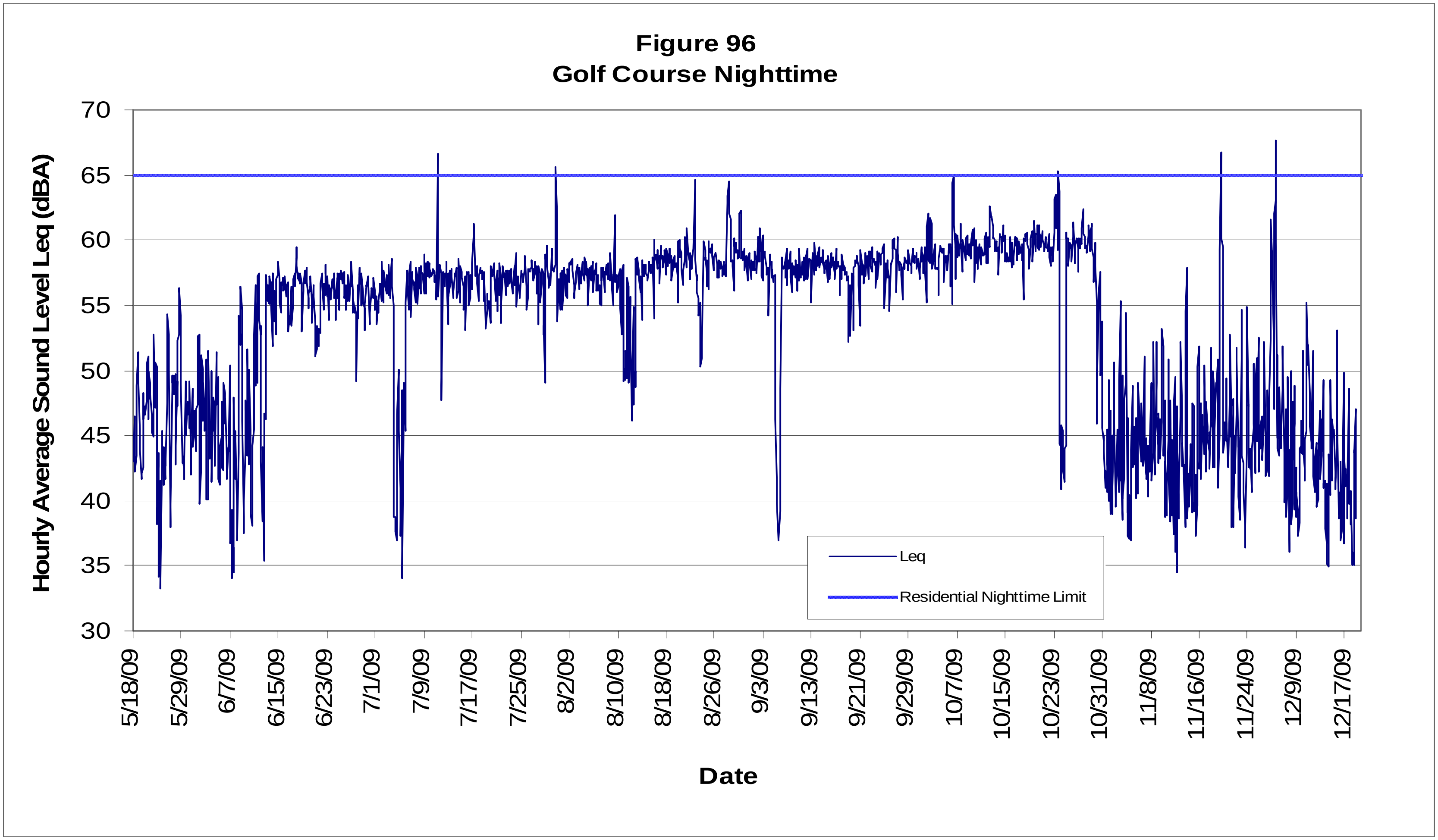

Figure 96
Golf Course Nighttime

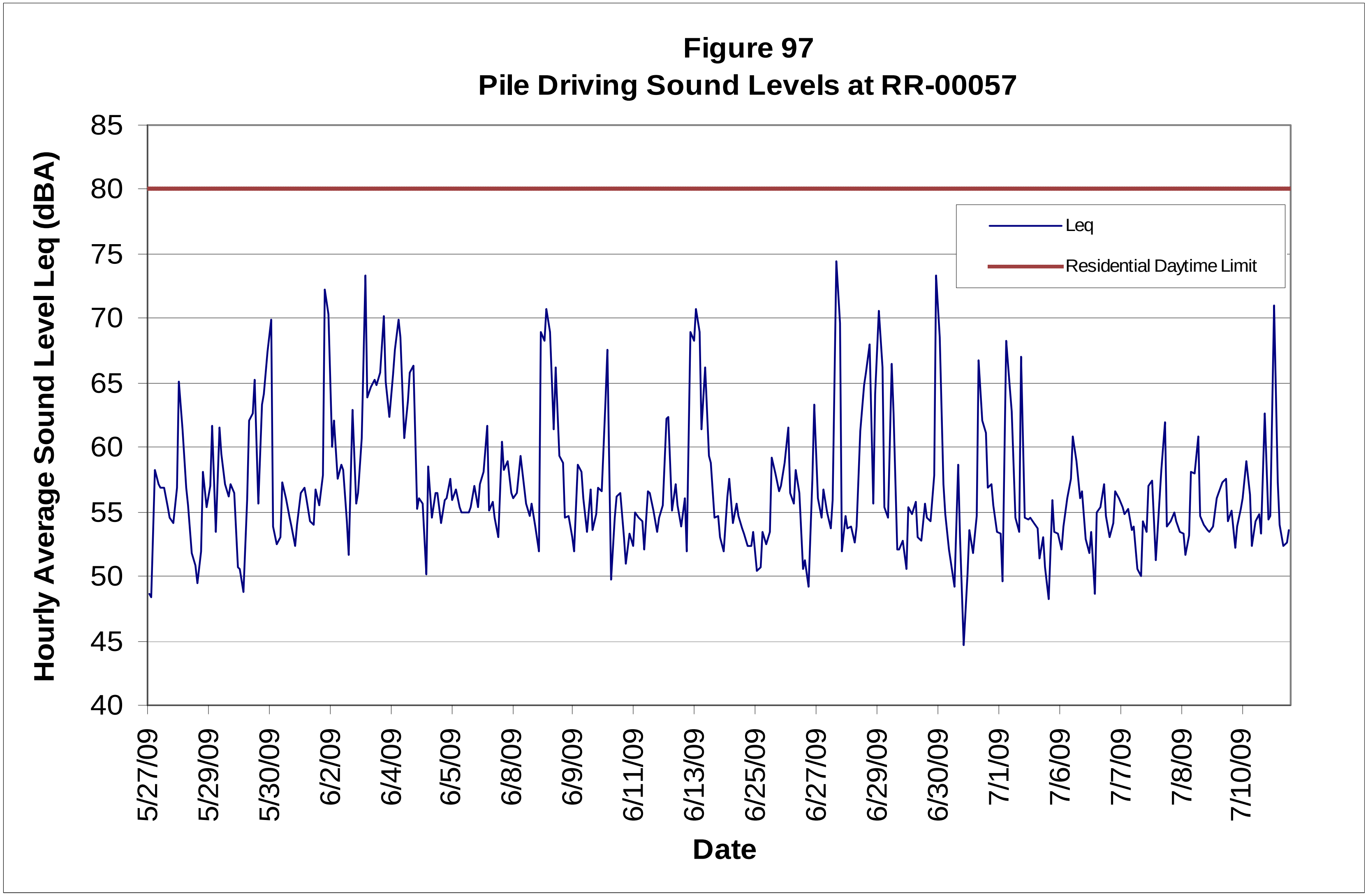

Figure 97
Pile Driving Sound Levels at RR-00057
Hourly Average Sound Level Leq (dBA)
85
80
75
70
65
60
55
50
45
40
Leq
Residential Daytime Limit
5/27/09
5/29/09
5/30/09
6/2/09
6/4/09
6/5/09
6/8/09
6/9/09
6/11/09
6/13/09
6/25/09
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7/8/09
7/10/09
Date

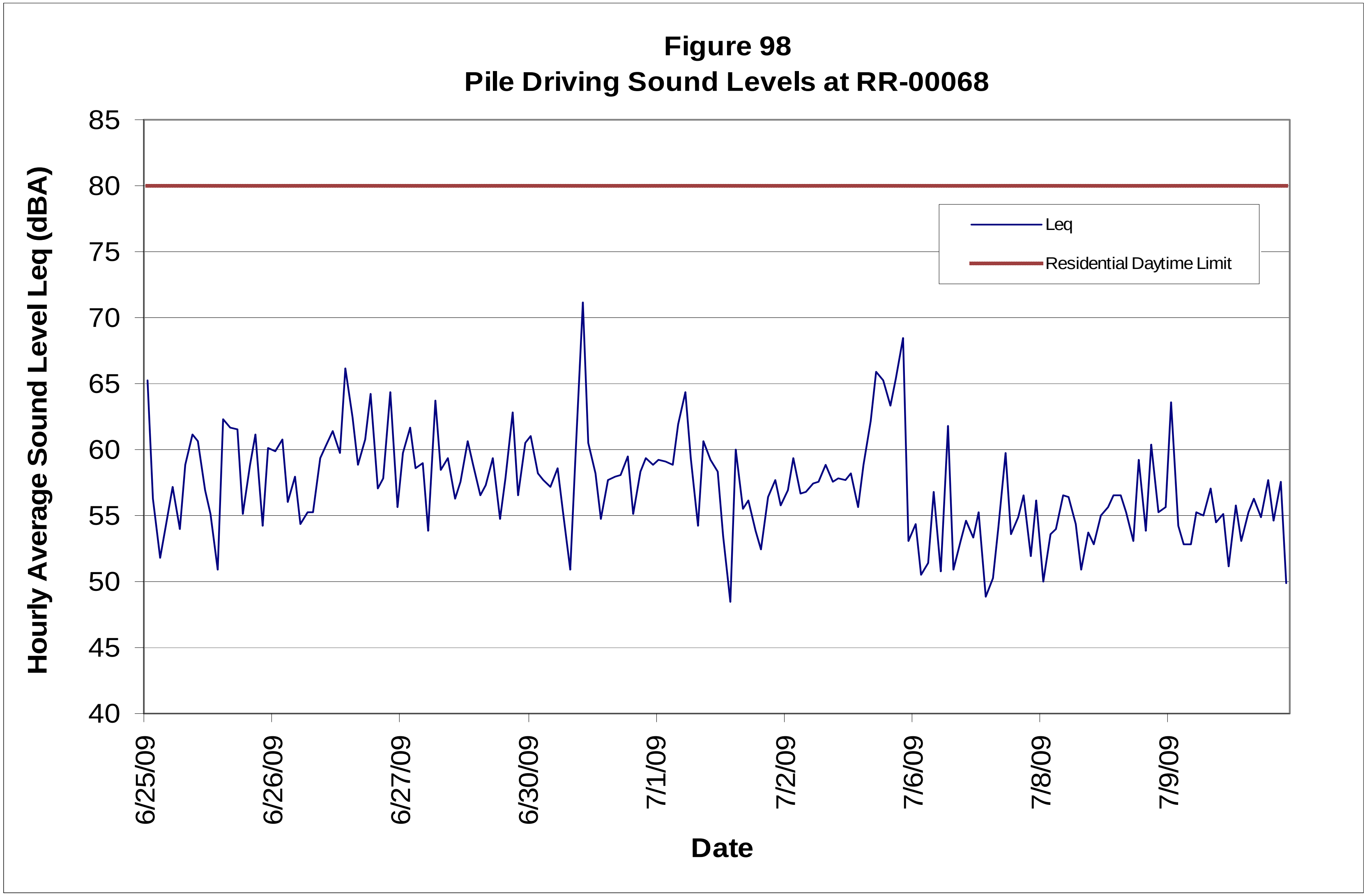
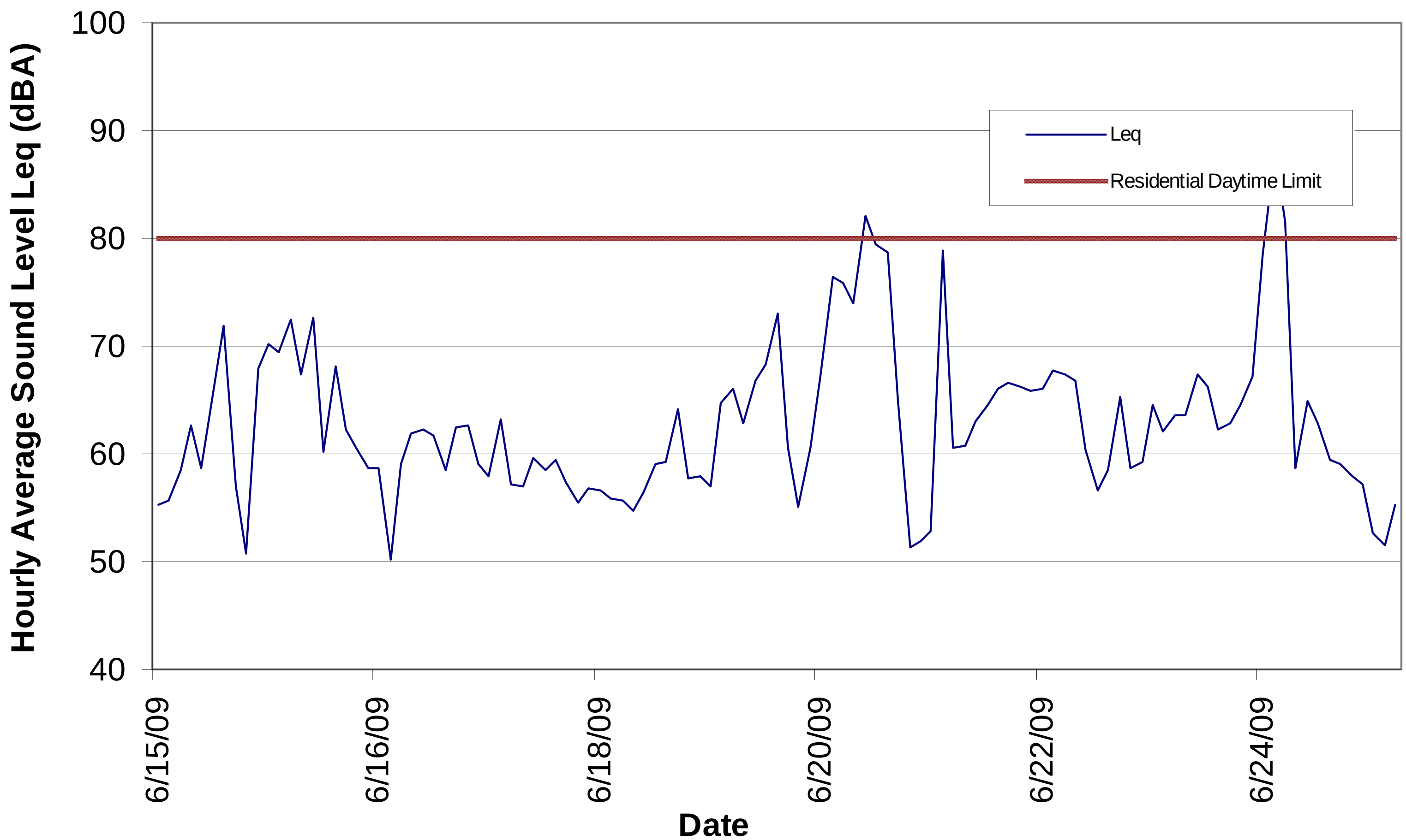


Figure 98
Pile Driving Sound Levels at RR-00068

Figure 99
Pile Driving Sound Levels at DRC-E1901-RR-00036



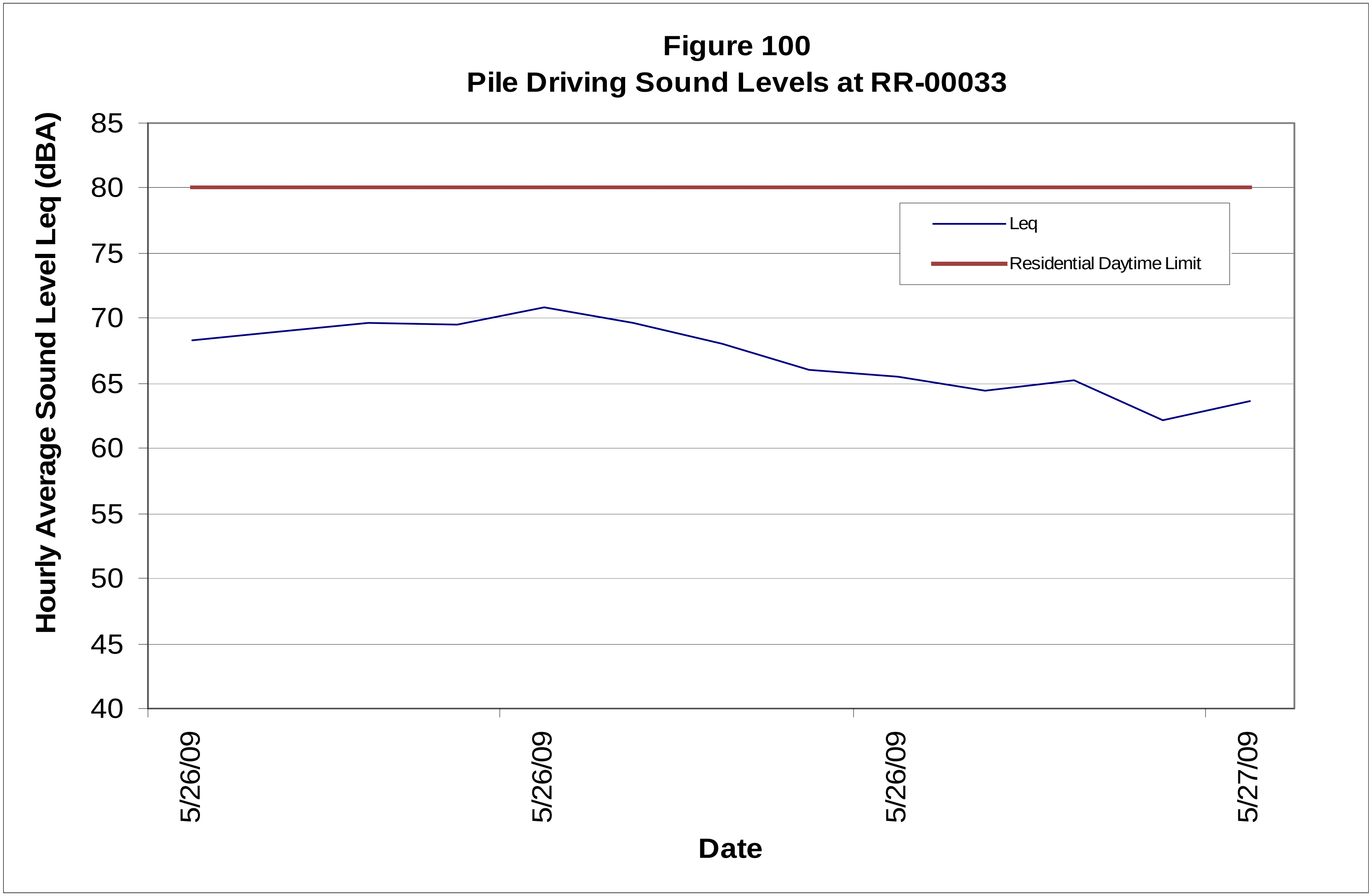


Figure 100
Pile Driving Sound Levels at RR-00033
Hourly Average Sound Level Leq (dBA)
85
80
75
70
65
60
55
50
45
40
Leq
Residential Daytime Limit
5/26/09
5/26/09
5/26/09
5/27/09
Date

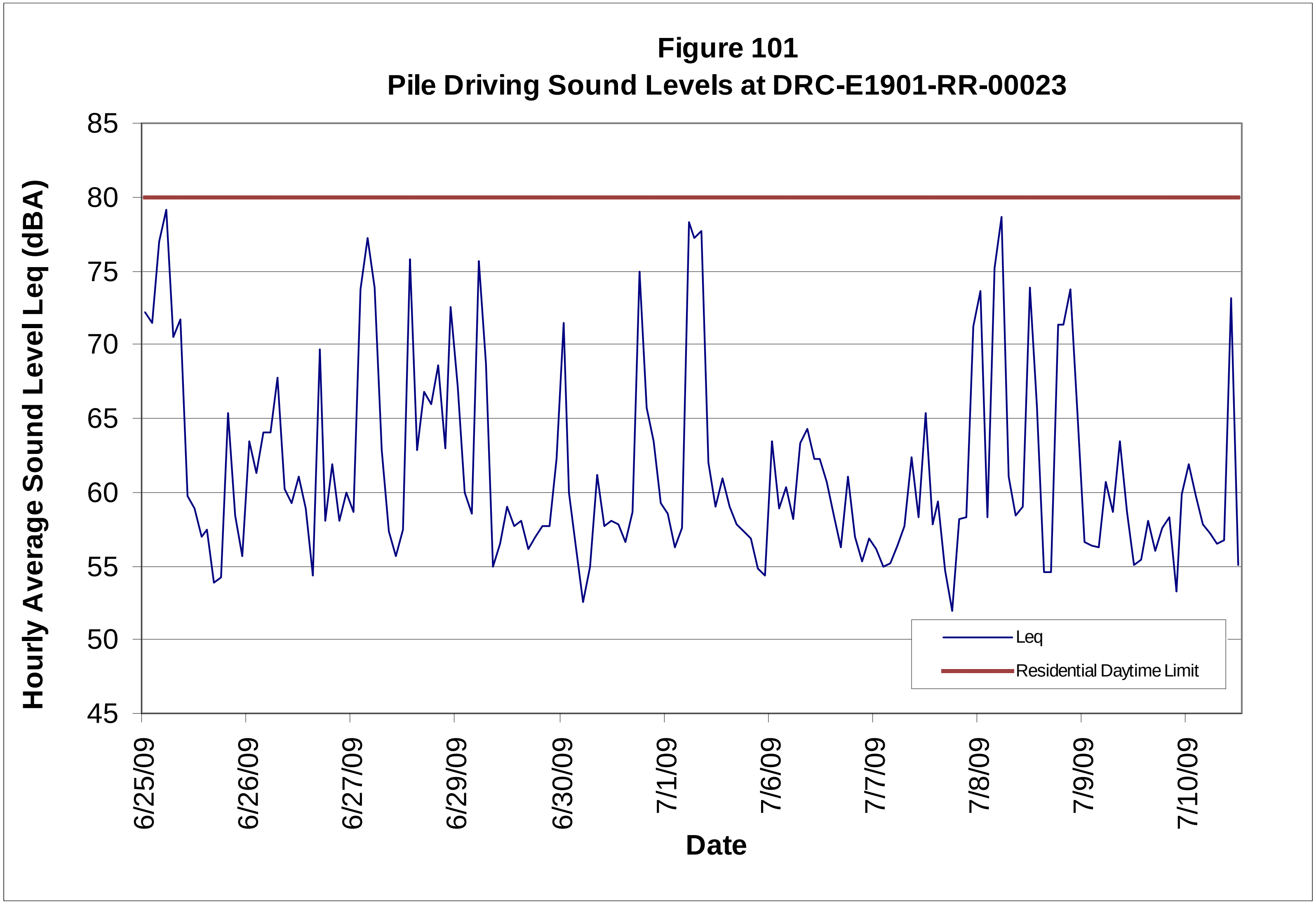


Figure 101
Pile Driving Sound Levels at DRC-E1901-RR-00023
Hourly Average Sound Level Leq (dBA)
85
80
75
70
65
60
55
50
45
Leq
Residential Daytime Limit
6/25/09
6/26/09
6/27/09
6/29/09
6/30/09
7/1/09
7/6/09
7/7/09
7/8/09
7/9/09
7/10/09
Date

B

Air Technical Memorandum

HUDSON RIVER PCB SUPERFUND SITE
PHASE 1 AIR QUALITY REVIEW
TECHNICAL MEMORANDUM
MARCH 2010

At the request of the U.S. Environmental Protection Agency (EPA), Ecology and Environment, Inc. (E & E) evaluated the Quality of Life Performance Standards (QoLPS) pertaining to air emissions measured by General Electric (GE) contractors during the 2009 Phase 1 activities at the Hudson River PCB Superfund Site. Sampling data representing the ambient air concentrations collected during Phase 1 of dredging were used to demonstrate compliance with the performance standards. This data was used by EPA to determine whether adjustments to operations or monitoring requirements are needed for Phase 2 dredging.

As indicated in previous project documents, EPA has provided the public with data from Phase 1 dredging and completed an evaluation of the success or failure of the work in meeting the performance standards. EPA will provide GE with an opportunity to discuss the changes to the Phase 1 QoLPS that EPA believes are appropriate, before EPA makes a decision regarding such changes.

This technical memorandum presents the results of the air emissions evaluation, compares those results with the QoLPS established for the project, and presents recommendations to further reduce air impacts during Phase 2. In addition, a discussion of potential air emissions downstream of dredging activities, i.e., the relation of the Phase 1 measured PCB mass loss between far-field monitoring stations (Thompson Island Dam and Waterford), is included.

Overview of Air Quality Performance Standards

The QoLPSs for PCBs in air were developed by EPA to be protective of residential exposures for children and adults, considering the long-term and short-term effect of the toxicity of PCBs and the potential risks from PCB emissions. The standard for PCBs is summarized in Table 1. Performance standards were also developed for opacity and dust (hydrogen sulfide is addressed in the Odor Performance Standard). The standard for opacity was based upon New York State's limitation of 20% opacity over a 6-minute average, except that there can be one continuous 6-minute period per hour of not more than 57% opacity. The standard for dust states that there should be no visible PCB-laden dust.

Table 1 Summary of Air Performance Standard for PCBs

Use of Standard	Averaging Period	Standard/ Guideline ($\mu g/m^3$)	Demonstration of Compliance
During remedial action, for residential monitoring	24-hour average, total PCBs	0.11	Continuous monitoring, 24-hour samples
During remedial action, for commercial/ industrial monitoring	24-hour average, total PCBs	0.26	Continuous monitoring, 24-hour samples

Table 2 provides a summary of actions required during typical operations and in the event of exceedances of the standard or concern levels.

Table 2 Air Quality Action Levels for PCBs and Required Responses

Action Level	Concentration Levels	Required Action	Reporting/ Notification
Typical Operations Level	Daily total PCBs under 80% of the standard ■ Residential areas (< 0.08 µg/m^3 for 24-hour samples) ■ Commercial/industrial areas (< 0.21 µg/m^3 for 24-hour samples)	■ Continue with existing controls.	■ Weekly reporting of monitoring data to the EPA.
Concern Level	Daily PCBs within 20% of the standard ■ Residential areas (between 0.08 µg/m^3 and 0.11 µg/m^3 for 24-hour samples) ■ Commercial/industrial areas (between 0.21 µg/m^3 and 0.26 µg/m^3 for 24-hour samples)	■ Identify cause of increased emissions. ■ Implement monitoring to confirm and quantify background concentrations. ■ Reduce laboratory turnaround time to 48 hours. ■ Implement mitigation as outlined in the project contingency plan.	■ Notify the EPA within 24 hours of receipt of analytical results. ■ Weekly report to include a description of corrective actions.
Exceedance Level	Daily total PCBs exceed standard ■ Residential areas (> 0.11 µg/m^3 for 24-hour samples) ■ Commercial/industrial (> 0.26 µg/m^3 for 24-hour samples)	■ Identify cause of exceedance. ■ Establish additional monitoring stations (as needed, including background) to evaluate cause of increased emissions. ■ Reduce laboratory turnaround time to 48 hours. ■ Develop action plan and implement additional mitigation. ■ Continue monitoring to confirm compliance with the standard.	■ Notify the EPA, the New York State Department of Environmental Conservation (NYSDEC), and the New York State Department of Health (NYSDOH) immediately. ■ Provide daily monitoring reports. ■ Within 3 days of discovery of the exceedance, provide a corrective action report describing causes of exceedance and mitigation implemented.

Key:
µg/m^3 = Micrograms per cubic meter.

PCB Emissions

Dredging Operations

Monitoring Activities

Monitored activities included debris removal, containment structure installation, dredging, backfilling and capping, and sediment unloading and processing operations. Battery-powered, low-volume samplers fitted with sorbent polyurethane foam (PUF) cartridges were used in accordance with EPA Method TO-10A to collect 24-hour composite samples. Samples were analyzed for PCB Aroclors and total PCBs by Method SW-846 8082 (Anchor QEA LLC 2009).

Monitoring locations associated with dredging operations were to include two portable low-volume samplers. These locations were to be established in each general dredging area with one sampler upwind and one downwind. During Phase 1, GE and EPA agreed to modify the sampling program and establish permanent air monitoring locations that would be representative of the closest receptor for each dredge area/Certification Unit (CU).

Modeling

Modeling was conducted before the start of Phase 1 to evaluate the potential for exceedances of the Air Performance Standard. This modeling indicated that several CUs, including CUs 2, 3 and 4, were predicted to exceed the standard and are highlighted in Table 3 below. Review of the sampling data confirmed this prediction, as most exceedances occurred at CUs predicted to exceed the standards.

Table 3 Predicted Maximum 24-Hour Average Ambient PCB Impacts, Equilibrium Partitioning Model

CU	Sediment Removal Unit (SRU)	PCB Impacts at Commercial Receptors (µg/m^3)		PCB Impacts at Residential Receptors (µg/m^3)	
		No Wind Screens	With Wind Screens	No Wind Screens	With Wind Screens
2	43A	0.175	0.063	0.165	0.046
	43B	0.076	0.032	0.242	0.082
	45	0.055	0.013	0.156	0.058
	48	0.158	0.027	0.201	0.074
	49	0.094	0.016	0.124	0.047
3	57	0.401	0.083	0.148	0.067
	58	0.388	0.083	0.149	0.067
	73	0.260	0.083	0.048	0.025
4	79	0.362	0.140	0.188	0.091
	80	0.203	0.090	0.101	0.049
	81	0.202	0.093	0.100	0.049
	85	0.143	0.038	0.091	0.027
	86	0.638	0.128	0.499	0.076
	87	0.570	0.116	0.454	0.069
	90	0.238	0.058	0.030	0.018
	101	0.383	0.071	0.233	0.039

Source: TRC Environmental Corporation 2006.

Exceedances

During Phase 1, 62 air monitoring locations were established to document PCB emissions from dredging activities and evaluate ambient PCB emissions between the dredging activities and the receptors (see Figures AQ-1 and AQ-2).

There were 81 exceedances of the Air Performance Standard in the dredging corridor during Phase 1. Many of these exceedances occurred in specific areas with unique situations (as described below). During the 166-day dredging season, fewer than 4% of the total number of samples collected to demonstrate compliance exceeded the standard.

Based on EPA's review of the data from Phase 1, it appears that the concentration of PCBs in sediment and proximity were the primary factors related to predicting air exceedances (i.e., high concentration sediments closer to receptors resulted in potential exceedances). Temperature, wind speed, and wind direction appeared to be secondary factors.

Sheet Pile Enclosure at CU 18

A series of air exceedances occurred in this area. There were 13 exceedances at CU 18 at one monitor, which is located on the shore and near the majority of dredging operations. The exceedances were associated primarily with mini-hopper use along the shoreline. EPA requested that the use of the mini-hoppers in this area be limited to the extent possible because of the exceedances. Higher levels of PCB contamination in the water and sheens within the sheet pile enclosure also contributed to the exceedances recorded in this area.

Staging Dolphins

Six air exceedances occurred near the staging dolphins when highly contaminated material was staged in barges. EPA requested that these barges be moved to the Processing Facility as soon as possible, but in some cases, due to limitations with off-loading and processing, the barges remained in place, causing a series of exceedances. These exceedances were not related to dredging operations but to productivity delays at the Processing Facility.

East Channel of Rogers Island

As described above, CUs 2, 3 and 4 were projected by the modeling to exceed the Air Performance Standard, so mitigation in these areas was expected. GE started the work in CUs 2 and 3 without mitigation, using mini-hopper barges that were not equipped with adequate windscreens and did not cover sediment with water or use covers. When air monitors started to record exceedances (and at EPA's request), GE took steps to mitigate these emissions as the dredging progressed. Some mitigation measures included limiting the use of mini-hoppers in the shallow water areas of CU 3, followed by adding water on top of sediment in large hopper barges and placing lower PCB-concentration material over higher PCB-concentration material. However, mitigation measures took some time to implement. There were 23 exceedances of the Air Performance Standard at receptor monitoring locations associated with CU 2 operations on 19 days and 14 exceedances of the Air Performance Standard at receptor monitoring locations associated with CU 3 operations on 14 days.

Complaints

There were three complaints (May 26, 2009; June 2, 1009; and July 7, 2009) regarding dust from the road to the Route 4 Staging Area. After each complaint, a water truck was dispatched to the Route 4 Staging Area to mitigate the problem.

Mitigation

Sampling locations were added along the dredging corridor to support analysis of exceedances caused by dredging operations. In addition, two meteorological stations were added to investigate upwind and downwind conditions.

In addition to this expanded sampling, EPA suggested several modifications to the dredging operations to help limit PCB emissions. This included the even distribution of sediment in the hopper barge (instead of in piles in the center) and adding water to cover sediment, thereby reducing emissions. GE also implemented an additional control measure recommended by EPA during Phase 1—placing lower PCB-concentration sediment on top of higher PCB-concentration sediment. When properly implemented, these approaches reduced emissions.

As predicted in design evaluations, freeboard in the large hopper barges also reduced emissions by reducing air movement across the contaminated sediment and water. However, it cannot be determined if the wind screens placed on the mini-hopper barges reduced emissions because they did not extend up 5 feet, as required in the specifications.

Sediment Processing Facility

Monitoring Activities

Sampling equipment was sited at the perimeter of the Processing Facility and at receptors (residences and a golf course) adjacent to the Processing Facility (see Figure AQ-3). The four fixed locations along the perimeter of the Processing Facility and Unloading Wharf were monitored using high-volume air samplers fitted with non-size selective quartz fiber filters and sorbent PUF cartridges, according to EPA Method TO-4A. Locations across the canal at the golf course were equipped with battery-powered, low-volume samplers equipped with a PUF cartridge, in accordance with EPA Method TO-10A. All samples were collected as 24-hour composites. The results were compared with the Air Performance Standards for total PCB concentrations in ambient air in residential areas and commercial/industrial areas with “concern” and “standard” levels identified (see Overview of Air QoLPS above).

Samples from the Processing Facility were submitted for analysis based on predominant wind direction and proximity to site operations. A minimum of two samples were analyzed for each 24-hour period to represent upwind and downwind conditions. Additional samplers were added at the receptors across the canal to provide continuous monitoring of ambient air concentrations.

Exceedances

During the 166-day dredging season, there were 12 exceedances at the perimeter of the Processing Facility fence line and 7 exceedances at the golf course.

In addition to the PCB air exceedances, visible dust occasionally was observed at the facility. It was noted that there were not enough water trucks at times to keep the entire facility wetted down. GE resolved this issue later in the dredging season. Areas where this occurred included the Main Haul Road from the Coarse Material Staging Area (CMSA), the rail yard, and the Unloading Wharf.

Complaints

No complaints about PCB air emissions were registered during Phase 1.

Mitigation

To reduce the number of exceedances at the Processing Facility, EPA suggested that hopper barges with higher PCB-concentration sediment be given priority in off-loading to reduce the time that they were staged at the Unloaded Wharf. GE implemented this recommendation.

Opacity

Opacity was measured at sources of potential particulate air emissions to demonstrate compliance with the New York State opacity regulations. These sources include vessels, vehicles, equipment, and the switcher engine locomotive permanently assigned to the site. Opacity was measured at the initial start-up of each piece of equipment that has visible particulate air emissions and that was under consideration for permanent site use. The measurements were performed by a certified visual observer using EPA Method 9. The initial opacity measurements served as certification for use of each piece of equipment prior to assignment to the site. Additional opacity observations were to be conducted as-needed, including:

- If a complaint was received by the public,
- Prior to re-use of a piece of equipment that previously exceeded the Opacity Standard and that had been repaired, or
- At the direction of the Construction Manager for any given piece of equipment that showed a change in emissions output.

Forty-six pieces of equipment were observed. These included two switcher engine locomotives, 10 vehicles, and 34 other pieces of on-site equipment. Opacity field logs demonstrated opacity readings between 0% and 20%, with average opacity between 0% and 5%. There were no exceedances of the Opacity Performance Standard for the 46 pieces of equipment that were observed.

Conclusions

Recommended Changes to Standard

There are no recommendations for adjustments to the QoLPS values or requirements for monitoring frequency.

Recommended Changes to Monitoring

Air monitoring on the river should focus on receptor locations. Air sampling locations along the river should be placed at the nearest receptor or close to receptors near dredging operations.

Device locations should be pre-determined in consultation with EPA and agreed upon by the Oversight Team before dredging operations begin.

Air monitoring at the Processing Facility should continue, consistent with Phase 1.

Recommended Changes to Operating Procedures

PCB concentrations in air that exceed the action level are known to occur in areas where the PCB concentrations in the sediment are high or where material is exposed to the air for extended periods of time. When dredging occurs in areas that have high PCB concentrations in the sediment, preventive actions and controls should be implemented as standard practice to reduce the potential for exceedances.

Phase 1 operations have demonstrated that the following control measures can mitigate PCB emissions:

River Operations:

1. Maintaining a thin layer of water over sediments within hopper barges.
2. Placing lower PCB concentration sediment over the higher PCB concentration sediment within hopper barges.
3. Limiting the staging time of uncovered hopper barges.
4. Covering hopper barges containing higher PCB concentration sediment during transport and staging.
5. Establish a Standard Operating Procedure (SOP) for the management of higher PCB concentration sediments to ensure quick processing of material to prevent extended staging times on river, at locks, or at the Processing Facility.

Processing Facility Operations:

1. Minimizing staging time of uncovered hopper barges at the Unloading Wharf.
2. Covering inactive sediment piles at the Processing Facility.
3. Minimizing staging time of debris at the Unloading Wharf; moving debris as soon as possible to the CMSA.
4. Maintaining cleanliness of the unloading and waterfront areas.

References

Anchor QEA, LLC. 2009. Phase 1 Data Compilation Report – Hudson River PCBs Superfund Site. Prepared for the General Electric Company.

Anchor QEA, LLC and Arcadis. 2010. Draft Phase 1 Evaluation Report – Hudson River PCBs Superfund Site.

TRC Environmental Corporation. November 2006. PCB Emissions from barges: 5-year maximum case analysis.

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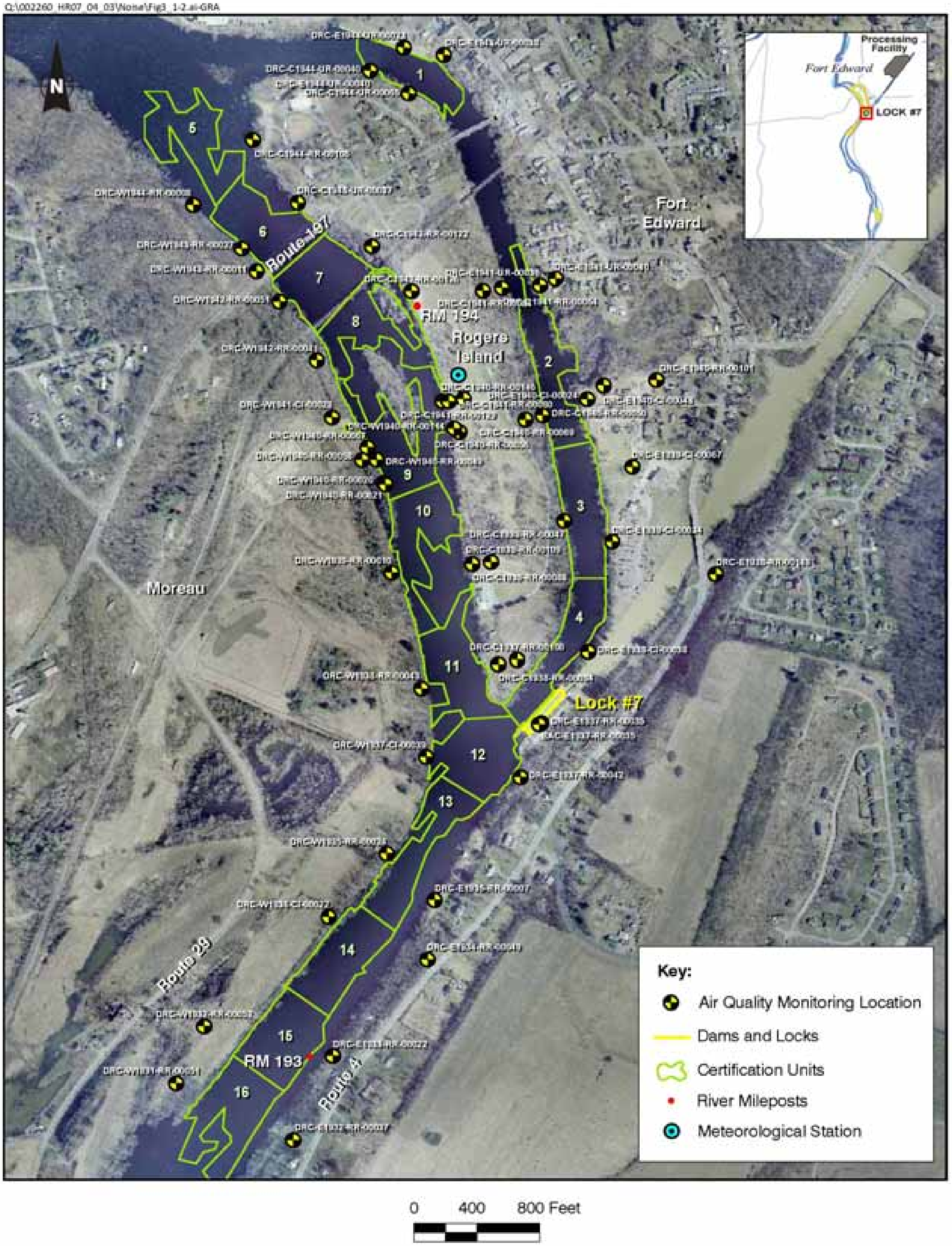
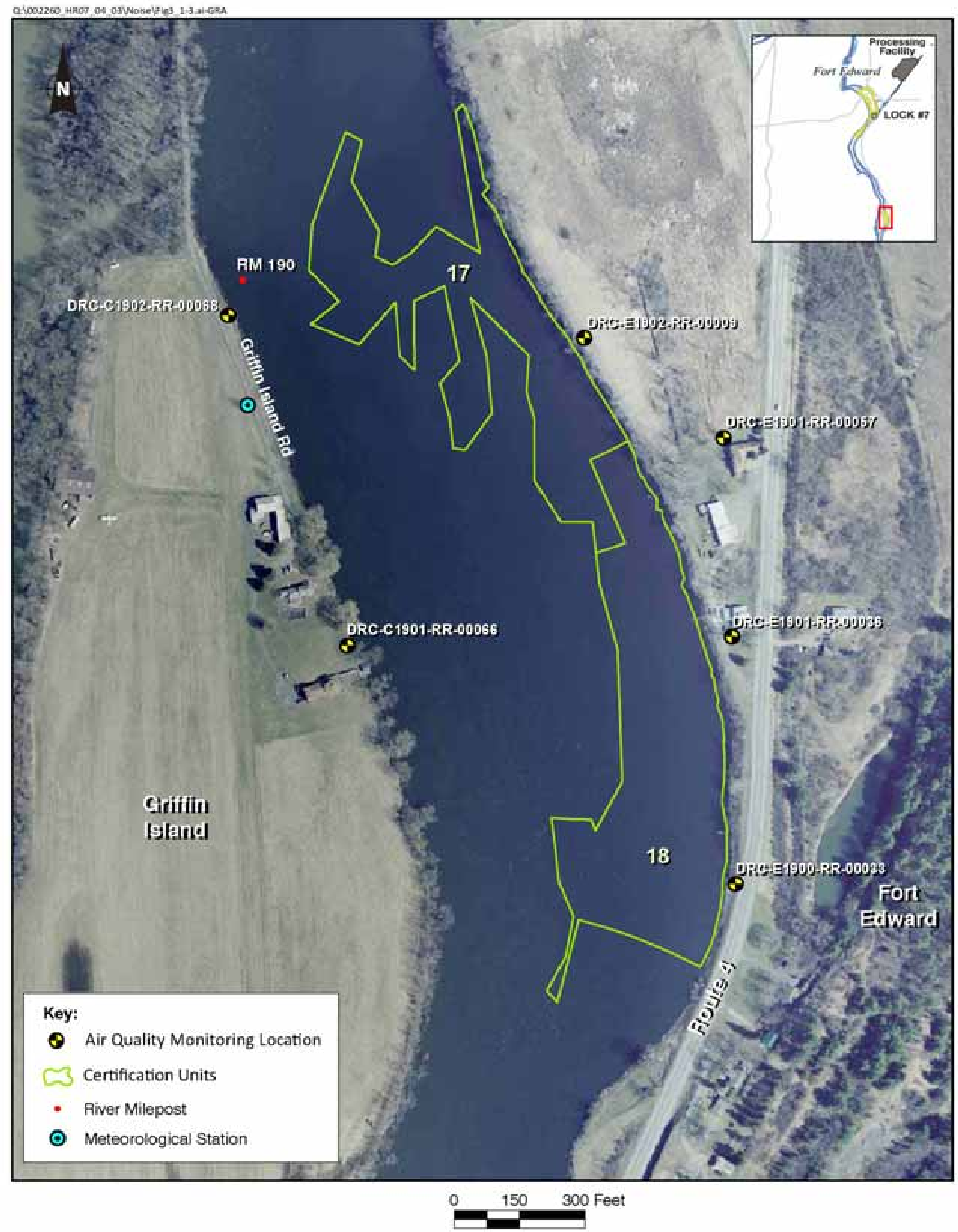


AQ-1 Air Quality Monitoring for Phase 1 Dredging



AQ-2 Air Quality Monitoring for Phase 1 Dredging

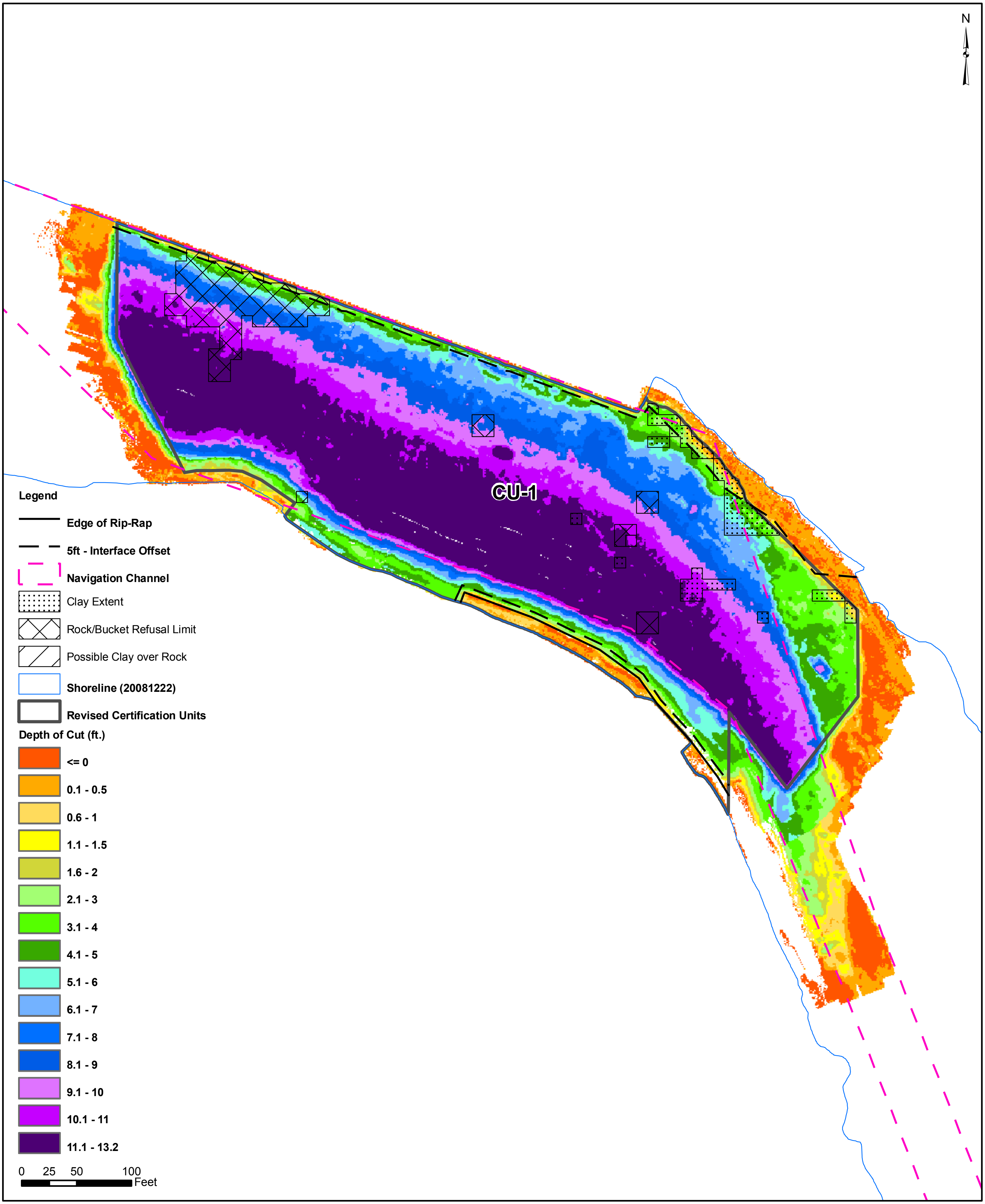
Q:\002260_HR07_04_03\Air\Fig3_1-1.ai-GRA

AQ-3 Sediment Processing Facility Air Quality Monitoring for Phase 1 Dredging

CHAPTER II RESIDUALS APPENDICES

Appendix II-A

Maps of Post-Dredging Elevation and Depth of Cut



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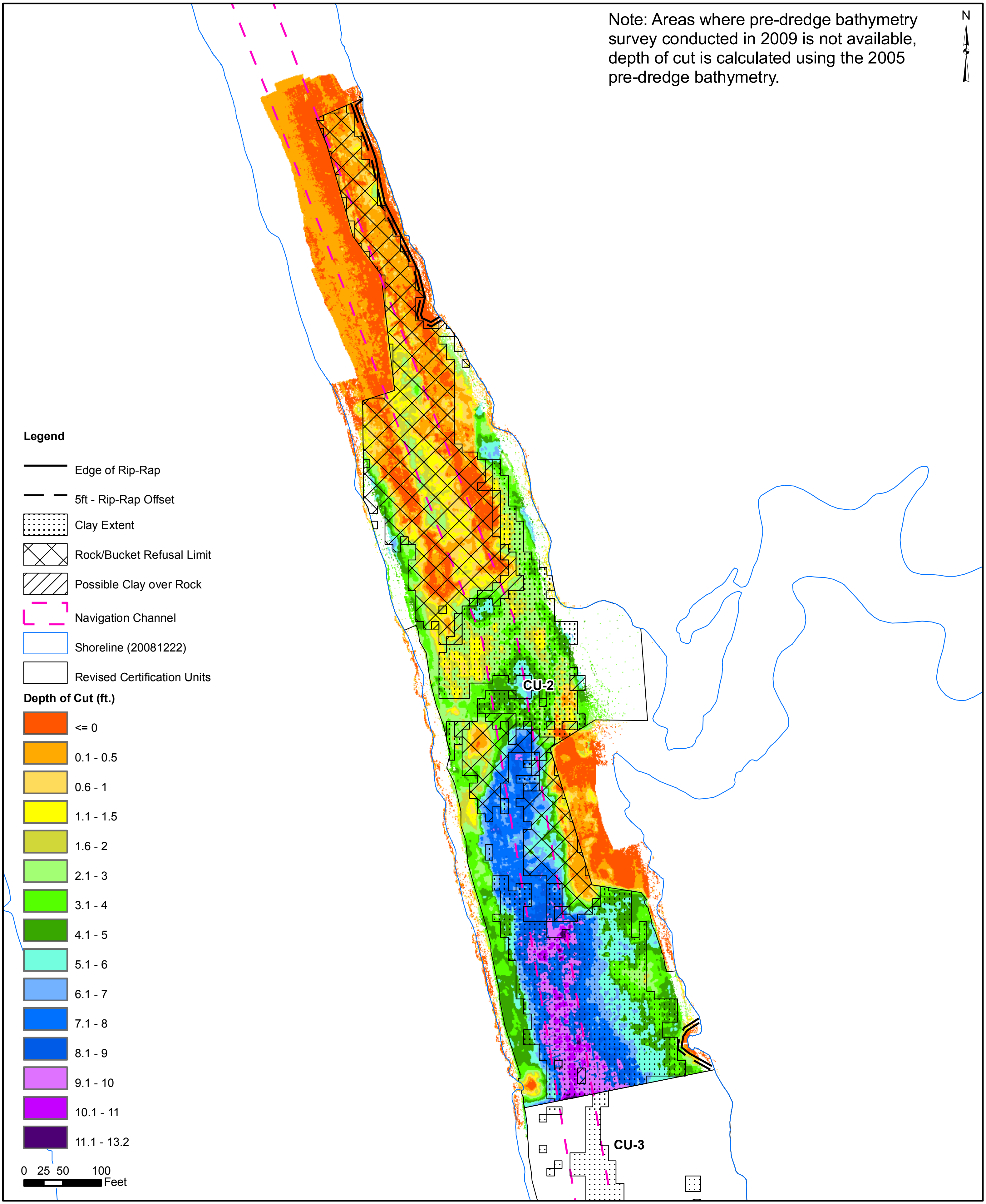
Actual Depth of Cut As of October 2009

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010



Actual Depth of Cut As of October 2009

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010

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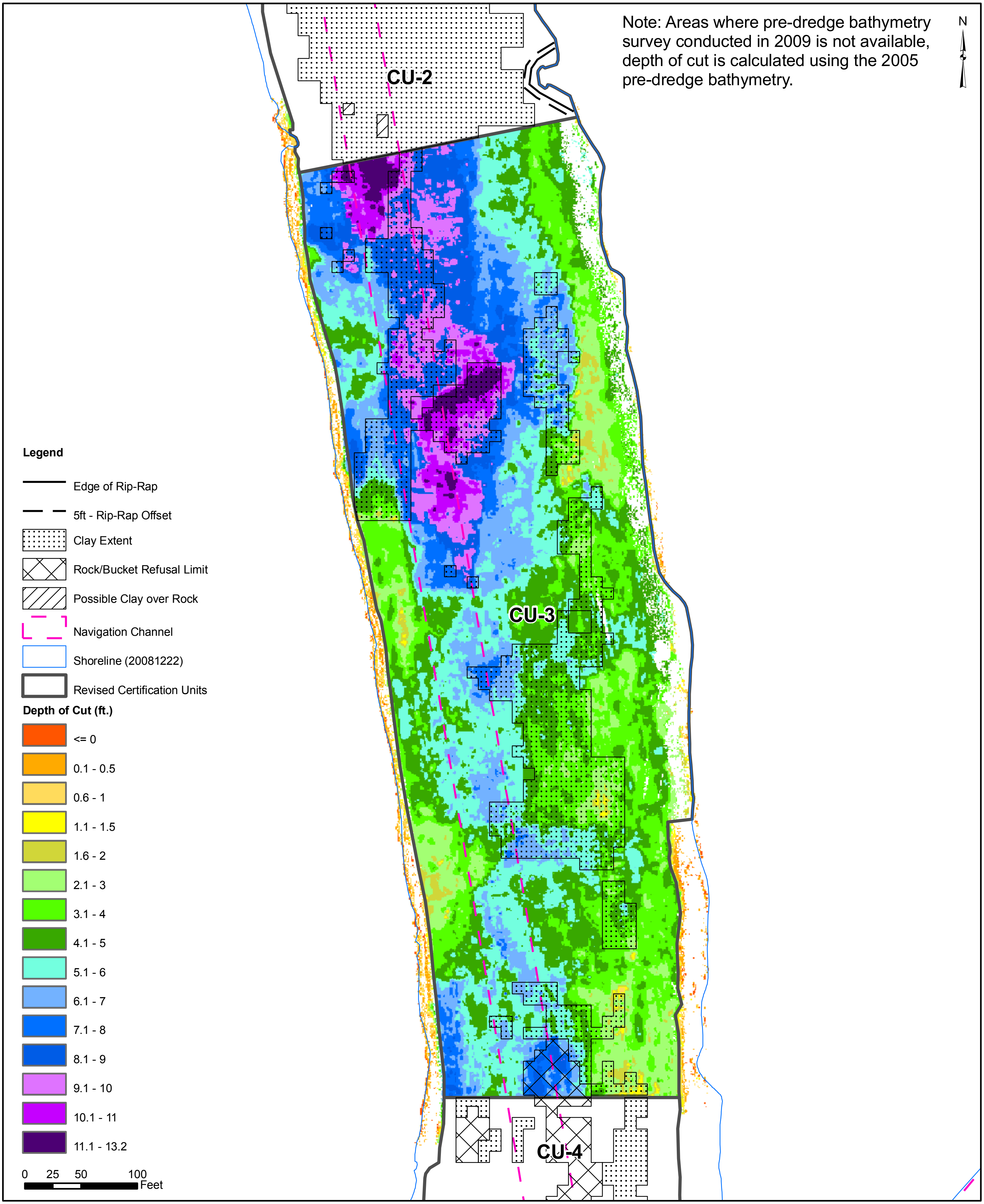

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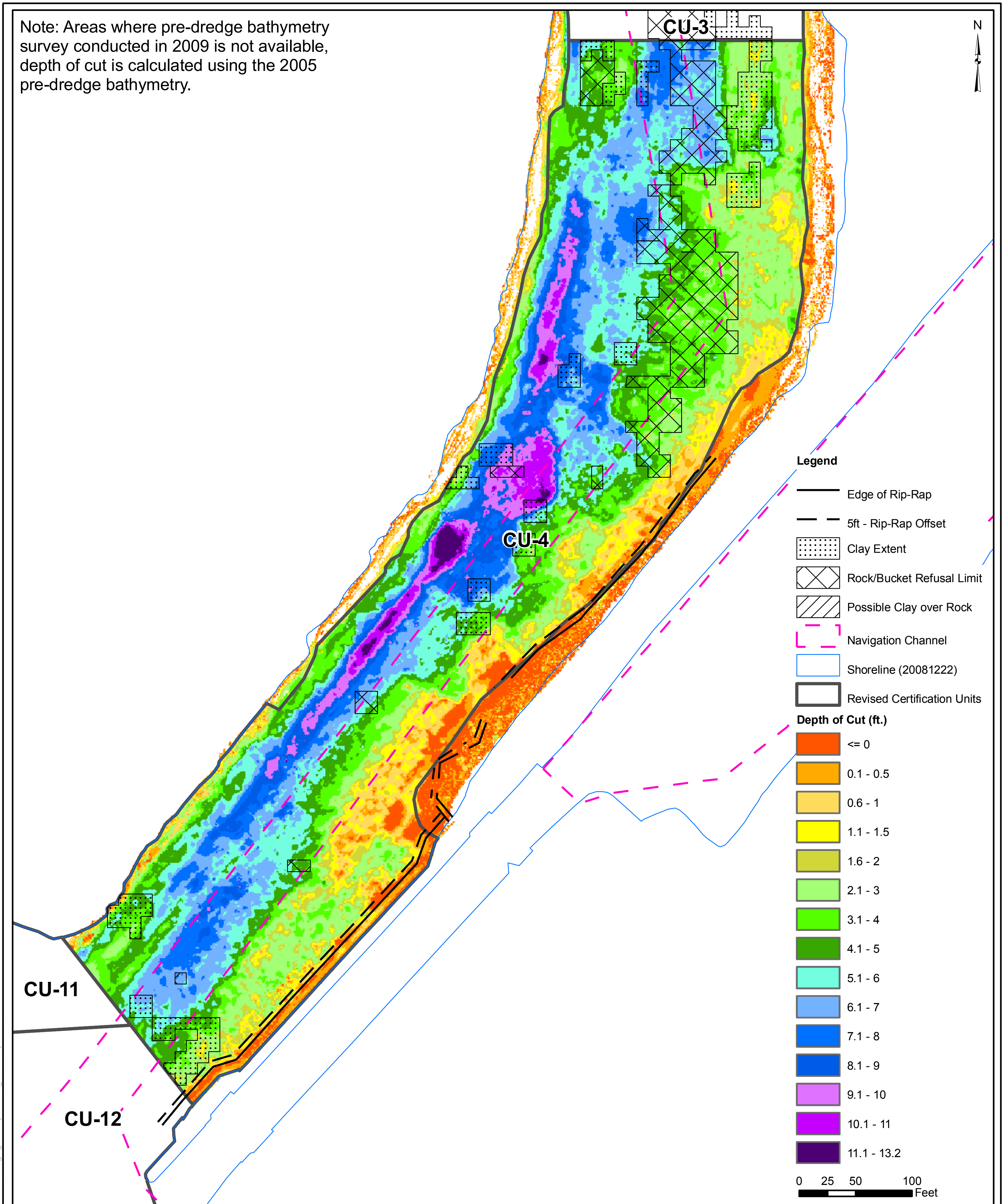
Actual Depth of Cut As of October 2009

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010

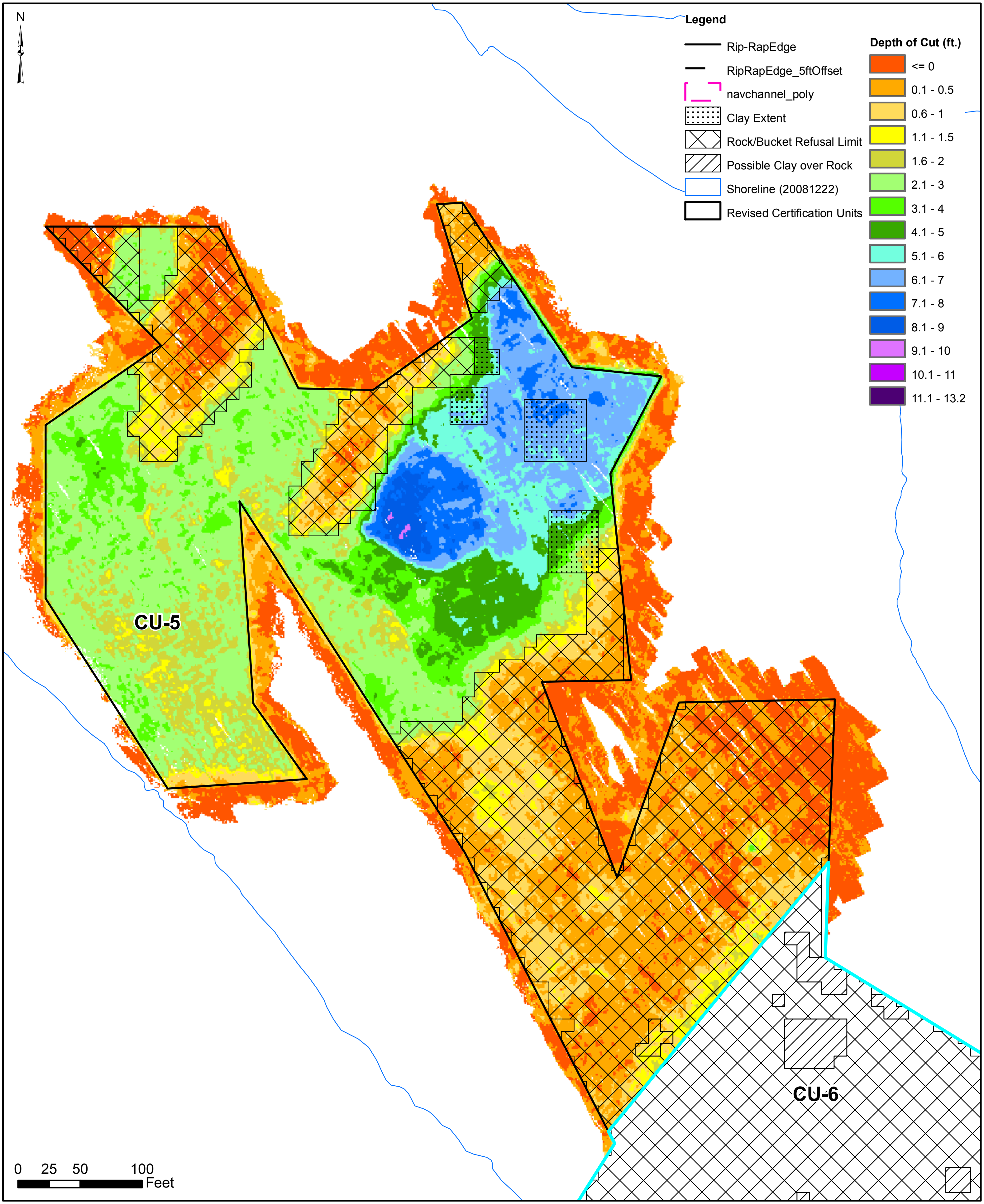


Depth of Cut As of October 2009

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010



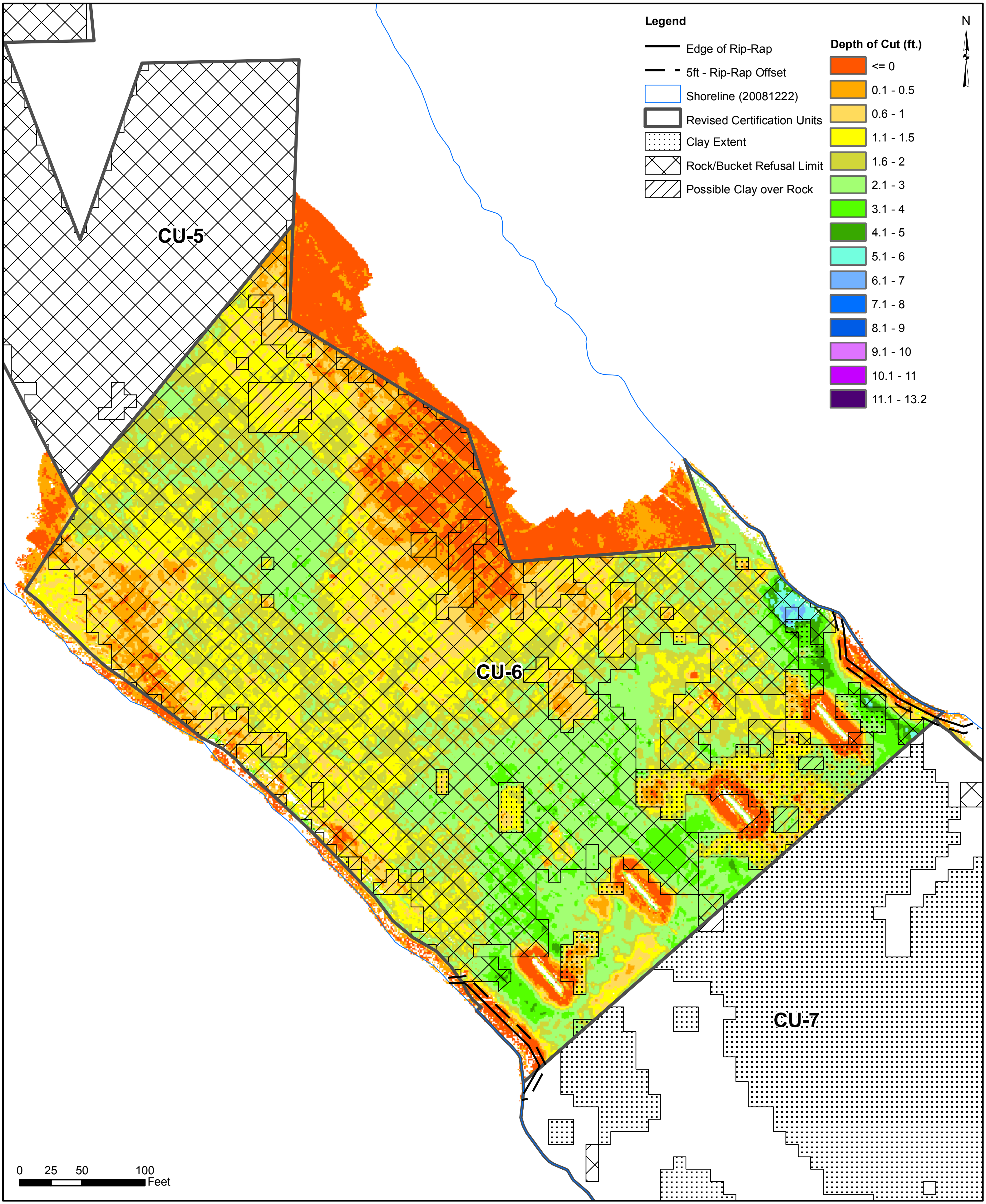
E:\hudson\MapDocuments\PostDredging\ForReport\CU5_ActualDepthofCut.mxd

Actual Depth of Cut As of September 2009

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010

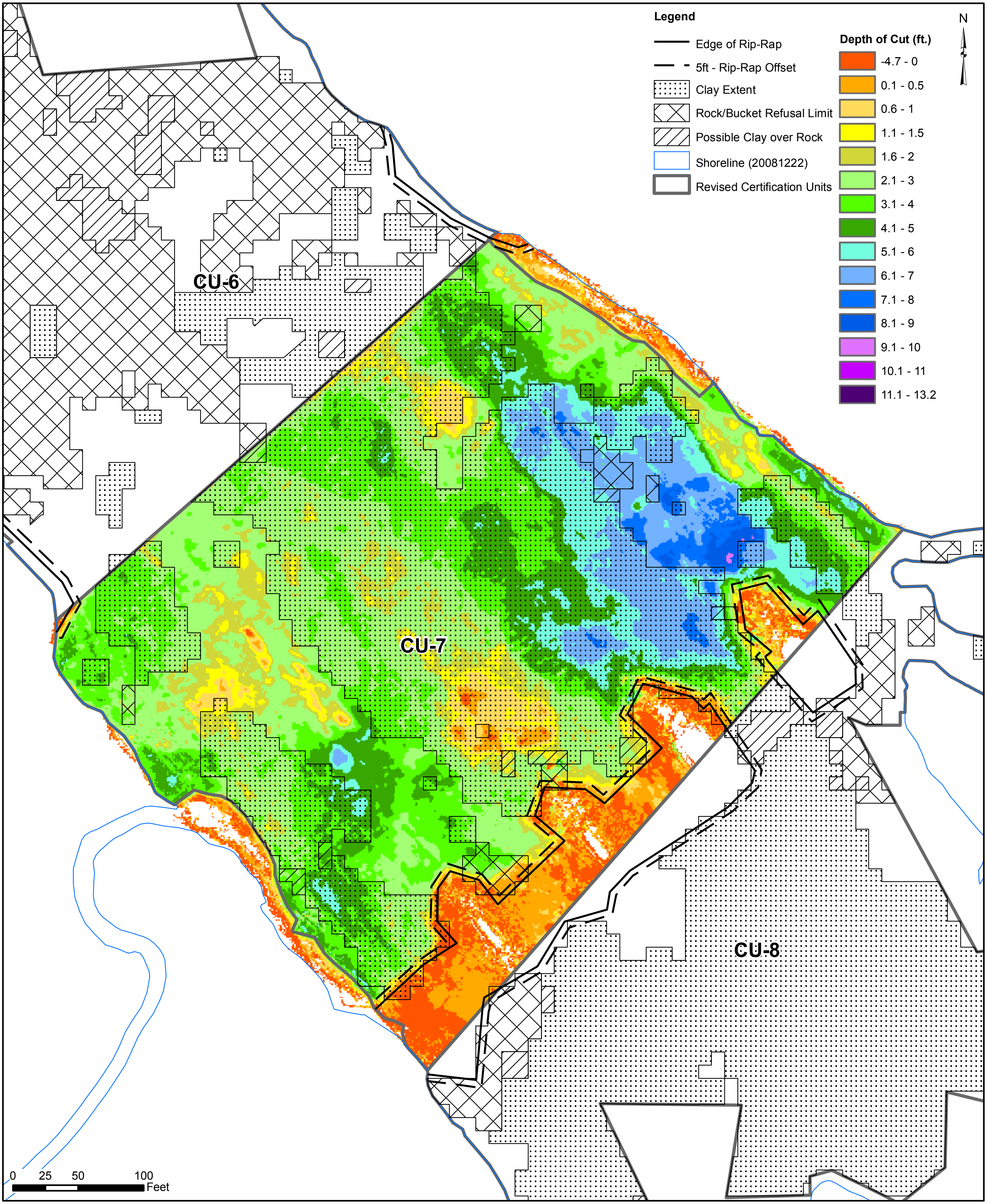


Depth of Cut As of September 2009

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010



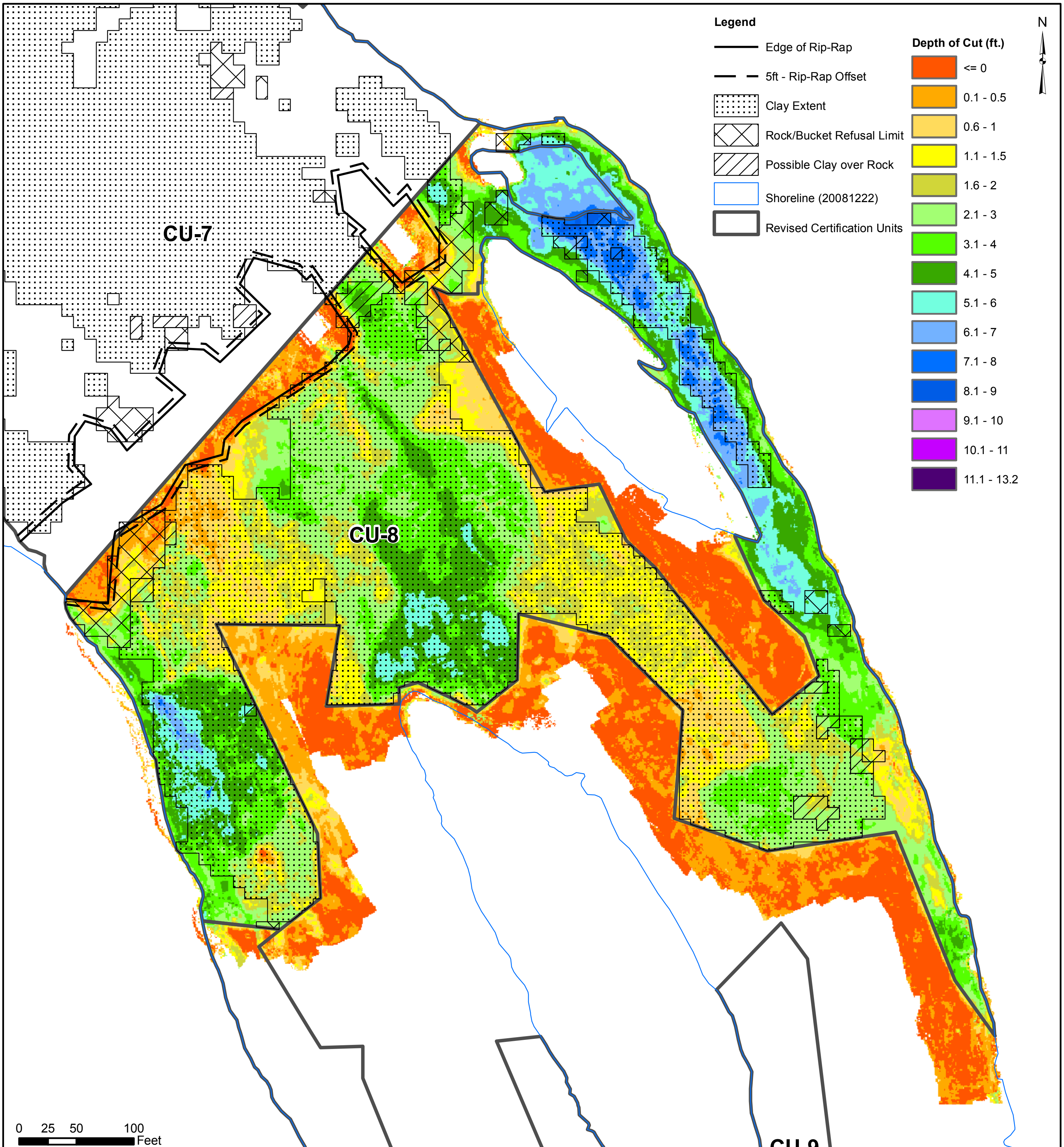
E:\hudson\MapDocuments\PostDredging\ForReport\CU7_ActualDepthofCut.mxd

Depth of Cut As of October 2009

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010



Note: Areas where pre-dredge bathymetry survey conducted in 2009 is not available, depth of cut is calculated using the 2005 pre-dredge bathymetry.
Depth of Cut in the sandbar is calculated with respect to an original elevation of 119 ft.

E:\hudson\MapDocuments\PostDredging\ForReport\CU8_ActualDepthofCut.mxd

Actual Depth of Cut As of October 2009

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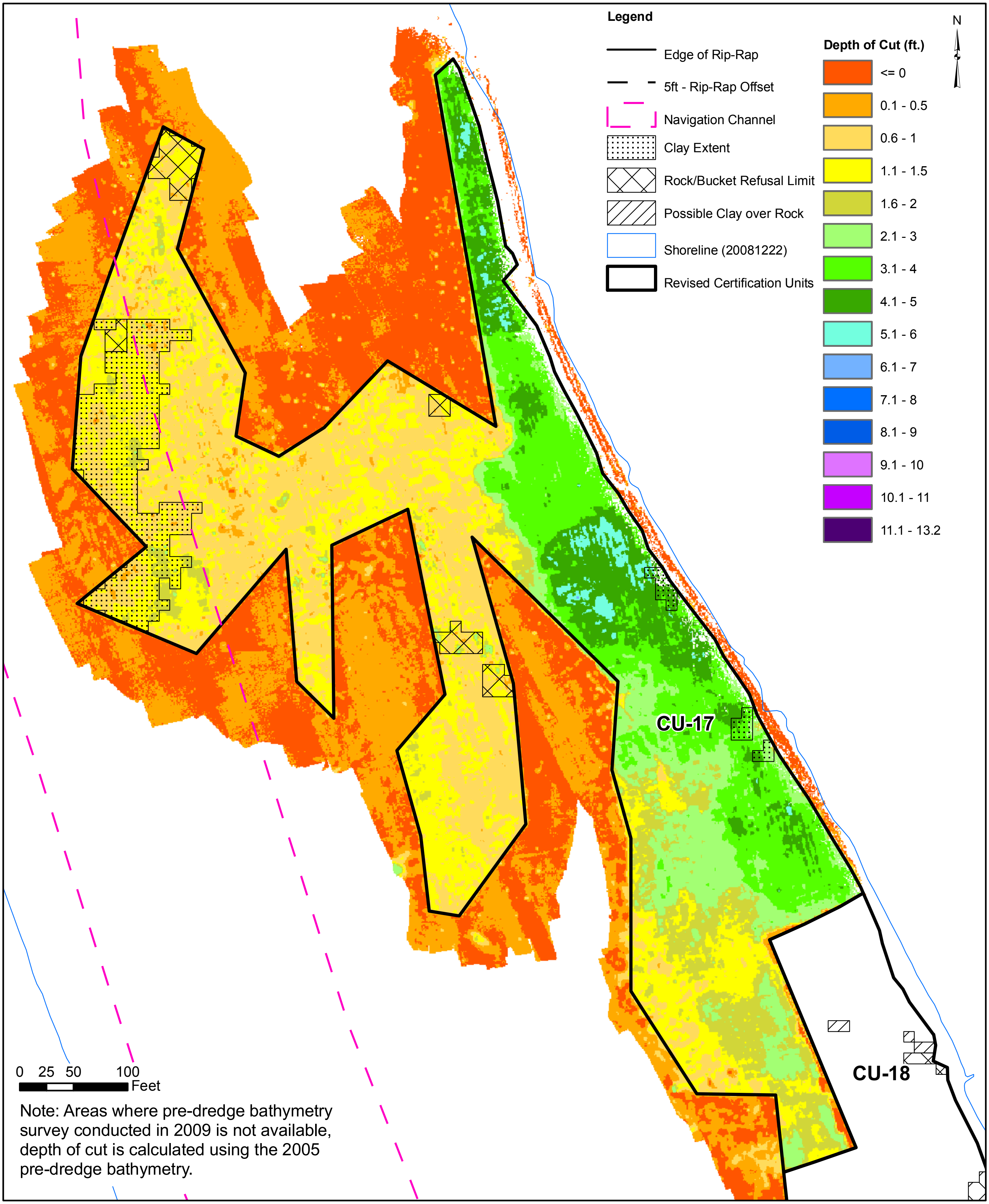
March 2010



Actual Depth of Cut As of September 2009

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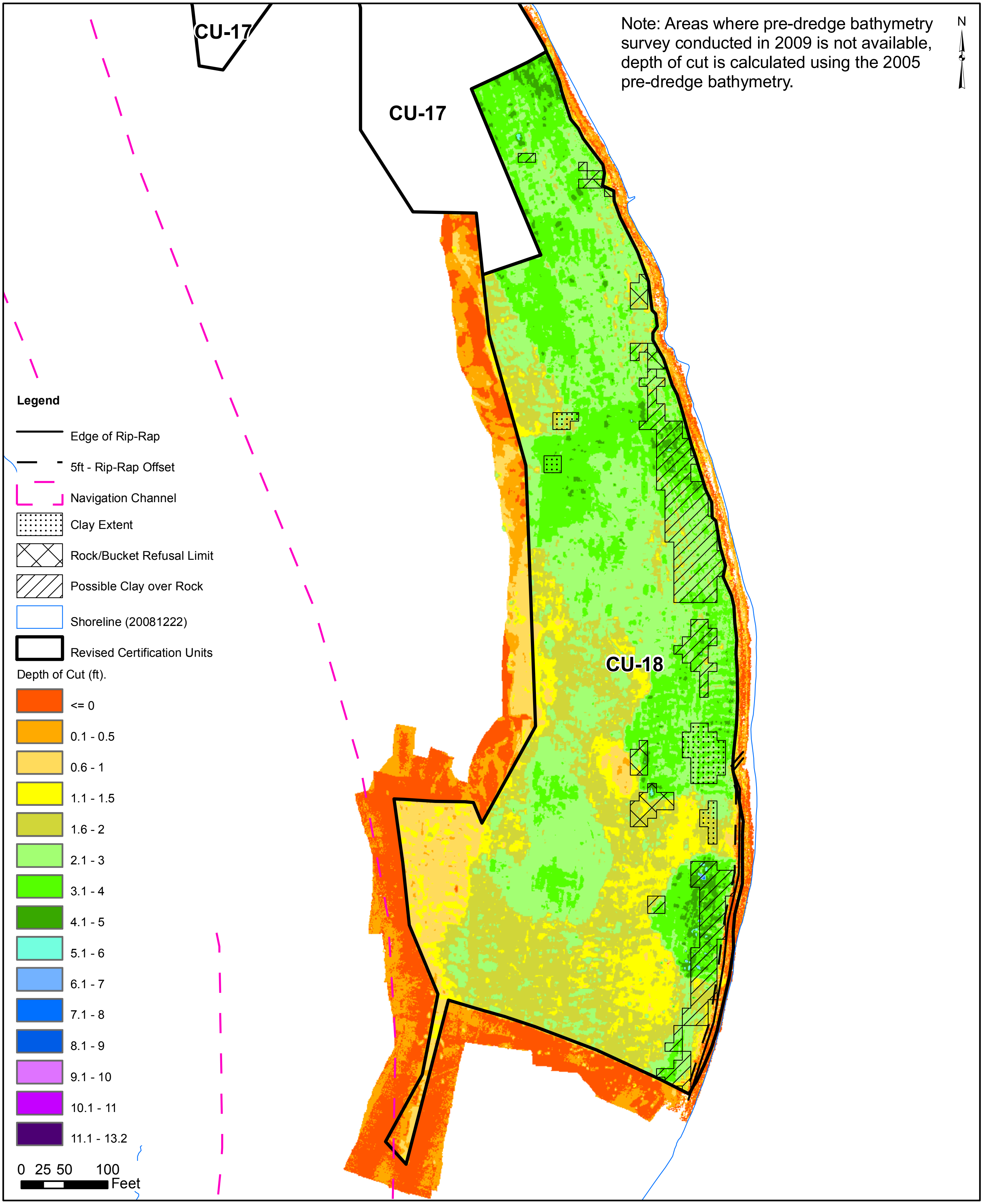
Appendix II-A

March 2010



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Actual Depth of Cut As of October 2009

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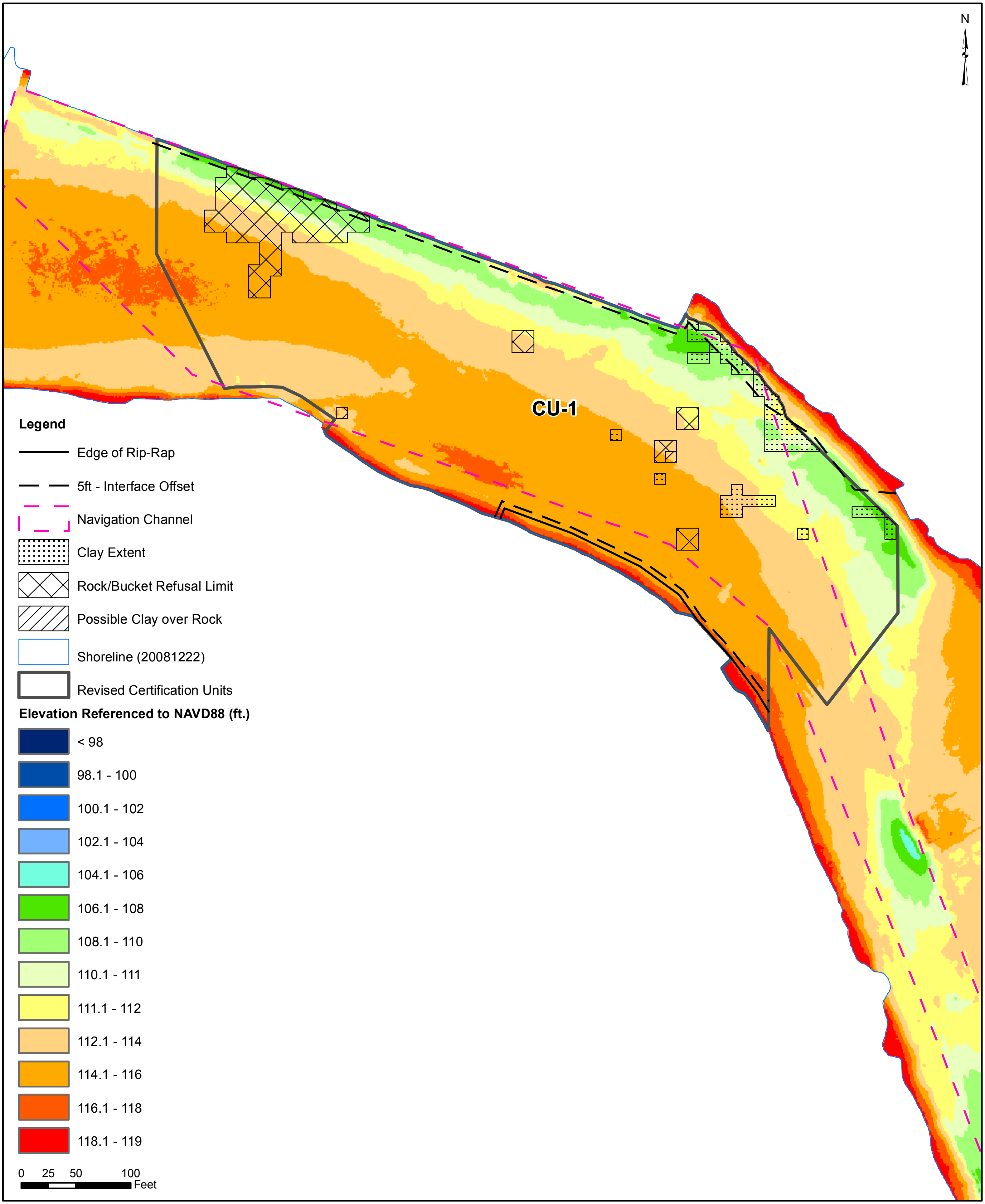
March 2010



2005 Pre-Dredging Elevations

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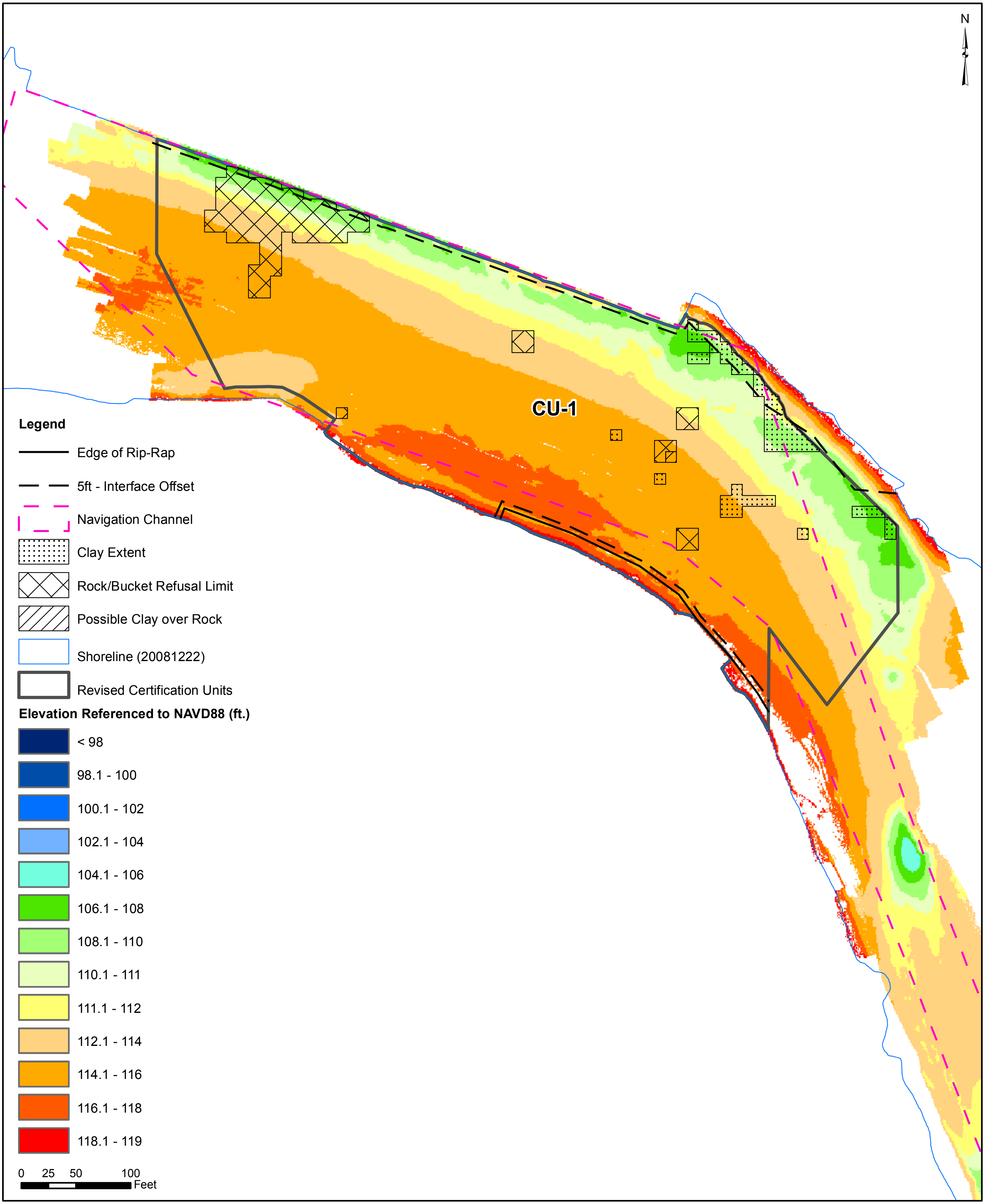
Appendix II-A

March 2010



E:\hudson\MapDocuments\PostDredging\ForReport\CU1_PrePostDredgingElevations.mxd

2009 Pre-Dredging Elevations

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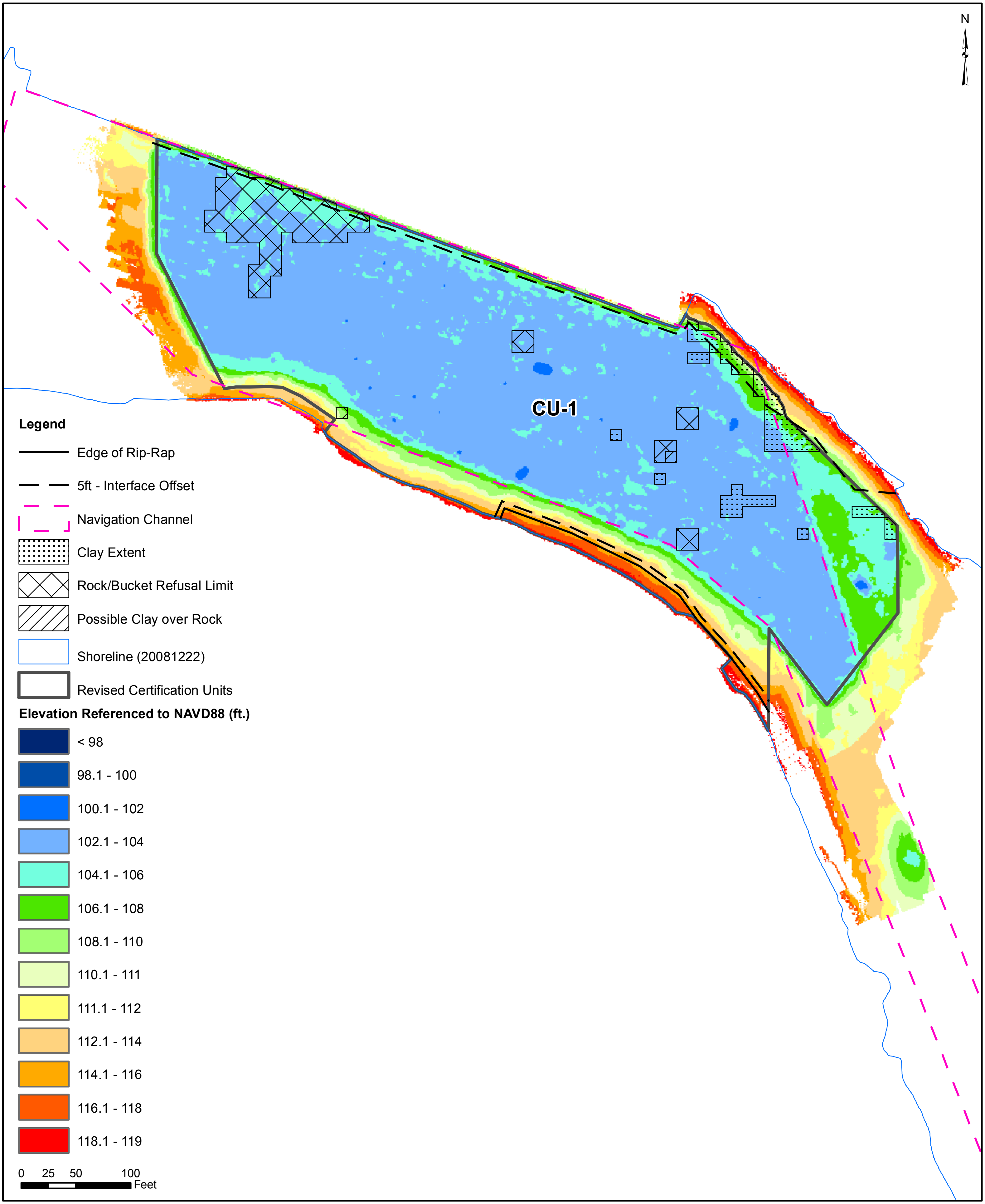
Appendix II-A

March 2010



Post Dredging Elevations As of October 2009

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010

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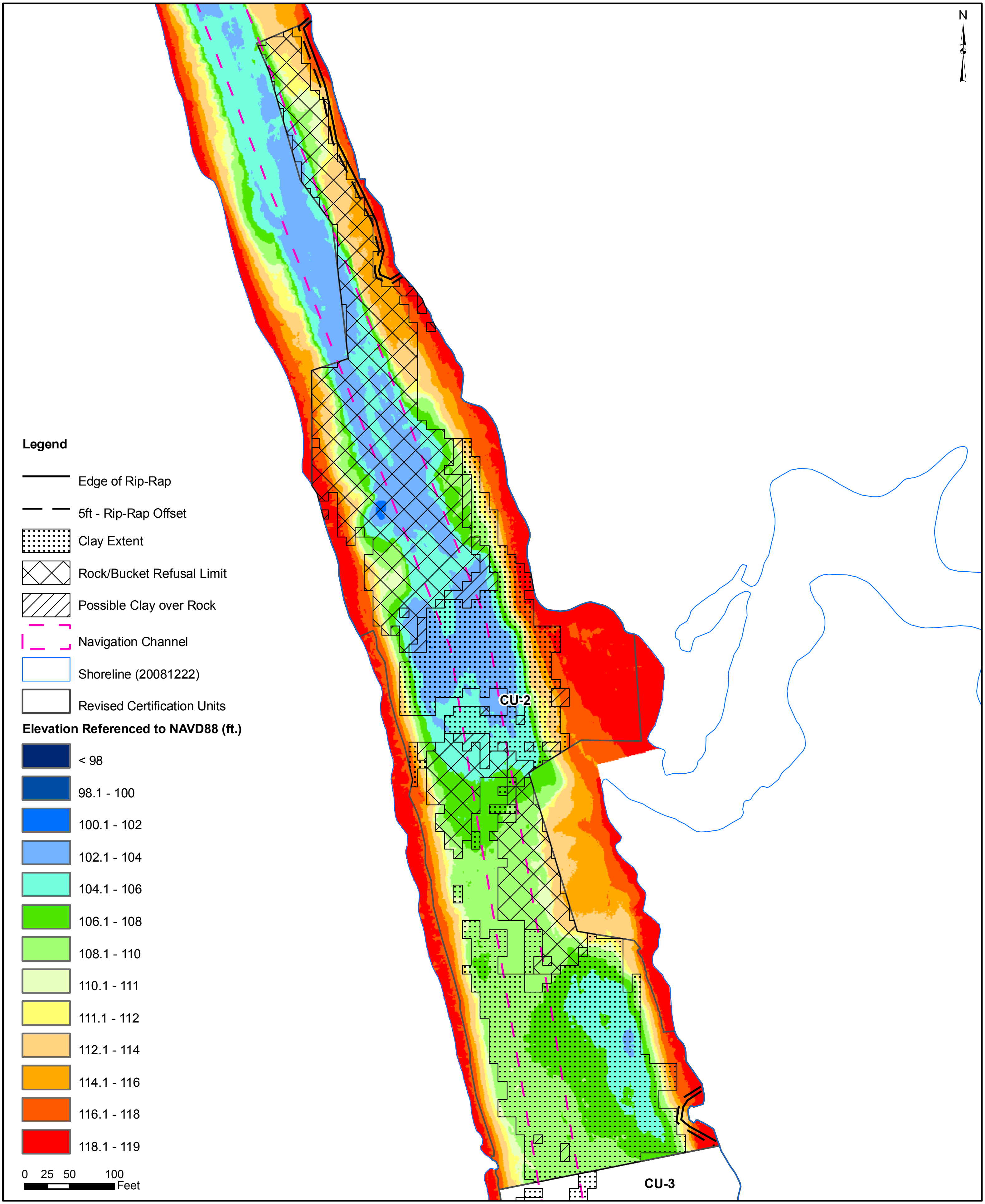
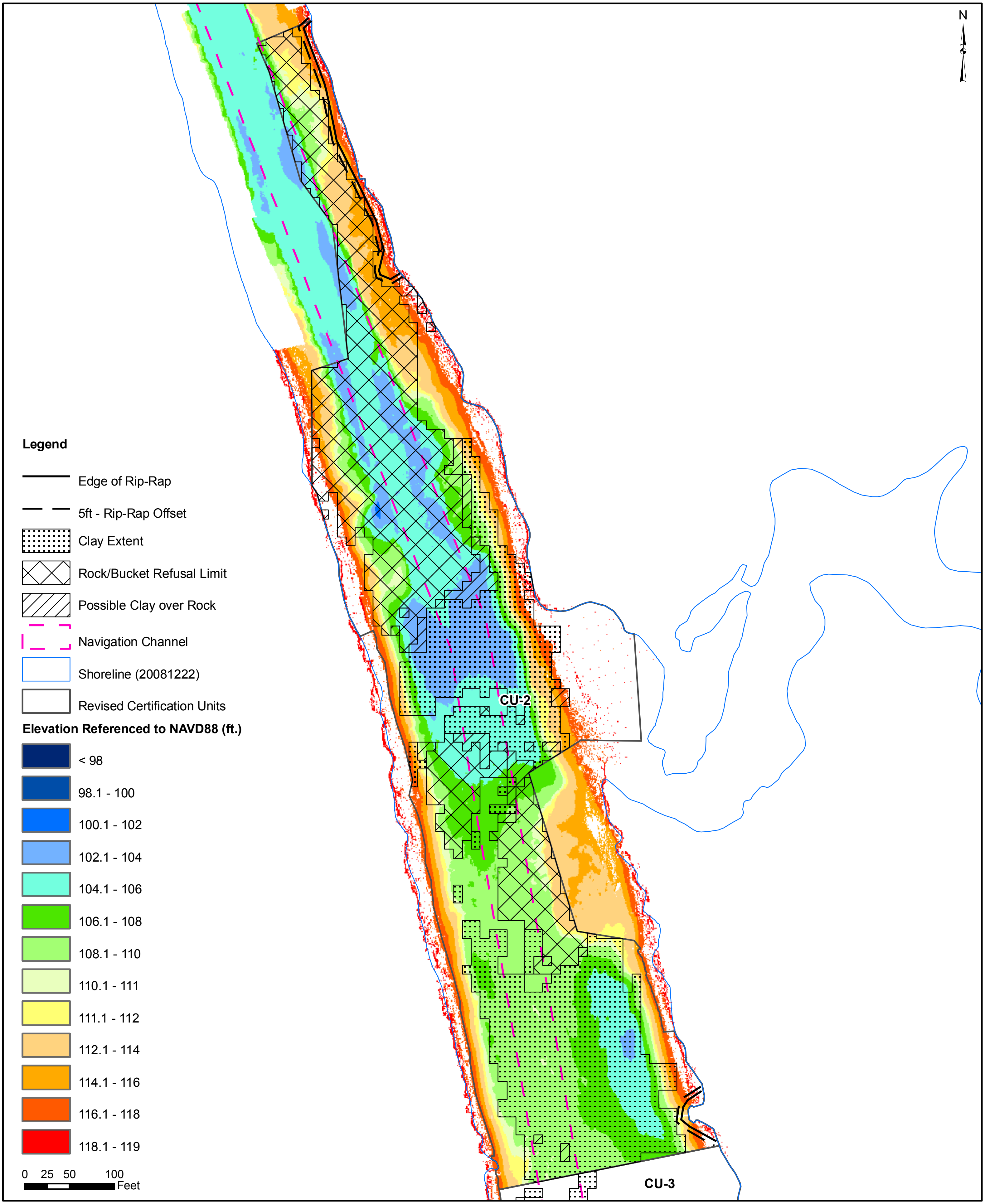


2005 Pre-Dredging Elevations

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010



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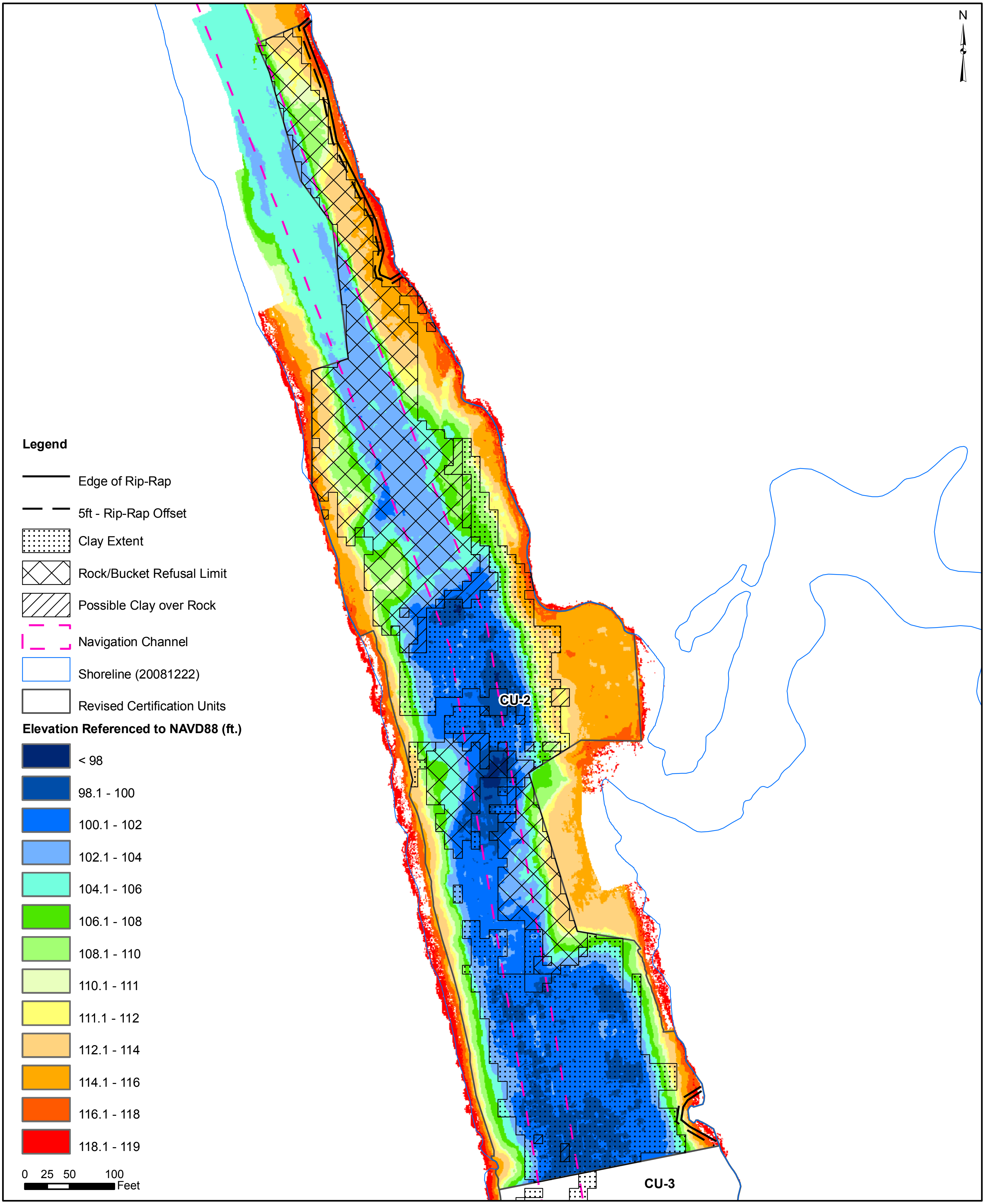
2009 Pre-Dredging Elevations

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010



Post Dredging Elevations As of October 2009

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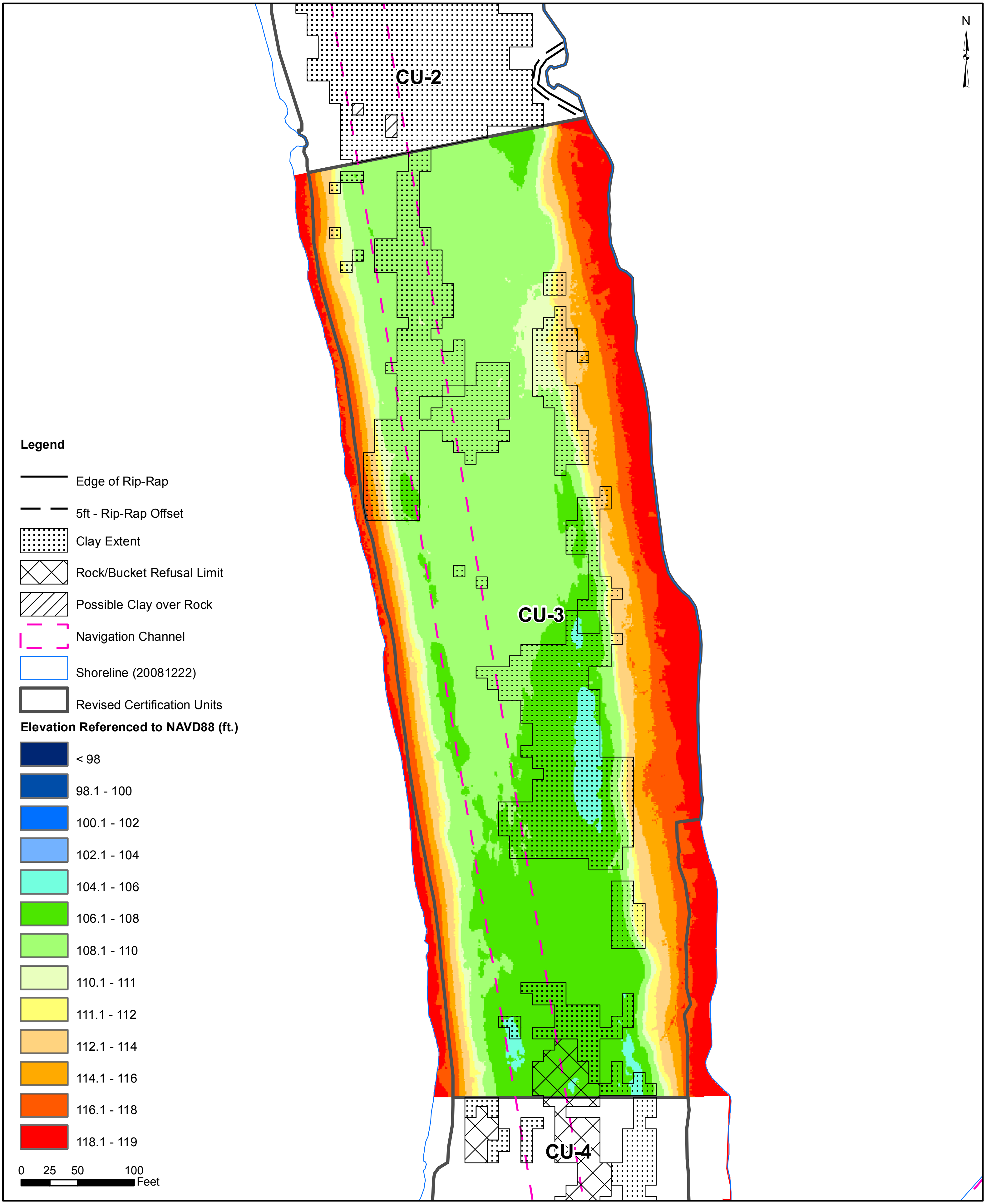
March 2010



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2005 Pre-Dredging Elevations

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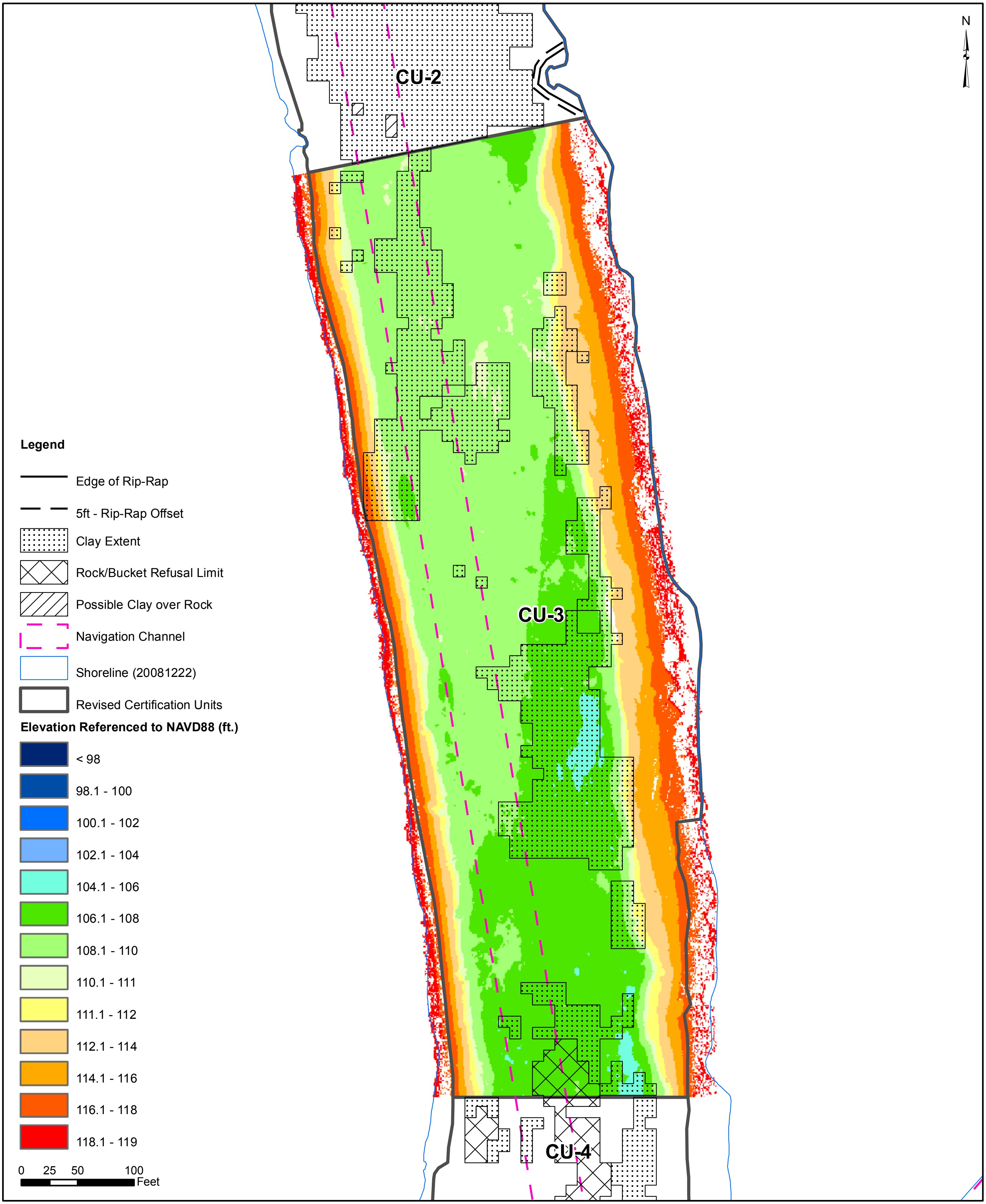
Appendix II-A

March 2010



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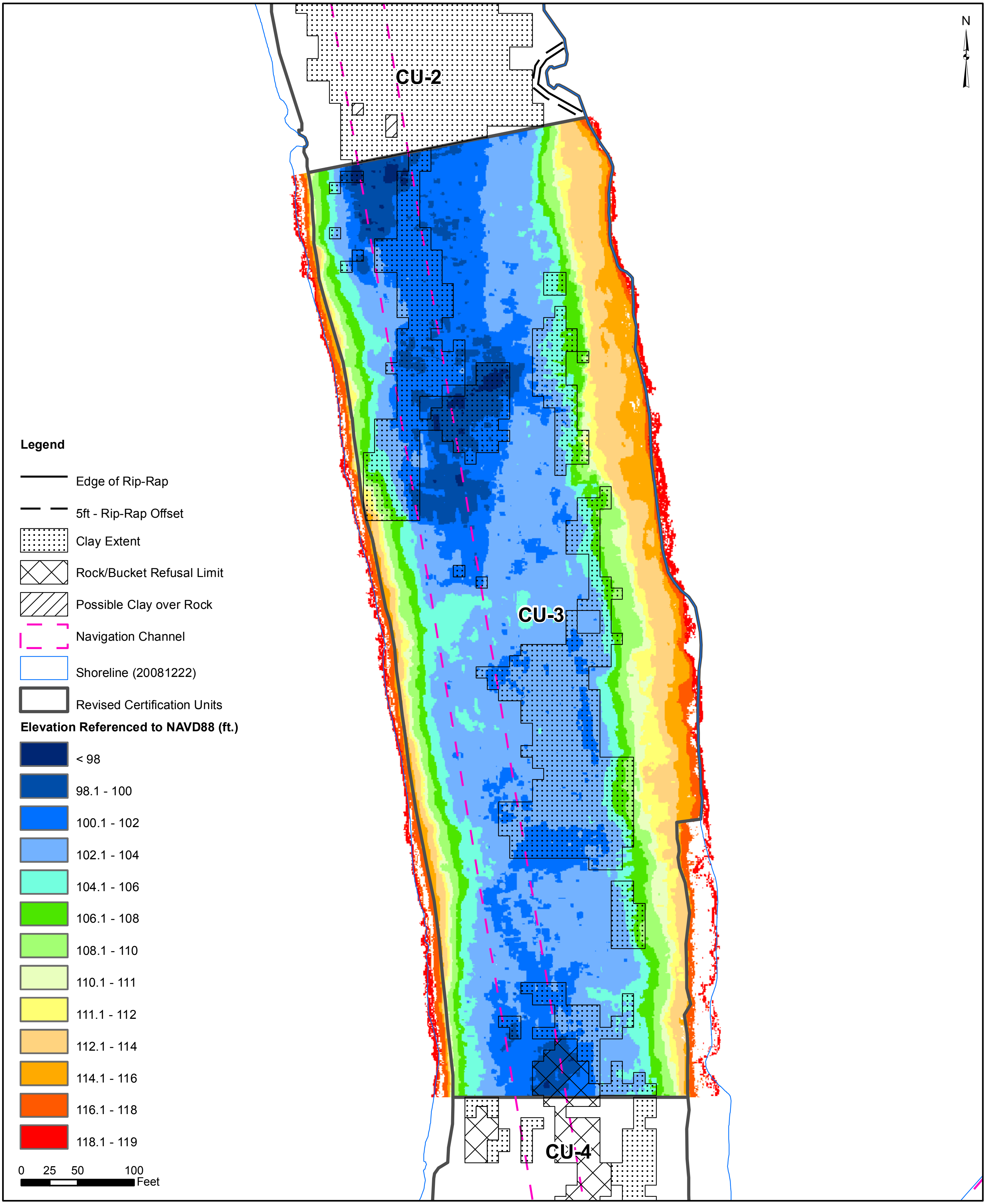
2009 Pre-Dredging Elevations

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010



Post Dredging Elevations As of October 2009

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Appendix II-A

March 2010

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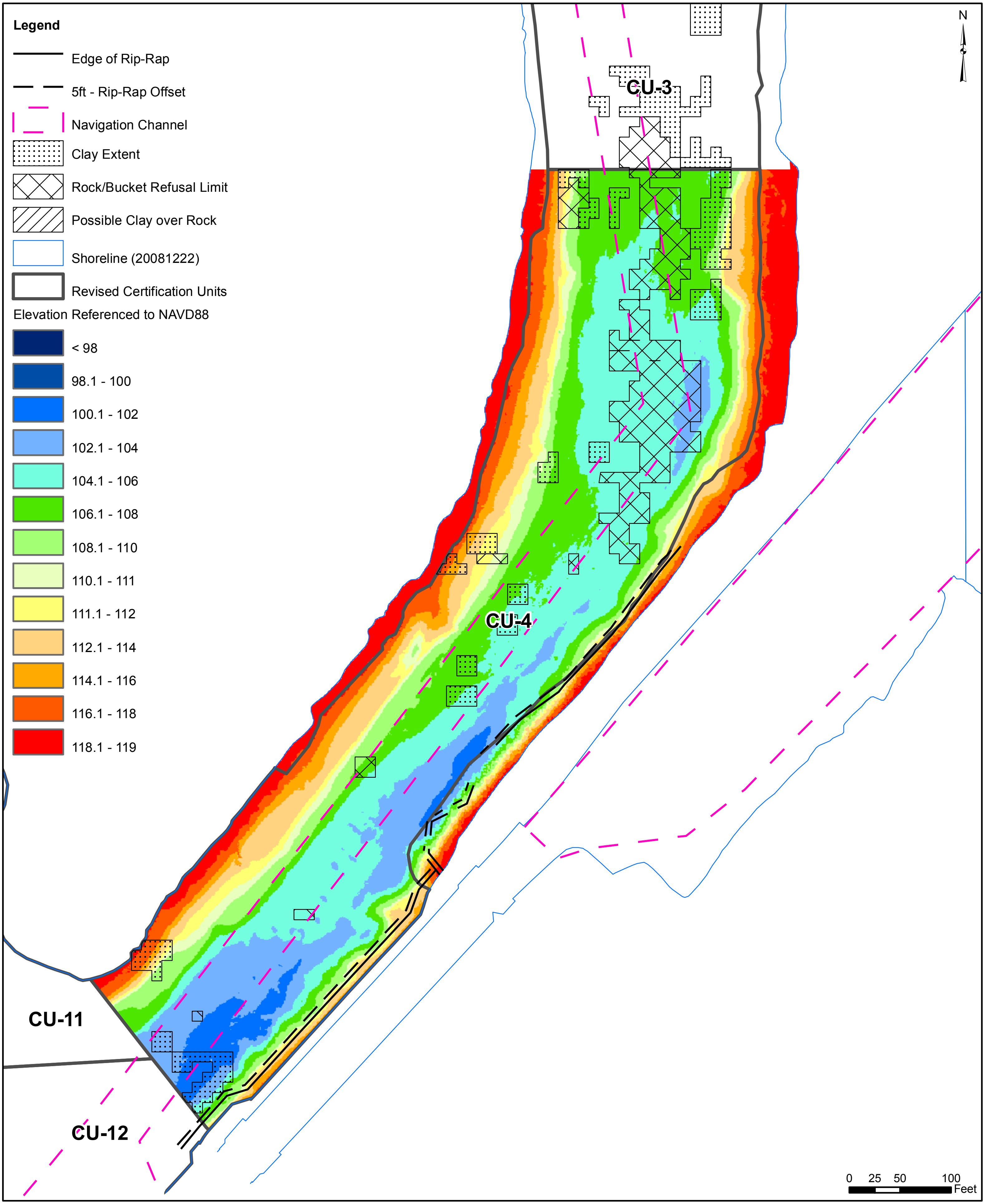

2005 Pre-Dredging Elevations

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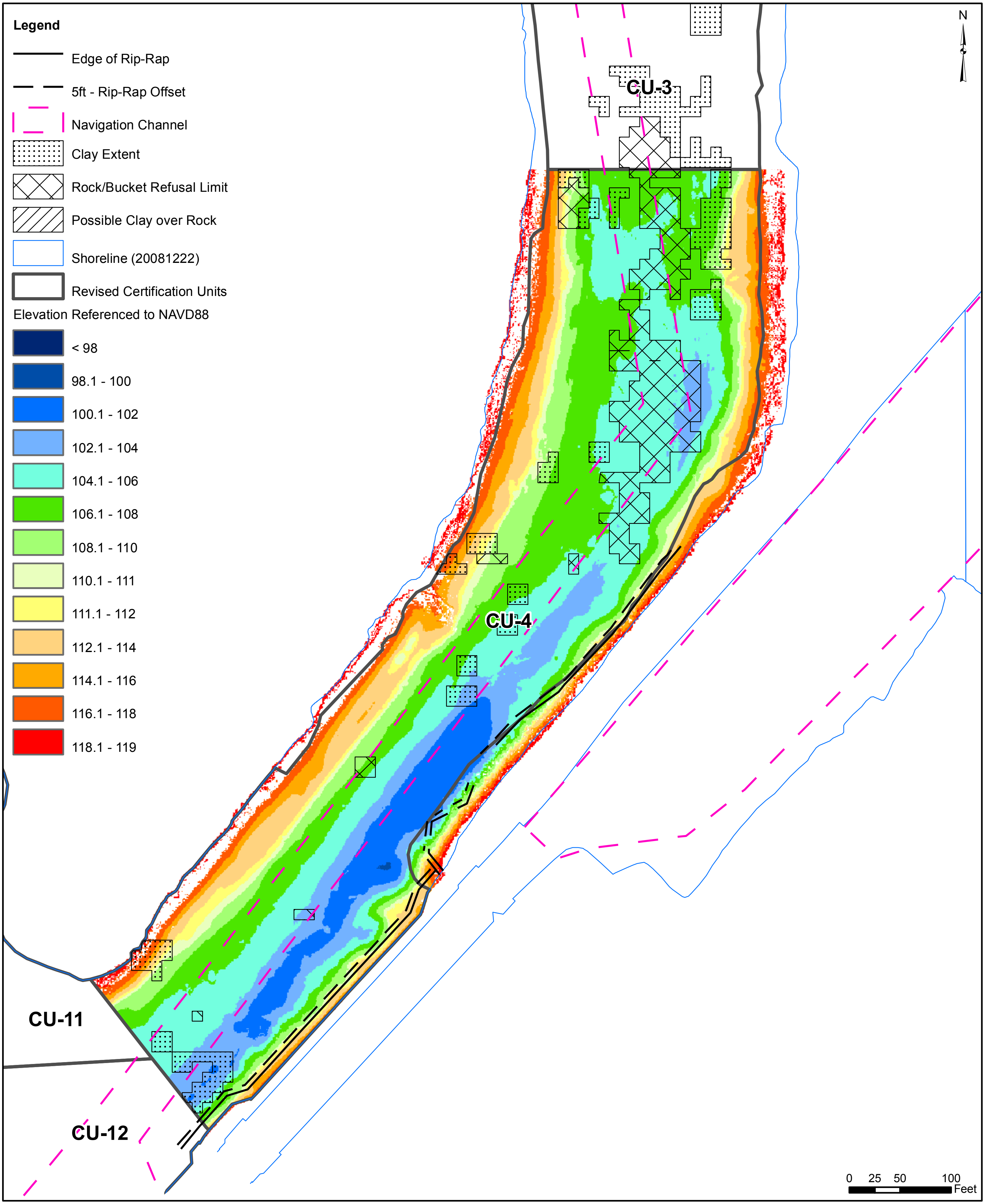
March 2010



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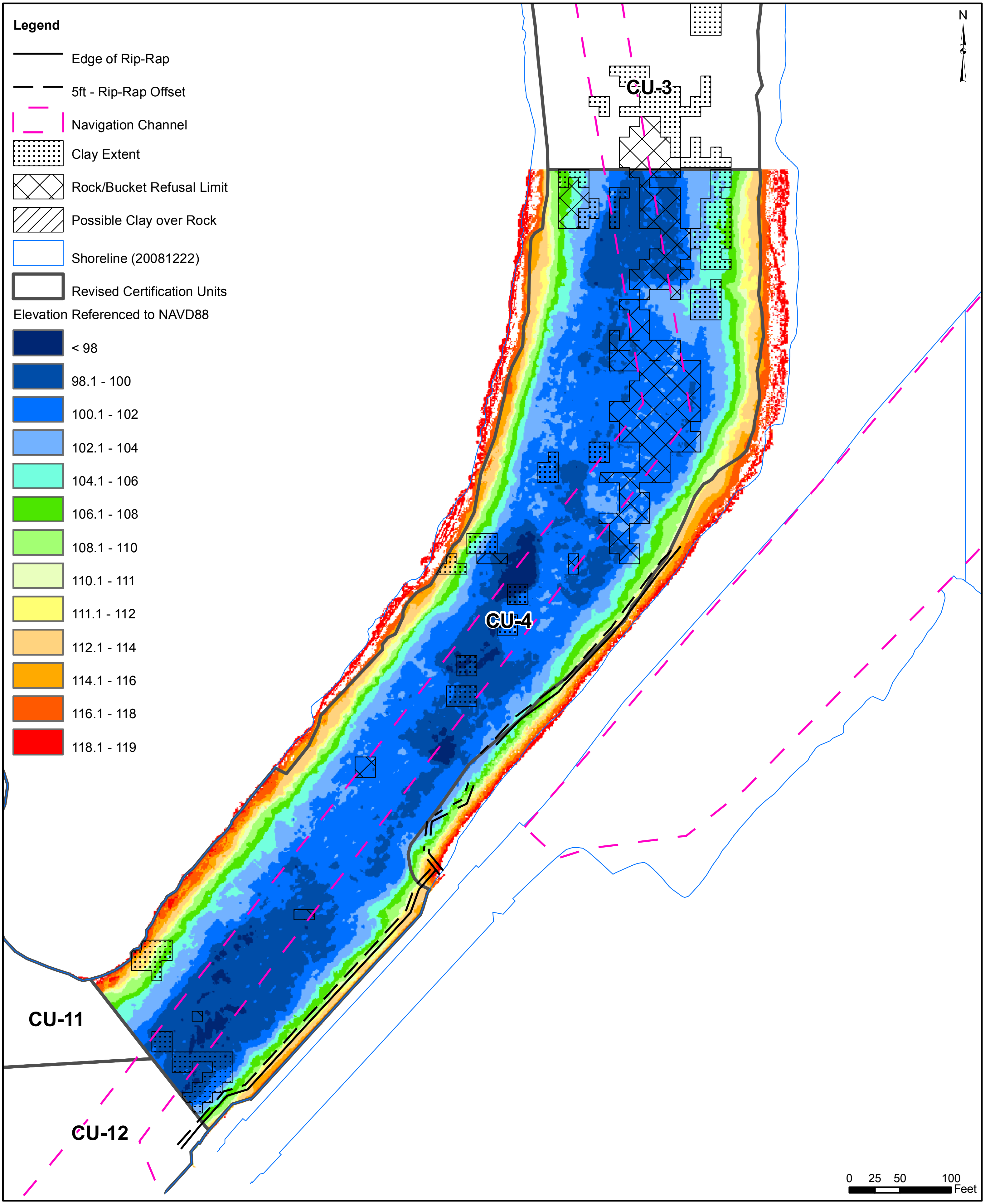
2009 Pre-Dredging Elevations

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010



Post Dredging Elevations As of October 2009

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010

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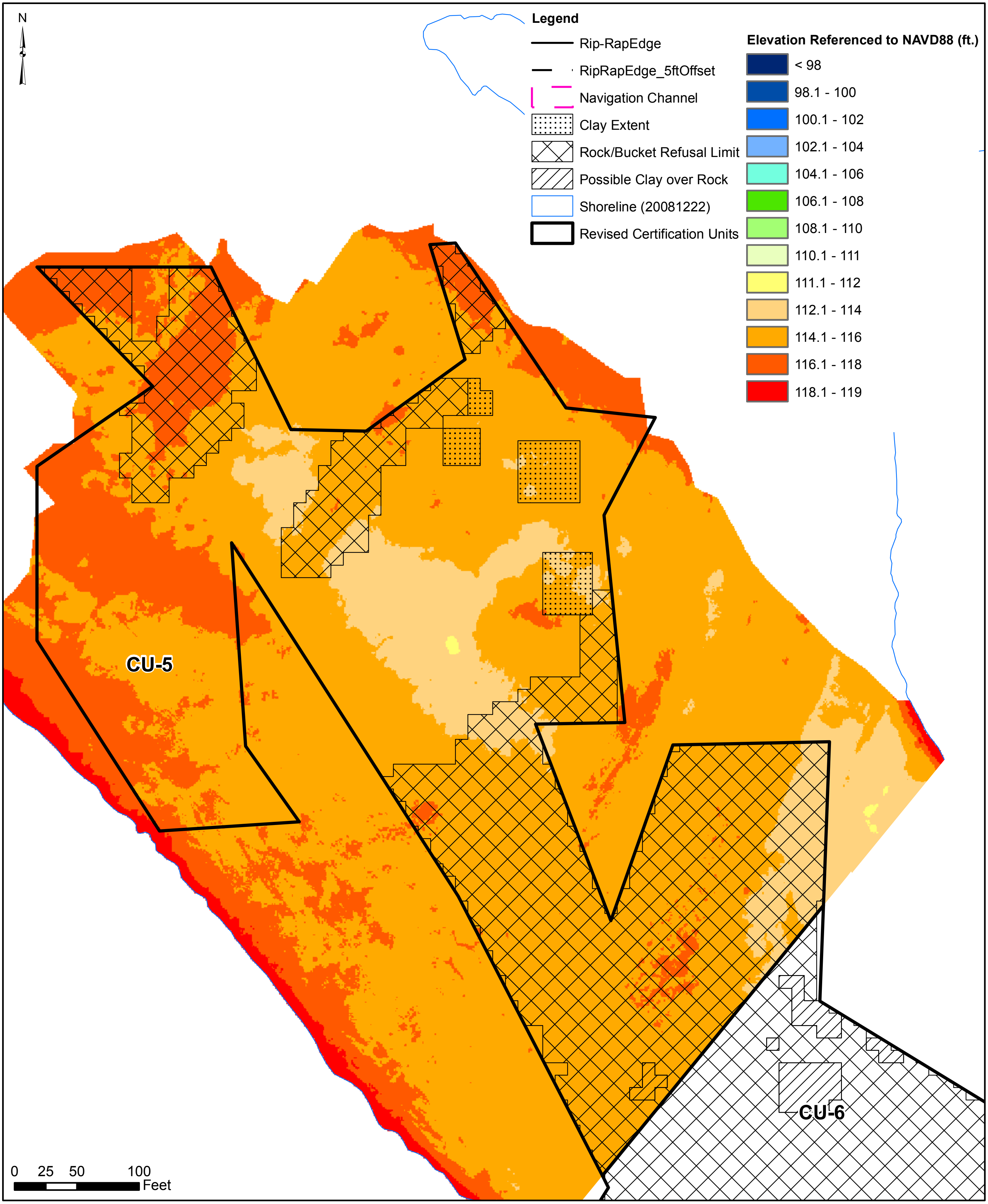

2005 Pre-Dredging Elevations

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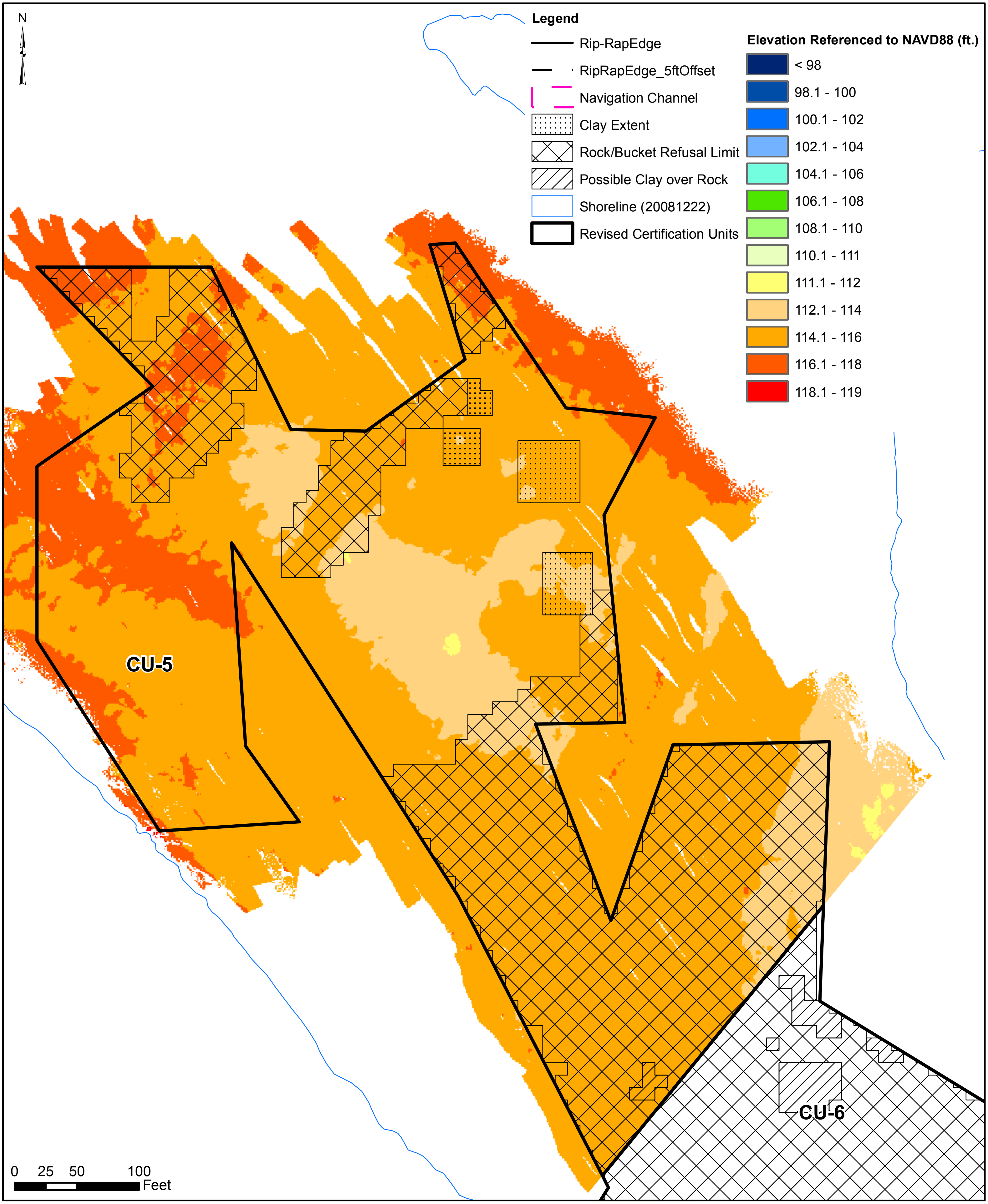
March 2010



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2009 Pre-Dredging Elevations

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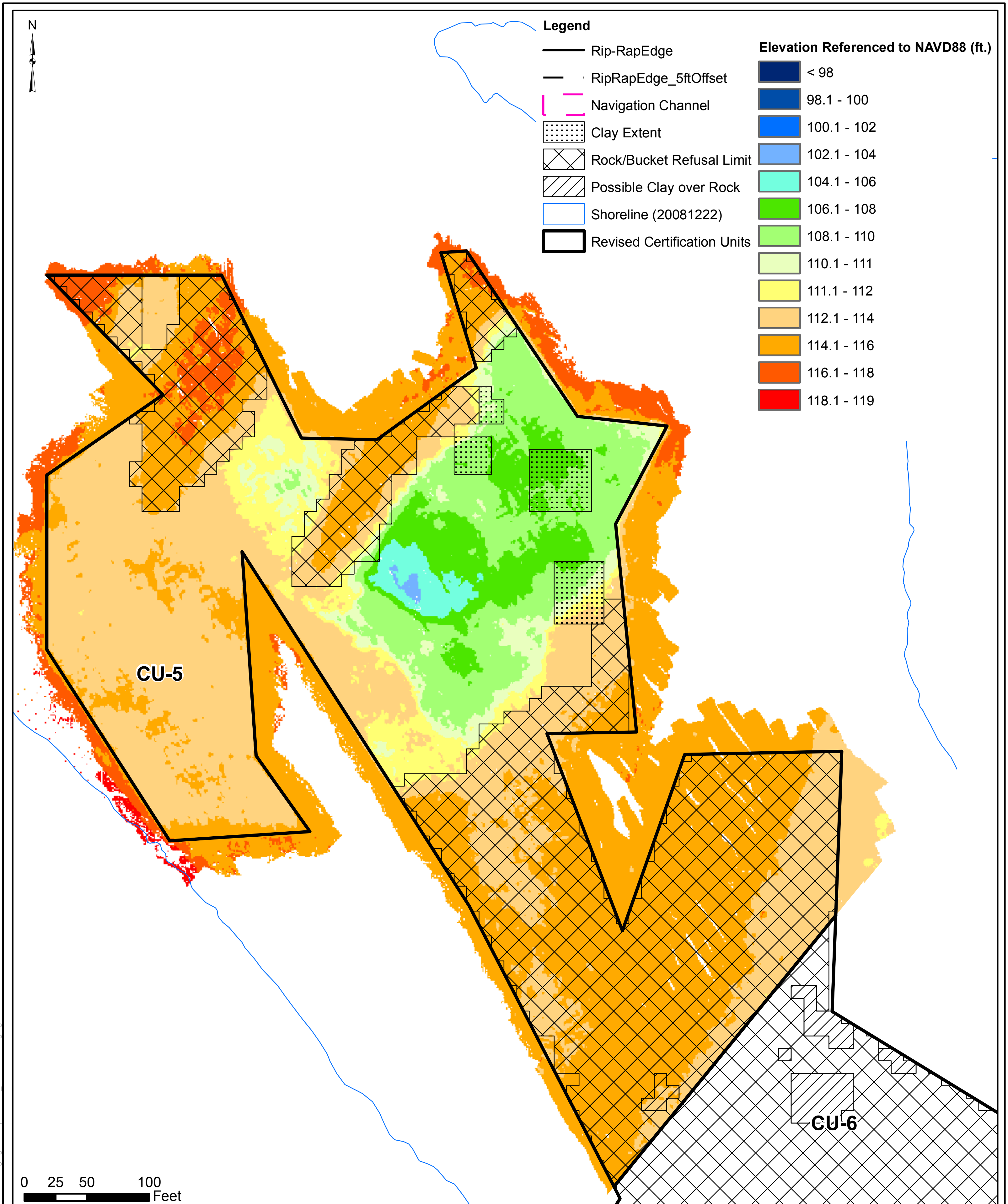
Appendix II-A

March 2010



Post Dredging Elevations As of September 2009

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010

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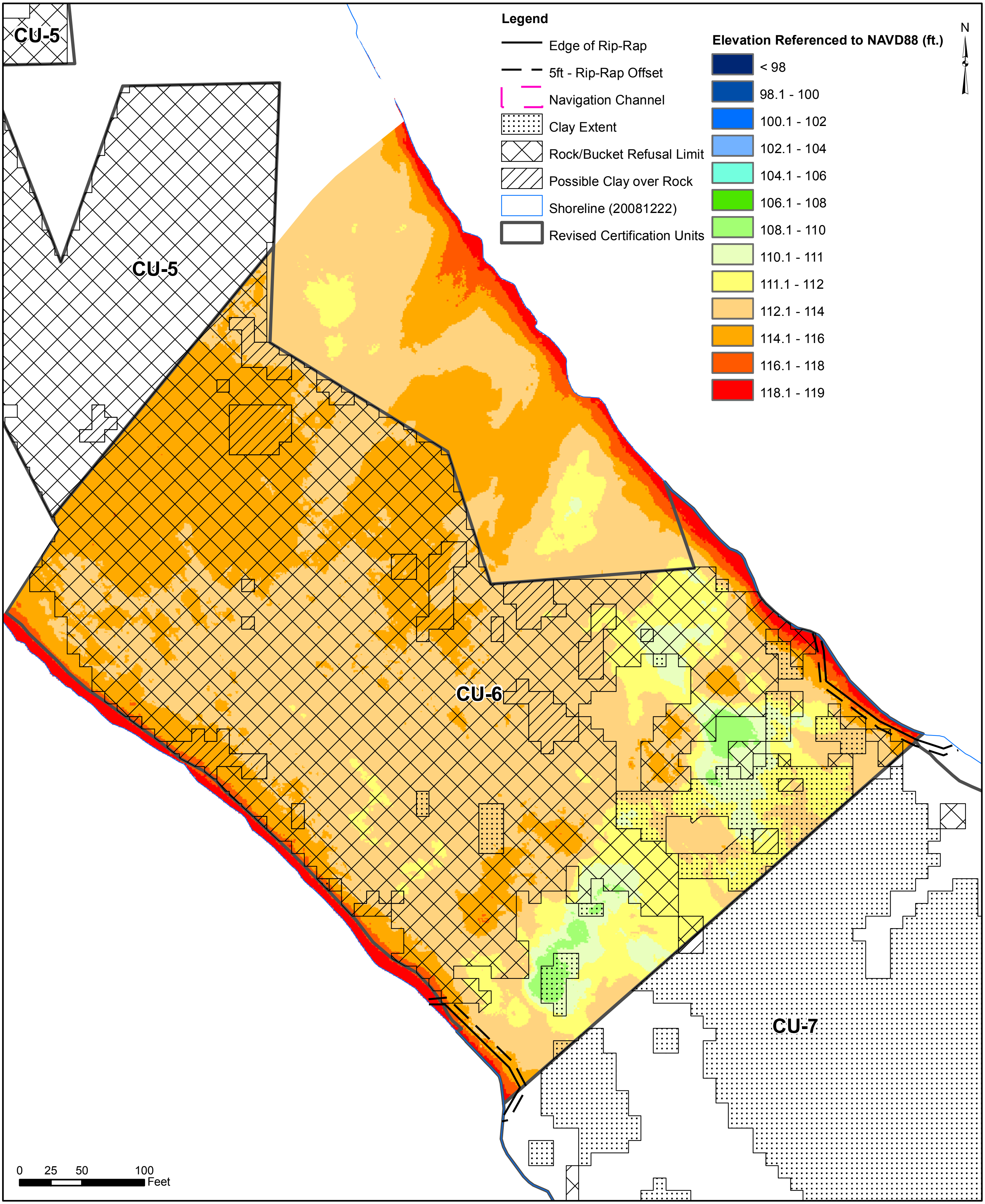

2005 Pre-Dredging Elevations

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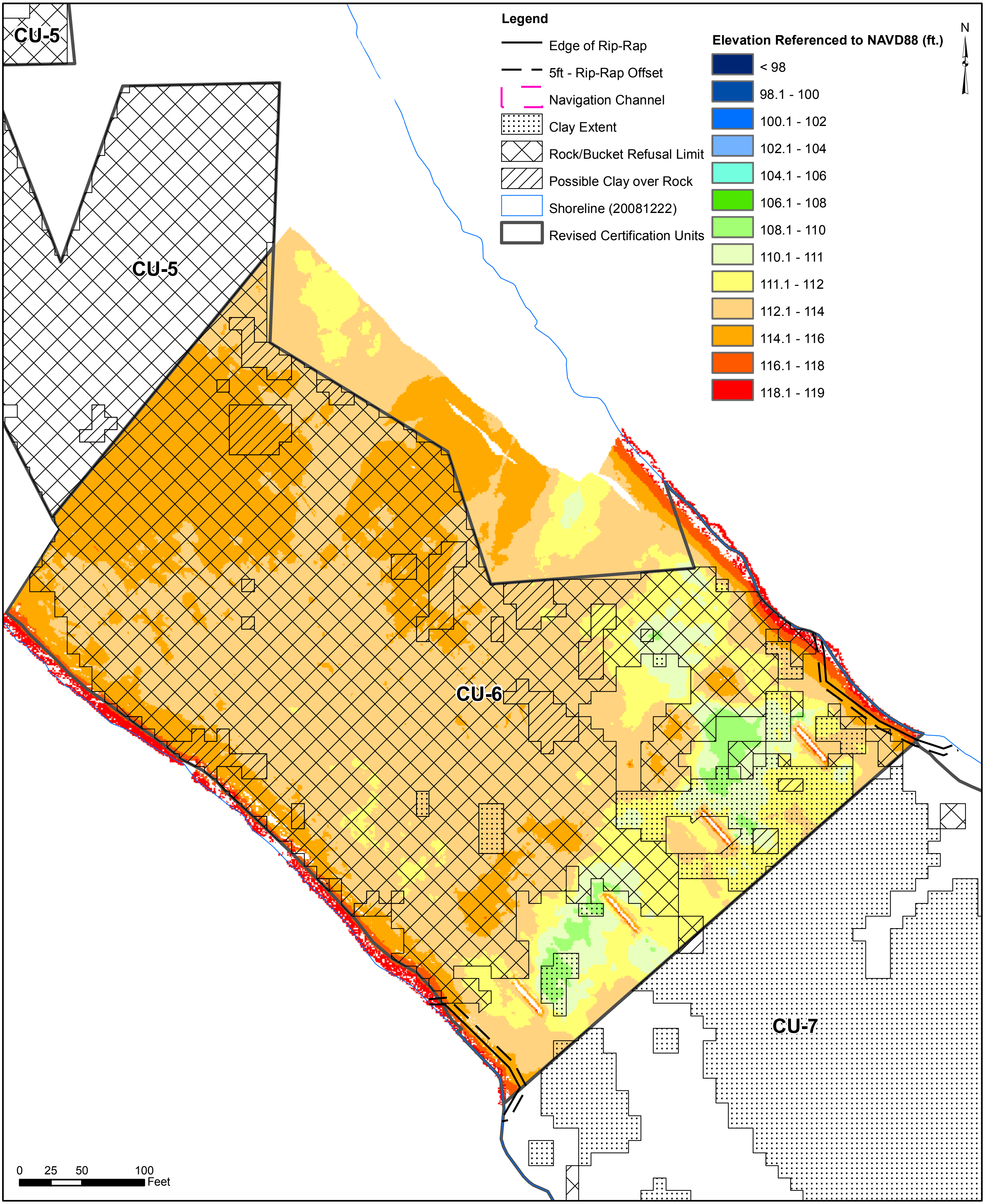
March 2010



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2009 Pre-Dredging Elevations

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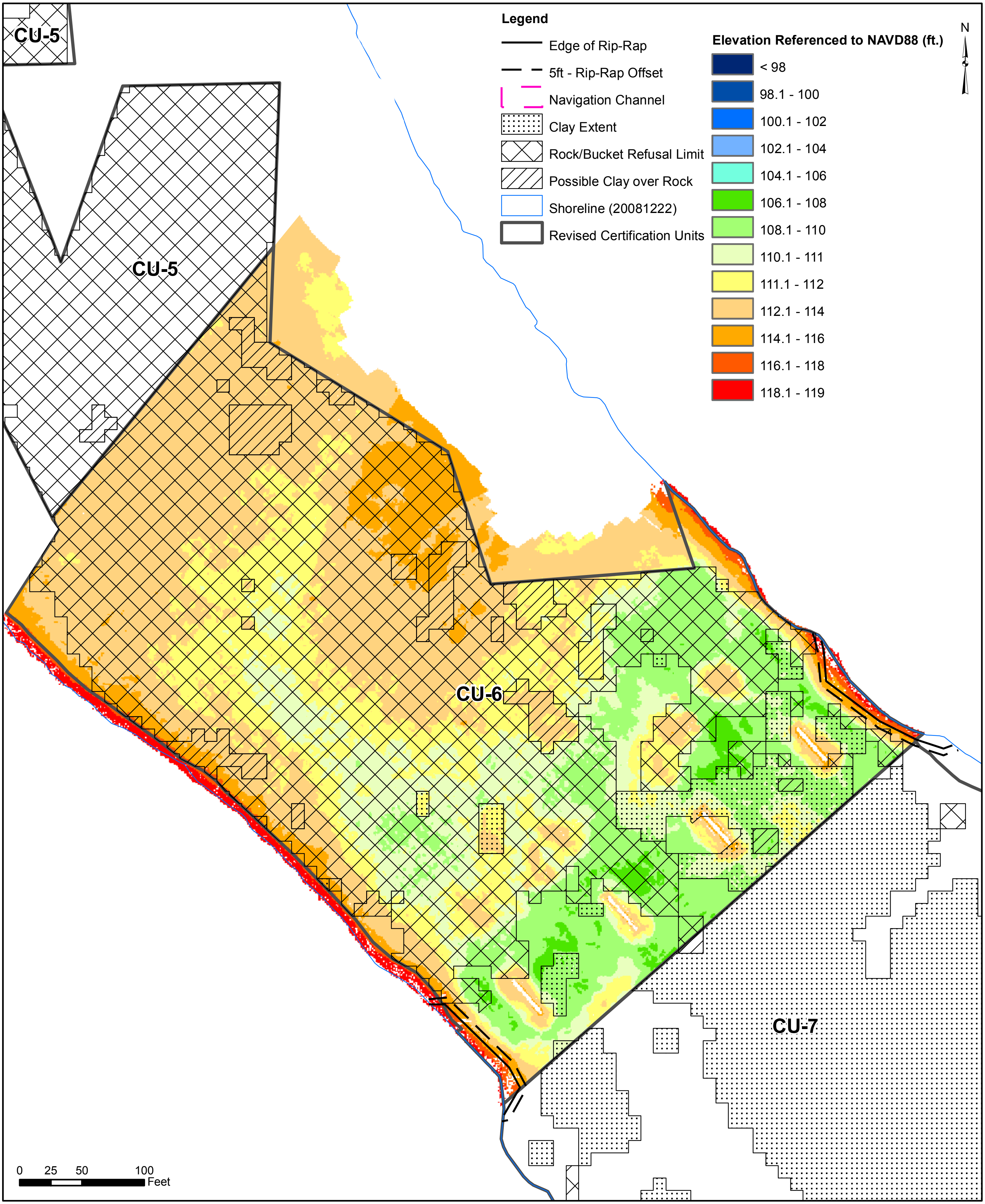
March 2010



Post Dredging Elevations As of September 2009

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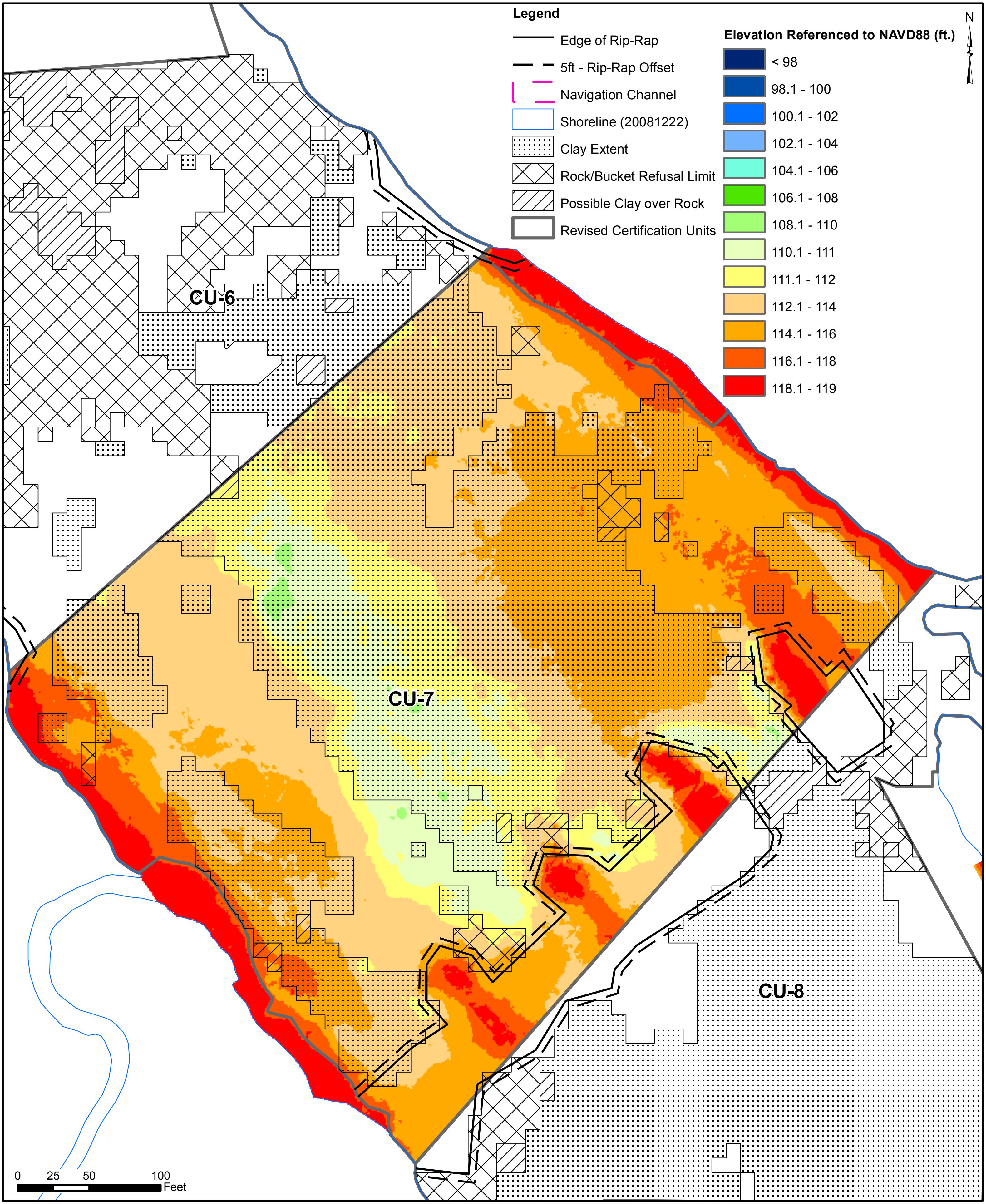
March 2010



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2005 Pre-Dredging Elevations

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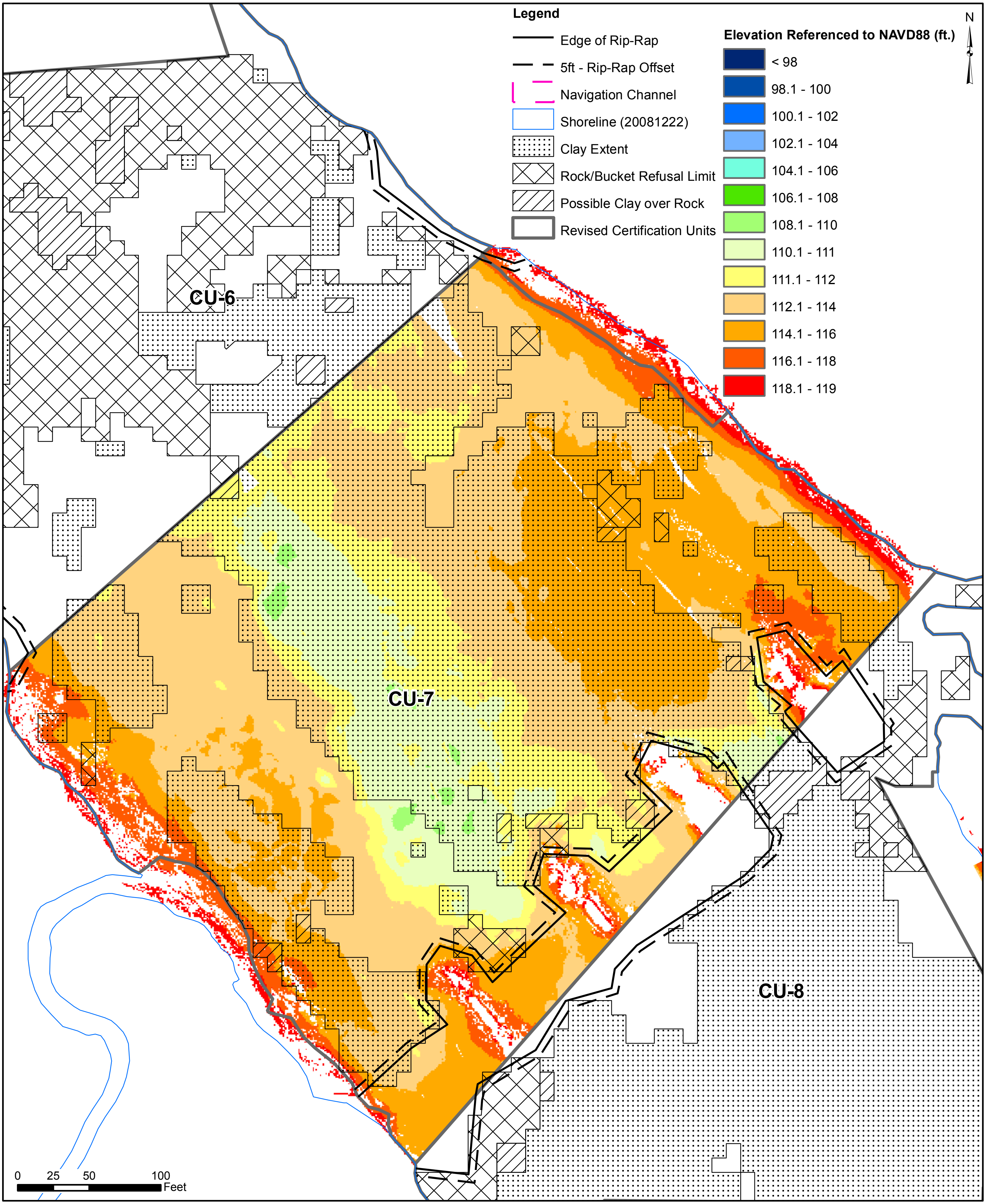
Appendix II-A

March 2010



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2009 Pre-Dredging Elevations

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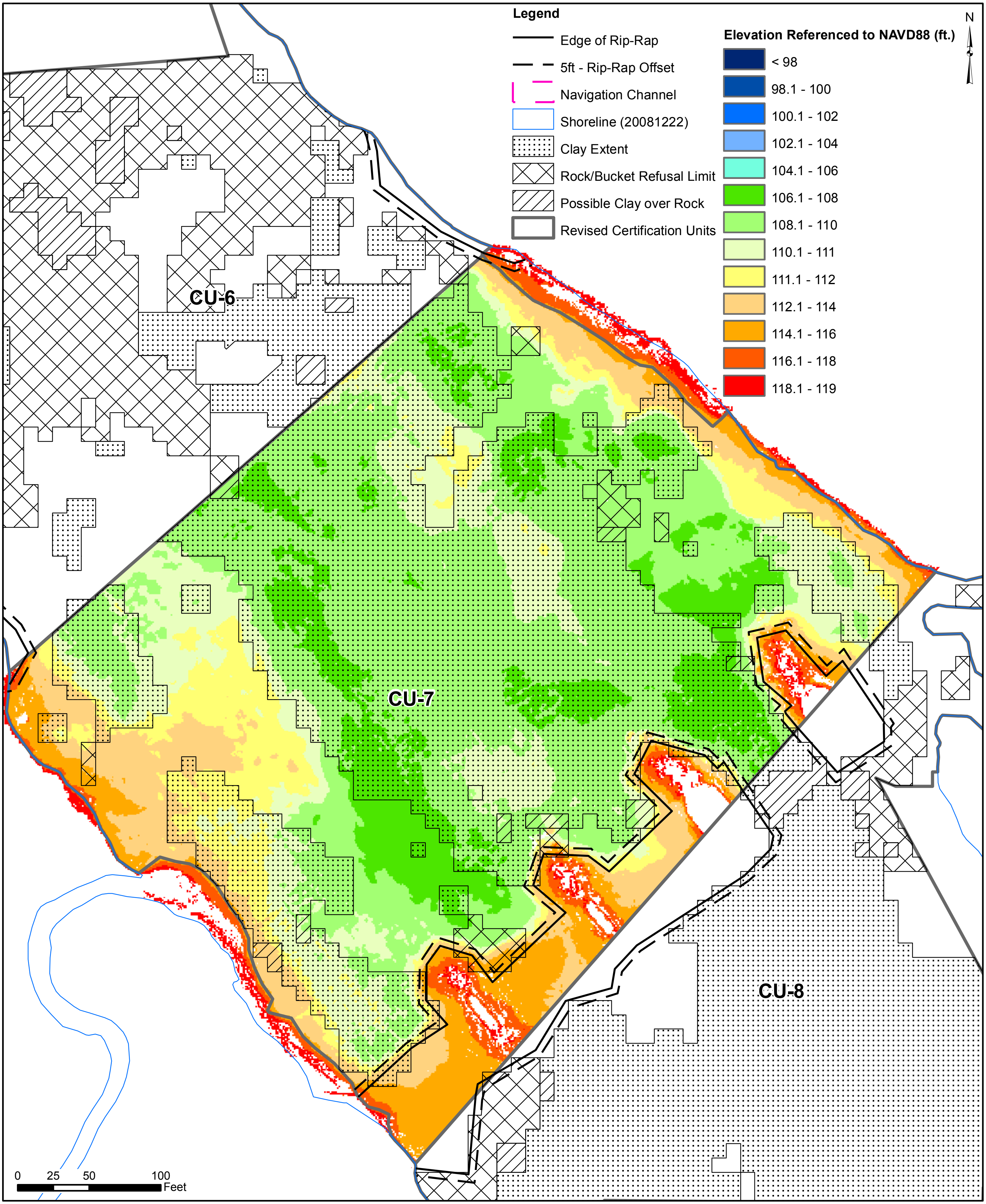
March 2010



Post Dredging Elevations As of October 2009

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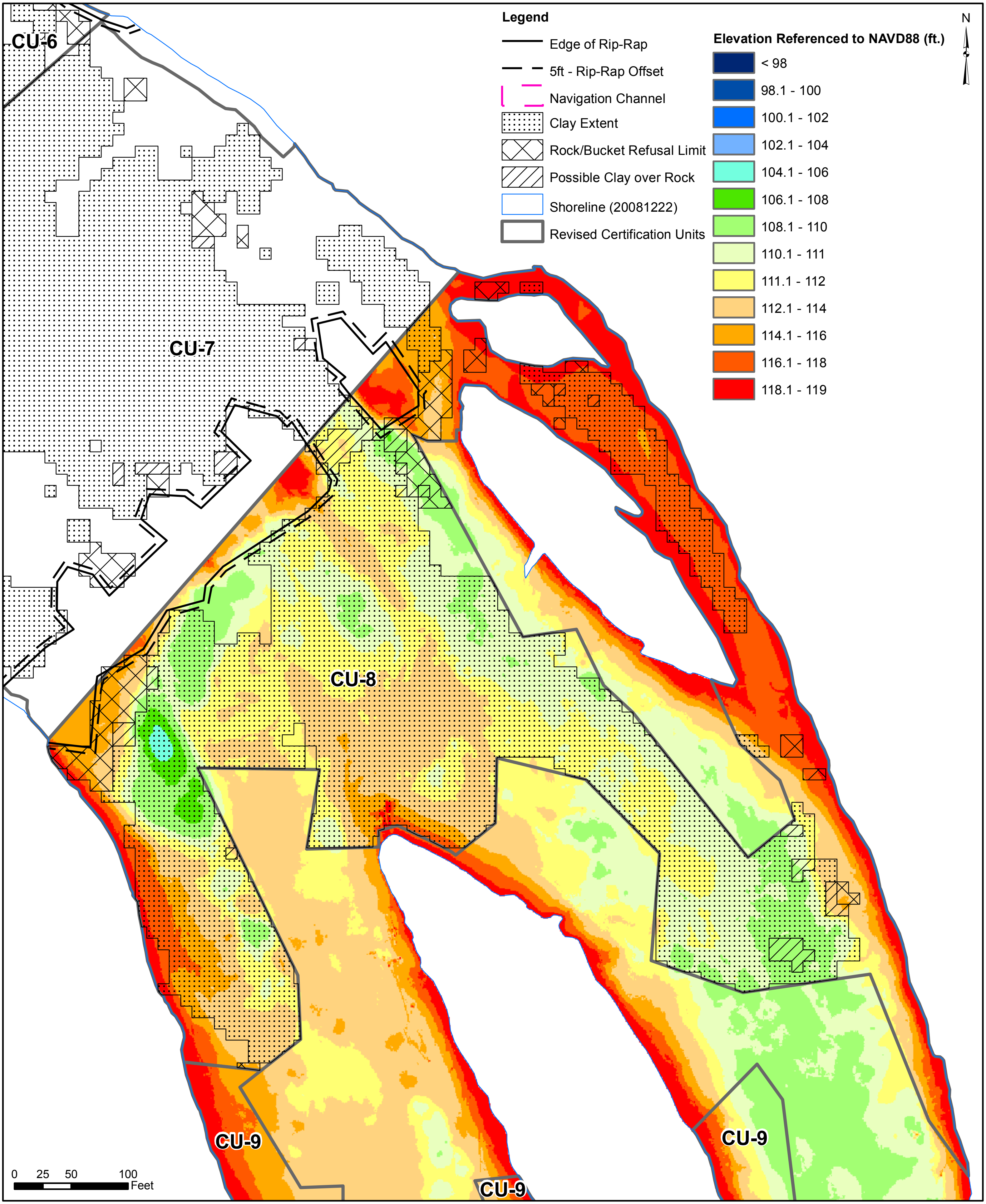
March 2010



E:\hudson\MapDocuments\PostDredging\ForReport\CU8_PrePostDredgingElevations.mxd

2005 Pre-Dredging Elevations

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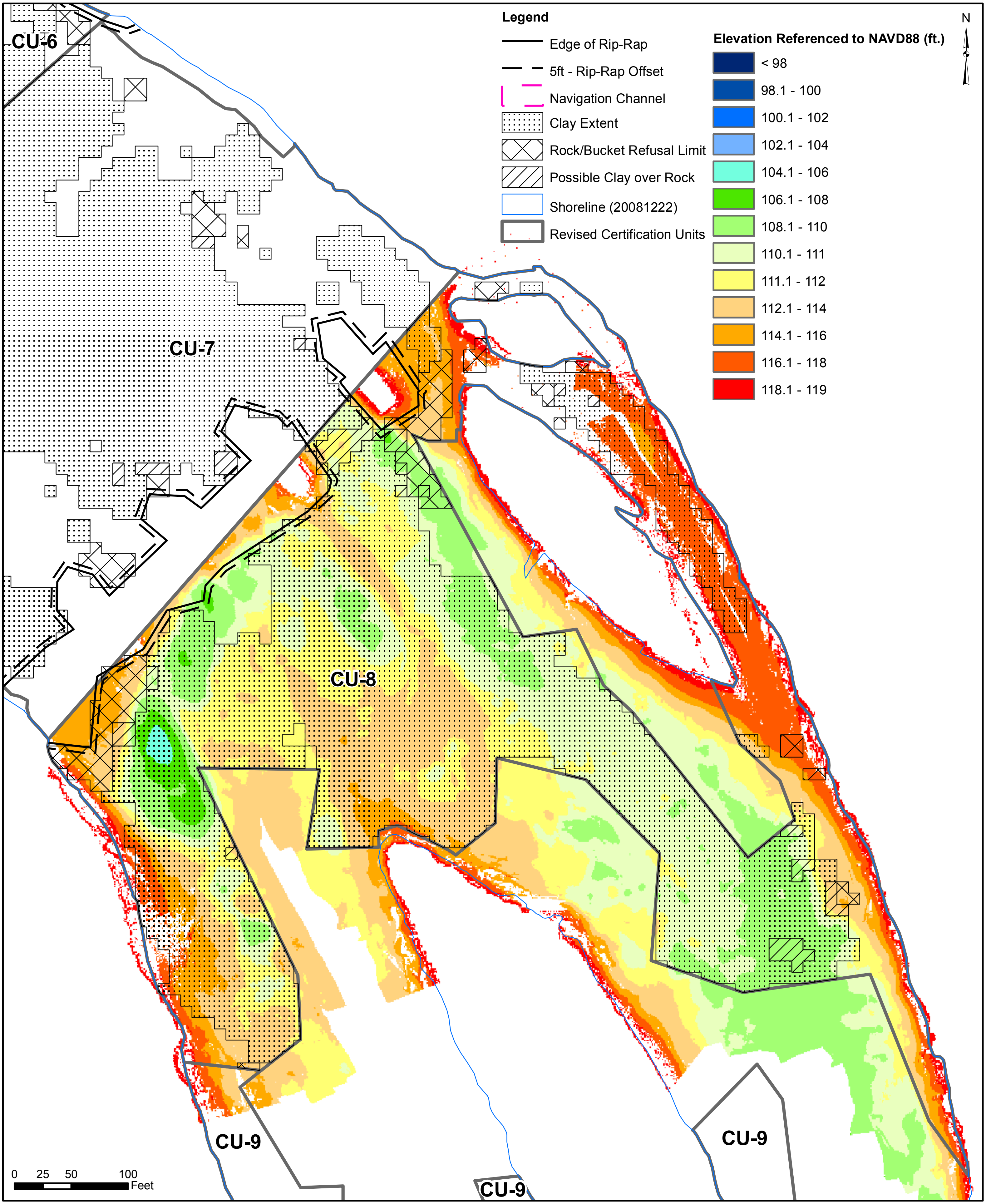
March 2010



2009 Pre-Dredging Elevations

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Appendix II-A

March 2010

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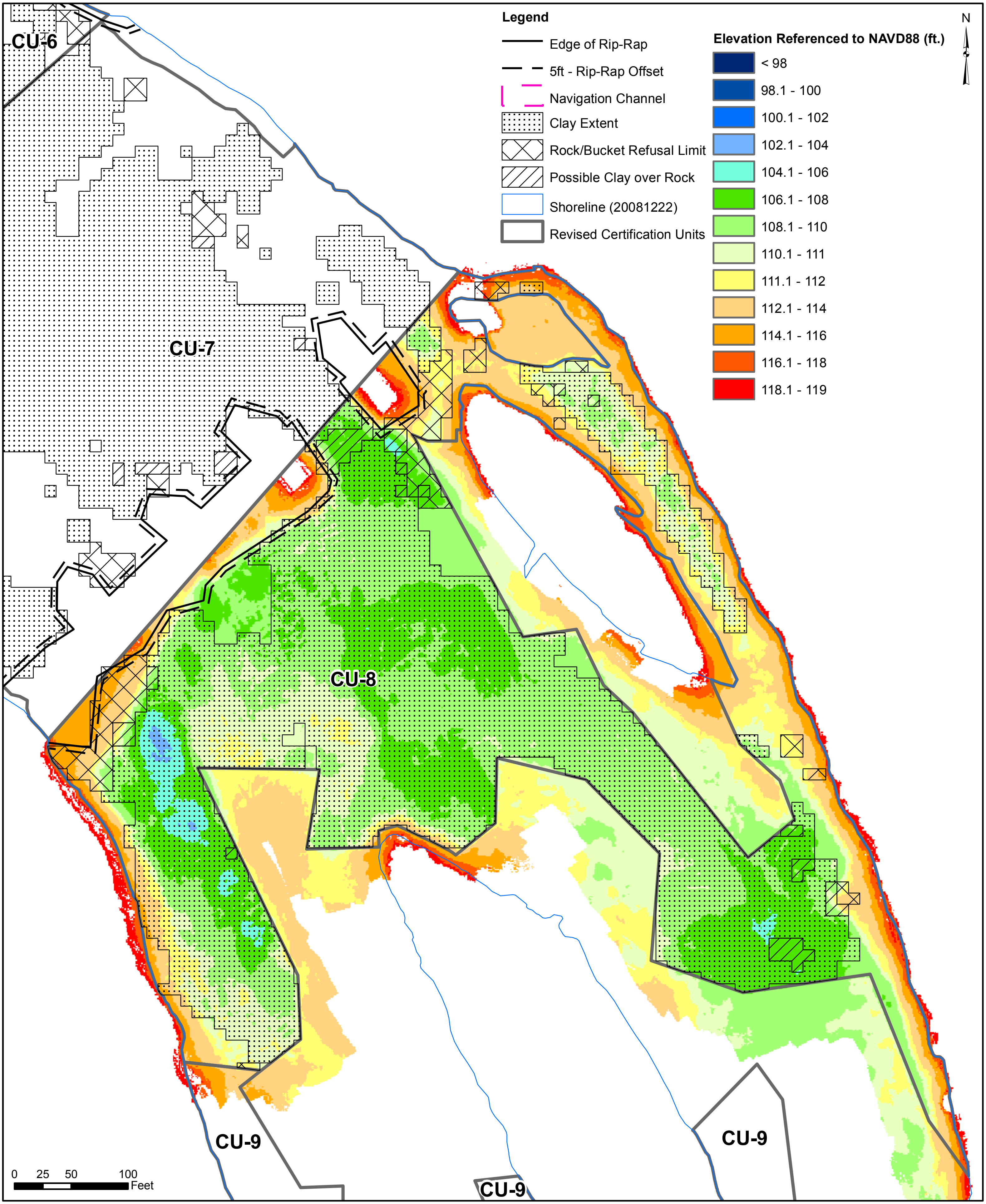

Post Dredging Elevations As of October 2009

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March 2010

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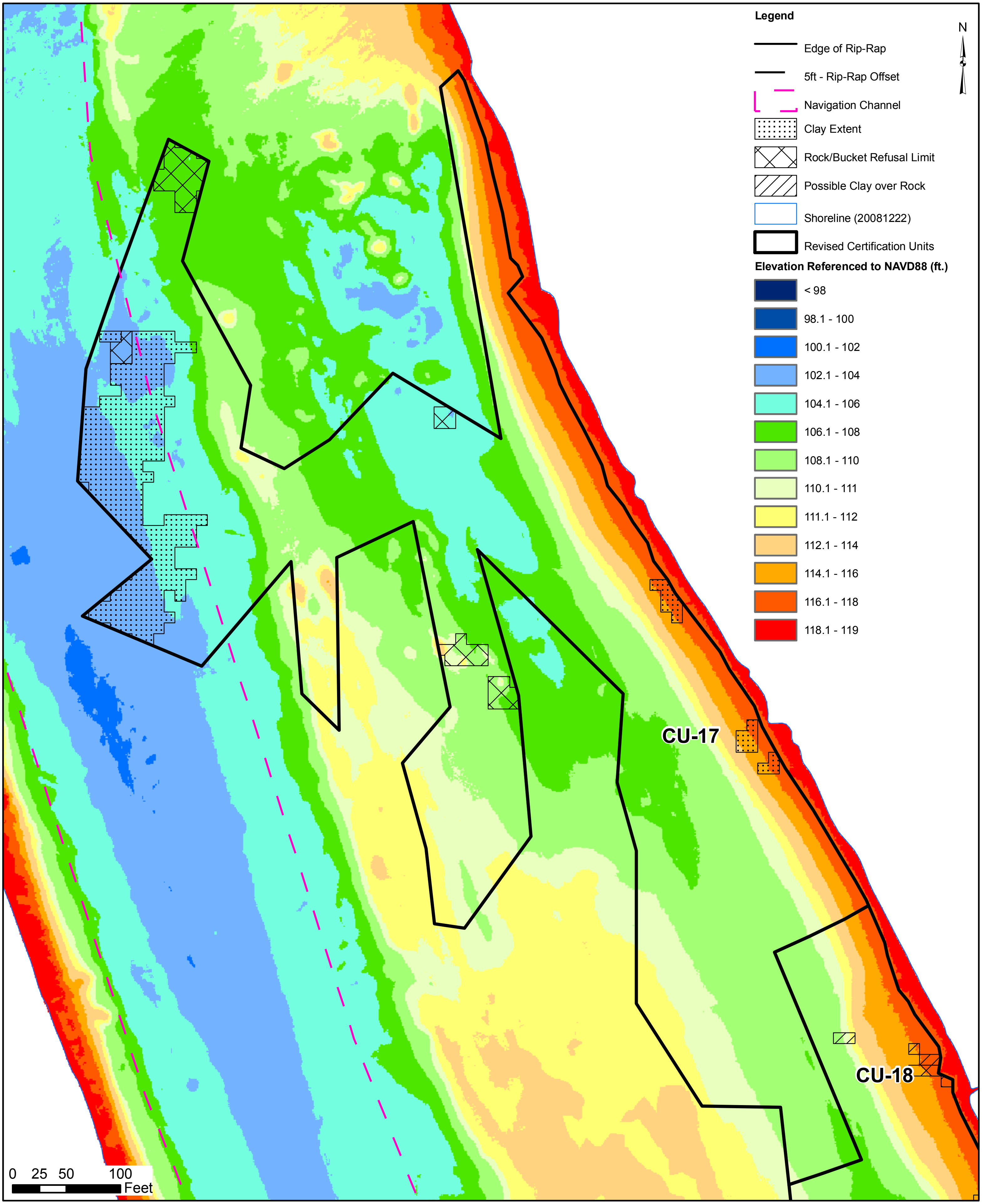

2005 Pre-Dredging Elevations

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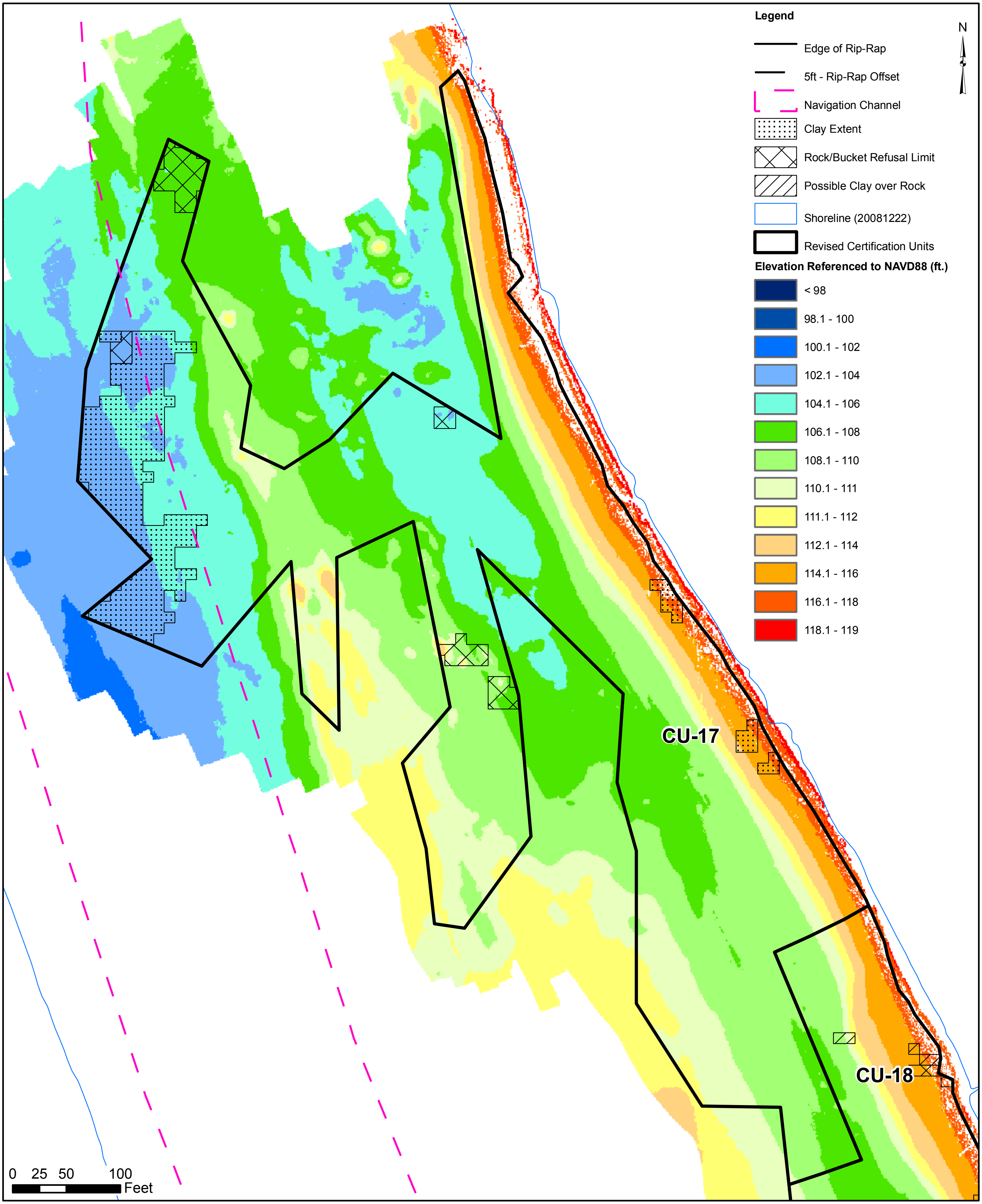
March 2010



2009 Pre-Dredging Elevations

EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010

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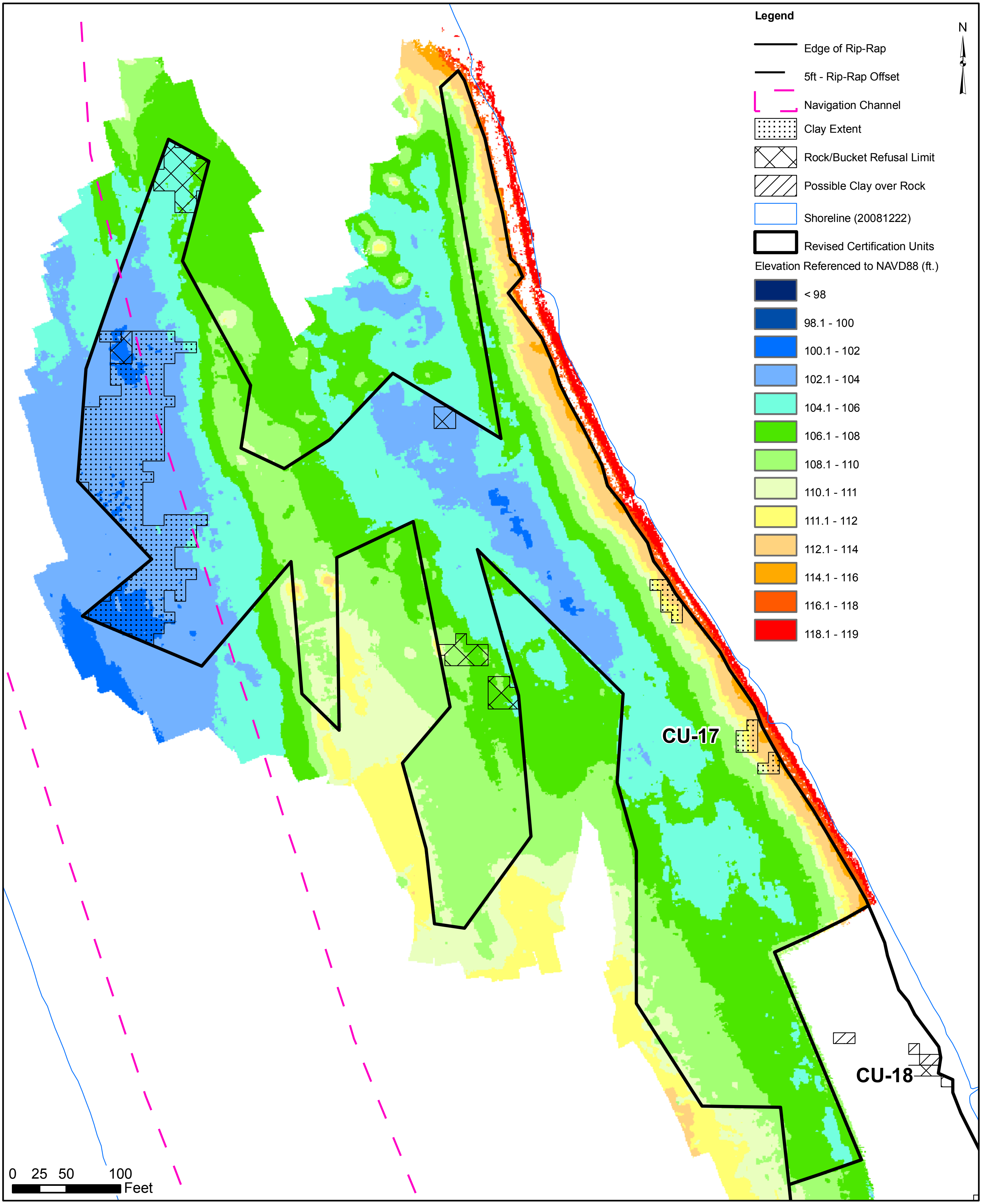

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Post Dredging Elevations As of September 2009

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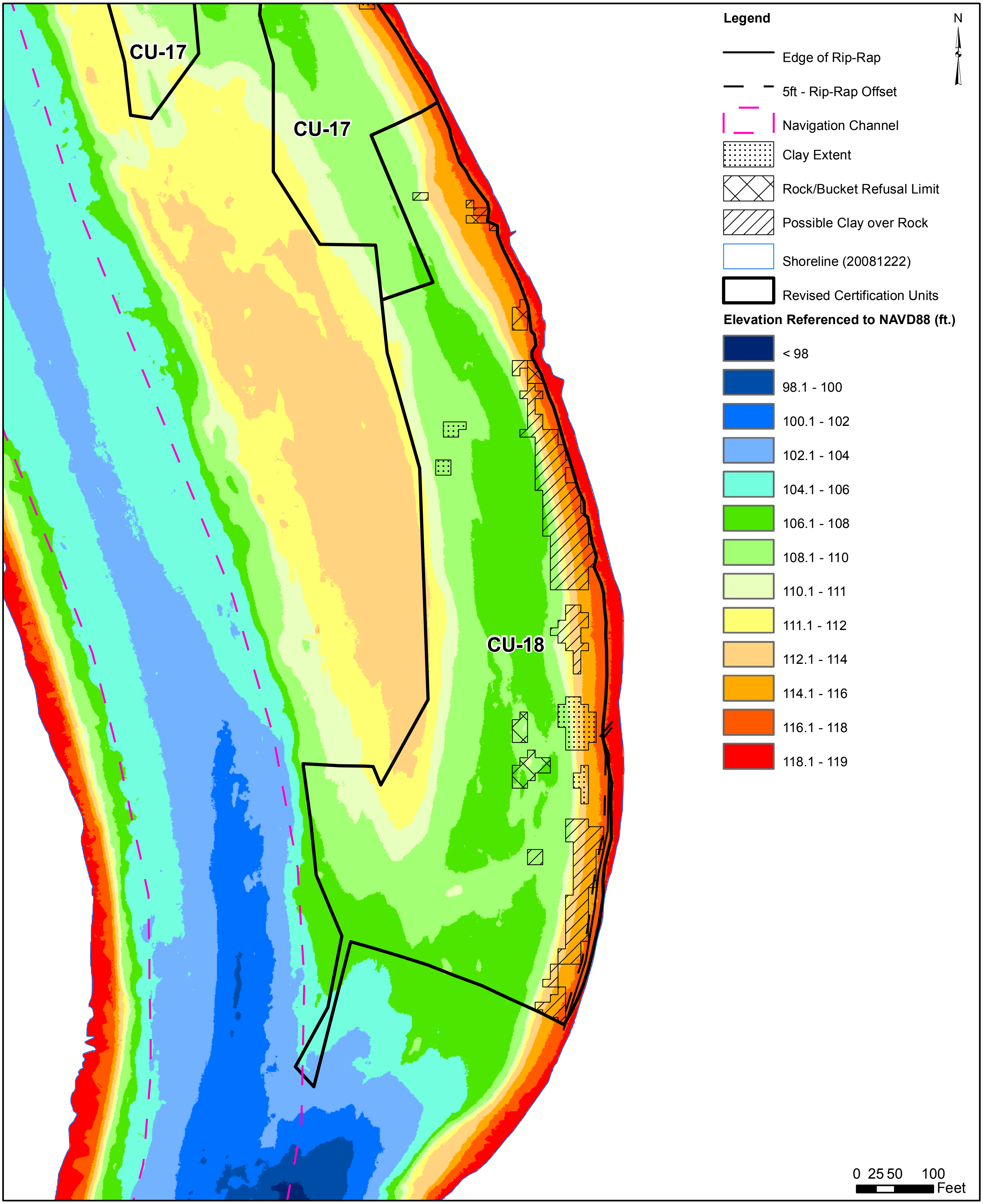
March 2010



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2005 Pre-Dredging Elevations

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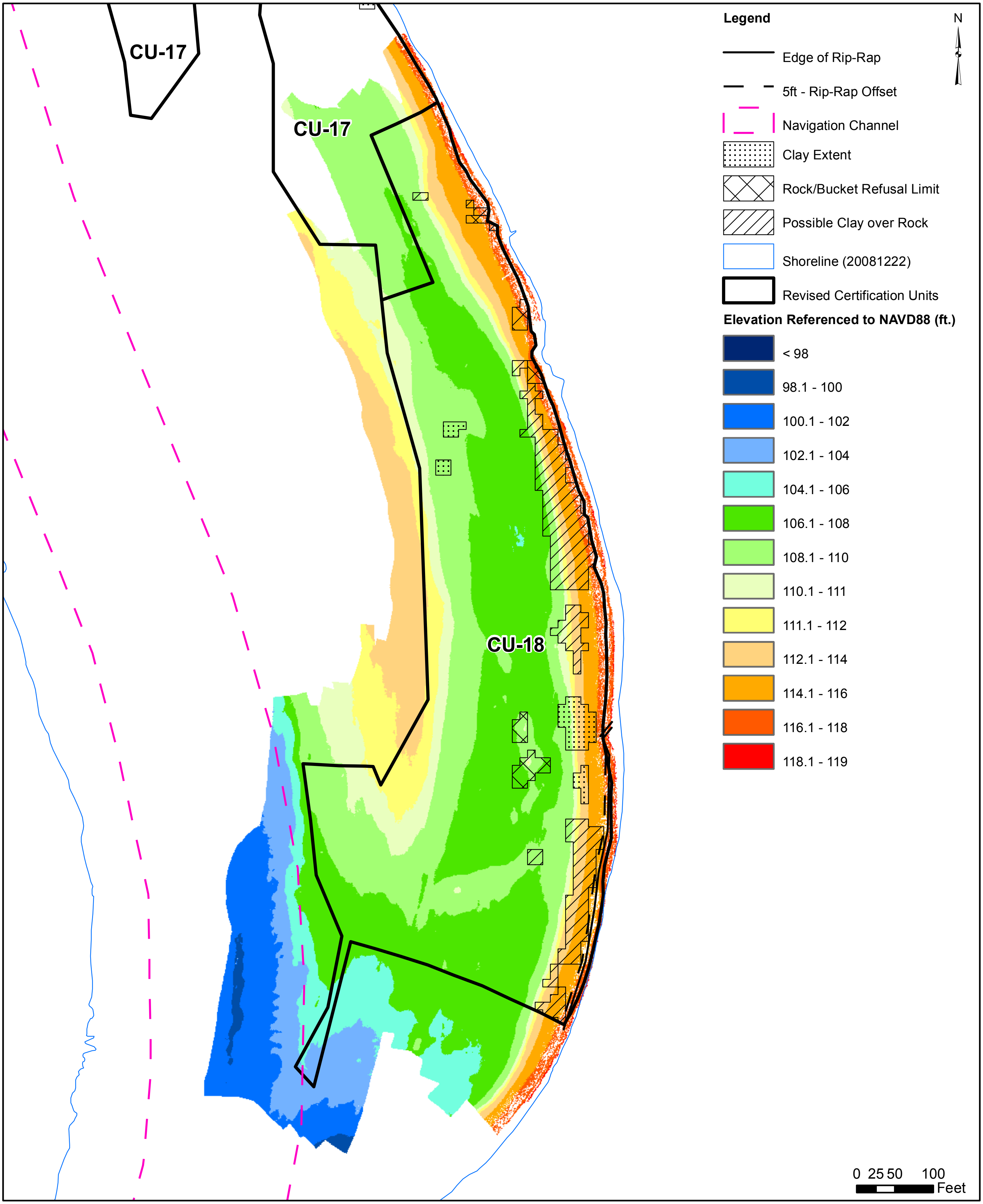
March 2010



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2009 Pre-Dredging Elevations

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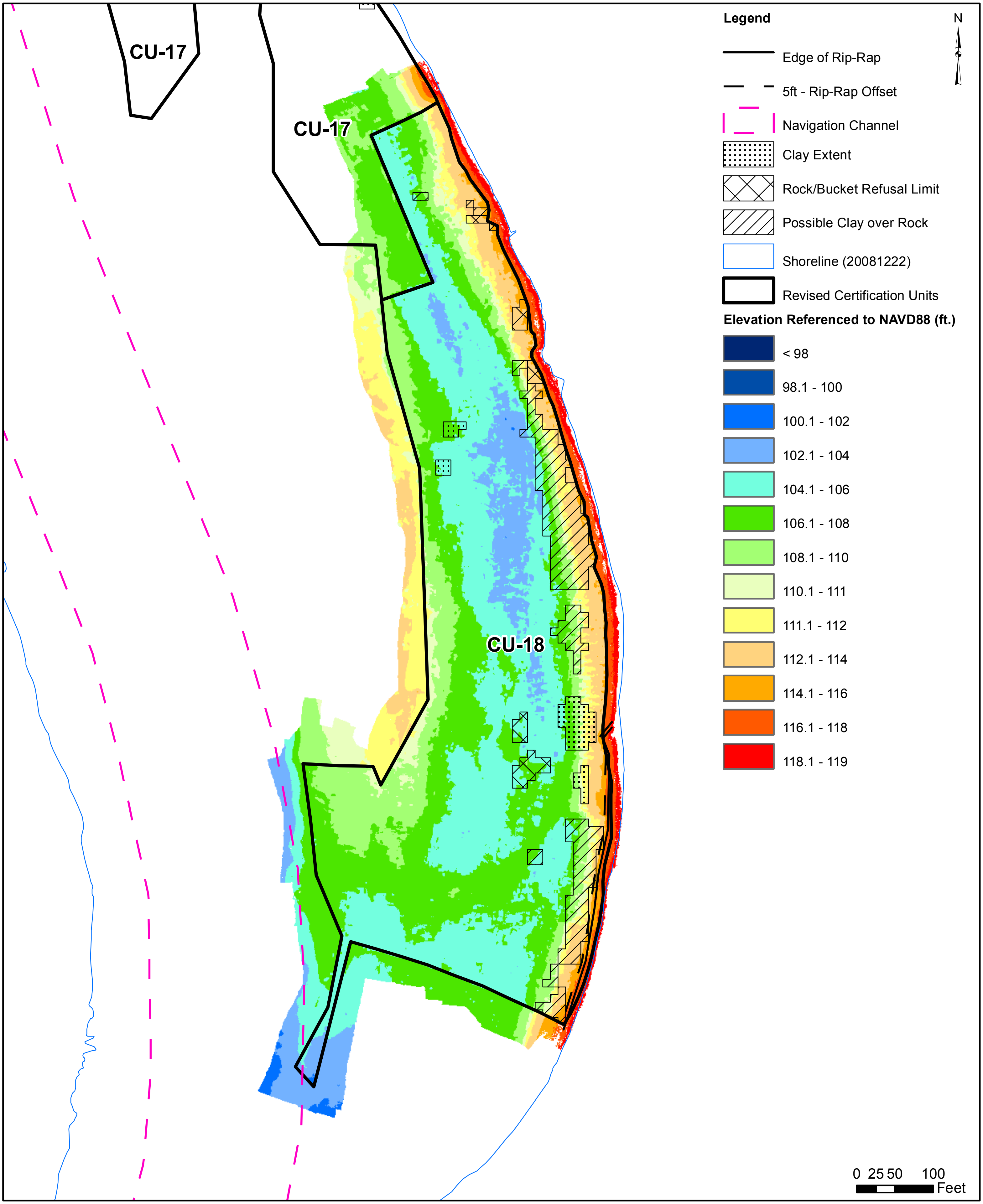
March 2010



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Post Dredging Elevations As of September 2009

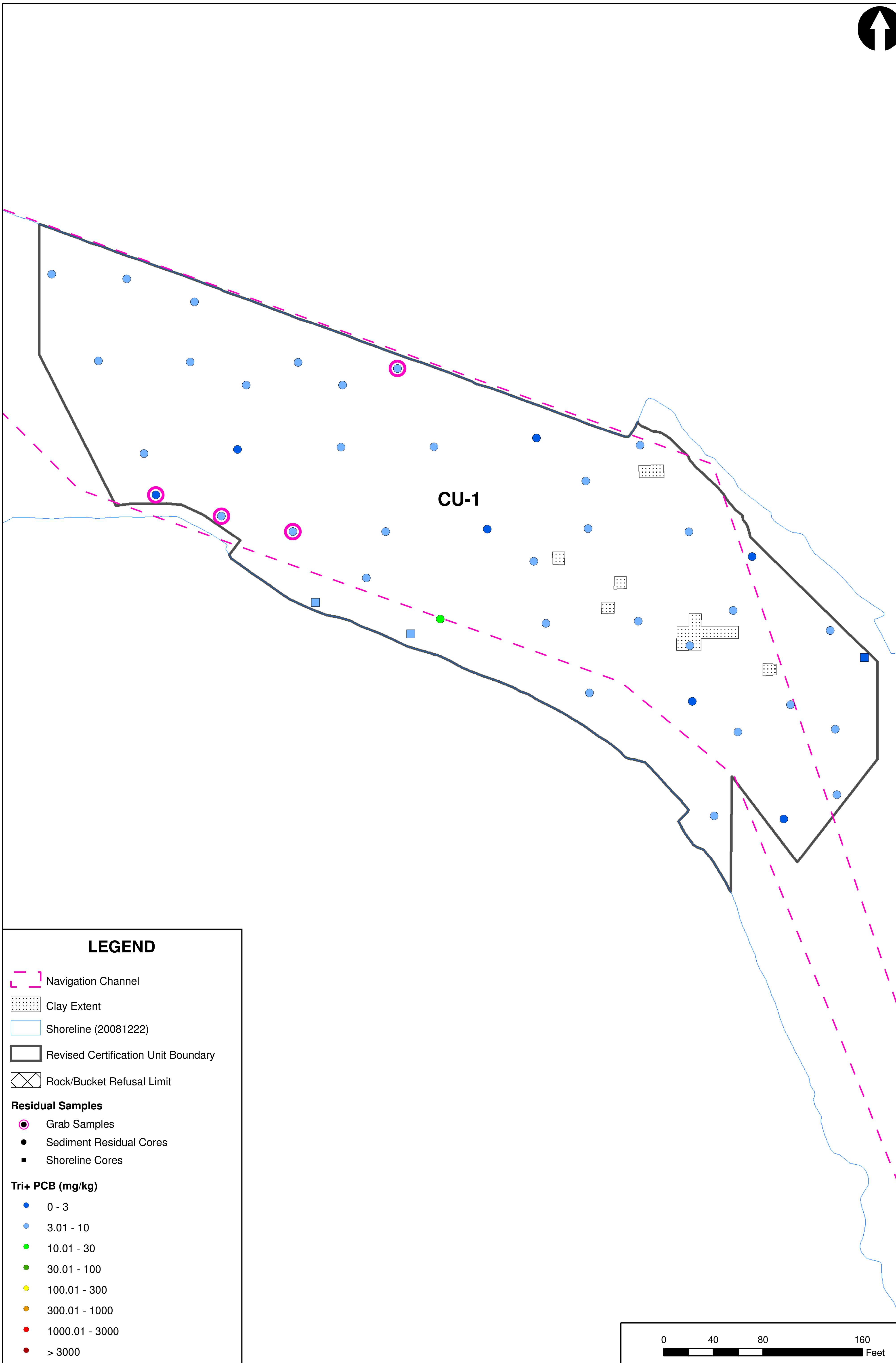
EPA Phase 1 Evaluation Report - Hudson River PCBs Site

Appendix II-A

March 2010

Appendix II-B

Post-Dredging Core Maps for Different Dredging Passes



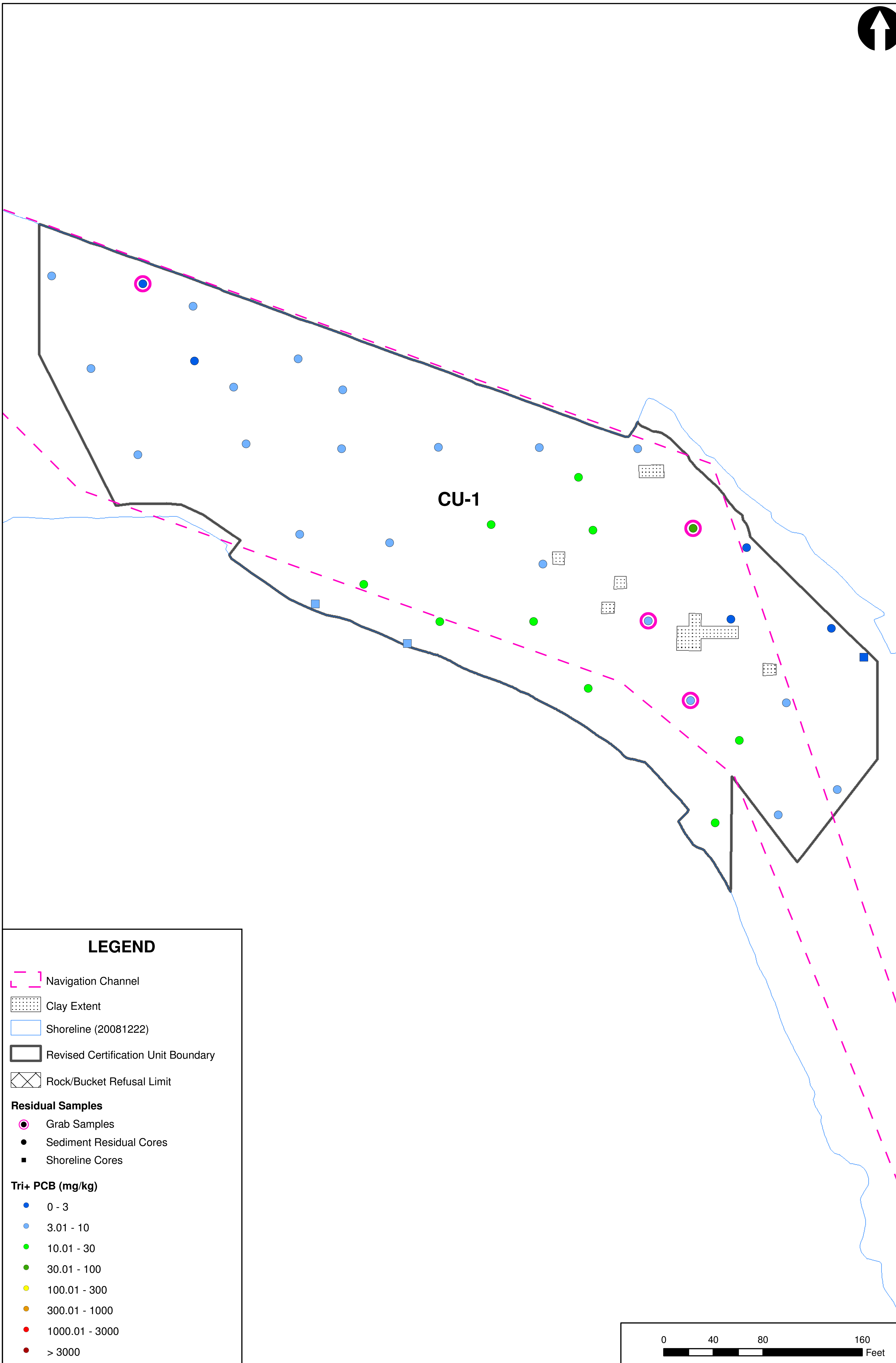
Surface Tri+PCB Concentrations for Residual Cores
(0-6 inches) First Inventory Dredge Pass - CU1

EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-1a

March 2010

E:\hudsonMapDocuments\PostDredging\ForReport\CU01_ResidualCore_Tri_Conc_1stInv.mxd



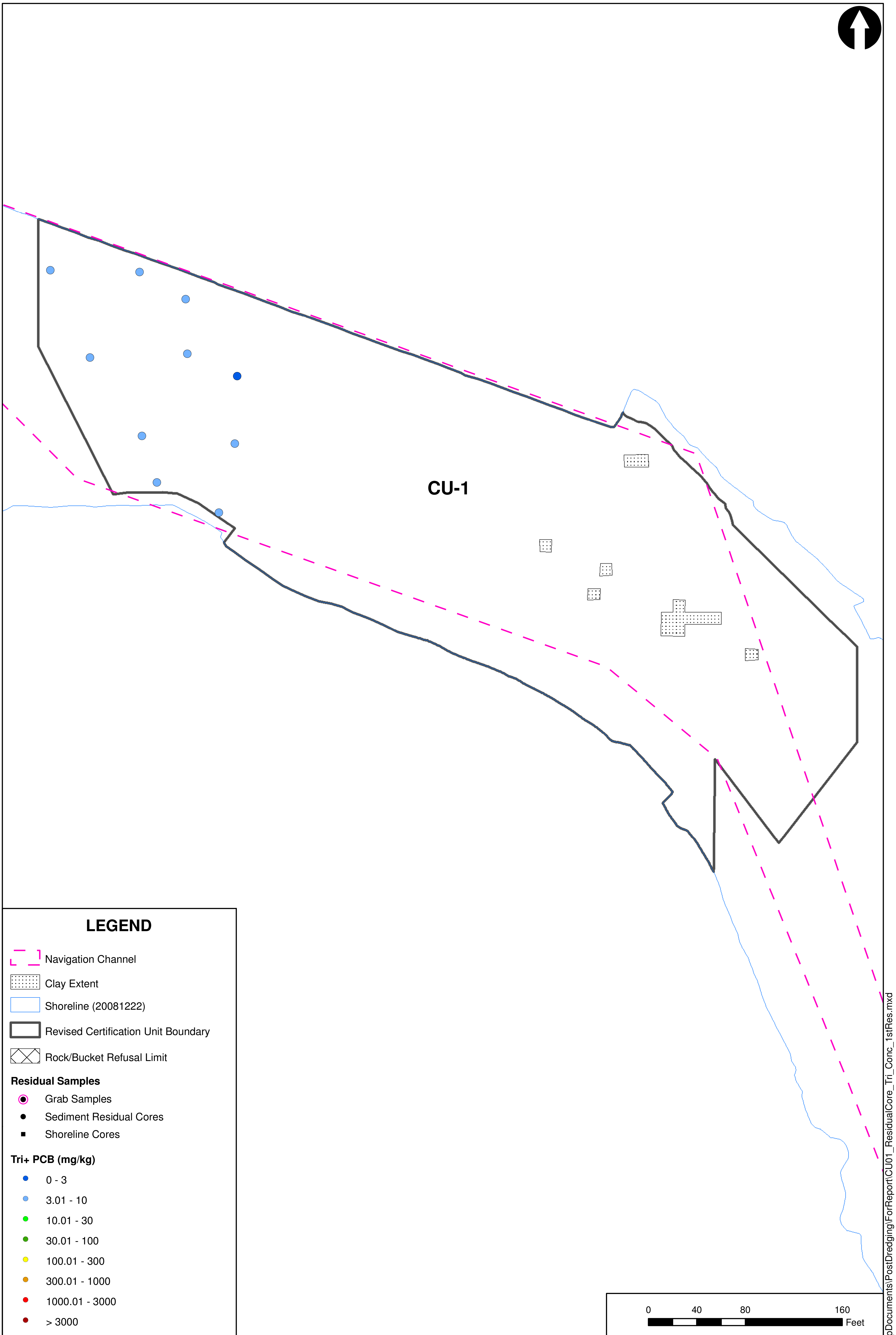
Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) Second Inventory Dredge Pass - CU1

EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-1b

March 2010

E:\hudson\MapDocuments\PostDredging\ForReport\CU01_ResidualCore_Tri_Conc_2ndInv.mxd

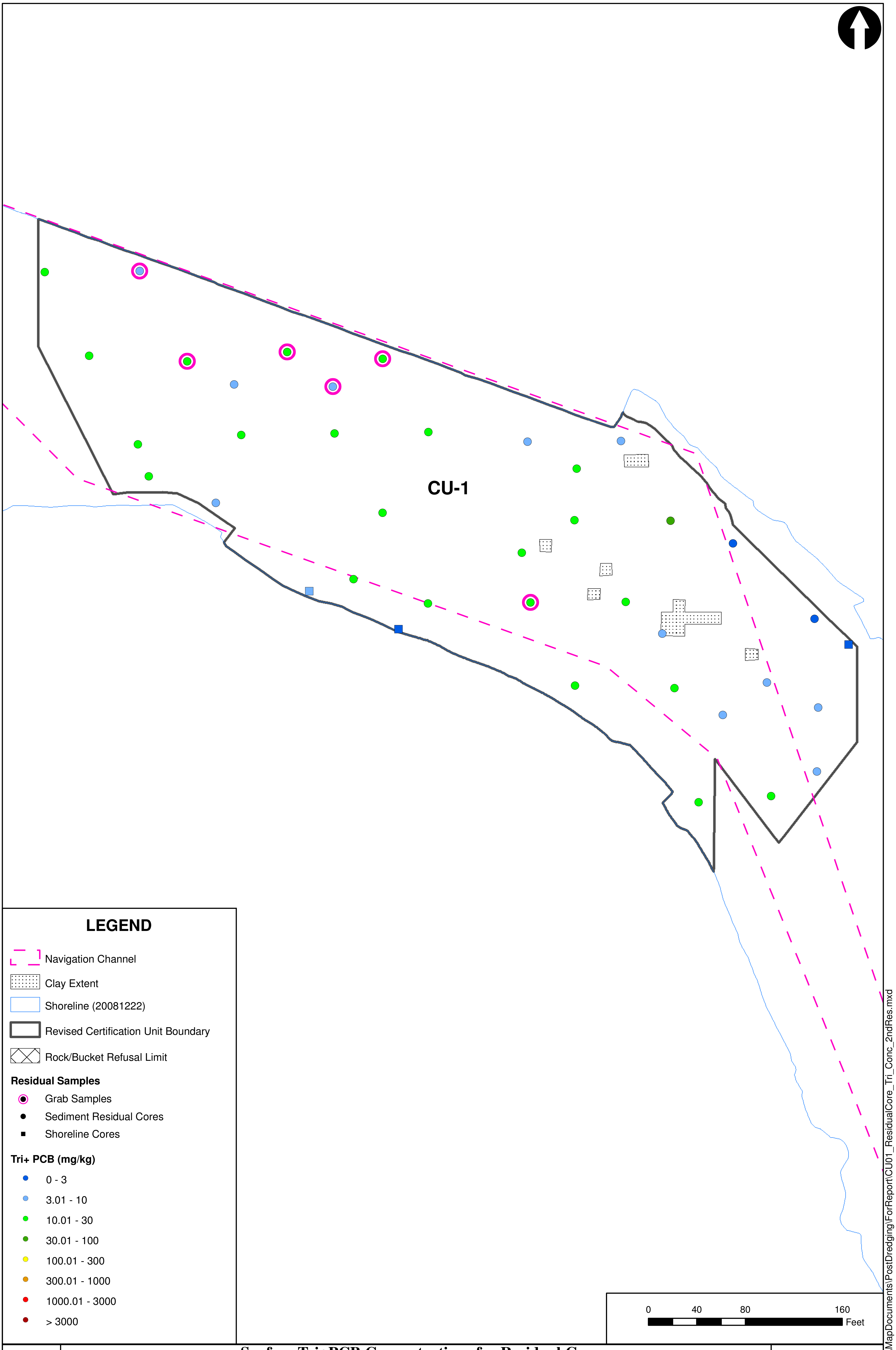


Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) First Residual Dredge Pass - CU1

EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-1c

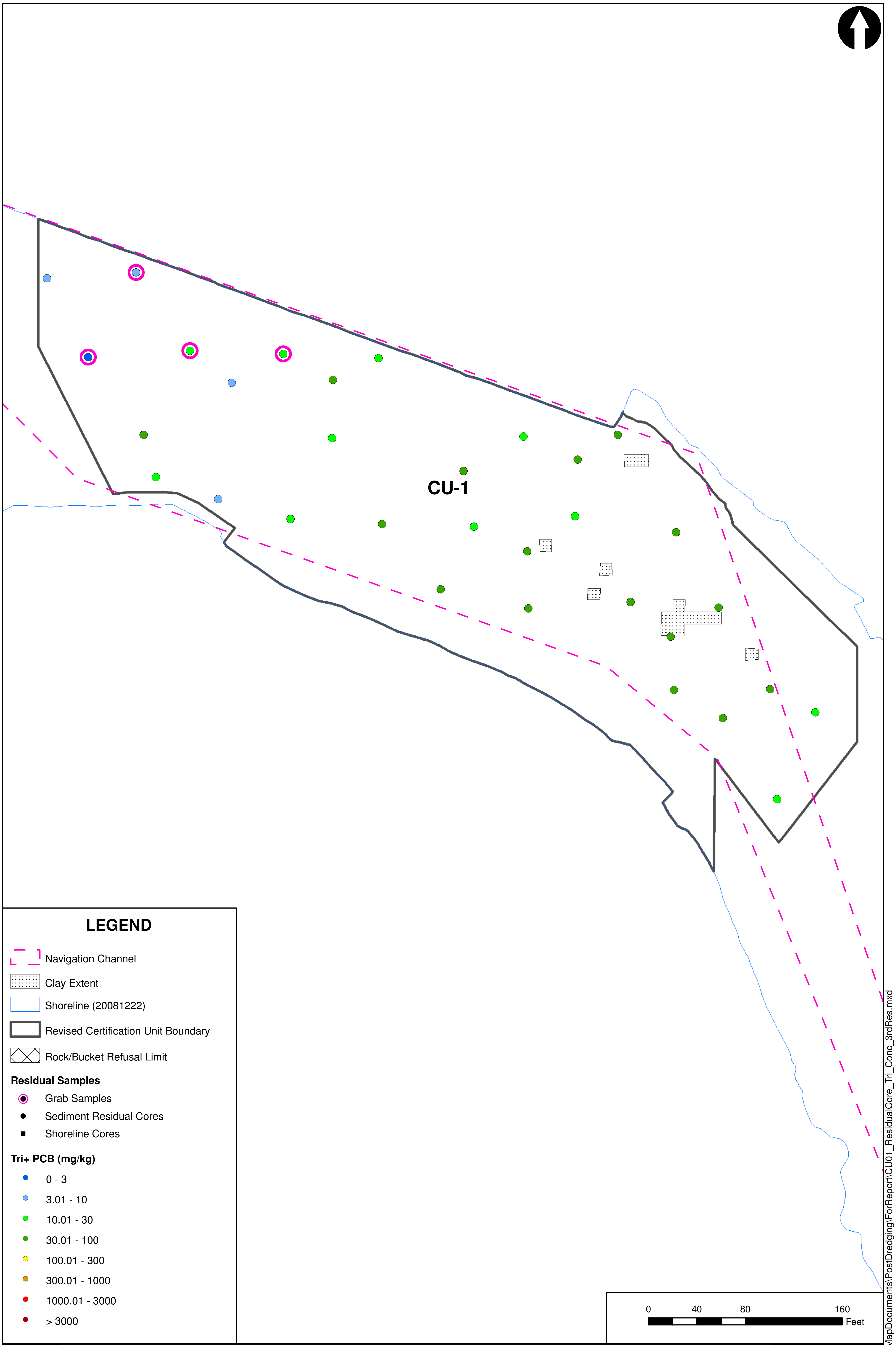
March 2010



Surface Tri+PCB Concentrations for Residual Cores
(0-6 inches) Second Residual Dredge Pass - CU1
EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-1d

March 2010

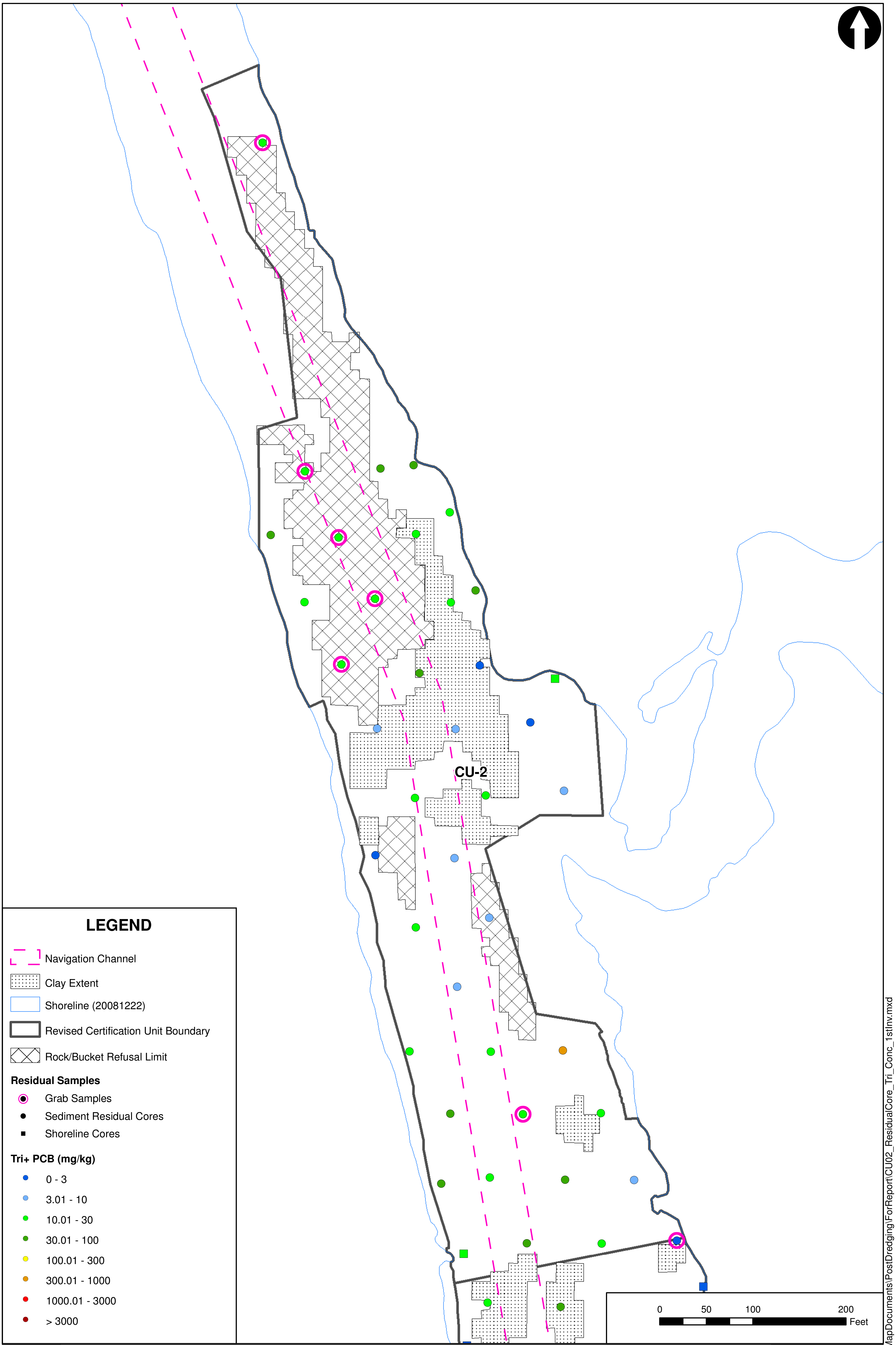


Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) Third Residual Dredge Pass - CU1

EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-1e

March 2010

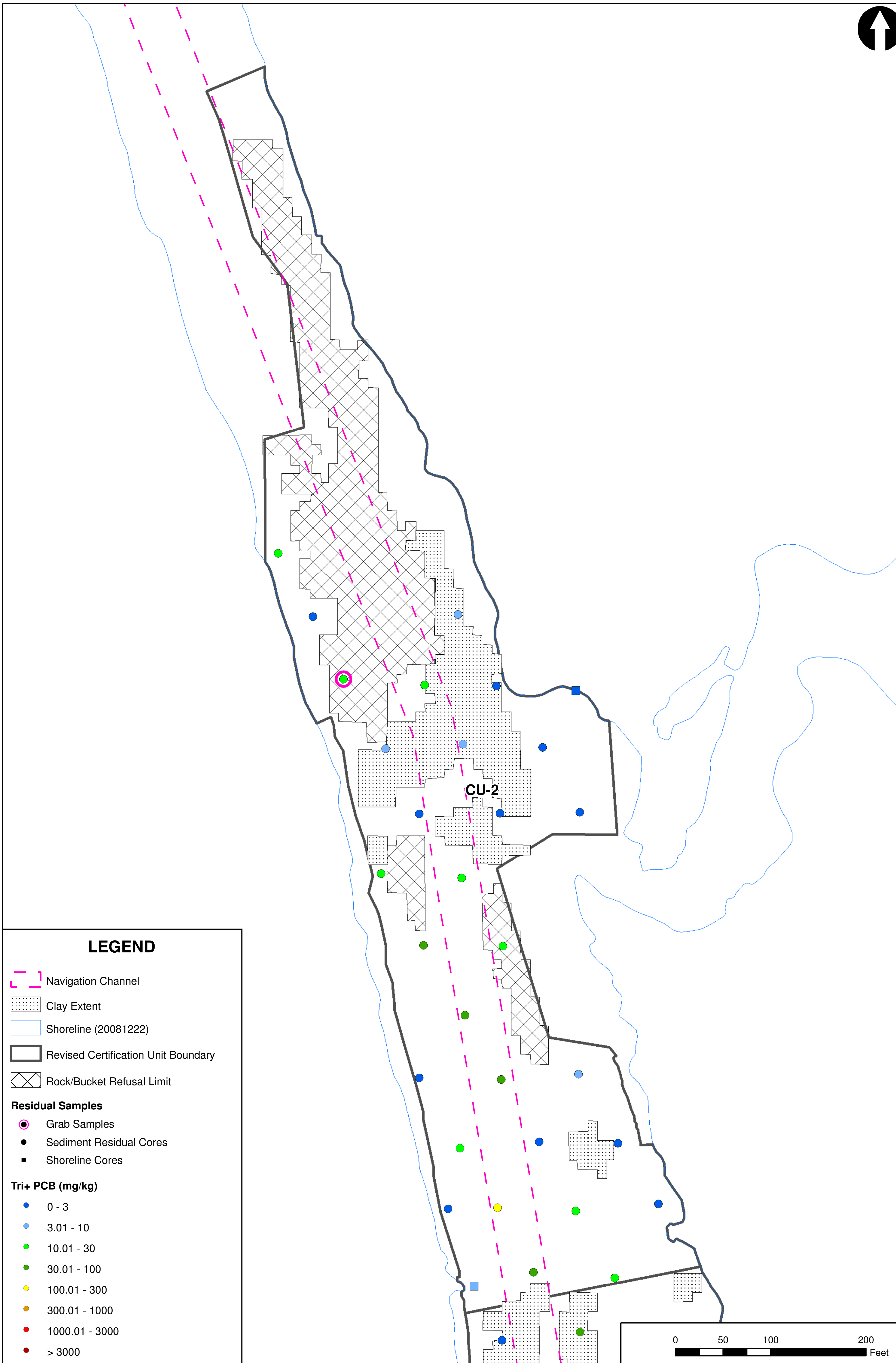


Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) First Inventory Dredge Pass - CU2

EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-2a

March 2010



Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) Second Inventory Dredge Pass - CU2

EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-2b

March 2010

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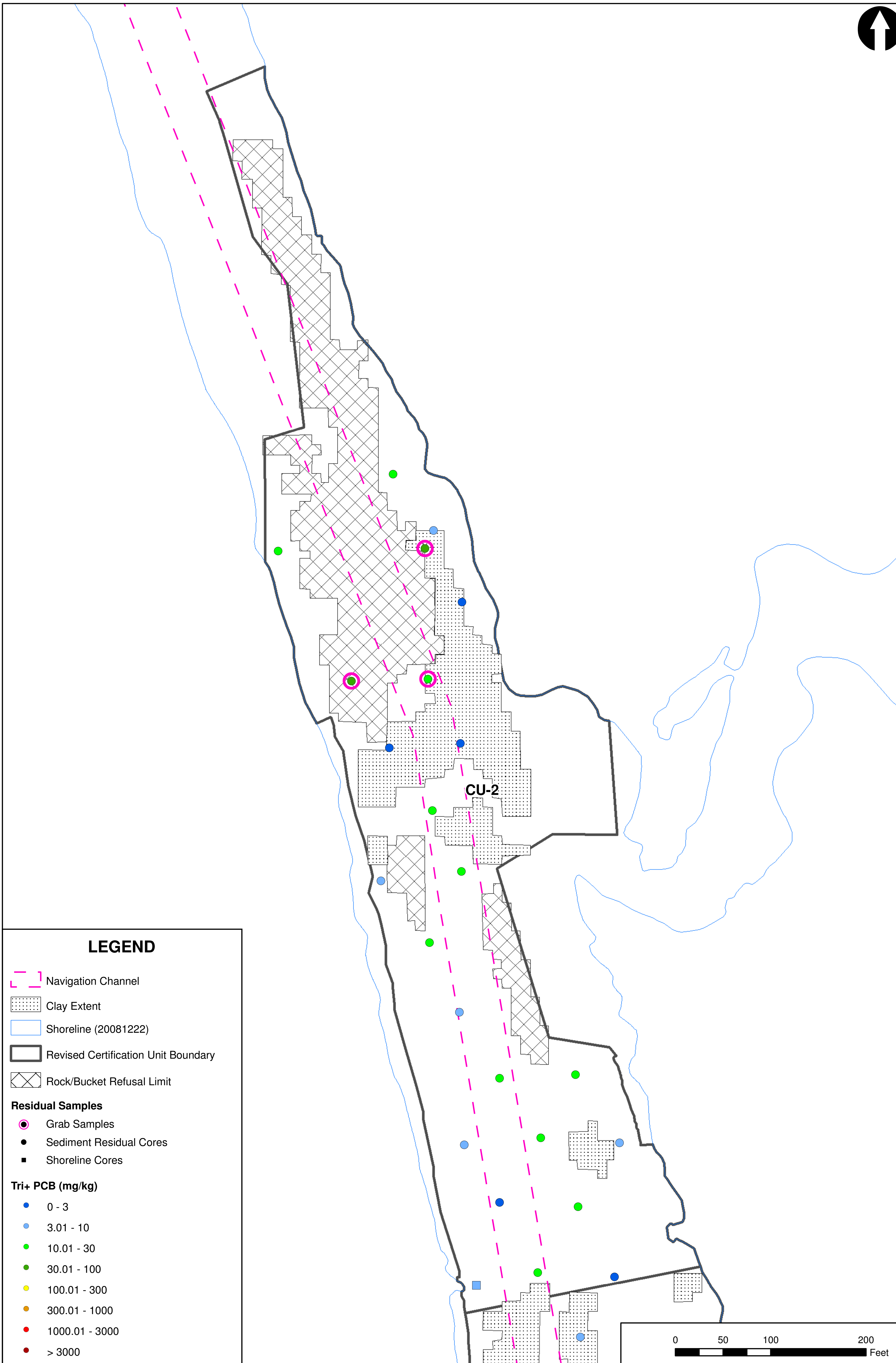

Surface Tri+PCB Concentrations for Residual Cores
(0-6 inches) First Residual Dredge Pass - CU2
EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-2c

March 2010

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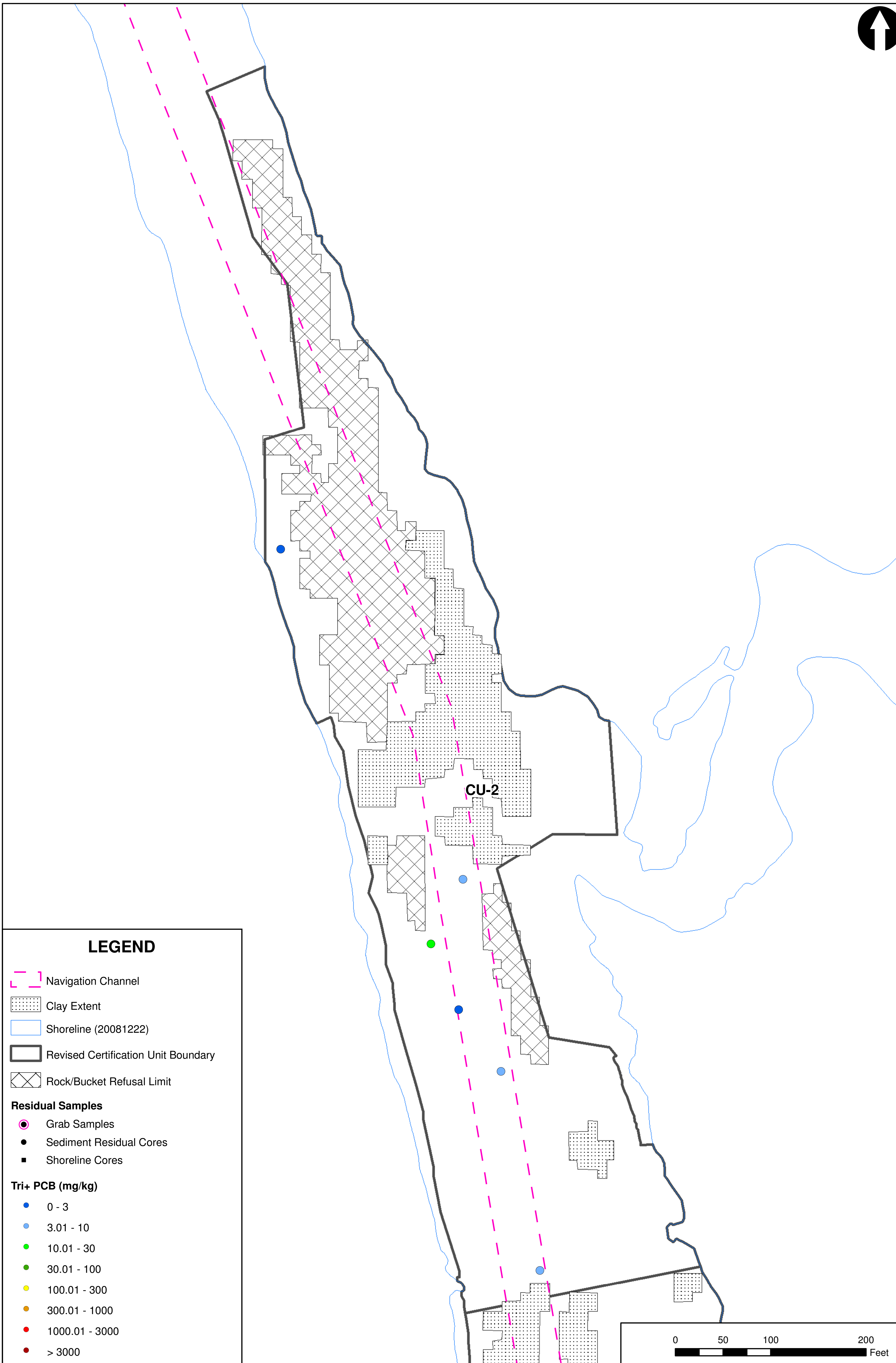

Surface Tri+PCB Concentrations for Residual Cores
(0-6 inches) Second Residual Dredge Pass - CU2
EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-2d

March 2010

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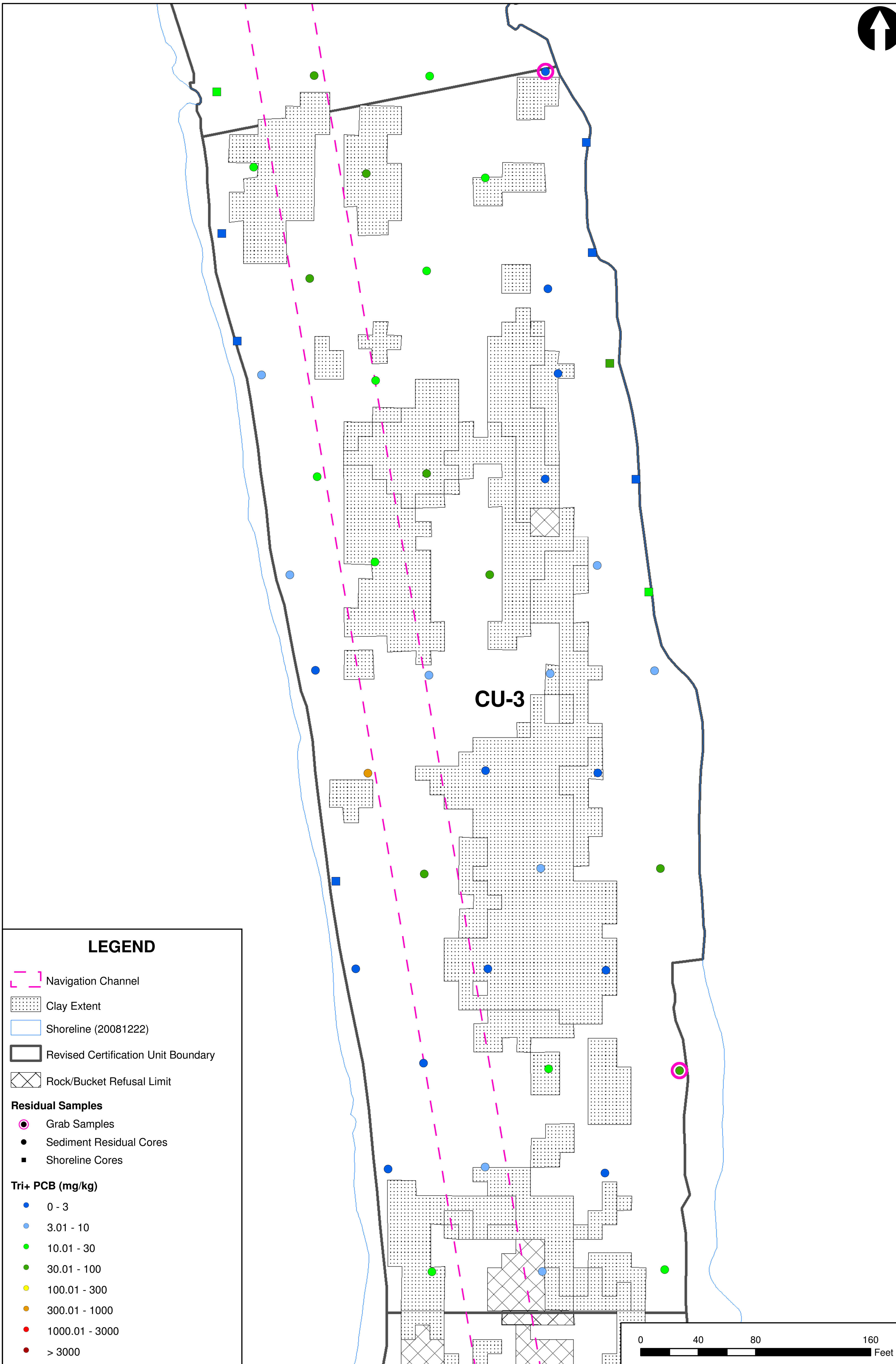
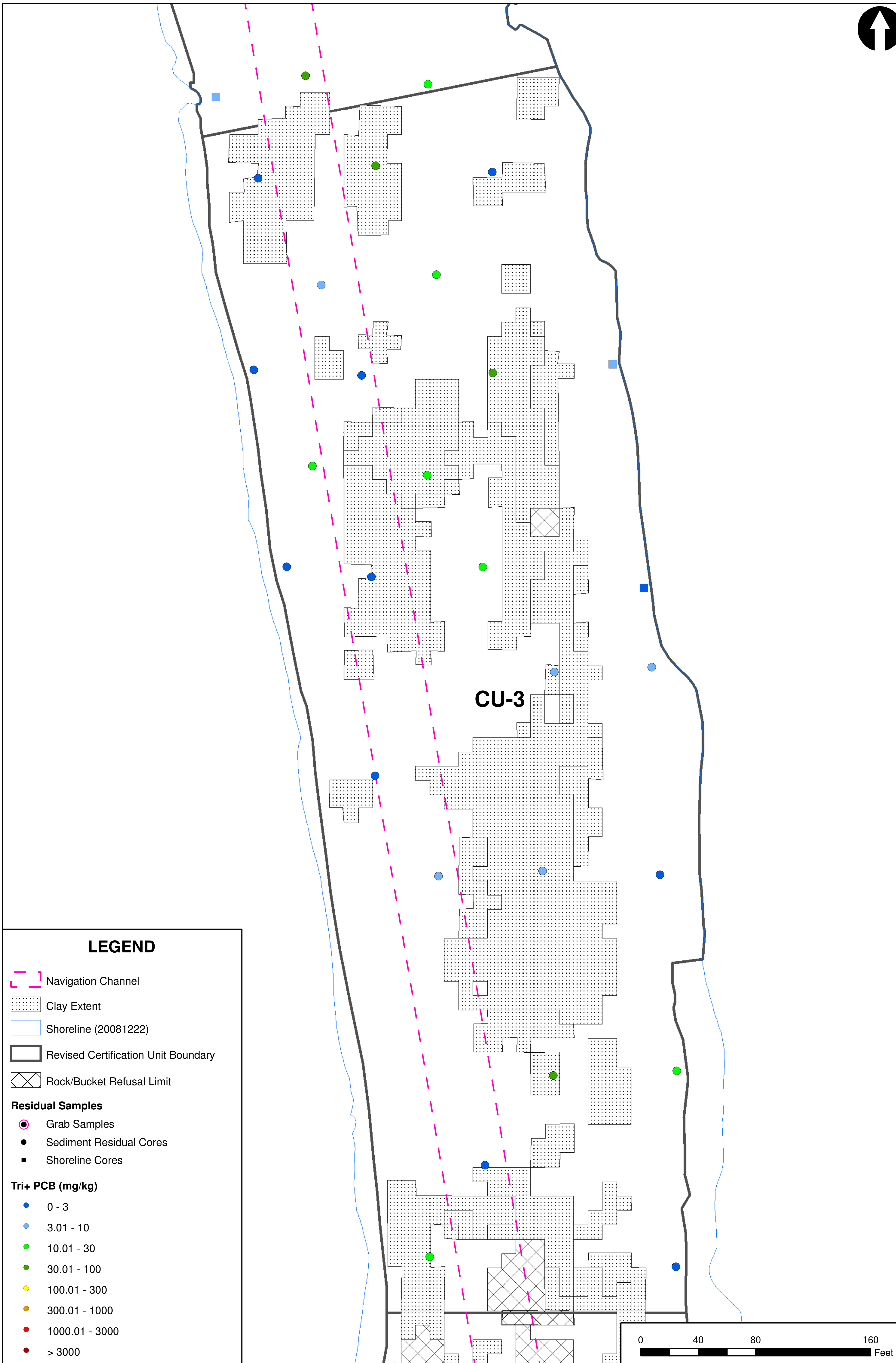


Surface Tri+PCB Concentrations for Residual Cores
(0-6 inches) First Inventory Dredge Pass - CU3

EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-3a

March 2010



Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) Second Inventory Dredge Pass - CU3

EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-3b

March 2010

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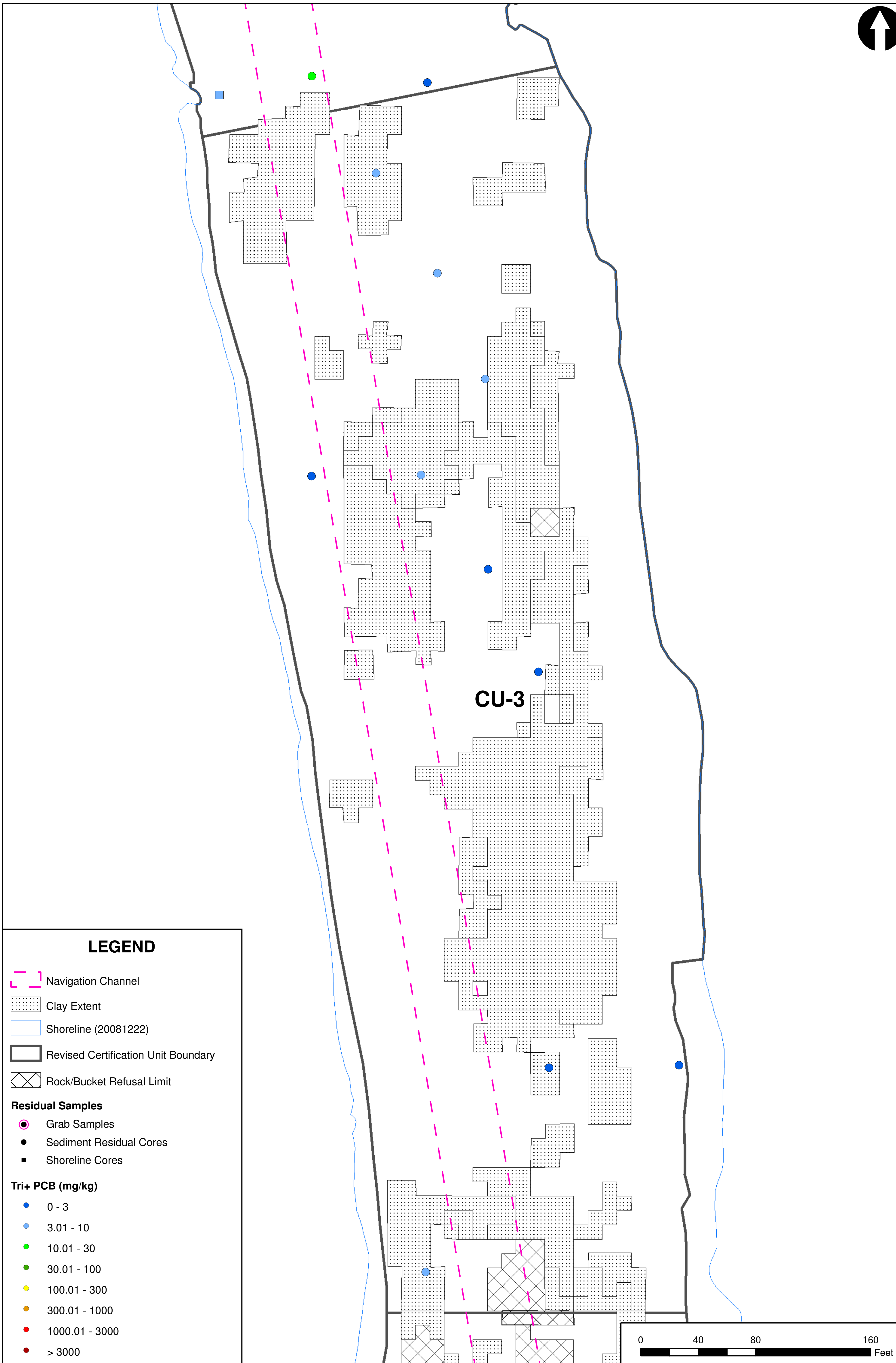

Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) First Residual Dredge Pass - CU3

EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-3c

March 2010

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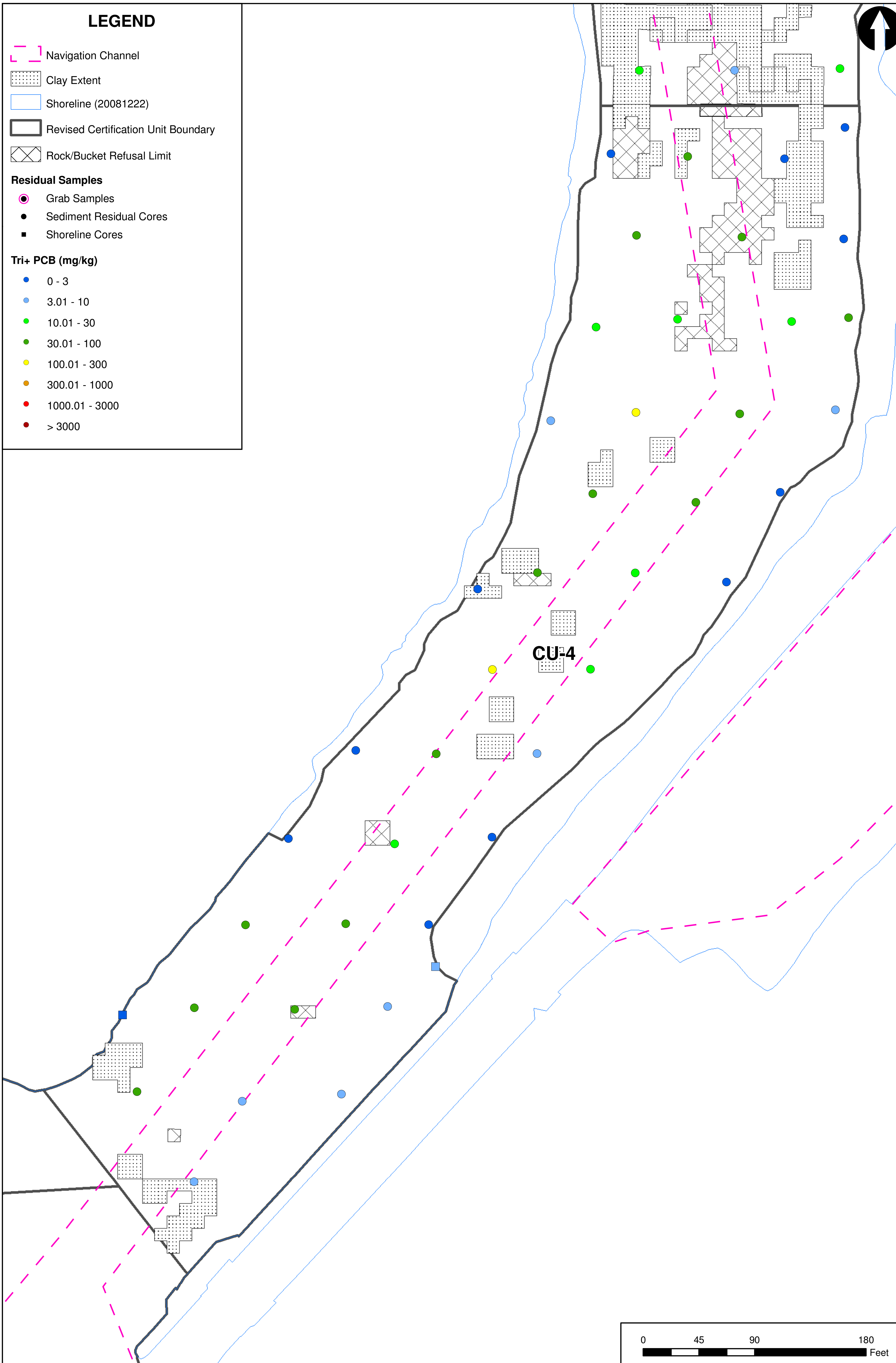
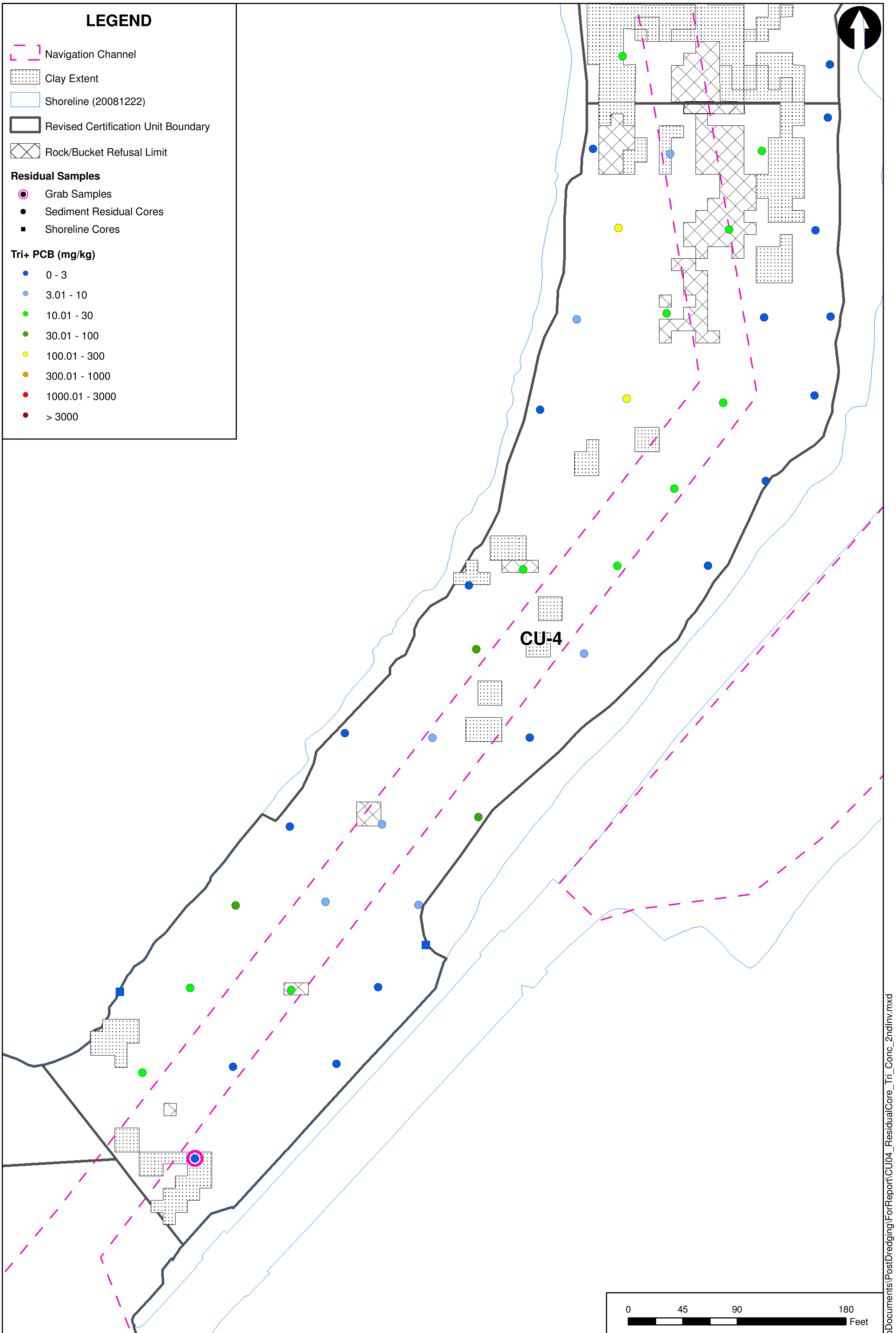


Surface Tri+PCB Concentrations for Residual Cores
(0-6 inches) First Inventory Dredge Pass - CU4

EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-4a

March 2010



Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) Second Inventory Dredge Pass - CU4

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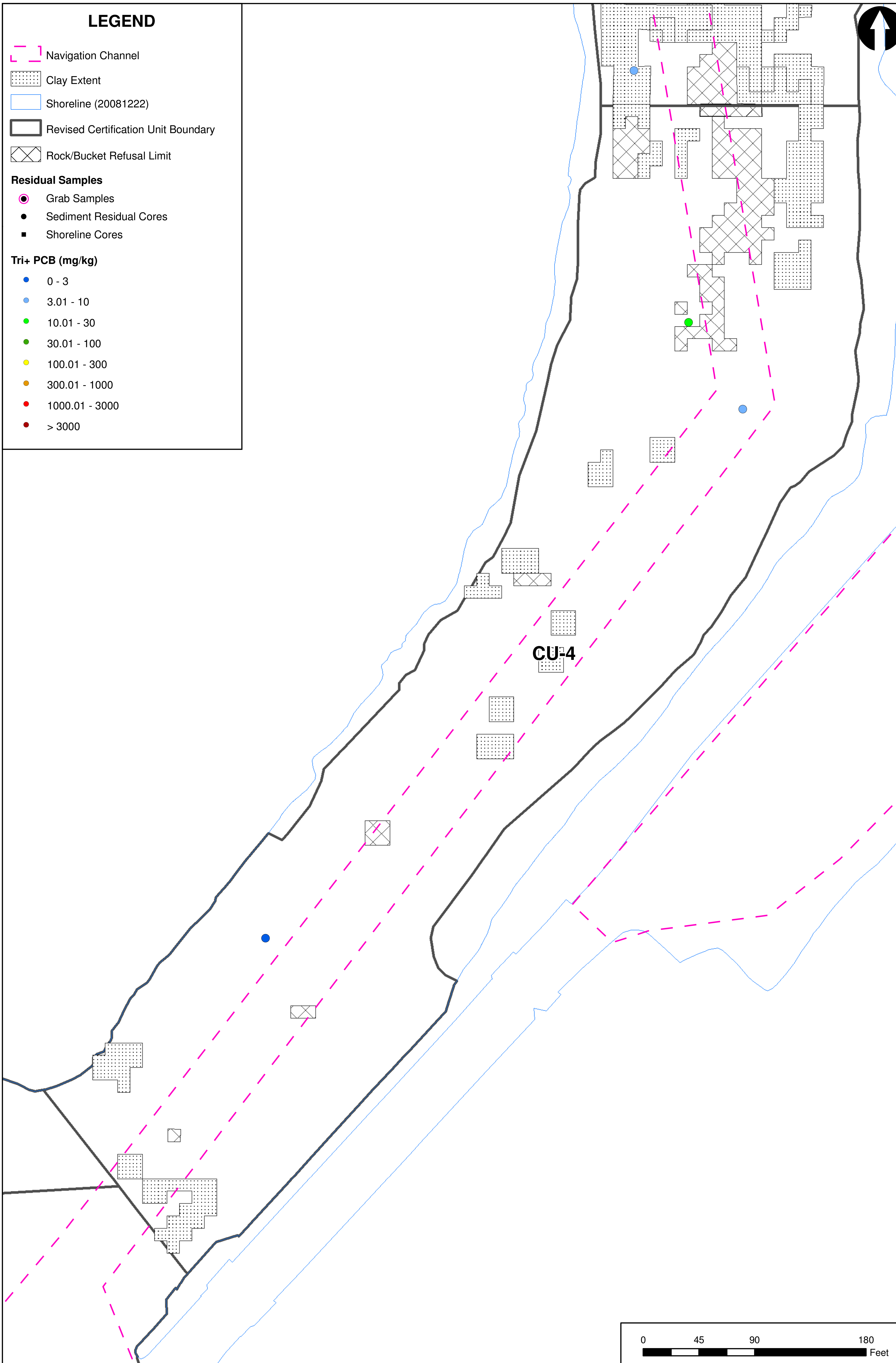
Appendix II-B-4b

March 2010

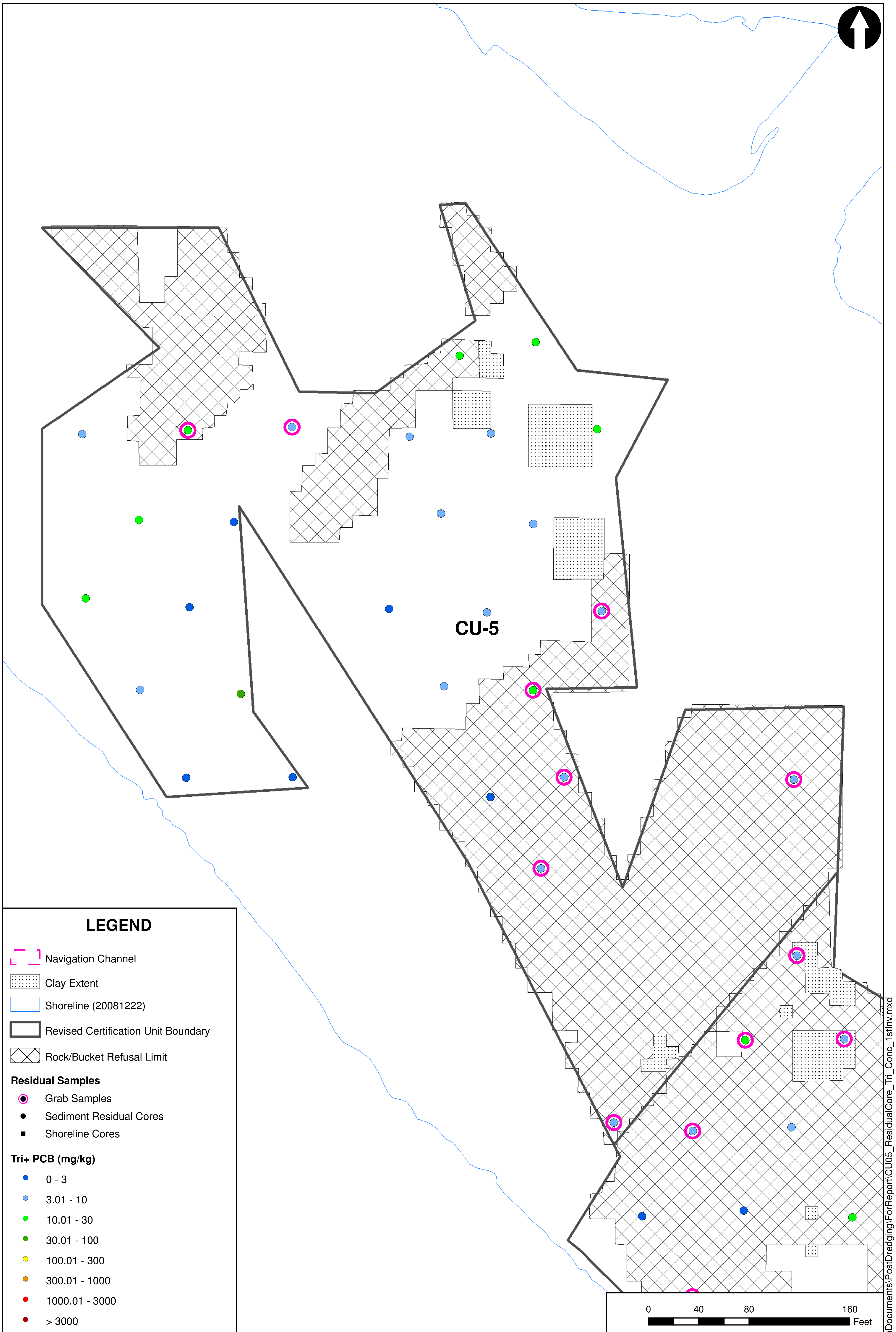


Surface Tri+PCB Concentrations for Residual Cores
(0-6 inches) First Residual Dredge Pass - CU4
EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-4c

March 2010

E:\hudsonMapDocuments\PostDredging\ForReport\CU04_ResidualCore_Tri_Conc_1stRes.mxd



Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) First Inventory Dredge Pass - CU5

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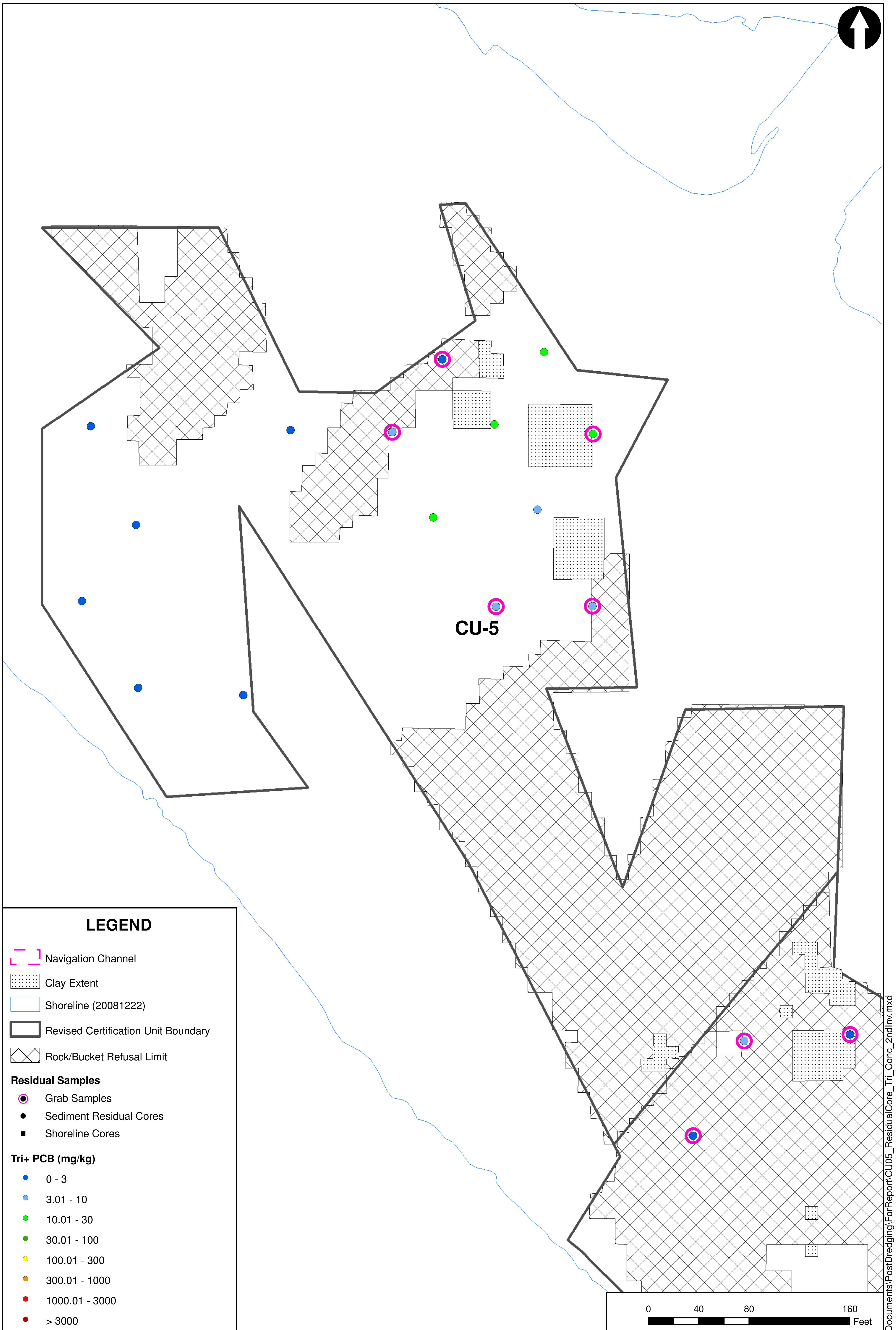
Appendix II-B-5a

March 2010

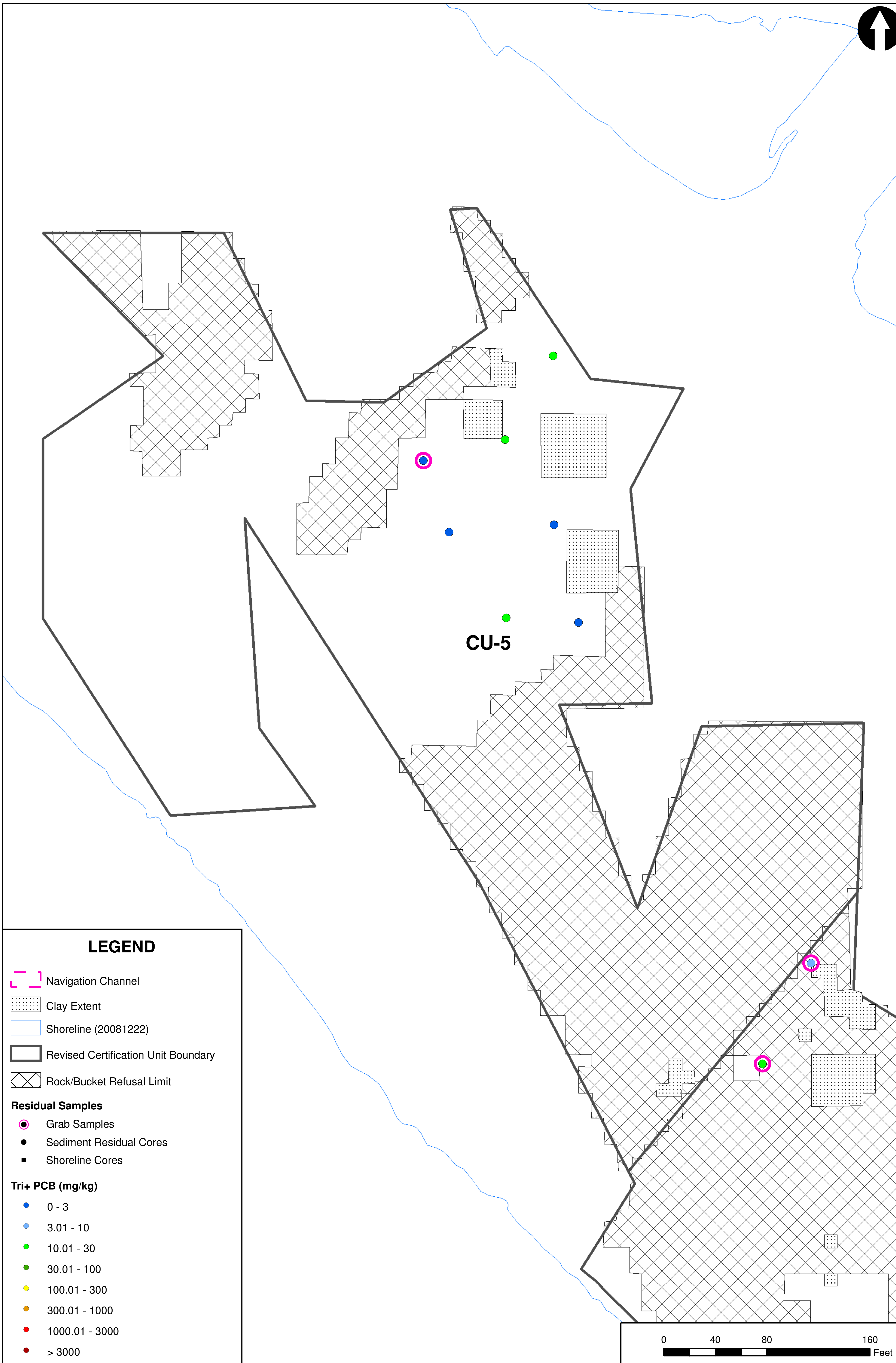


Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) Second Inventory Dredge Pass - CU5

EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-5b

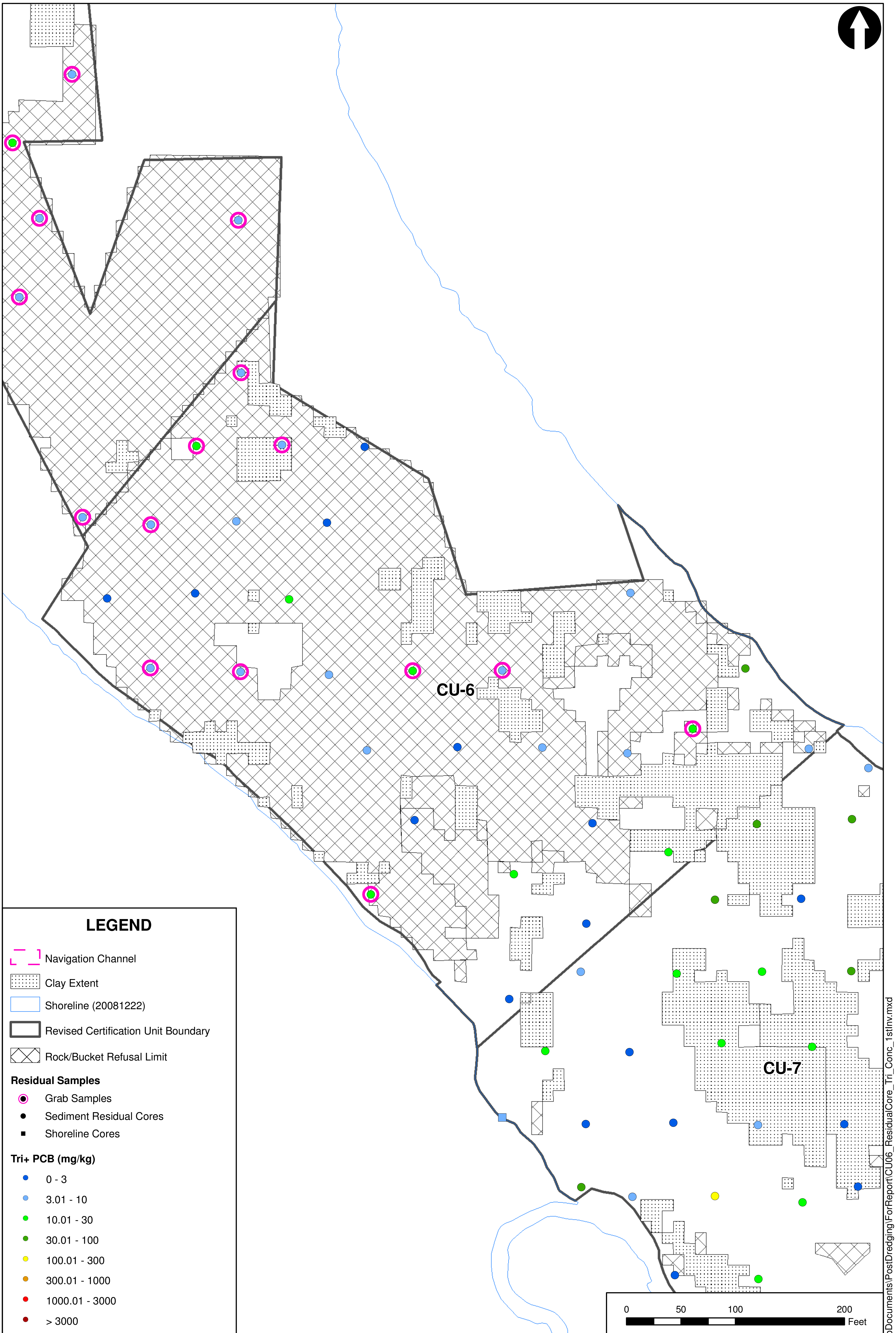
March 2010



Surface Tri+PCB Concentrations for Residual Cores
(0-6 inches) First Residual Dredge Pass - CU5
EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-5c

March 2010



Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) First Inventory Dredge Pass - CU6

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Appendix II-B-6a

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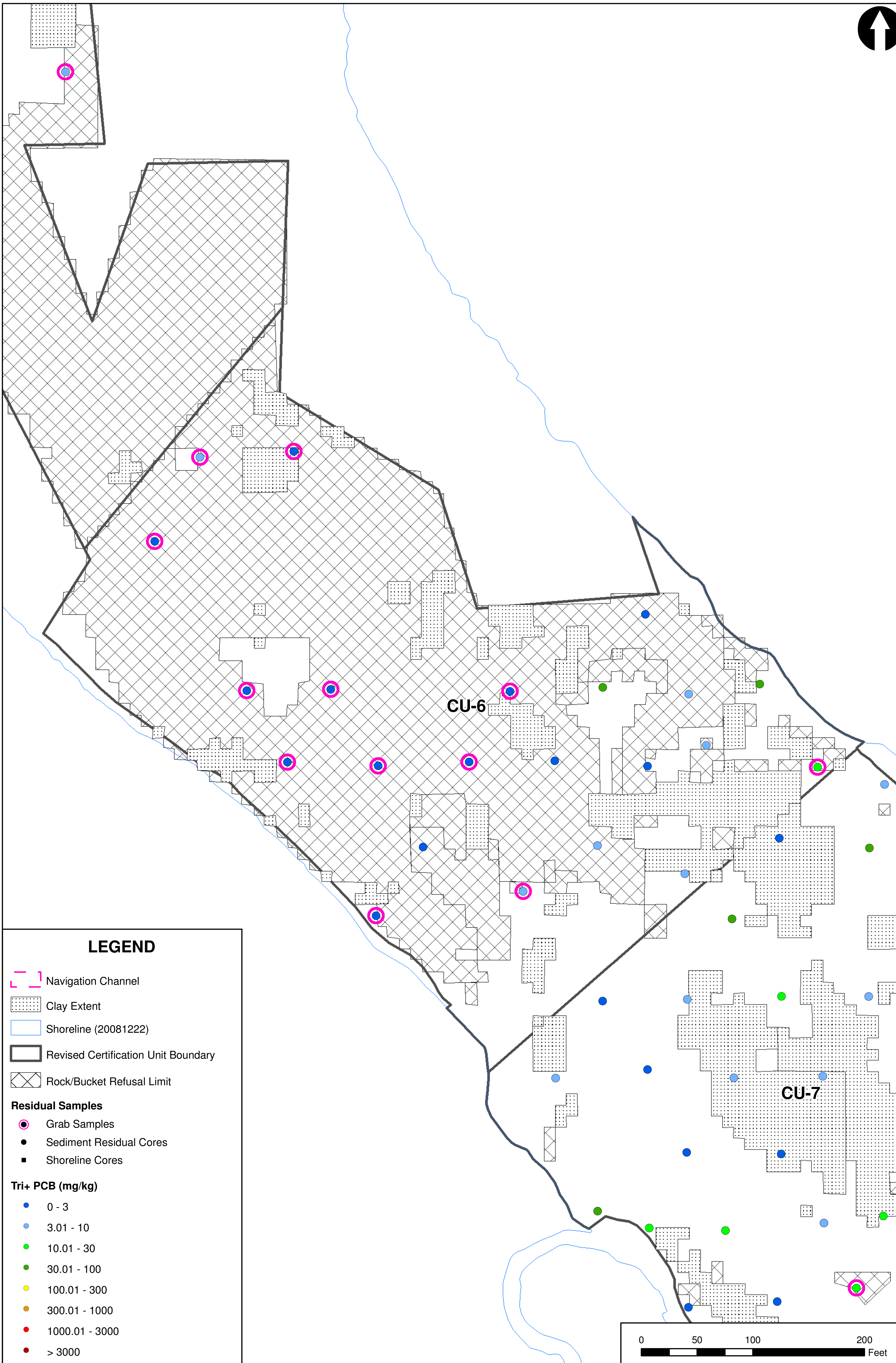

Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) Second Inventory Dredge Pass - CU6

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Appendix II-B-6b

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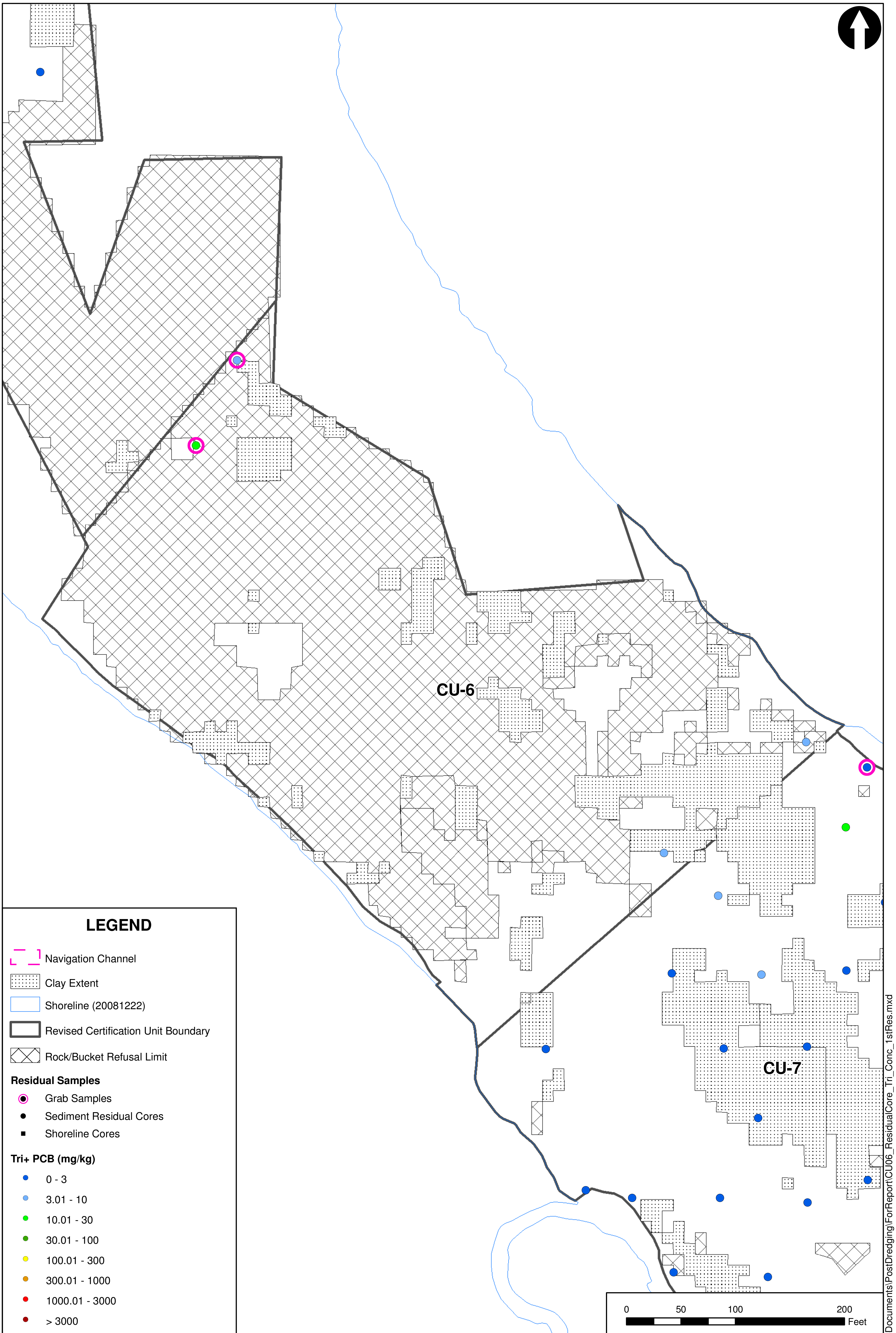
E:\hudsonMapDocuments\PostDredging\ForReport\CU06_ResidualCore_Tri_Conc_2ndInv.mxd



Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) First Residual Dredge Pass - CU6

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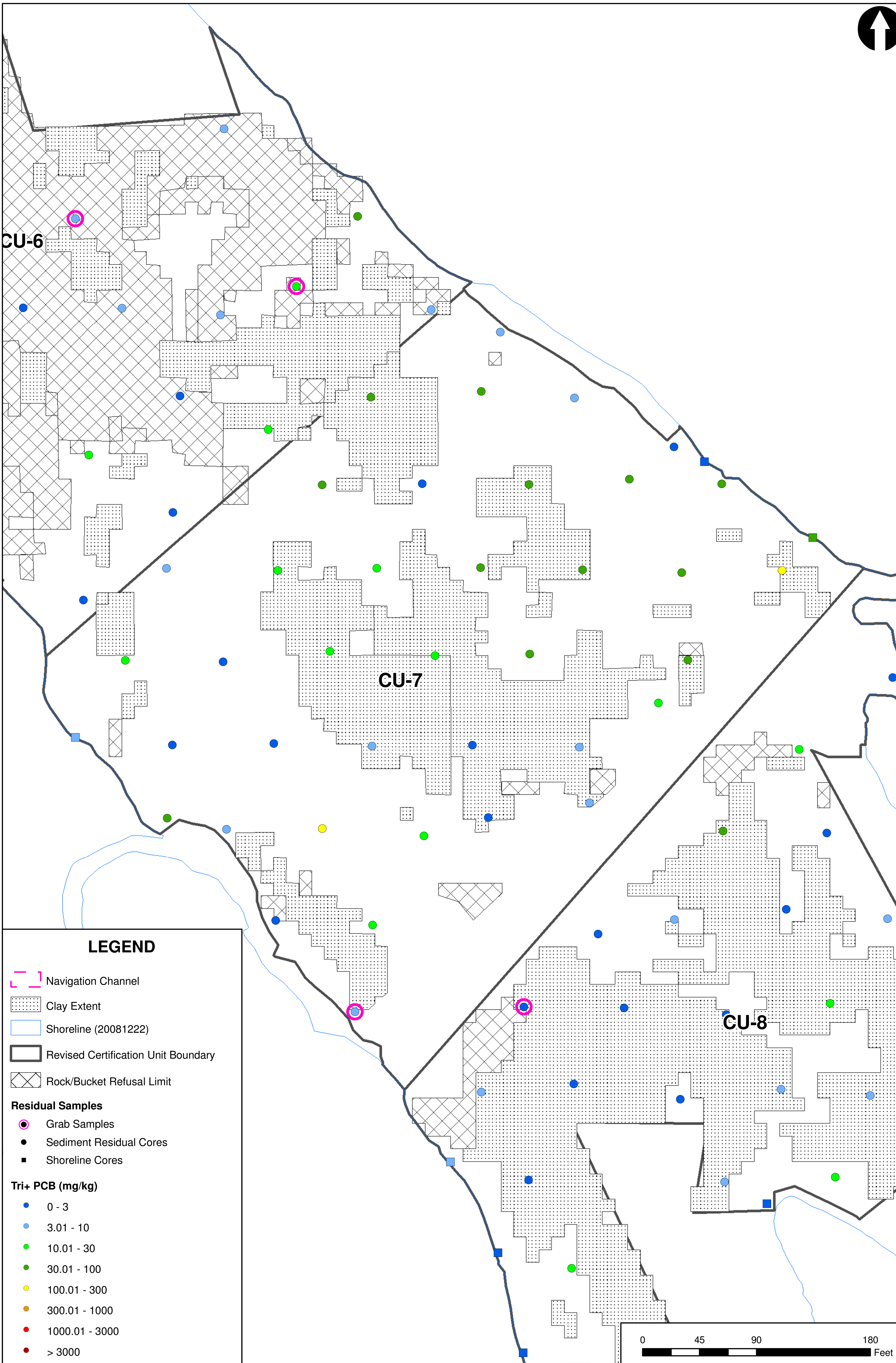

Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) First Inventory Dredge Pass - CU7

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Appendix II-B-7a

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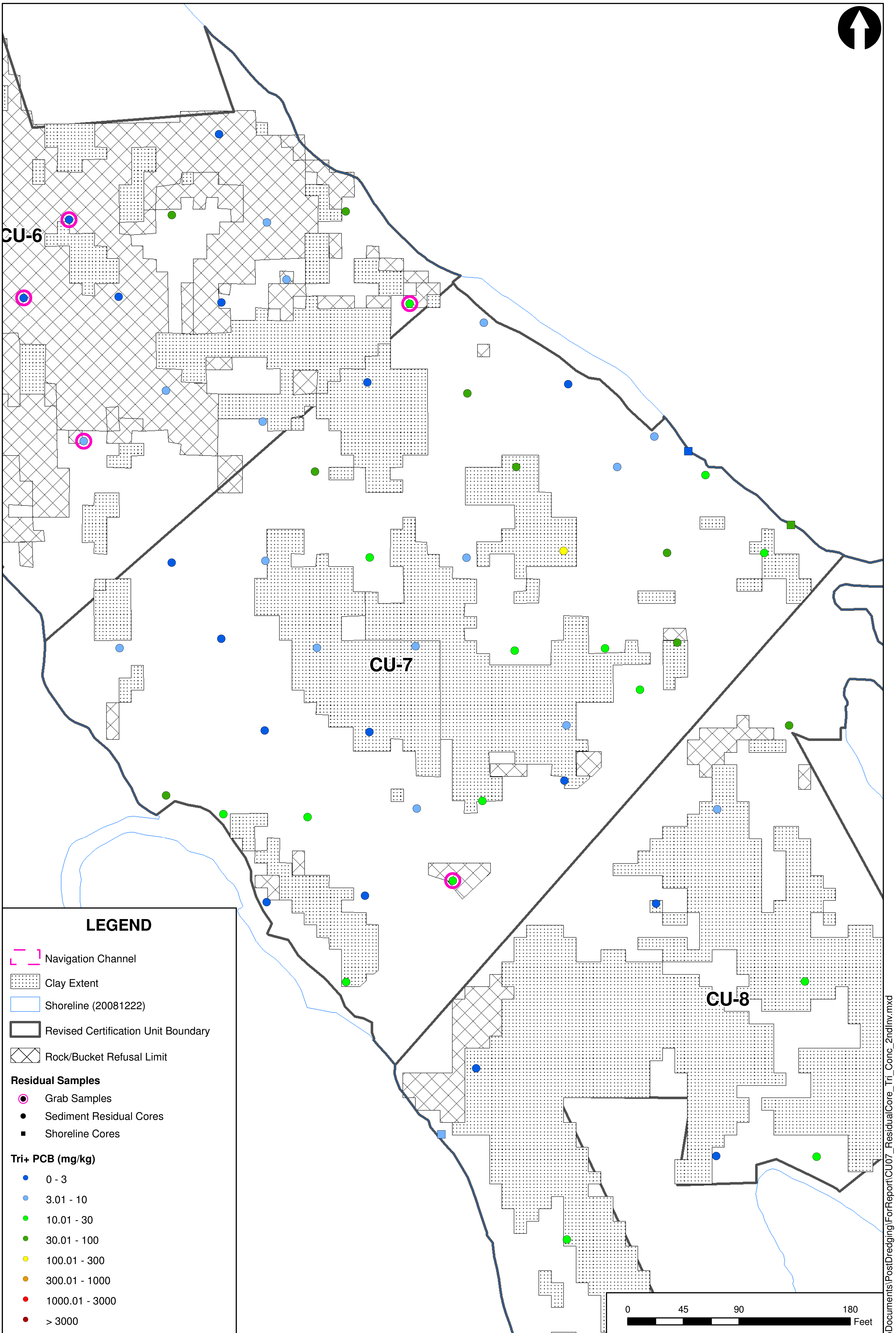
E:\hudson\MapDocuments\PostDredging\ForReport\CU07_ResidualCore_Tri_Conc_1stInv.mxd



Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) Second Inventory Dredge Pass - CU7

EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-7b

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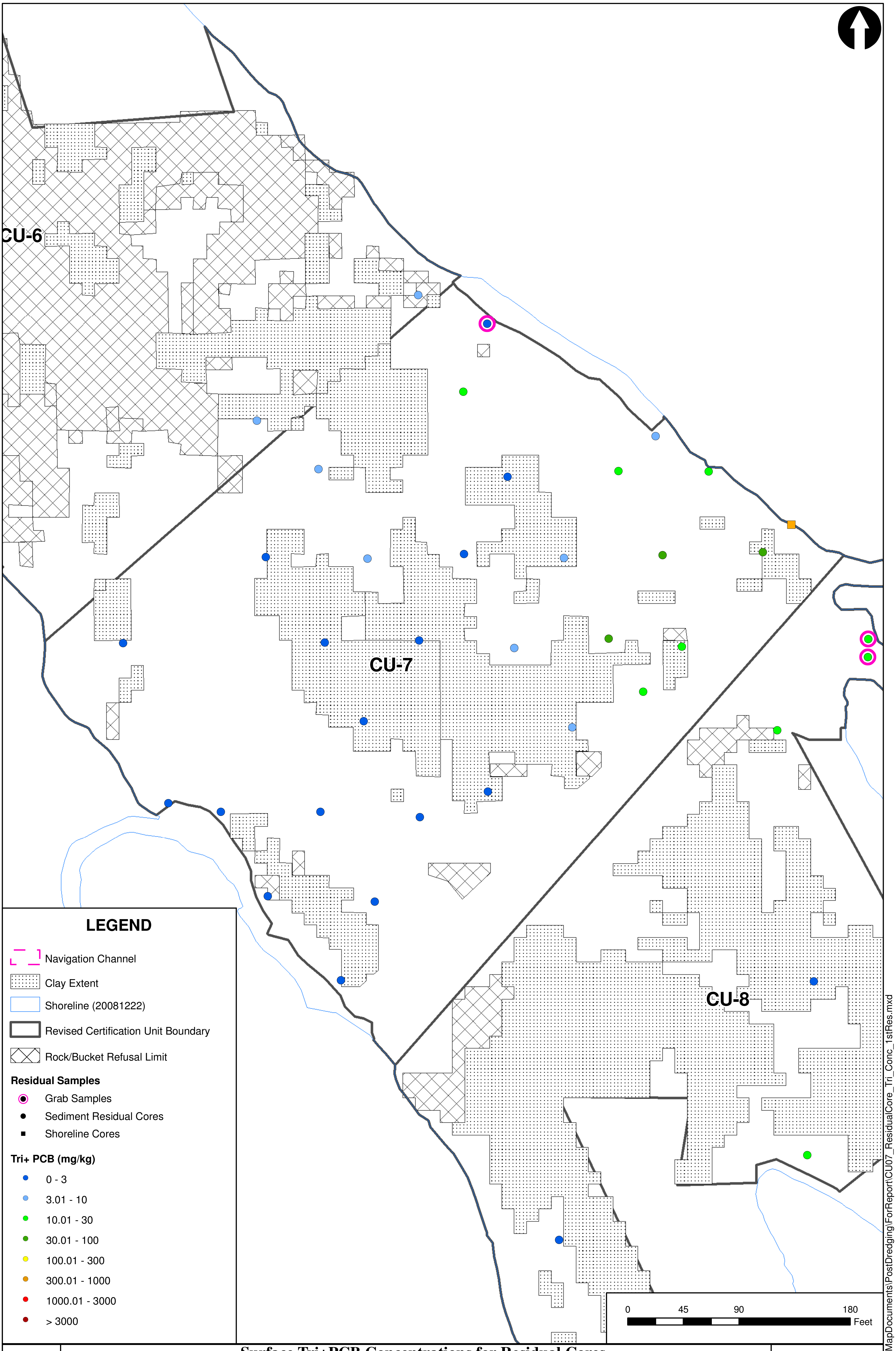

Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) First Residual Dredge Pass - CU7

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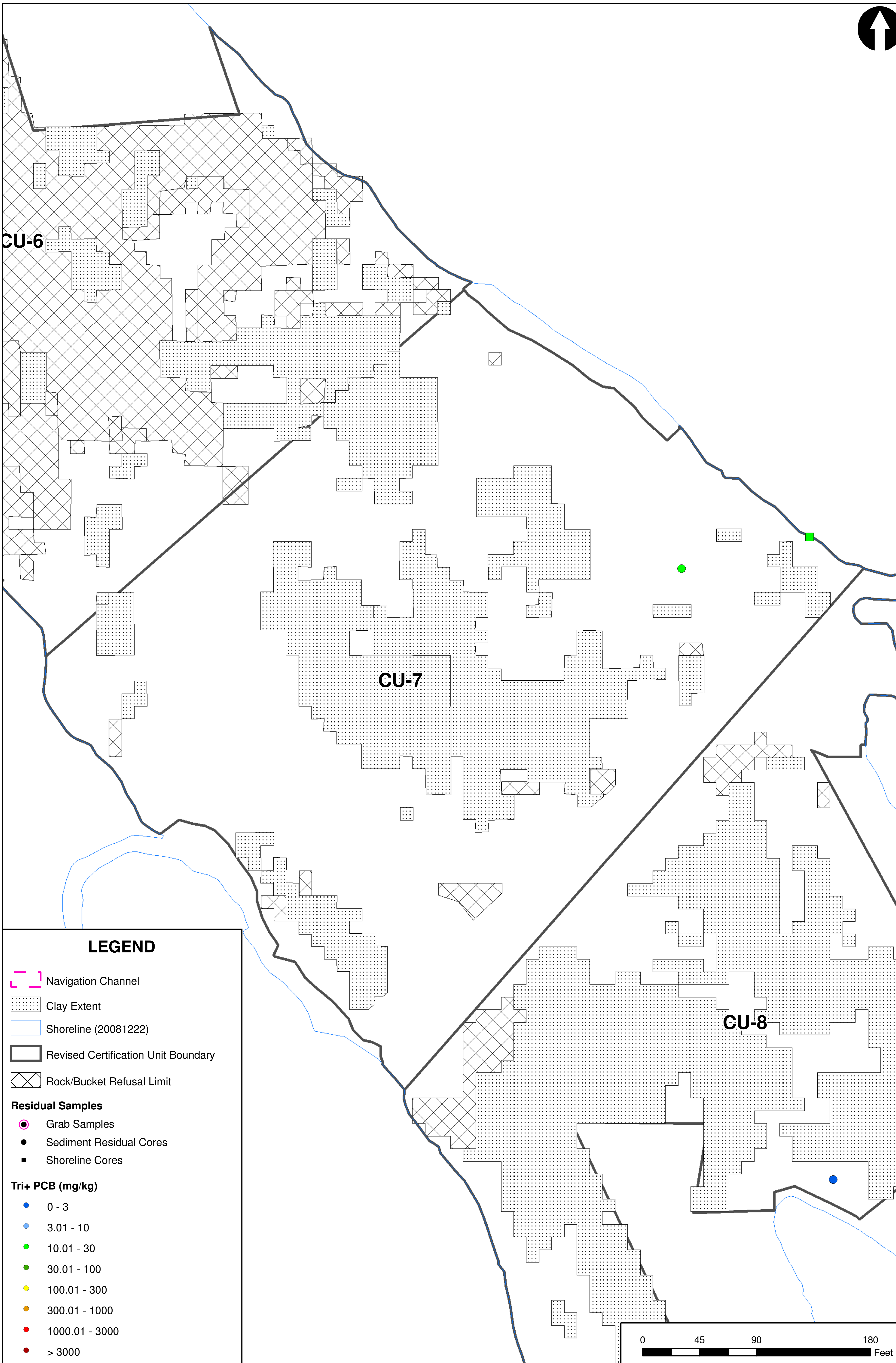
Appendix II-B-7c

March 2010



Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) Second Residual Dredge Pass - CU7

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Appendix II-B-7d

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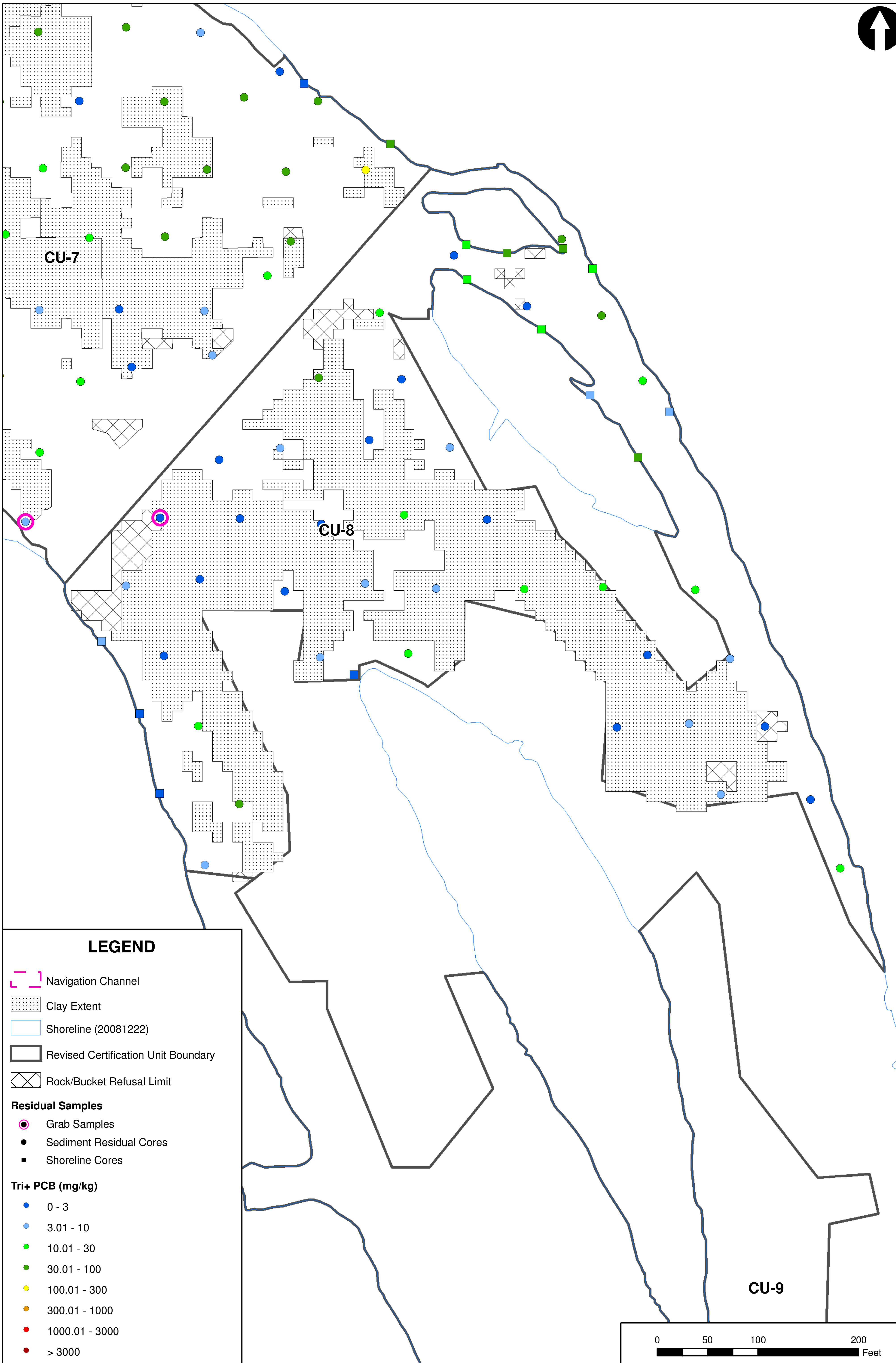
E:\hudson\MapDocuments\PostDredging\ForReport\CU07_ResidualCore_Tri_Conc_2ndRes.mxd



Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) First Inventory Dredge Pass - CU8

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Appendix II-B-8a

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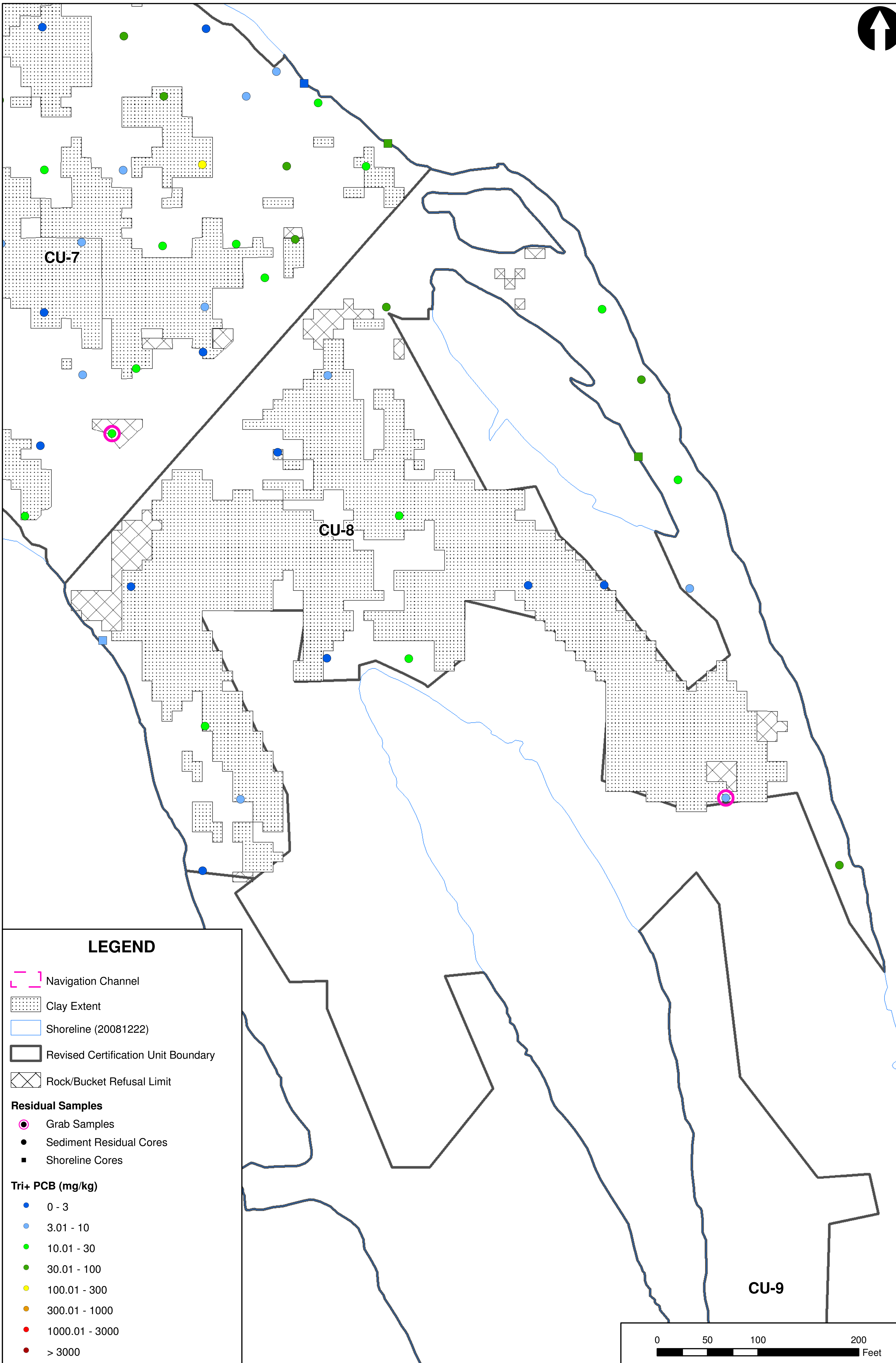

Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) Second Inventory Dredge Pass - CU8

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Appendix II-B-8b

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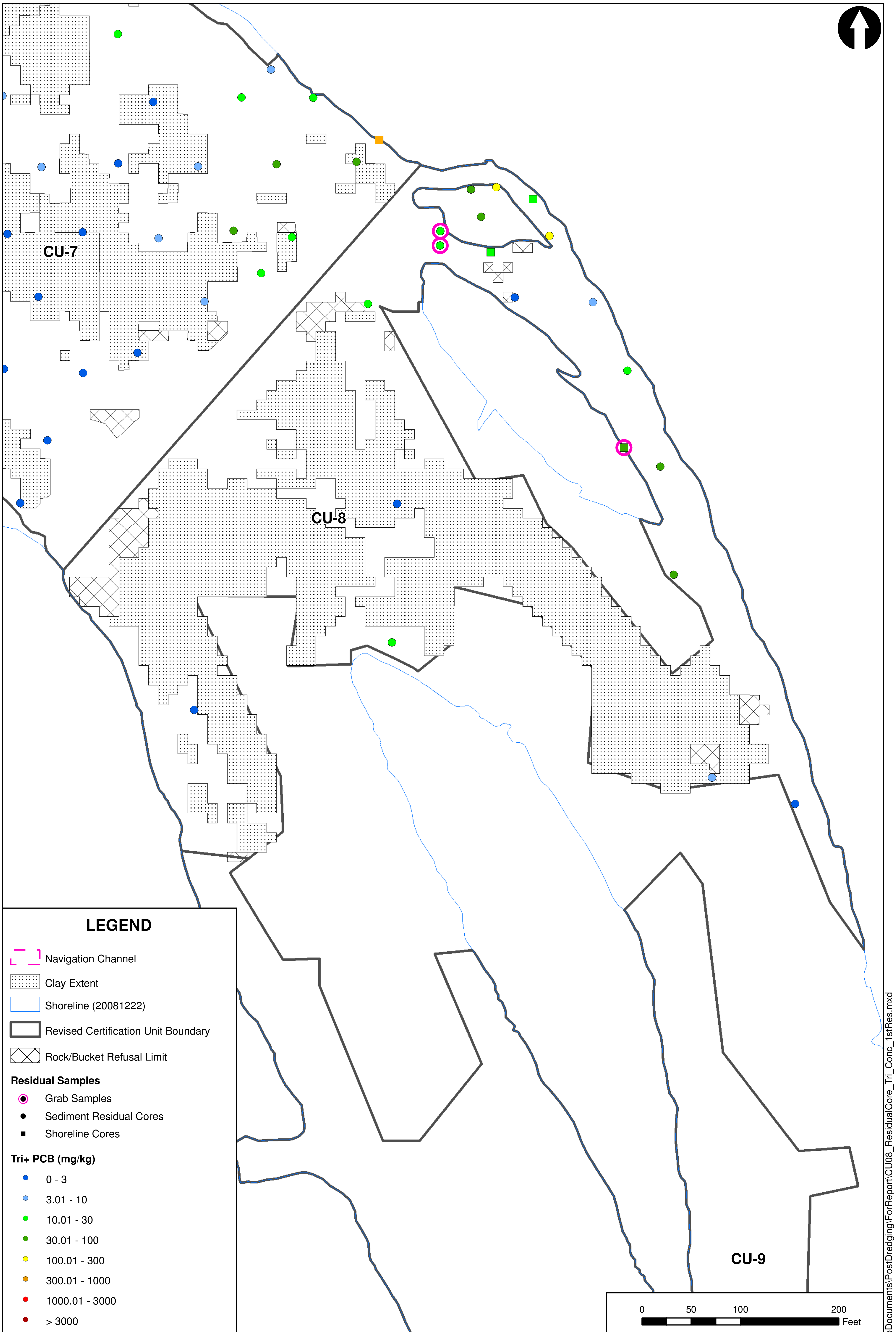
E:\hudson\MapDocuments\PostDredging\ForReport\CU08_ResidualCore_Tri_Conc_2ndInv.mxd



Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) First Residual Dredge Pass - CU8

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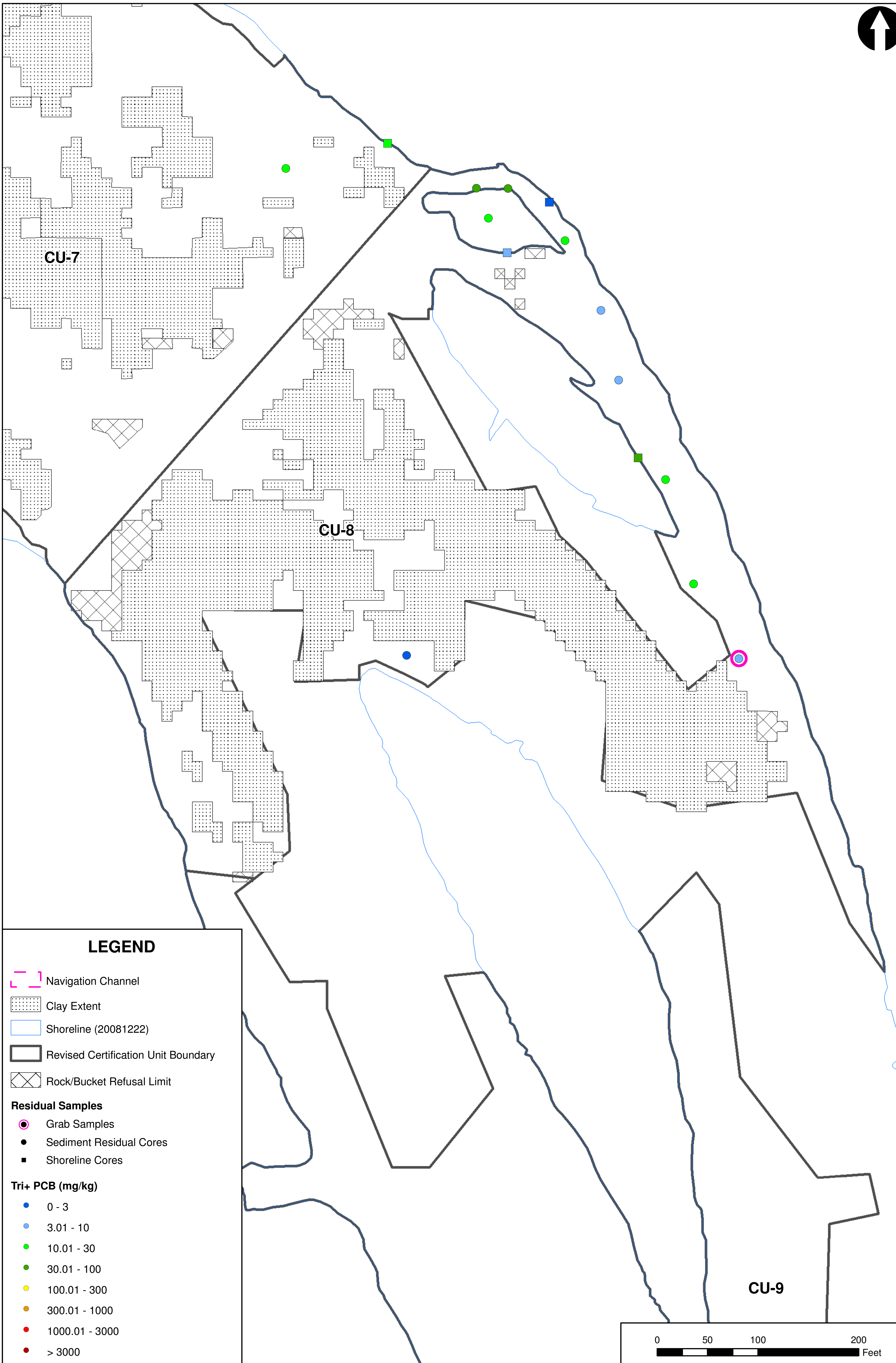
Appendix II-B-8c

March 2010



Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) Second Residual Dredge Pass - CU8

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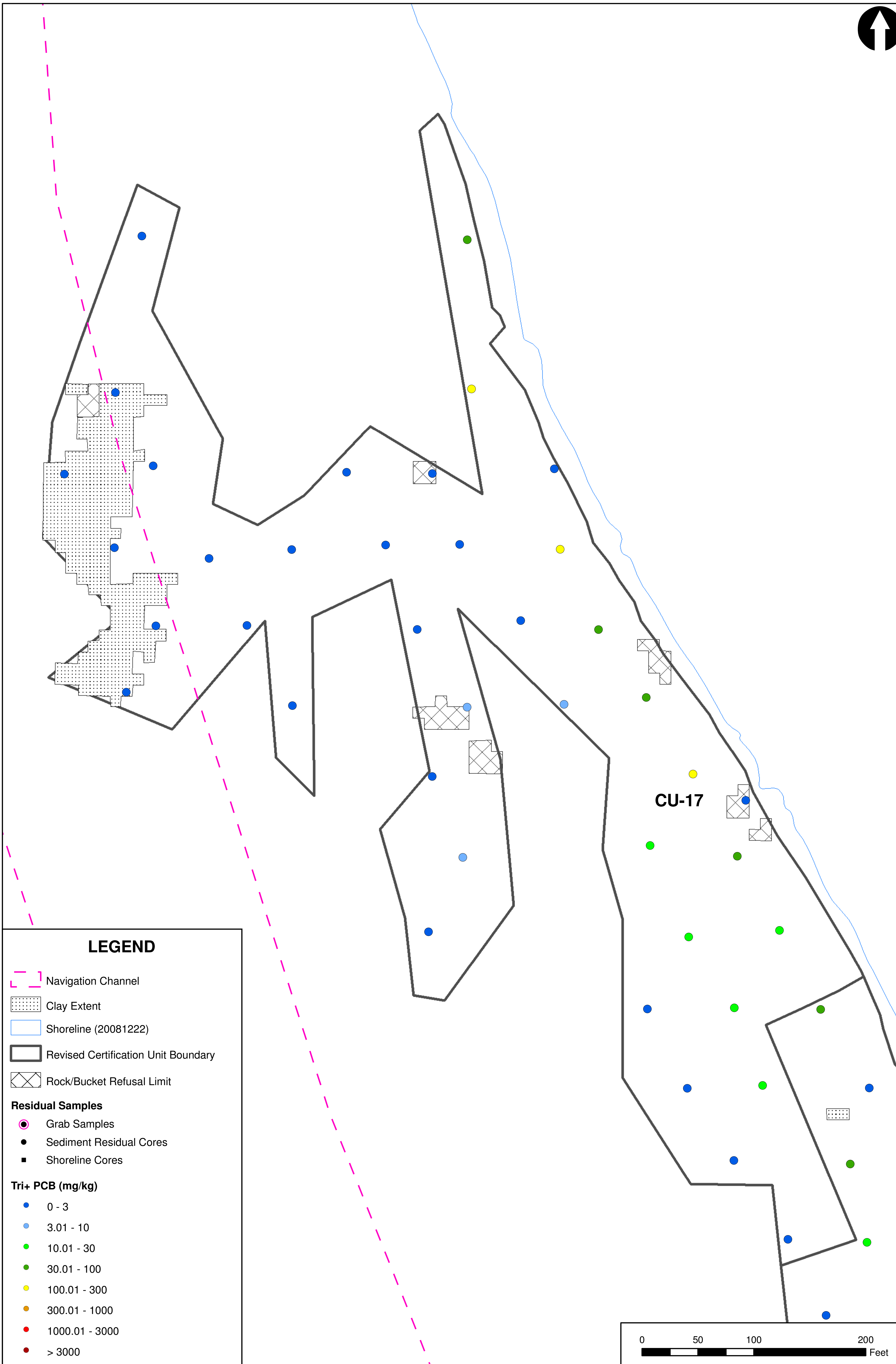
Appendix II-B-8d

March 2010

E:\hudsonMapDocuments\PostDredging\ForReport\CU08_ResidualCore_Tri_Conc_2ndRes.mxd



Surface Tri+PCB Concentrations for Residual Cores
(0-6 inches) First Inventory Dredge Pass - CU17

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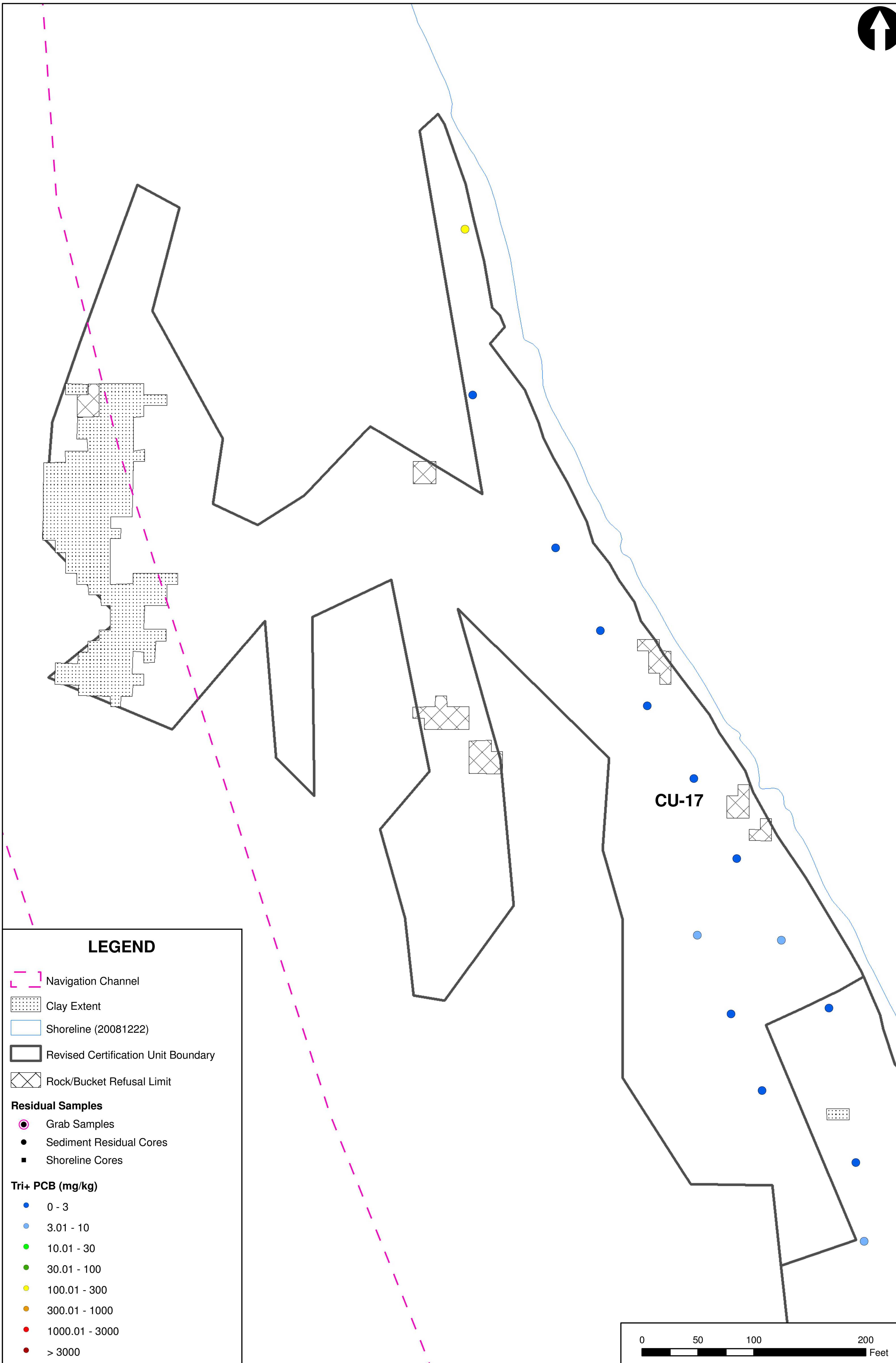
Appendix II-B-9a

March 2010

E:\hudsonMapDocuments\PostDredging\ForReport\CU17_ResidualCore_Tri_Conc_1stInv.mxd



Surface Tri+PCB Concentrations for Residual Cores
(0-6 inches) Second Inventory Dredge Pass - CU17

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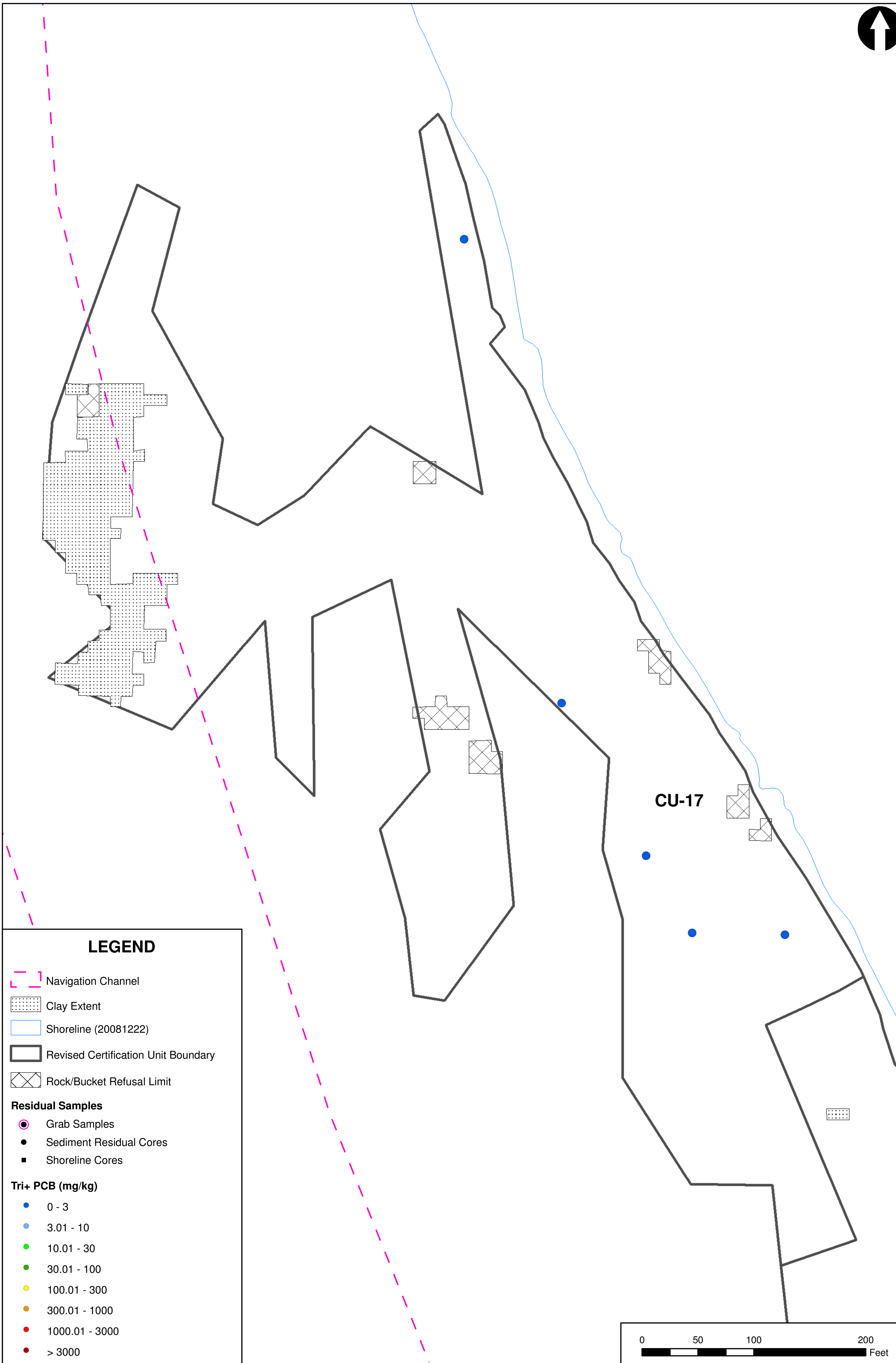
Appendix II-B-9b

March 2010

E:\hudsonMapDocuments\PostDredging\ForReport\CU17_ResidualCore_Tri_Conc_2ndInv.mxd



Surface Tri+PCB Concentrations for Residual Cores (0-6 inches) First Residual Dredge Pass - CU17

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Appendix II-B-9c

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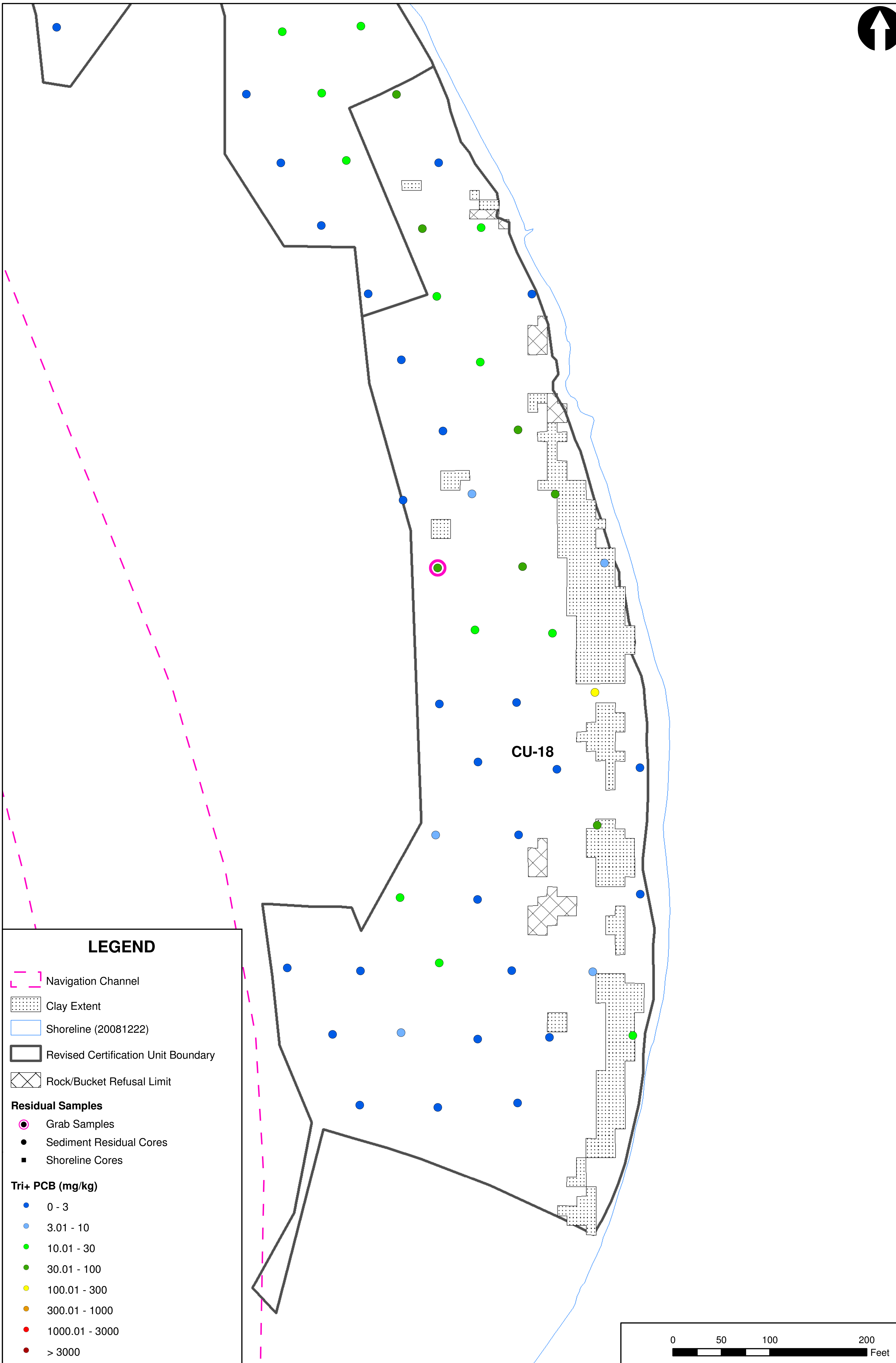
E:\hudson\MapDocuments\PostDredging\ForReport\CU17_ResidualCore_Tri_Conc_1stRes.mxd



Surface Tri+PCB Concentrations for Residual Cores8
(0-6 inches) First Inventory Dredge Pass - CU18
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Appendix II-B-10a

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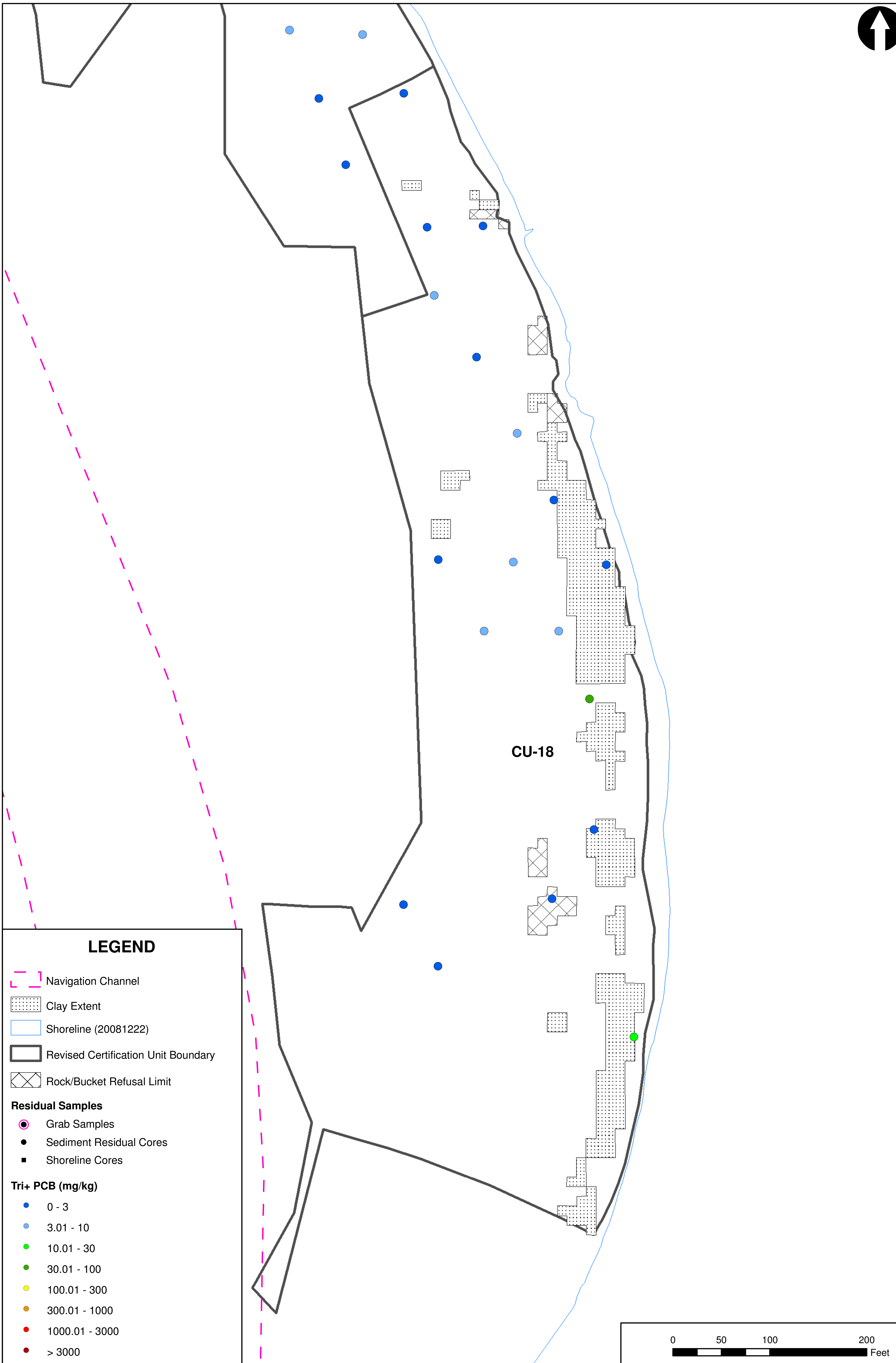
E:\hudson\MapDocuments\PostDredging\ForReport\CU18_ResidualCore_Tri_Conc_1stInv.mxd



Surface Tri+PCB Concentrations for Residual Cores8
(0-6 inches) Second Inventory Dredge Pass - CU18
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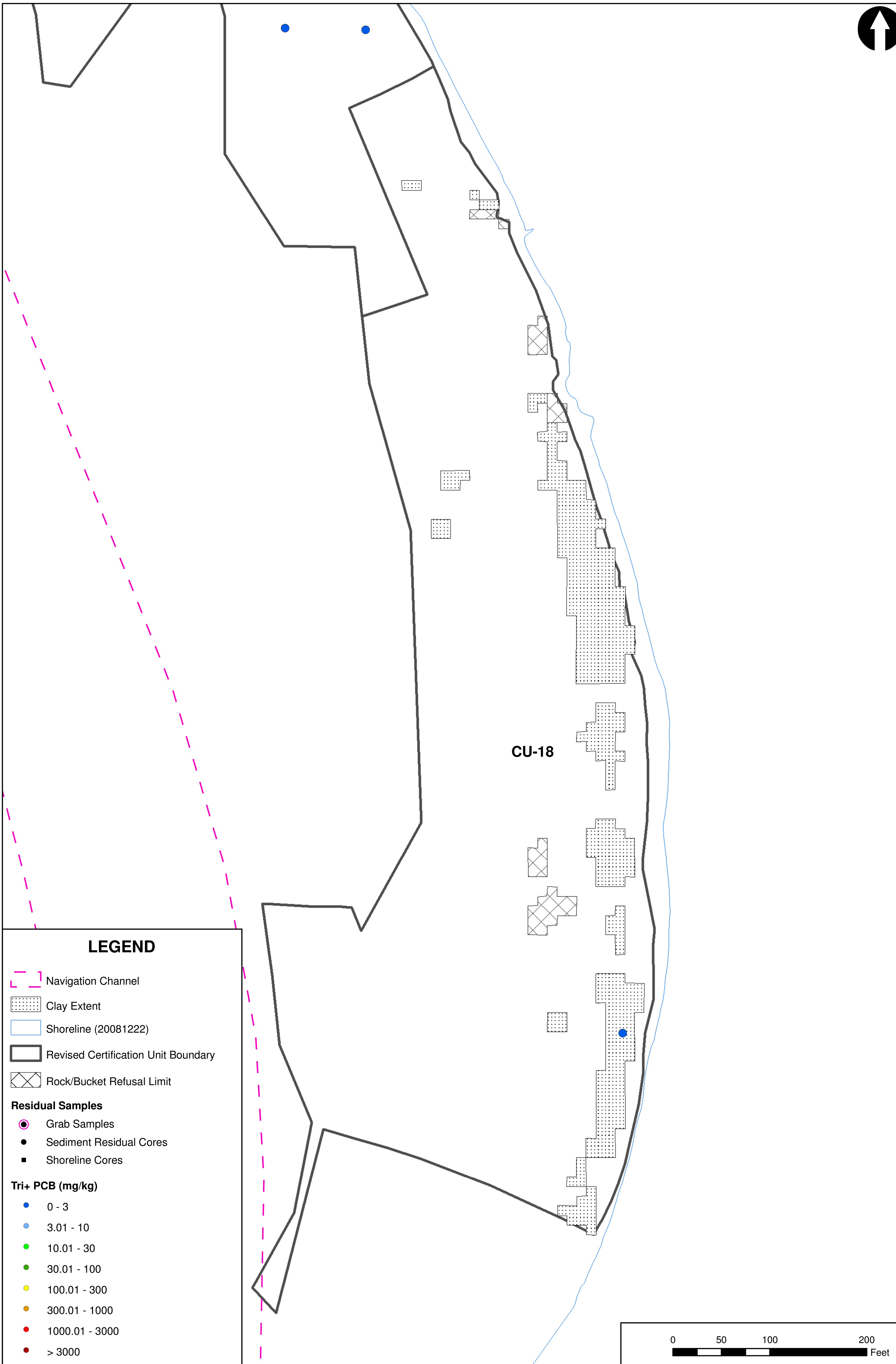
Appendix II-B-10b

March 2010

E:\hudson\MapDocuments\PostDredging\ForReport\CU18_ResidualCore_Tri_Conc_2ndInv.mxd



Surface Tri+PCB Concentrations for Residual Cores8
(0-6 inches) First Residual Dredge Pass - CU18
EPA Phase 1 Evaluation Report – Hudson River PCBs Site

Appendix II-B-10c

March 2010

E:\hudson\MapDocuments\PostDredging\ForReport\CU18_ResidualCore_Tri_Conc_1stRes.mxd

Appendix II-C

3-D Visualization of Post-Dredging Bathymetry

[3-D files are provided in the CD]

Appendix II-C

Three-Dimensional Visualization of Bathymetry and Sediment Core PCB Data for Phase 1 Certification Units (CUs)

1. Introduction

MVS (Mining Visualization System) is state-of-the-art sophisticated software that allows the visualization and analysis of complex three-dimensional problems. The use of this software has allowed the Louis Berger Group Hudson River Project Team to present intuitive visualizations of the data associated with the dredging operations at the Hudson River PCBs Site. Many of our findings were directly derived from and supported with data-based visualization. Individual data components (e.g., sediment core PCB data) were viewed and assessed within the context of the dredging operation so that data issues could be addressed. Multiple types of data (e.g., sediment core PCB data and dredging cut depths) were integrated into one scene for evaluation so that correlation between different types of data could be addressed. In the discussion below, C-Tech's Four-Dimensional Interactive Model (4DIM) Technology was used for visualization of PCB concentrations in sediment cores, and pre- and post-dredging surfaces. A 4DIM contains multiple frames. Each frame is a complete 3D model that can be freely zoomed, moved and rotated.

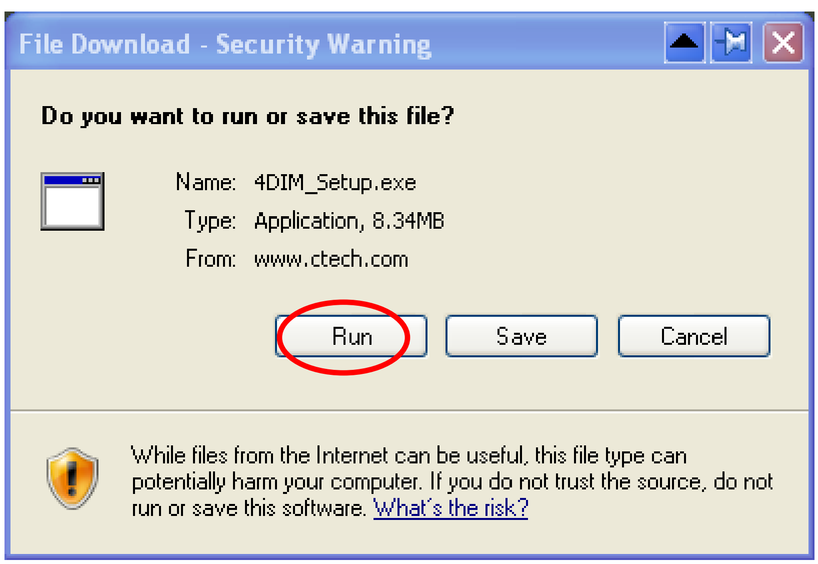
2 Installation of 4DIM Player and Navigation of 4DIMs

2.1 Instructions for Installation of 4DIM Player

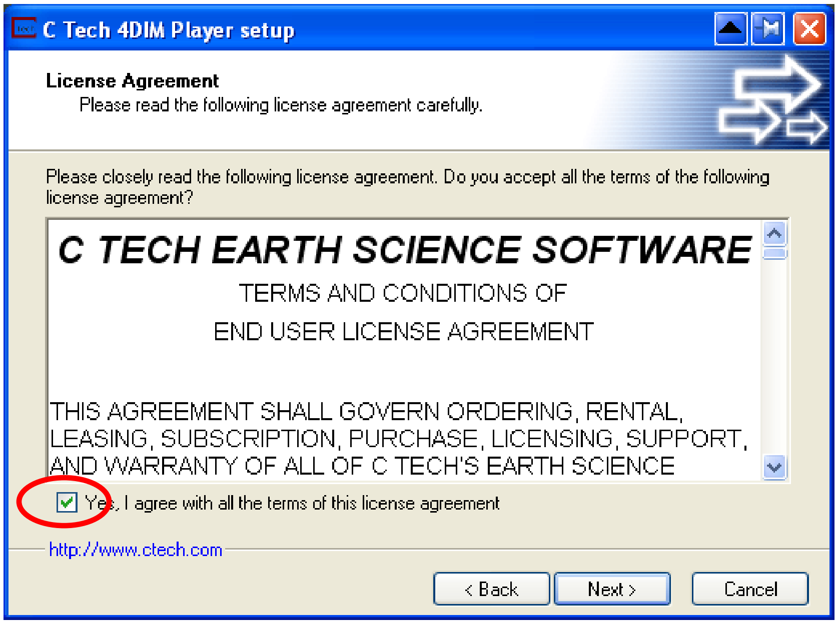
The 4DIMs can be visualized interactively using 4DIM Player, which is a free viewer developed by C-Tech Development Corporation. It is available for download at http://www.ctech.com. The steps for download and installation of 4DIM Player are as follows:

First, simply Ctrl+Click ***HERE***, the C-Tech's file download page will appear:

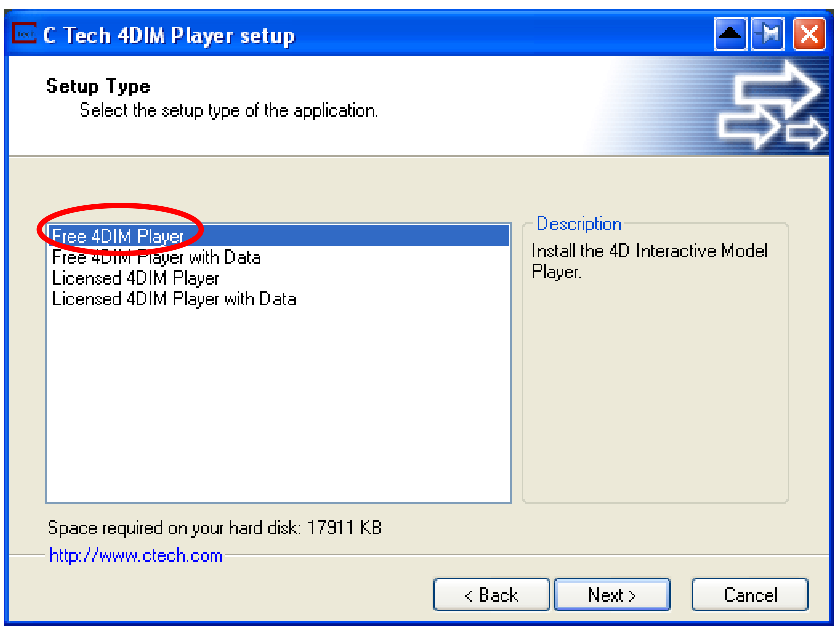
Then, click “Standalone 4DIM Player Installation”, the file download window will pop up:



Click Run button, follow the instructions on screen. Then the following window will pop up,



Select “Yes, I agree with all the terms of this license agreement”, then the following window will pop up,



Select “Free 4DIM Player”, then, click Next button. Follow the screen instruction to finish up the installation.

As an alternative way for downloading 4DIM Player, you can also first access C-Tech's web page (The URL is http://www.ctech.com); click SUPPORT; then click DOWNLOAD to go to file download page. Then go through the same steps for download and installation of 4DIM Player as described above.

2.2 Navigating 4DIMs

Rotate the model: Move the mouse to a location within the viewer portion of the 4DIM Player's window. Hold down the left mouse button and move the mouse pointer in various directions. The model rotates.

Zoom in or out on the model: The middle mouse button on a 3 button mouse can be clicked and dragged to change the zoom level, or a wheel button will also affect the zoom.

Move (Translate or Pan) the model: Hold down the right mouse button and drag the object up, down, and around, then center the model.

Run Animation: 4DIMs II-C-13 through 16 show animations of cross sections for CU-1, CU-4, CU-7 and CU-18, respectively. Click "Run" button in the bottom of 4DIM Player window. The speed of animation can be adjusted by selecting different delay time.

3 4DIM Development for Phase 1 Certification Units

Appendix II-C figures present snapshots of 4DIMs. Detail information about each figure can be obtained through interactive visualization of the 4DIM associated with the figure. A 4DIM file is named the same as the figure which the 4DIM is associated with.

The figures and 4DIMs are present in the following three categories:

- Pre-dredging, post-dredging and backfilled surface elevations for Phase 1 Certification Units (CUs). (See Figures II-C-1 through 10 and the associated 4DIMs II-C-1 through 10).
- Three-dimensional representation of PCB concentrations in sediment cores in CU-1. (See Figures II-C-11 and II-C-12 and the associated 4DIMs II-C-11 and II-C-12).
- 3D View of Cross Sections for Phase 1 Certification Units (See Figures II-C-13 through 16 and the associated 4DIMs II-C-13 through 16).

The main observations and findings from these figures and 4DIMs are described below.

4 Visualization of Pre-dredging, Post-dredging and Backfilled Surfaces

The 3D visualization of the sediment surface elevations at different dredging stages (pre-dredging, post-dredging and backfill) for CU-1 through CU-8, CU-17 and CU-18 were conducted and are presented in 4DIMs II-C-1 through 10. Figures II-C-1 through 10 are snapshots of these 4DIMs. In each figure, the surface plots are arranged in clockwise way so that a final dredging surface is shown immediately below the associated design dredging surface for easy comparison of these two surfaces. The surfaces are numbered in the following sequences:

As shown in the figures and 4DIMs, the final dredging depth went deeper than the design dredging depth in all CUs. The final dredging depth was underestimated universally in all CUs. CU-1 represents the worst case for dredging underestimation. Majority of areas in CU-1, which were designed to be dredged to 108 to 116 feet (blue), were eventually dredged to 100 to 104 feet (yellow and orange). The final dredging depth was closer to the designed dredging depth in CU-6, CU-17 and CU-18 than in other CUs. The discrepancy between the final dredging depth and the designed dredging depth was within 2 feet almost everywhere within these three CUs and averaged about 0.7 feet.

5 Visualization of PCBs in SSAP and Post-dredging Pass Cores

Sediment core PCB data were integrated with dredging cut lines for visualization. Model II-C-11 presents Total PCBs concentrations in SSAP cores in CU-1, and the first and final post-dredging pass cores, while 4DIMs II-C-12 presents Tri+ PCBs concentrations in the final post-dredging pass cores. Figures II-C-11 and II-C-12 are the snapshots of these two 4DIMs. As a demonstration of the flexibility in navigating 4DIMs, Figures II-C-12b presents a view looking from below the 3D model of CU-1 (4DIMs II-C-12), while Figures II-C-12a presents a normal view.

The figures and 4DIMs show that in CU-1 most of the post-dredging pass cores, even after five dredging passes, still did not penetrate through the PCB inventory and demonstrates that the depth of contamination estimated from the SSAP cores underestimated the inventory presented in the CU. The test pits cores, which went as deep as elevation 100 feet (NGVD88), penetrated through the inventory of PCBs and reached the depth of contamination. Thus the true depth of contamination is estimated at an approximately elevation of 100 feet.

6 Animation of CU Cross Sections Showing Dredging Cut Lines

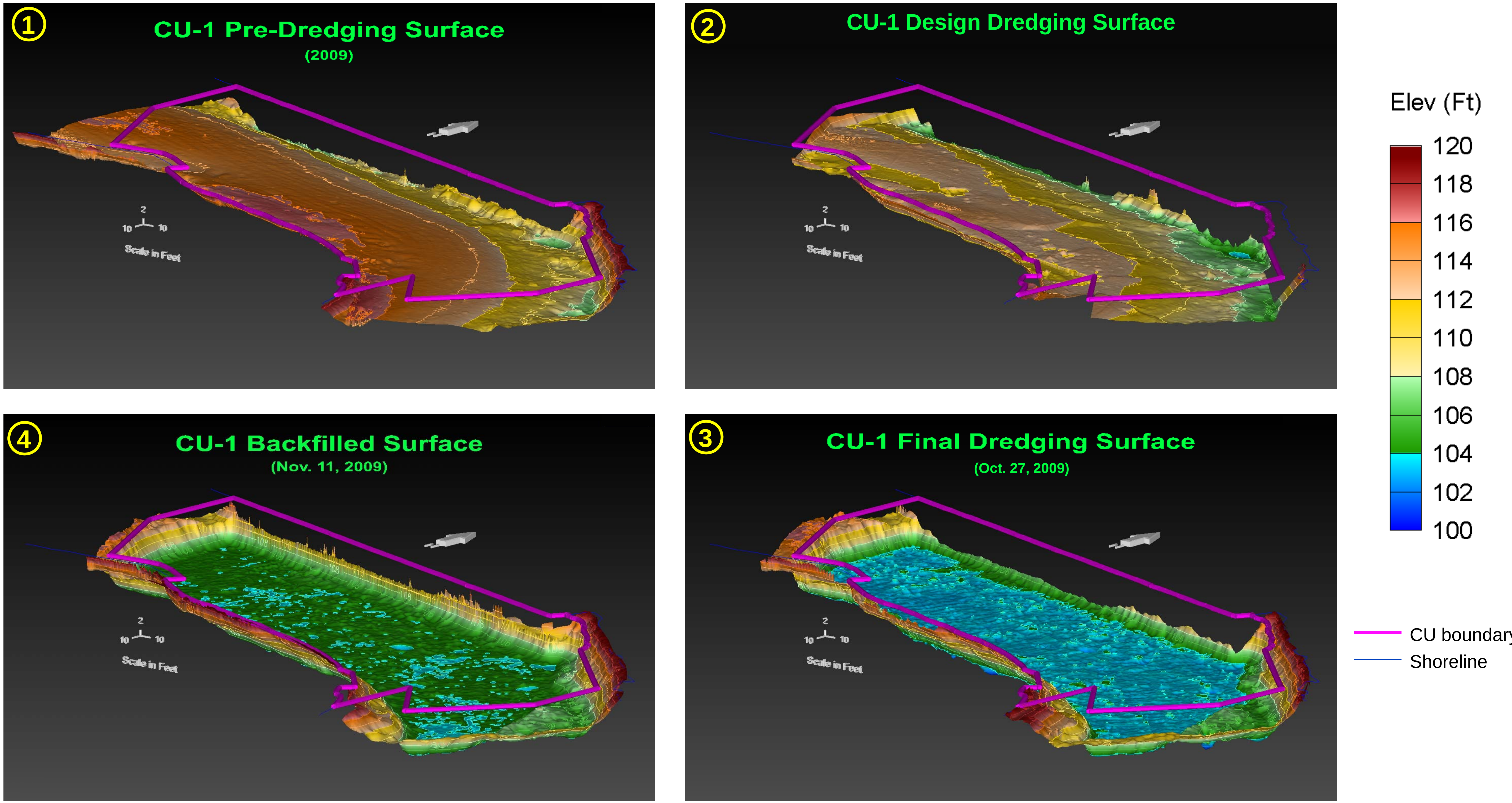
Cross-sectional view of dredging cut lines was animated along flow direction for CU-1, 4, 7 and 18. SSAP and final pass cores were also displayed together with the dredging cut lines. Figures II-C-13 through 16 show the snapshots of the animations. The animations are presented in 4DIMs II-C-13 through 16, respectively.

The animations facilitate the evaluation of sediment deposition and erosion throughout a CU. When cross sections depicting dredging cut lines move along the River, it is shown that the gap between the 2005 and 2009 pre-dredging bathymetry is pretty significant in some areas. For example, a gap of 2 feet or more is observed in many areas in CU-4 (refer to 4DIMs II-C-14). Both deposition and erosion are observed.

In the animations, it is clearly shown that the final cut is deeper than the design cut at almost every place in all CUs for which animations were conducted. Among the four CUs, the additional dredging depth below design cut needed in CU-1 is the biggest, while the least additional dredging depth was needed for CU-18. Since majority of SSAP cores (96%) are complete cores in CU-18, the prediction of DoC using SSAP cores is reliable. Incomplete cores comprise 94 percent of SSAP cores in CU-1. Therefore, the design cut based on SSAP core data cannot give appropriate prediction of true DoC in CU-1.

7 Summary

Through visualization of dredging cut lines and SSAP and post-dredging pass core PCB data, it is clearly seen that SSAP cores did not characterized the depth of contamination adequately.



Notes: (1) The vertical datum is NAVD88; (2) Vertical exaggeration is 3; (3) The backfilled surface elevations may not be the most recent survey data.

Pre-Dredging, Post-Dredging and Backfilled Surface Elevations (CU-1)

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Figure II-C-1

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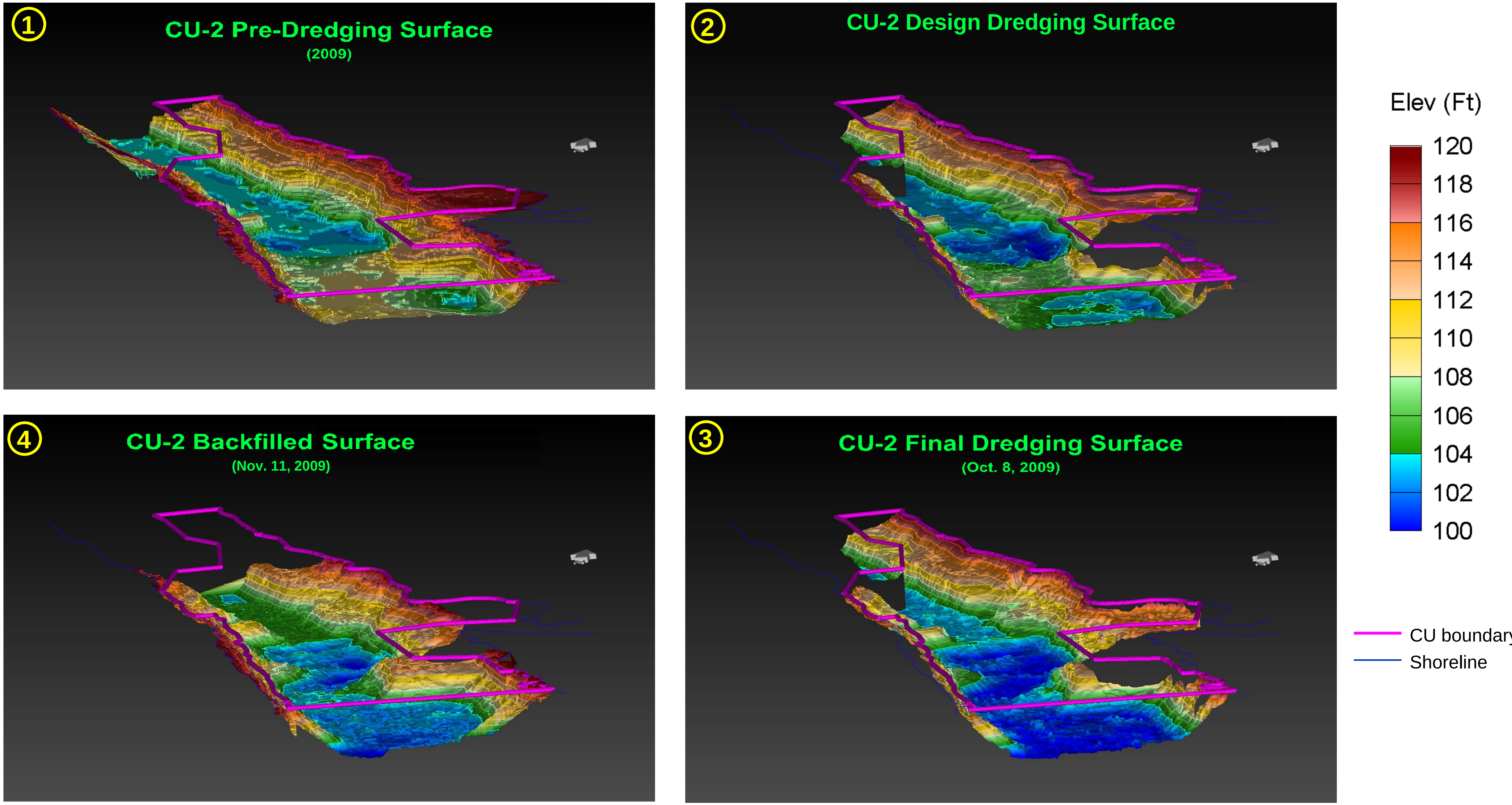

Notes: (1) The vertical datum is NAVD88; (2) Vertical exaggeration is 3; (3) The2005 pre-dredging bathymetry was used in conjunction with the 2009 bathymetry to generate pre-dredging surface.
(4) The backfilled surface elevations may not be the most recent survey data.

Pre-Dredging, Post-Dredging and Backfilled Surface Elevations (CU-2)

Figure II-C-2

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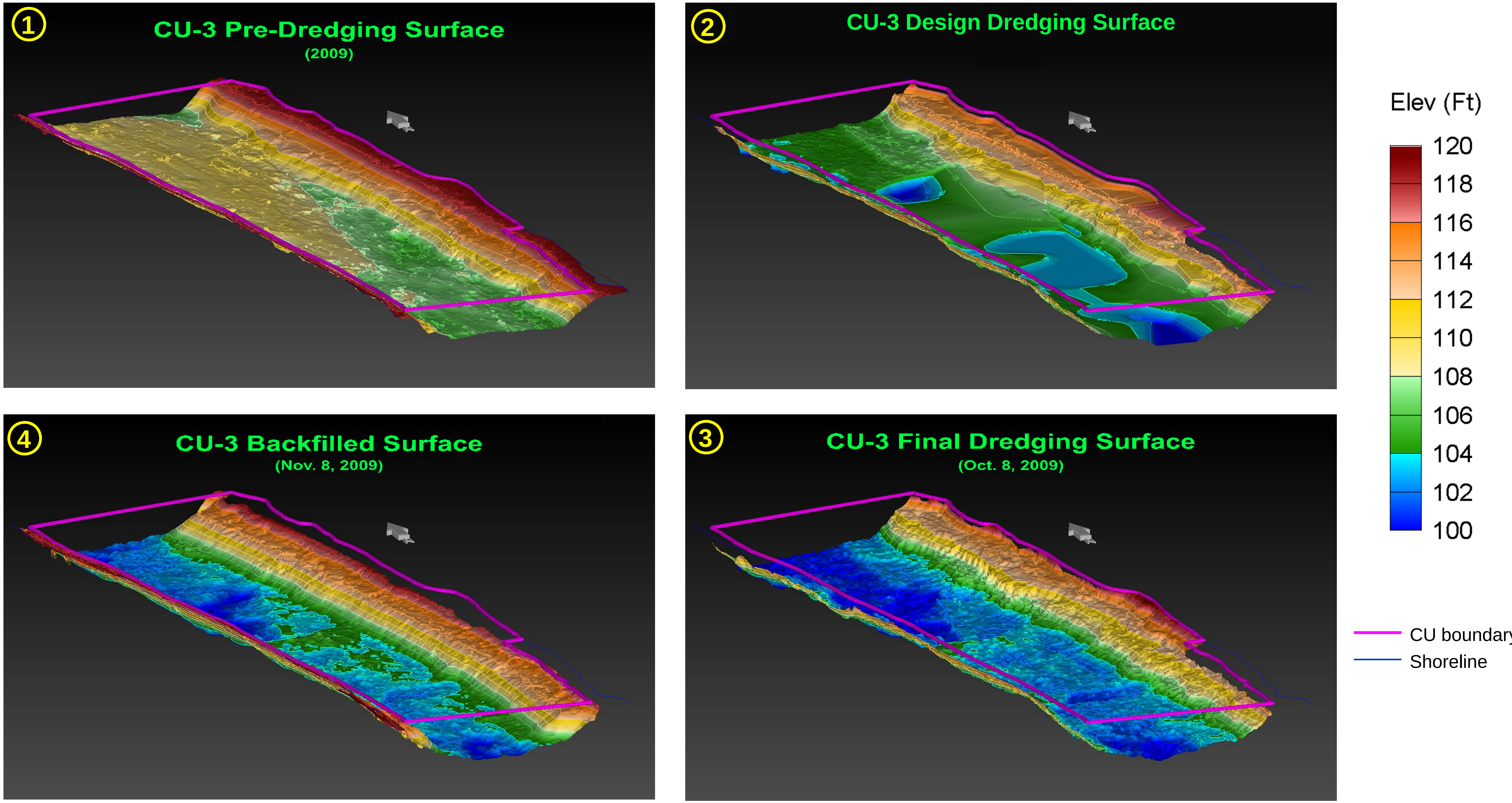

Notes: (1) The vertical datum is NAVD88; (2) Vertical exaggeration is 3; (3) The2005 pre-dredging bathymetry was used in conjunction with the 2009 bathymetry to generate pre-dredging surface.
(4) The backfilled surface elevations may not be the most recent survey data.

Pre-Dredging, Post-Dredging and Backfilled Surface Elevations (CU-3)

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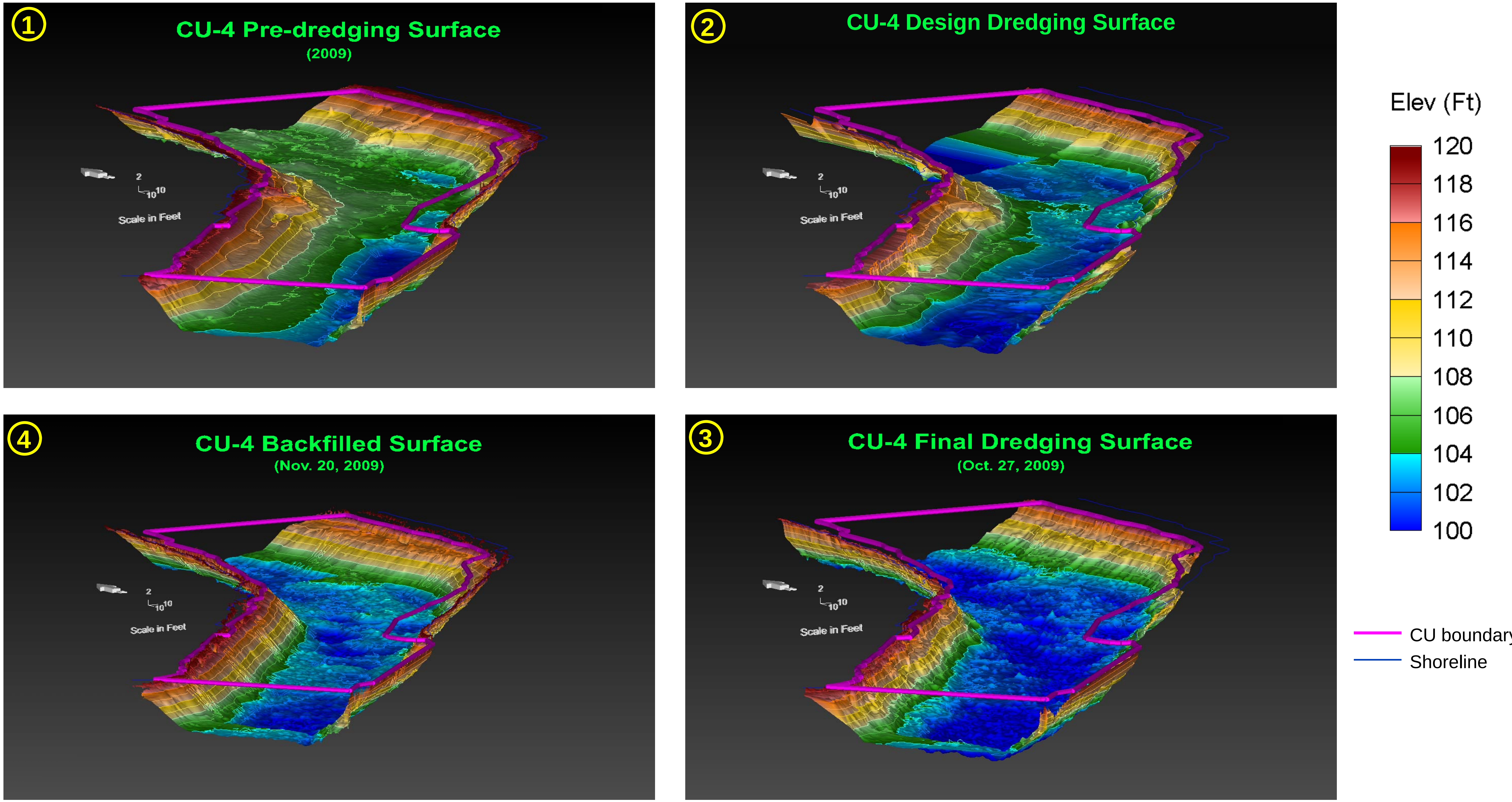
Figure II-C-3

March 2010



Notes: (1) The vertical datum is NAVD88; (2) Vertical exaggeration is 3.

Pre-Dredging, Post-Dredging and Backfilled Surface Elevations (CU-4)

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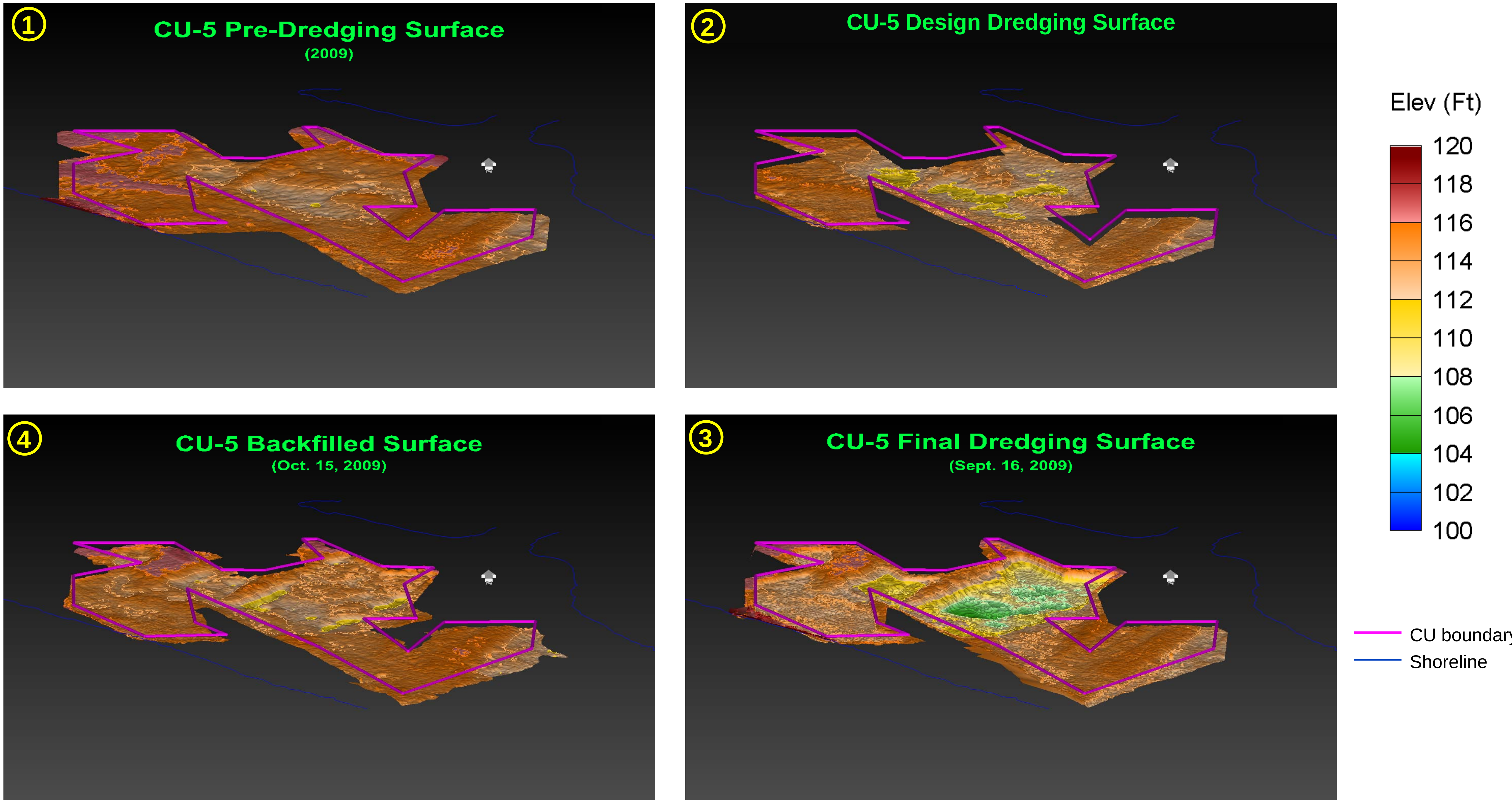
Figure II-C-4

March 2010



Notes: (1) The vertical datum is NAVD88; (2) Vertical exaggeration is 3; (3) The2005 pre-dredging bathymetry was used in conjunction with the 2009 bathymetry to generate pre-dredging surface.

Pre-Dredging, Post-Dredging and Backfilled Surface Elevations (CU-5)

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Figure II-C-5

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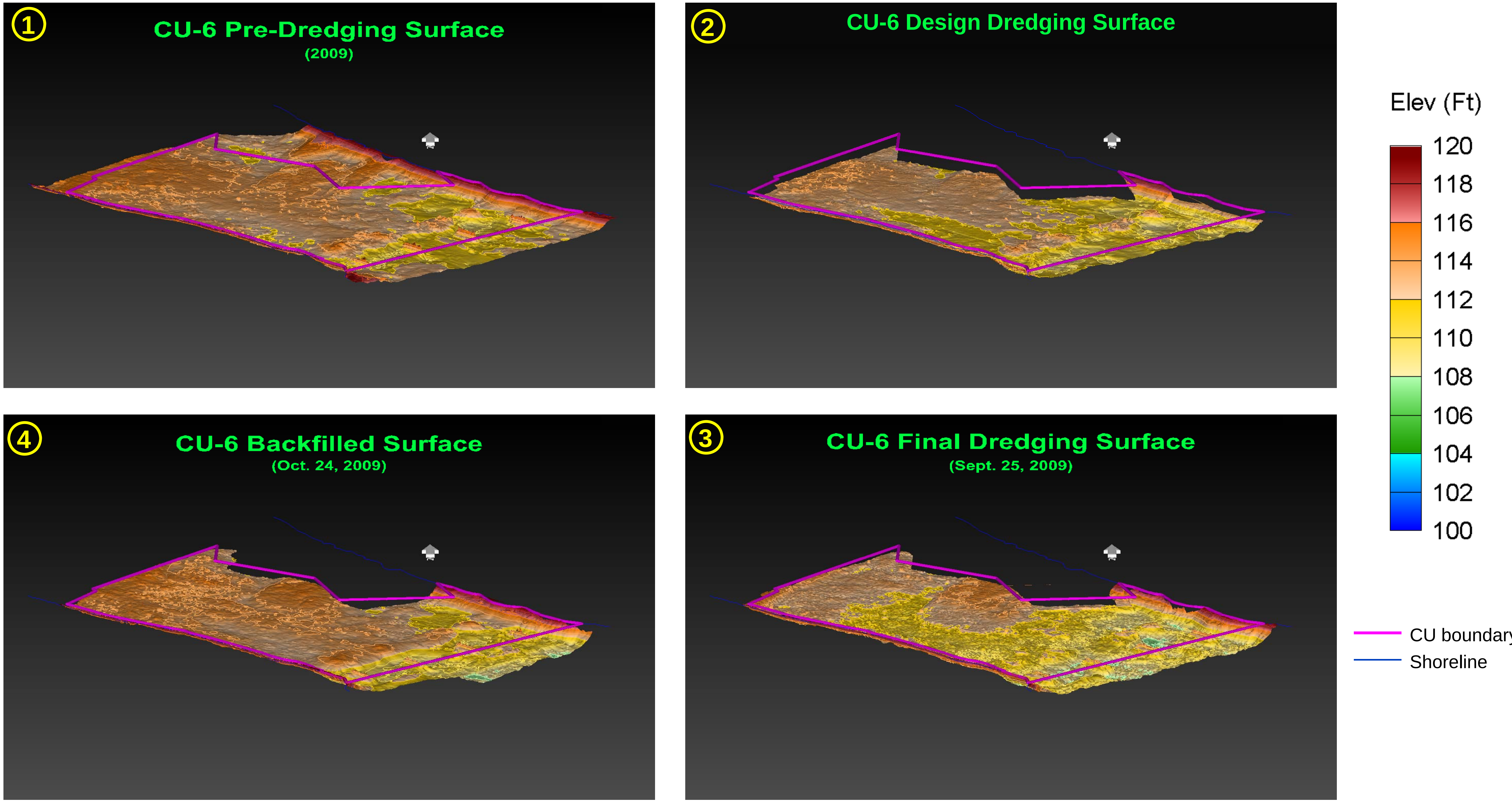

Notes: (1) The vertical datum is NAVD88; (2) Vertical exaggeration is 3; (3) The2005 pre-dredging bathymetry was used in conjunction with the 2009 bathymetry to generate pre-dredging surface.

Pre-Dredging, Post-Dredging and Backfilled Surface Elevations (CU-6)

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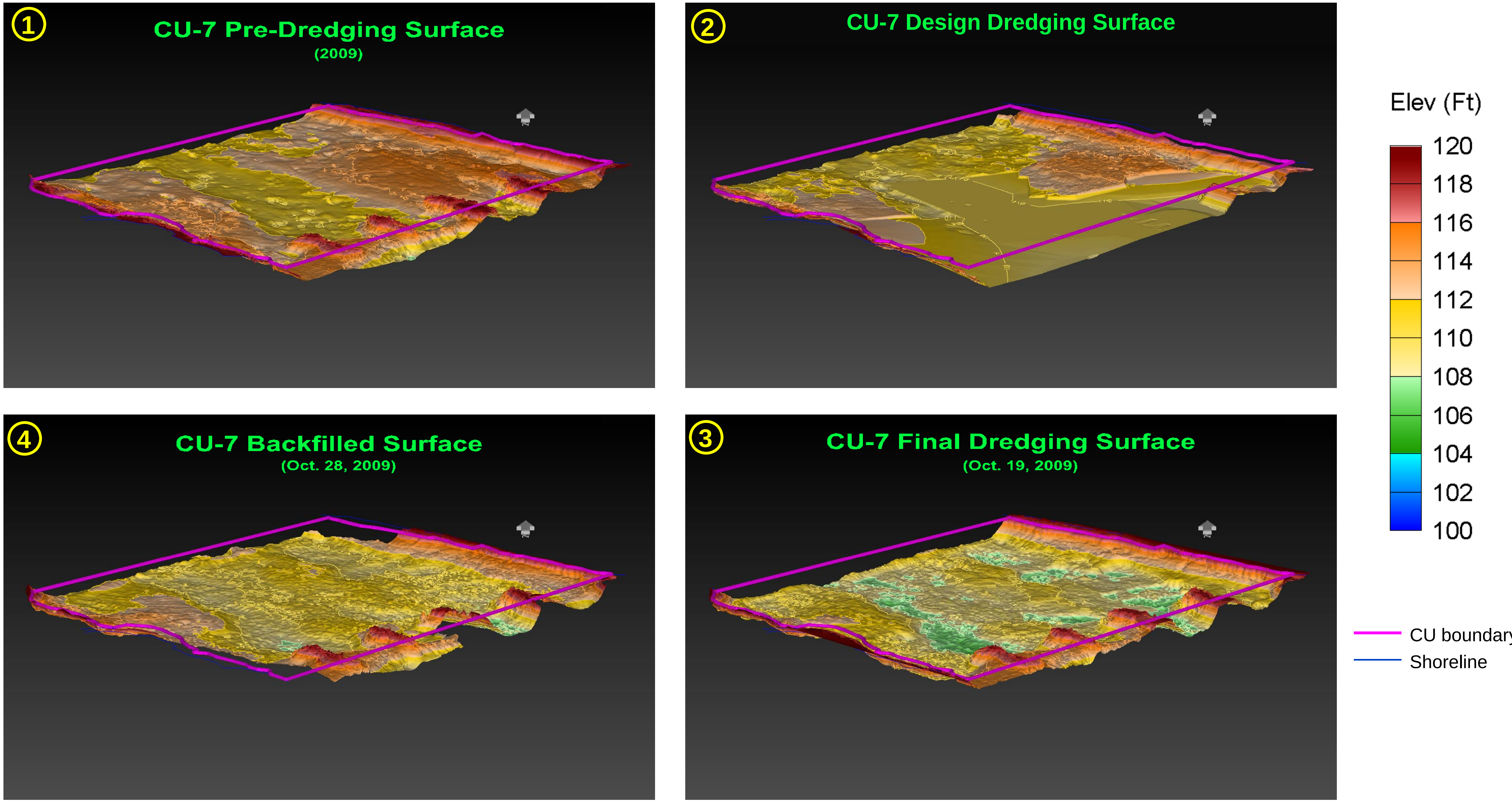
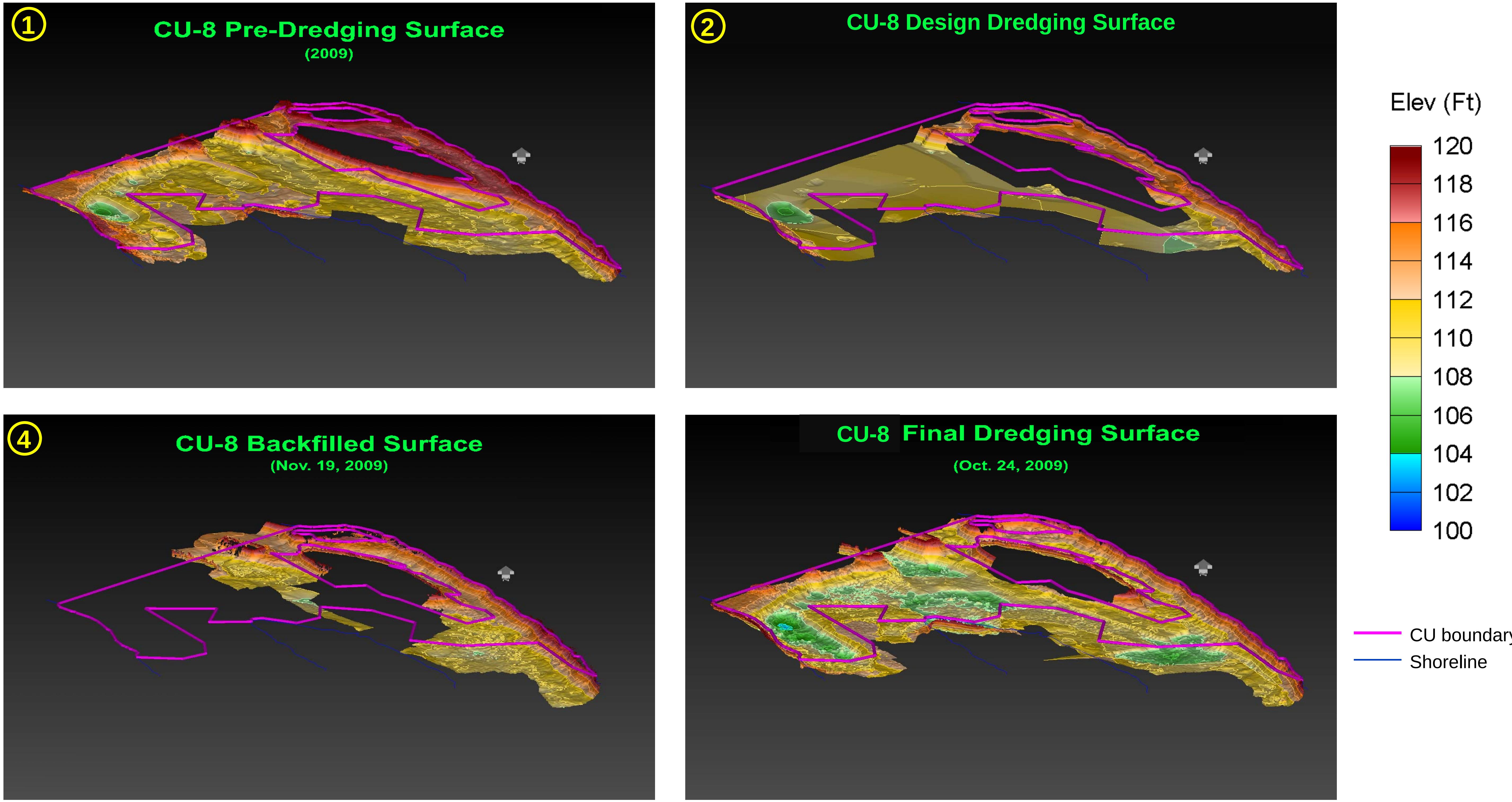
Figure II-C-6

March 2010



Notes: (1) The vertical datum is NAVD88; (2) Vertical exaggeration is 3.(3) The backfilled surface elevations may not be the most recent survey data.

	Pre-Dredging, Post-Dredging and Backfilled Surface Elevations (CU-7) Phase 1 Evaluation Report – Hudson River PCBs Site	Figure II-C-7 March 2010



Notes: (1) The vertical datum is NAVD88; (2) Vertical exaggeration is 3; (3) The2005 pre-dredging bathymetry was used in conjunction with the 2009 bathymetry to generate pre-dredging surface.

Pre-Dredging, Post-Dredging and Backfilled Surface Elevations (CU-8)

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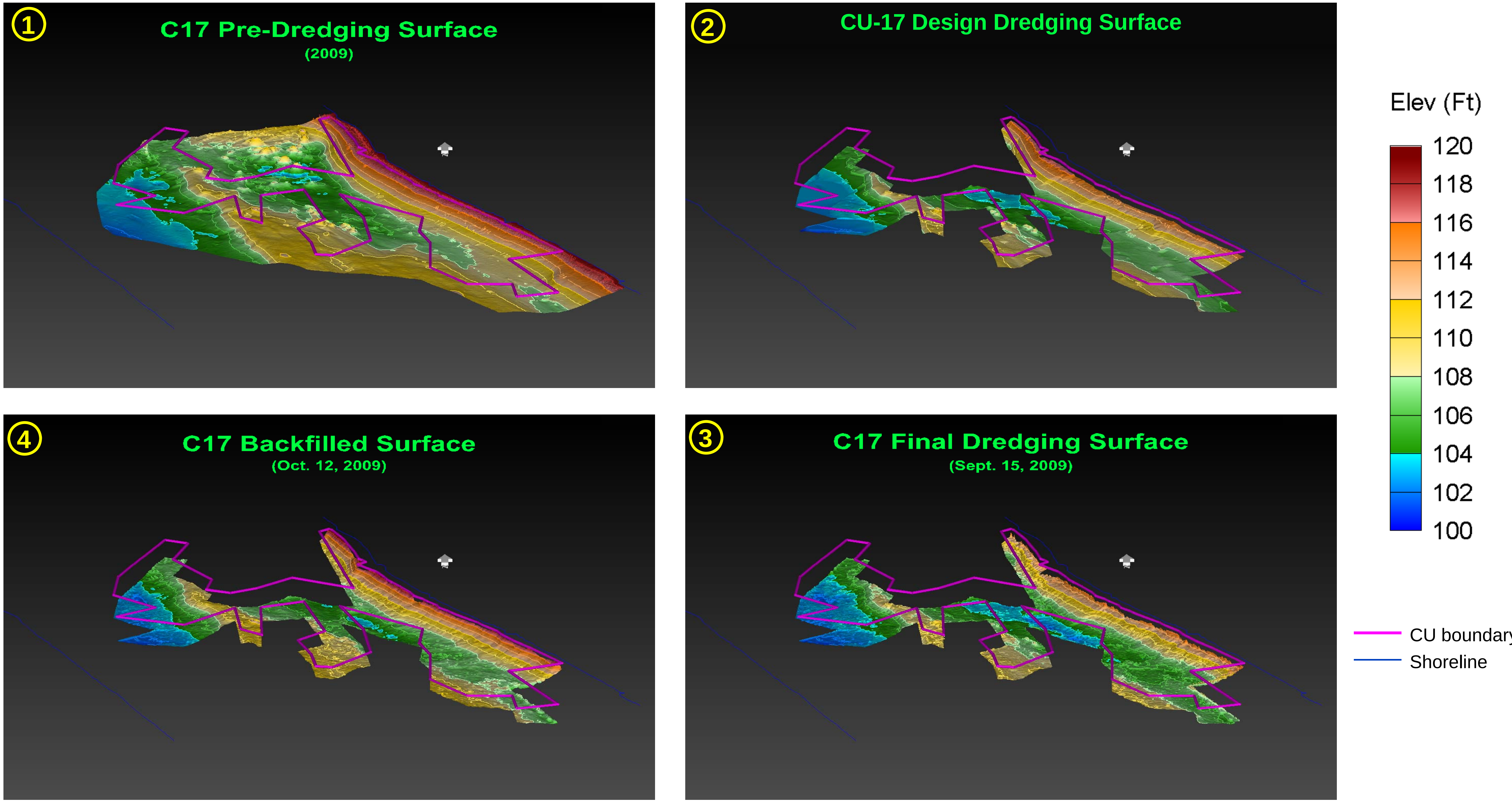
Figure II-C-8

March 2010



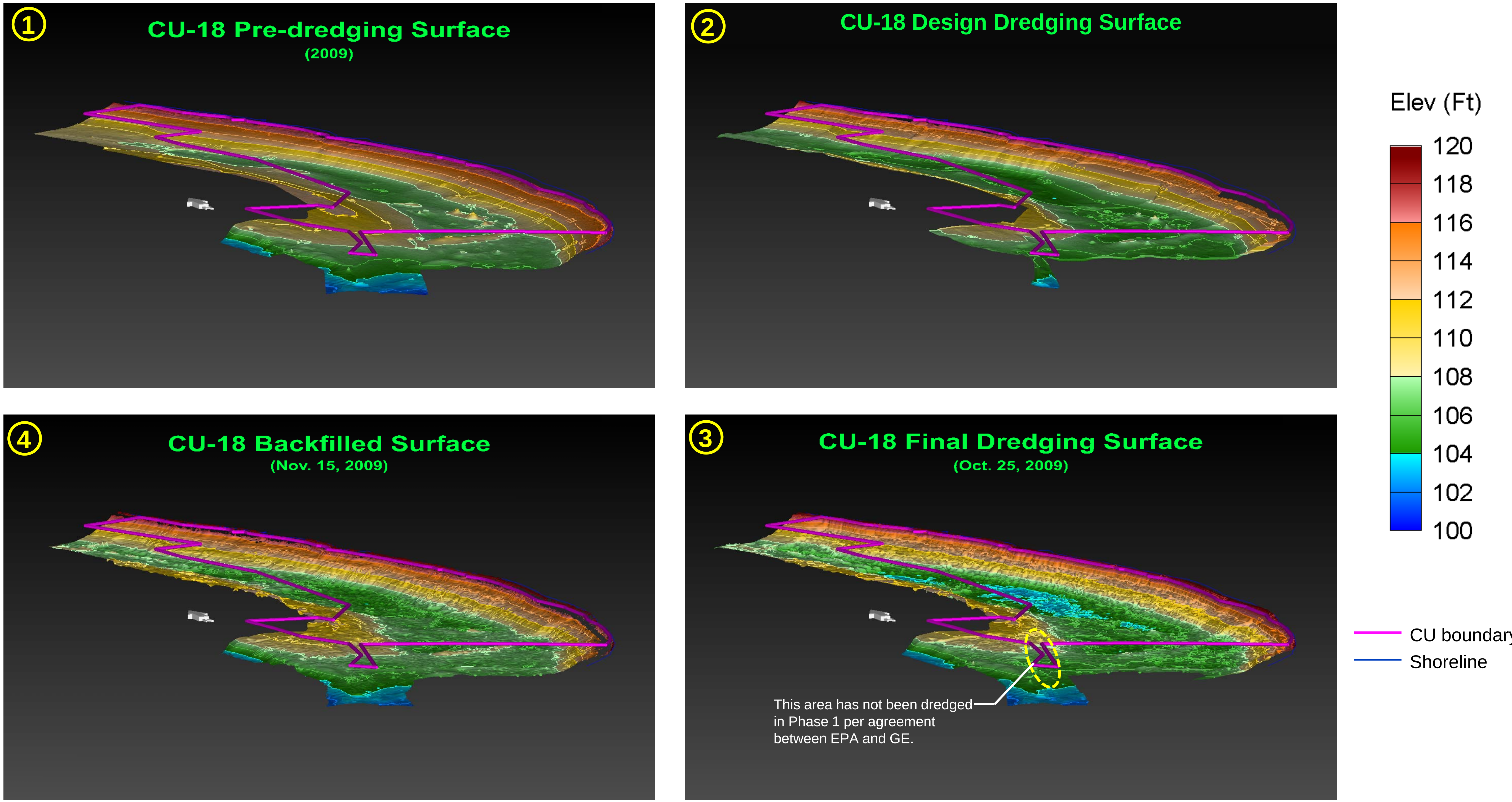
Notes: (1) The vertical datum is NAVD88; (2) Vertical exaggeration is 3; (3) The2005 pre-dredging bathymetry was used in conjunction with the 2009 bathymetry to generate pre-dredging surface.

Pre-Dredging, Post-Dredging and Backfilled Surface Elevations(CU-17)

Phase 1 Evaluation Report – Hudson River PCBs Site

Figure II-C-9

March 2010



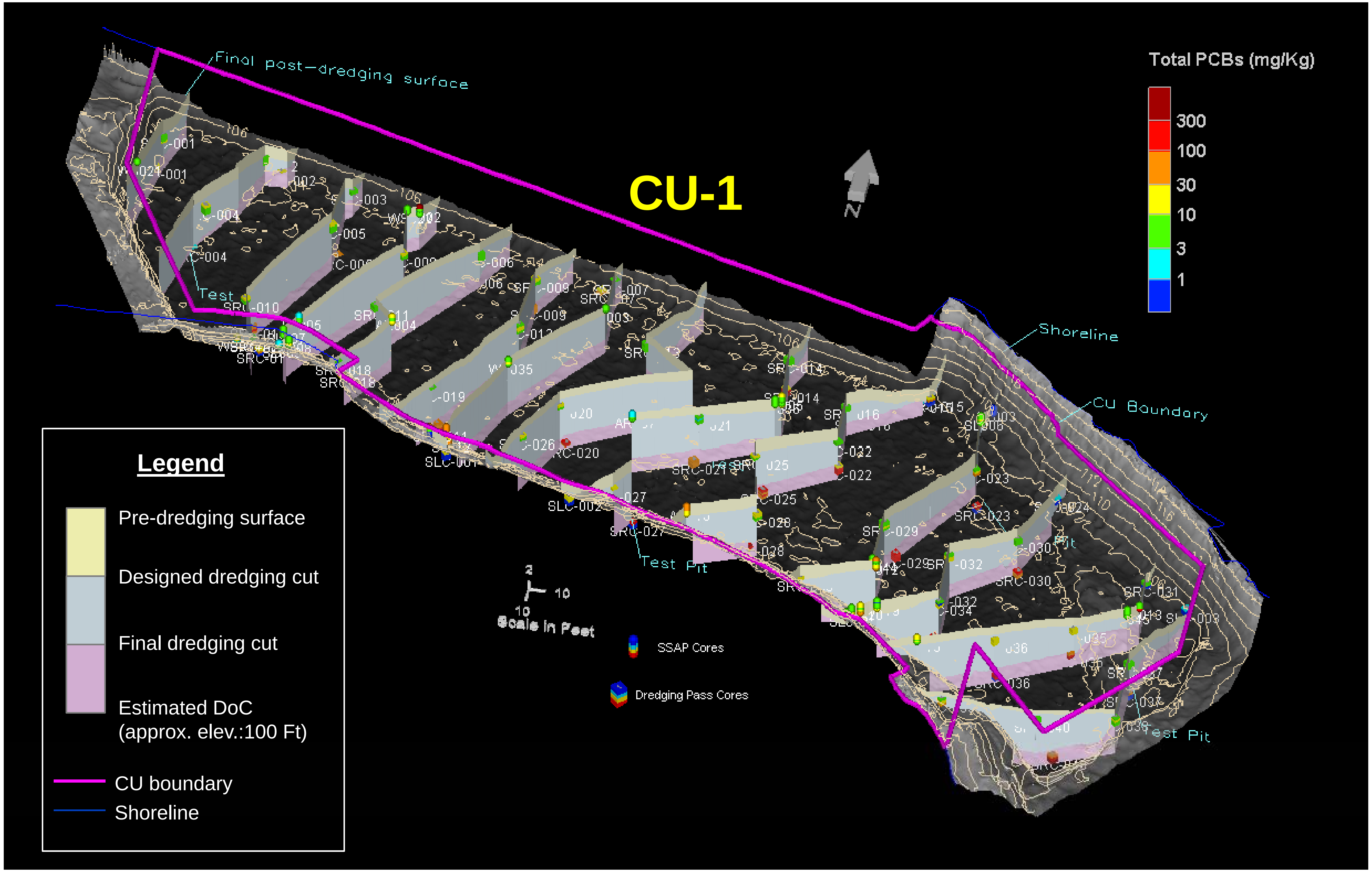
Notes: (1) The vertical datum is NAVD88; (2) Vertical exaggeration is 3.

Pre-Dredging, Post-Dredging and Backfilled Surface Elevations(CU-18)

Phase 1 Evaluation Report – Hudson River PCBs Site

Figure II-C-10

March 2010



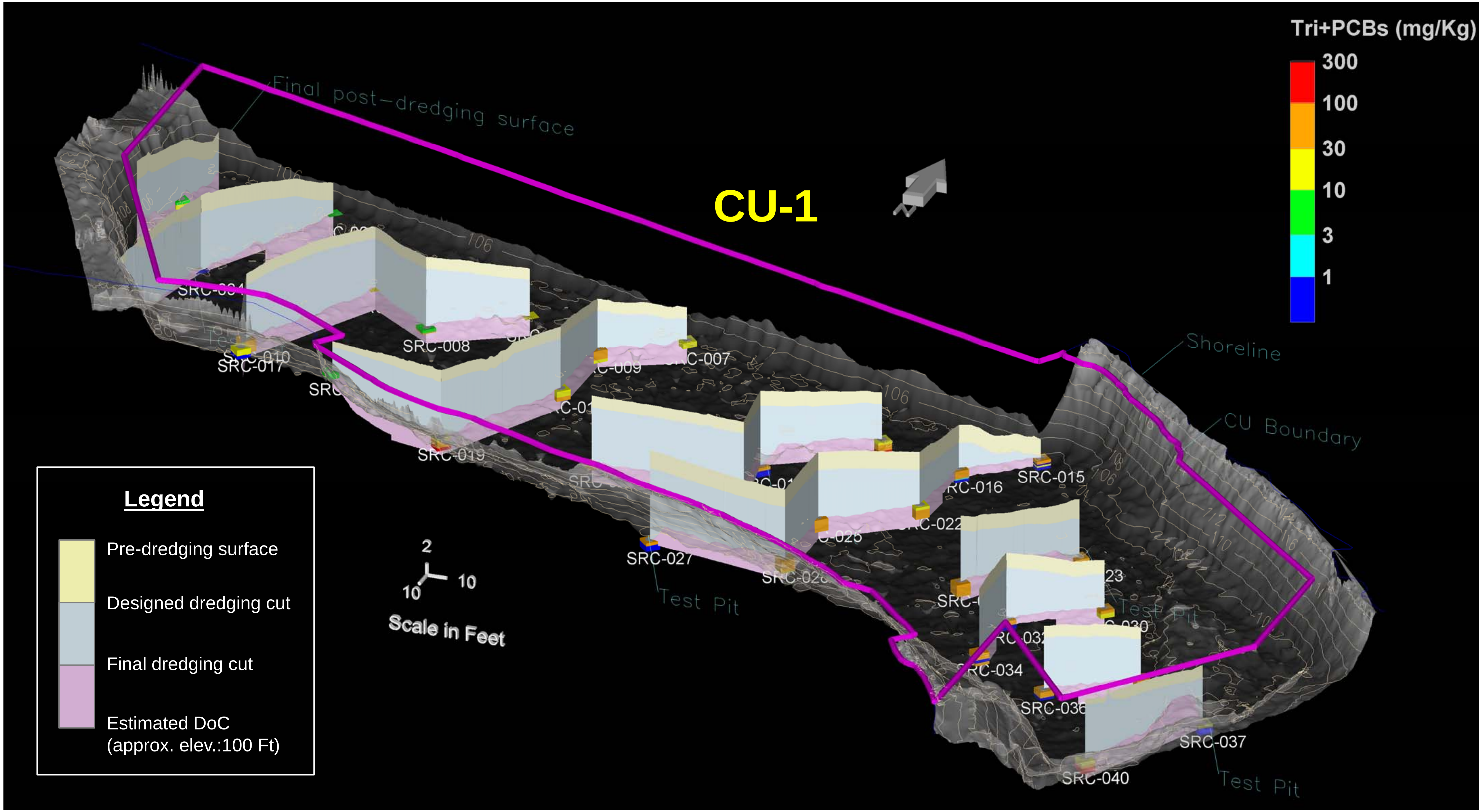
Notes:
(1) The vertical datum is NAVD88.
(2) The vertical exaggeration is 3.
(3) Final dredging cut , Oct. 27, 2009
(4) Pre-dredging bathymetry, 2005.
(5) The sizes of sample segments are mostly 6 inches.
(6) Only SSAP cores, first pass cores and final pass cores are displayed.
(7) Depth of Contamination is approximate and is not accurately depicted in the near shore slope area.

Three-Dimensional Representation of Total PCB Concentrations in Sediment Cores in CU-1

Phase 1 Evaluation Report – Hudson River PCBs Site

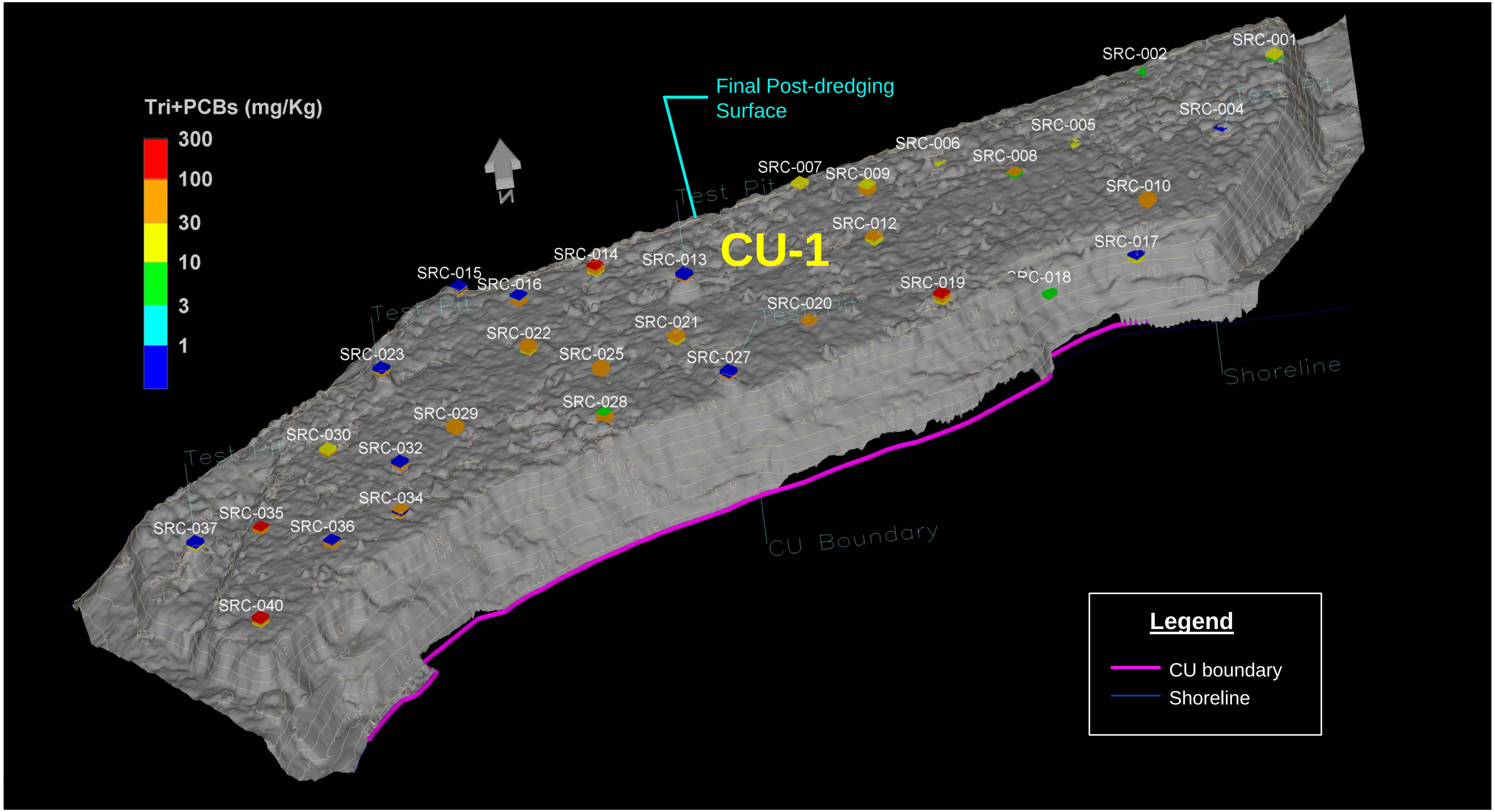
Figure II-C-11

March 2010



Notes: (1) The vertical datum is NAVD88. (2) Vertical exaggeration is 3. (3) Final dredging cut, Oct. 27, 2009. (4) Pre-dredging bathymetry, 2005.

	Three-Dimensional Representation of Tri+ PCB Concentrations in Sediment after CU-1 Completion (looking from above the model) Phase 1 Evaluation Report – Hudson River PCBs Site	Figure II-C-12a March 2010



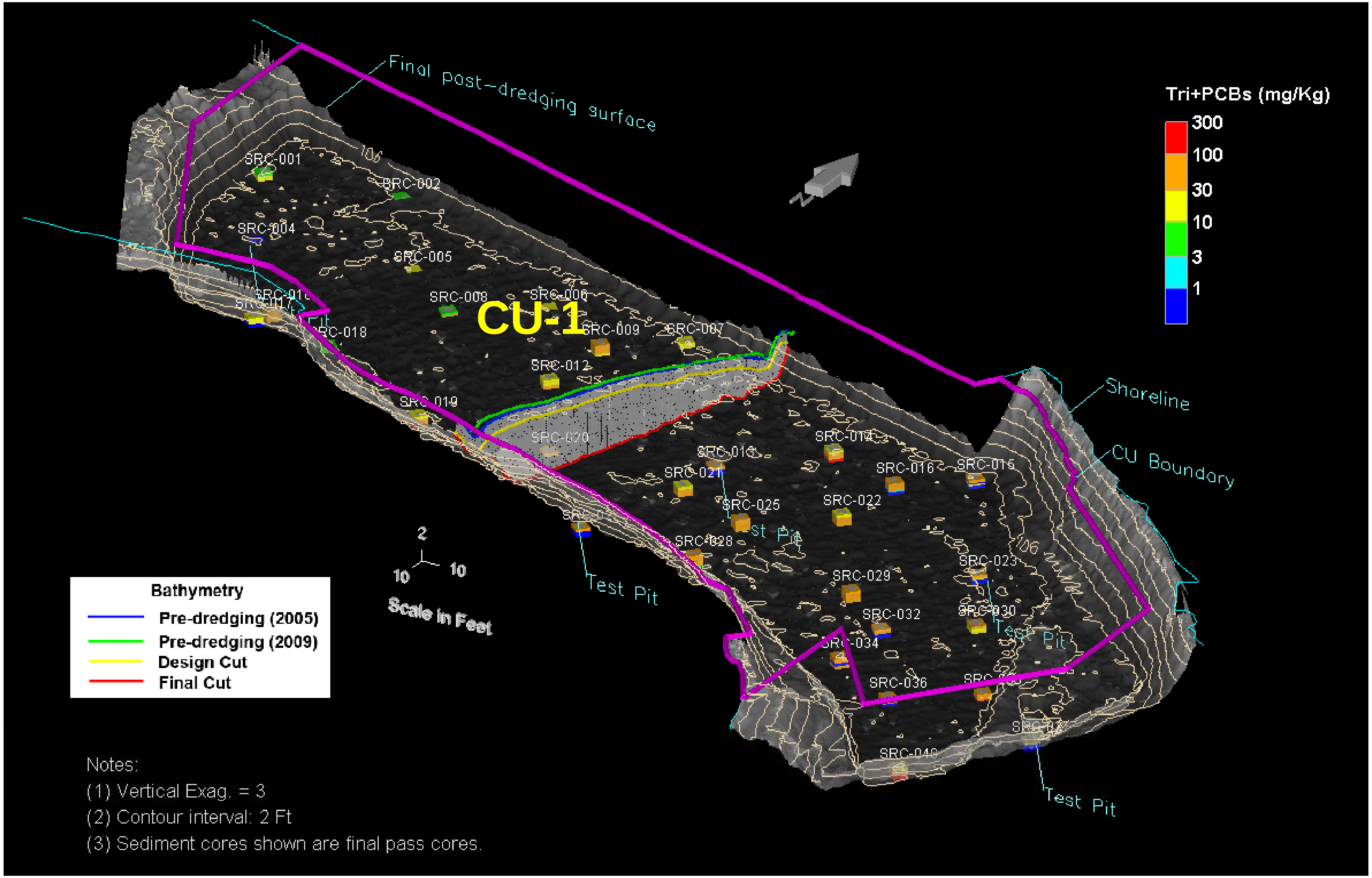
Notes: (1) The vertical datum is NAVD88. (2) Vertical exaggeration is 3. (3) Final dredging cut, Oct. 27, 2009.

Three-Dimensional Representation of Tri+ PCB Concentrations in Sediment after CU-1 Completion
(looking from beneath the model)

Phase 1 Evaluation Report – Hudson River PCBs Site

Figure II-C-12b

March 2010

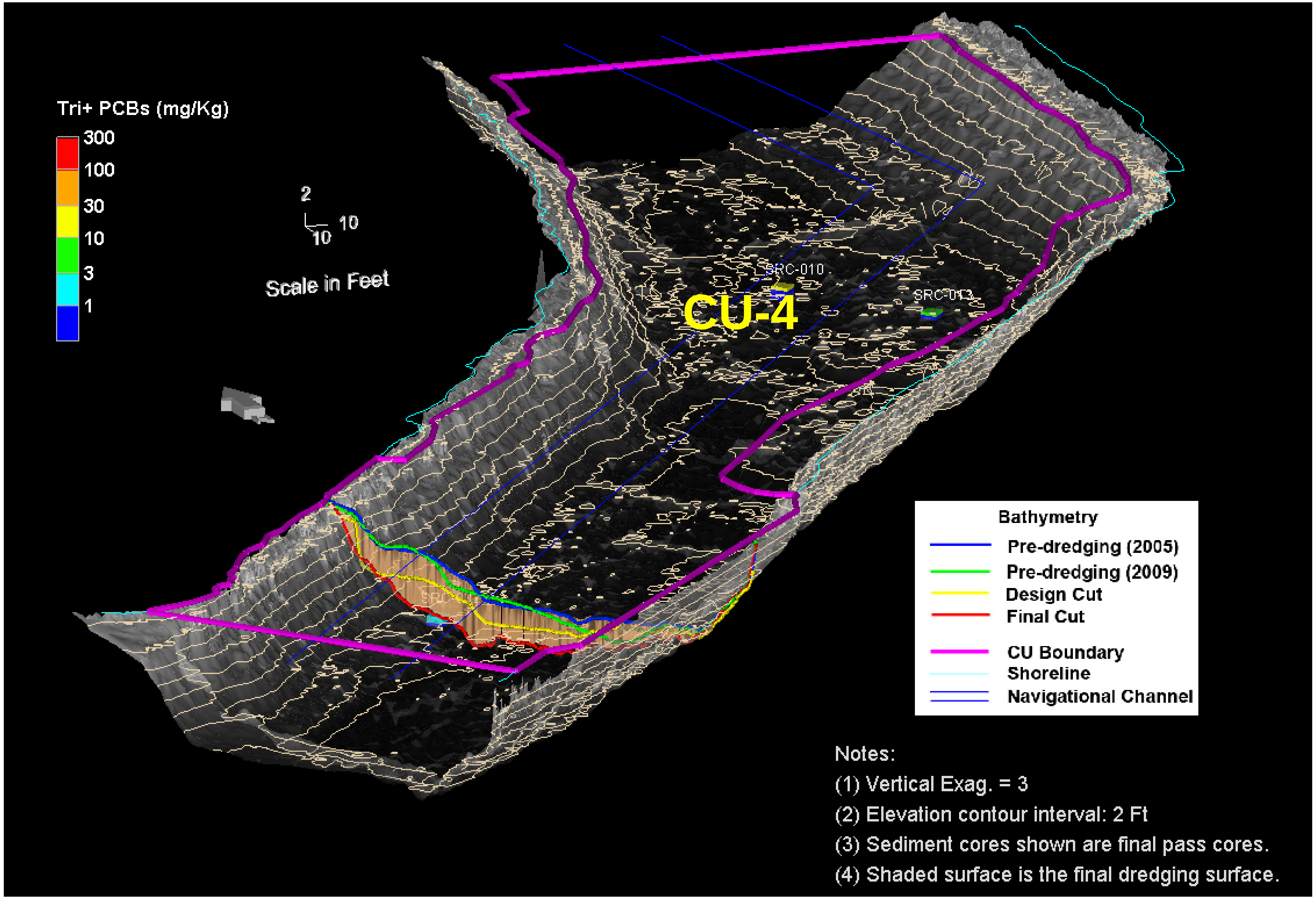


An Example of Three-Dimensional View of CU-1 Cross Section

Phase 1 Evaluation Report – Hudson River PCBs Site

Figure II-C-13

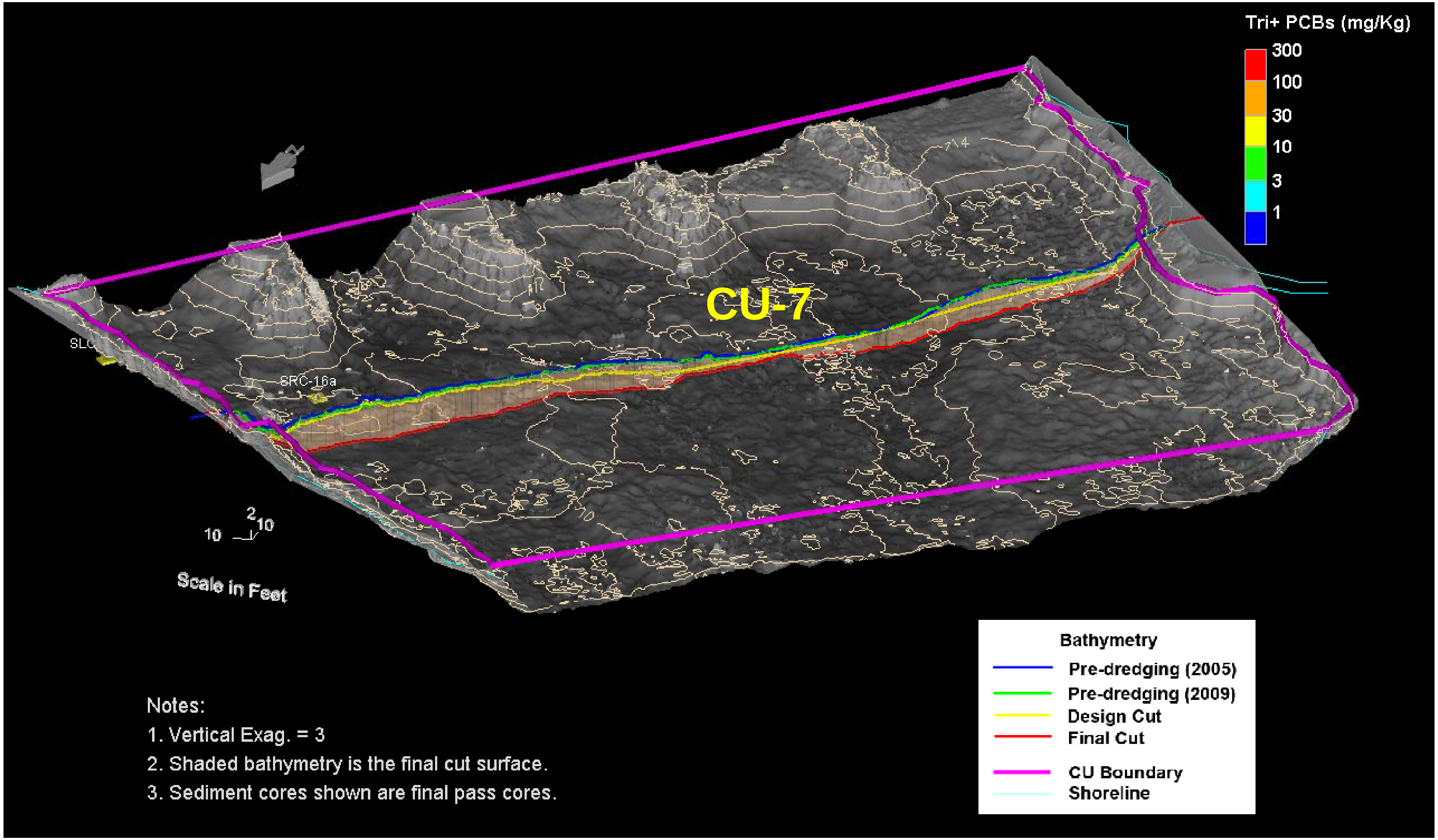
March 2010



An Example of Three-Dimensional View of CU-4 Cross Section

Figure II-C-14

March 2010

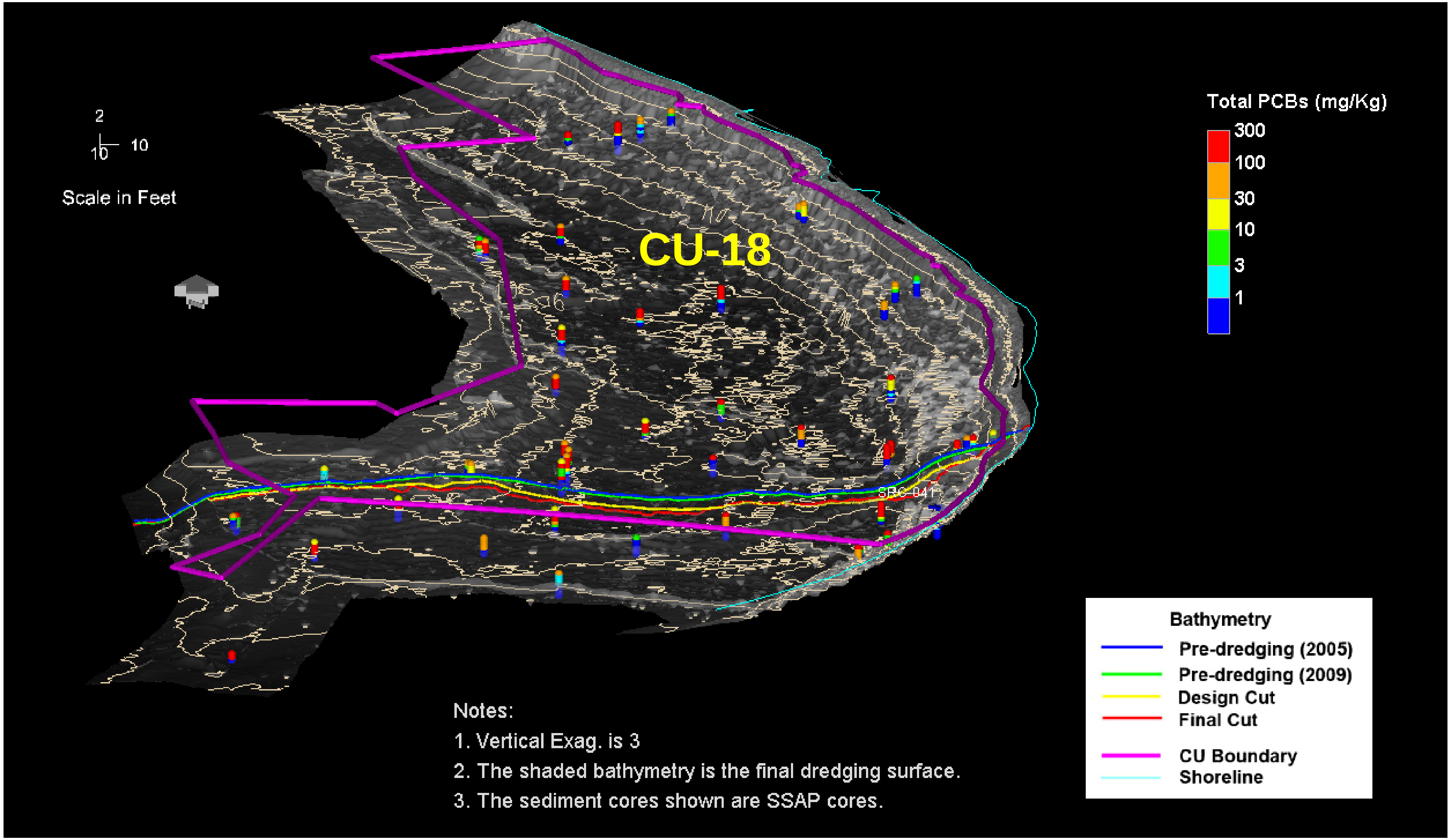


An Example of Three-Dimensional View of CU-7 Cross Section

Phase 1 Evaluation Report – Hudson River PCBs Site

Figure II-C-15

March 2010



	An Example of Three-Dimensional View of CU-18 Cross Section Phase 1 Evaluation Report – Hudson River PCBs Site	Figure II-C-16 March 2010

Appendix II-D

Form 1 Packages

[Provided in the CD]

Appendix II-E

Form 2 Packages

[Provided in the CD]

Appendix II-F

Tables 2.6-5 through 2.6-14 from Supplement to Phase 1 Data Compilation Report, January 2010

Table 2.6-5
Approximate CU Acceptance Timeline for CU 01

Action	CU 1				Comments
	CU1-1	CU1-2	CU1-3	CU1-4	
Inventory Dredging					
Contractor Begins Inventory Removal	4-Jun	16-Jun	15-Jun	18-Jun	
Contractor Ends Inventory Bulk removal	19-Jun	28-Jun			
Contractor Ends Inventory clean-up	28-Jun	14-Jul			
1st OSI Verification survey	29-Jun	15-Jul			
2nd OSI Verification survey	NOT REQUIRED				
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	28-Jun	16-Jul			
EPA Concurrence to collect cores	16-Jul				
Collect / Process Cores	1-Jul	16-Jul	16-Jul	17-Jul	
Number of Regular cores	10	9	9	12	
Number of Shoreline Cores	0	2	0	1	
Cores to Lab	1-Jul	17-Jul	18-Jul	18-Jul	
Sample Results - dDMS	3-Jul	18-Jul			
Tri+ Required Action Map presented to EPA	19-Jul				
Notify Lab to run add'l segments - AQ	NOT REQUIRED				
Additional Sampling Results					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	19-Jul				
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	19-Jul				
Re-Dredge Pass 1					
Redredge Map (Residual)	20-Jul				
Residual Design Complete - Provided to Contractor	20-Jul				
Contractor Begins Residual Bulk Pass Removal	22-Jul				
Contractor Ends Residual Dredge Pass Bulk Removal	16-Aug				
Contractor Ends Residual Cleanup Bulk Pass Removal	4-Aug	18-Aug			
1st OSI Verification survey	5-Aug	18-Aug			*updated based on EPA draft review of data compilation report.*
2nd OSI Verification survey	N/R	NOT REQUIRED			
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	5-Aug	18-Aug			

Table 2.6-5
Approximate CU Acceptance Timeline for CU 01

Action	CU 1				Comments
	CU1-1	CU1-2	CU1-3	CU1-4	
EPA Concurrence sample additional cores	5-Aug	16-Aug			
Collect / Process Cores	NOT REQUIRED				
Number of Regular cores	10	9	9	12	
Number of Shoreline Cores	0	2	0	1	
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	8/14/2009 (e-mailed 8/13/09)				
Total PCBs at Depth AID1 Final Action Map Presented to EPA	15-Aug				
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	15-Aug				
Re-Dredge Pass 2					
Redredge Map (Residual)	17-Aug				
Residual Design Complete - Provided to Contractor	20-Aug				temporary prism provided to K4 on 8/16 while engineering considerations along shoreline / sheet pile areas completed.
Contractor Begins Residual Bulk Pass Removal	22-Aug				OSI did AID survey on 8/21
Contractor Ends Residual Dredge Pass Bulk Removal	9-Sep	16-Sep			2 week estimated duration. No dredging over water line.
Contractor Ends Residual Cleanup Bulk Pass Removal	10-Sep	19-Sep		18-Sep	
1st OSI Verification survey	11-Sep	20-Sep		19-Sep	
2nd OSI Verification survey	NOT REQUIRED				
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	11-Sep	22-Sep			
EPA Concurrence to collect cores	11-Sep				
Collect / Process Cores	12-Sep	22-Sep		18-Sep	
Number of Regular cores	10	9	9	12	
Number of Shoreline Cores	0	2	0	1	
Cores to Lab	12-Sep	22-Sep			
Sample Results - dDMS	13-Sep	23-Sep		20-Sep	
Tri+ Required Action Map presented to EPA	Not Prepared				
Notify Lab to run add'l segments - AQ	23-Sep				
Additional Sampling Results	25-Sep				
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	25-Sep				

Table 2.6-5
Approximate CU Acceptance Timeline for CU 01

Action	CU 1				Comments
	CU1-1	CU1-2	CU1-3	CU1-4	
Total PCBs at Depth AID1 Final Action Map Presented to EPA	25-Sep				
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	25-Sep				
Re-Dredge Pass 3					
Start CU1 - Access Dredging	26-Sep				
Complete CU1 - Access Dredging	28-Sep				
Redredge Map (Residual)	30-Sep				
Residual Design Complete - Provided to Contractor	29-Sep				
Contractor Begins Residual Bulk Pass Removal	30-Sep				
Contractor Ends Residual Dredge Pass Bulk Removal	14-Oct				
Contractor Ends Residual Cleanup Bulk Pass Removal	15-Oct				
1st OSI Verification survey	16-Oct				
2nd OSI Verification survey	NOT REQUIRED				
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	19-Oct				
EPA Concurrence to collect cores	15-Oct				
Collect / Process Cores	16-Oct				
Number of Regular cores	10	9	9	12	
Number of Shoreline Cores	0	2	0	1	
Cores to Lab	16-Oct				
Sample Results - dDMS	17-Oct				
Tri+ Required Action Map presented to EPA	17-Oct				
Notify Lab to run add'l segments - AQ	18-Oct				
Additional Sampling Results	21-Oct				
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	21-Oct				
Total PCBs at Depth AID1 Final Action Map Presented to EPA	26-Oct				
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	27-Oct				

Table 2.6-5
Approximate CU Acceptance Timeline for CU 01

Action	CU 1				Comments
	CU1-1	CU1-2	CU1-3	CU1-4	
Re-Dredge Pass 4					
Redredge Map (Residual)	22-Oct				
Residual Design Complete - Provided to Contractor	17-Oct				
Contractor Begins Residual Bulk Pass Removal	18-Oct				
Contractor Ends Residual Dredge Pass Bulk Removal	24-Oct	25-Oct	26-Oct	27-Oct	
Contractor Ends Residual Cleanup Bulk Pass Removal	24-Oct	25-Oct	26-Oct	27-Oct	
EPA requests 5 test pits	24-Oct				
EPA provide Test Pit locations to GE	25-Oct				
Dredge test pits.	26-Oct				GE and EPA representatives witnessed.
1st OSI Verification survey	25-Oct	27-Oct			
2nd OSI Verification survey	NOT REQUIRED				
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	1-Nov				
EPA Concurrence to collect cores	22-Oct				
Collect / Process Cores	26-Oct	27-Oct		28-Oct	
Number of Regular cores	10	7	9	8	
Number of Shoreline Cores	0	2	0	1	
Cores to Lab	26-Oct	28-Oct	28-Oct		
Sample Results - dDMS	27-Oct	29-Oct	30-Oct		
Tri+ Required Action Map presented to EPA	30-Oct				
Notify Lab to run add'l segments - AQ	30-Oct				
Additional Sampling Results	2-Nov				
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	2-Nov				
Total PCBs at Depth AID1 Final Action Map Presented to EPA	3-Nov				
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	3-Nov				
Backfill / Capping					
Partial Backfill Cap Design provided to Contractor (CU1-1)	26-Oct				
Complete Isolation Layer Cap Prism provided to Contractor.	29-Oct				
AQ / Arcadis revise 100 yr flood model	2-Nov				
GE provides new Cap drawing to EPA for review	3-Nov				

Table 2.6-5
Approximate CU Acceptance Timeline for CU 01

Action	CU 1				Comments
	CU1-1	CU1-2	CU1-3	CU1-4	
EPA concurrence of revised Cap Plan	4-Nov				
CU Form 1 - EPA Approval	4-Nov				
Backfill Cap Design complete and provided to Contractor	5-Nov				
Contractor begins Backfill / Capping	28-Oct				
Contractor ends bulk Cap placement - Isolation Layer A	1-Nov				
1st OSI Verification survey - Isolation Layer A	1-Nov				
CM Develop Isolation Layer drawings	2-Nov				
CM notified Contractor touch work of isloation layer required.	2-Nov				
Contractor performs touch up work # 1	3-Nov				Cashman 11/3 e-mail.
2nd OSI Verification survey - Isolation Layer A	4-Nov				
CM Develop Isolation Layer drawings (Rev 2)	4-Nov				
notify Contractor additional touch work is required	5-Nov				
CM meet with Contractor to review shoaling areas	7-Nov				C. Jacob & M. Galbraith
Contractor performs touch up work # 2	7-Nov				
3rd OSI Verification survey - Isolation Layer A	8-Nov				
CM Develop Isolation Layer drawings (Rev 3)	9-Nov				104.5 & 105.2 contours
GE / EPA discuss isolation layer placement in CU1	9-Nov				EPA's position is cap must be as close to tolerances as possible.
GE / Contractor discuss isolation layer placement	9-Nov				Monday 3:00 mtg.
Contractor completes begins placement / cleanup of Isolation layer	9-Nov				
OSI Recon survey - Isolation Layer A (CU1-1)	10-Nov				debris observed in bucket during backfill shoaling in CU1-1.
Contractor completes final placement / cleanup of Isolation layer CU1-1 & CU1-2	12-Nov				
Contractor completes final placement / cleanup of Isolation layer CU1-3 & CU1-4	13-Nov				
4th OSI Verification survey - Isolation Layer A CU1-1 & CU1-2	12-Nov				
develop Isolation layer Cap Acceptance drawings CU1-1 & CU1-2	12-Nov				
EPA concurrence of isolation layer CU1-1 and CU1-2	12-Nov				
CM issue armor stone layer to Contractor in CU1-1 and CU1-2	12-Nov				
4th OSI Verification survey - Isolation Layer A CU1-3 & CU1-4	13-Nov				

Table 2.6-5
Approximate CU Acceptance Timeline for CU 01

Action	CU 1				Comments
	CU1-1	CU1-2	CU1-3	CU1-4	
develop Isolation layer Cap Acceptance drawings CU1-3 & CU1-4	13-Nov				
EPA concurrence of isolation layer CU1-3 and CU1-4	13-Nov				
CM issue armor stone layer to Contractor in CU1-3 and CU1-4	13-Nov				
Contractor ends bulk placement 1 - Armor Stone CU1-1 and CU1-2	15-Nov				
Contractor ends fine placement placement 1 - Armor Stone CU1-1 & CU1-2	16-Nov				
1st OSI Verification armor stone survey 1 - Armor Stone [CU1-1 & CU1-2]	17-Nov				
CM notifies Contractor additional work required.	17-Nov				
Contractor ends bulk placement 2 - Armor Stone	18-Nov				
Contractor ends fine placement placement 2 - Armor Stone	19-Nov				
1st OSI Verification armor stone survey 2 - Armor Stone	19-Nov				
Prepare Record Drawings	22-Nov				
Draft Backfill / Cap Acceptance Package provided to EPA for review	23-Nov				
Address EPA comments to Draft Package	24-Nov				
CU Form 2 - EPA Approval [ACTUAL]					

Table 2.6-6
Approximate CU Acceptance Timeline for CU 02

Action	CU2					Comments
	CU2-1	CU2-2	CU2-3	CU2-4	CU2-5	
Inventory Dredging						
Contractor Begins Inventory Removal	8-Jun					
Contractor Ends Inventory Bulk removal	15-Jul					
Contractor Ends Inventory clean-up	20-Jul					
1st OSI Verification survey	21-Jul					
2nd OSI Verification survey	21-Jul					Cashman patched information.
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	22-Jul					
EPA Concurrence to collect cores	23-Jul					
Collect / Process Cores	7/25 - 7/29					
Number of Regular cores	7	9	6	9	9	
Number of Shoreline Cores	1	2	1	0	1	
Cores to Lab	29-Jul					
Sample Results - dDMS	30-Jul					
Tri+ Required Action Map presented to EPA	30-Jul					
Notify Lab to run add'l segments - AQ	1-Aug					
Additional Sampling Results	3-Aug					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	6-Aug					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	7-Aug					
Revised Total PCBs at Depth AID1 Final Action Map Presented to EPA	*10-Aug*					*revision based on daily data mtg.*
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	10-Aug					
Re-Dredge Pass 1						
Redredge Map (Residual)	12-Aug					
Inventory Dredge Pass #2 Design Complete - Provided to Contractor	13-Aug					
Contractor Begins Inventory Pass #2 Removal	14-Aug					
EPA provides written direction regarding rock delineated areas	*19-Aug*					*via e-mail.*
Revised Re-dredge Thickness By Area Map showing 20' offset.	*18-Aug*					*prepared in advanced of written notification.*

Table 2.6-6
Approximate CU Acceptance Timeline for CU 02

Action	CU2					Comments
	CU2-1	CU2-2	CU2-3	CU2-4	CU2-5	
Revised dredge prism to K4			*19-Aug*			*surface with 20' offsets of rock delineated areas.*
Contractor Ends Inventory Dredge Pass #2 Bulk Removal			24-Aug			based on communications with CM and K4.
Contractor Ends Cleanup Inventory Bulk Pass #2 Removal			1-Sep			Bond Creek / shoaling / EPA test locations. 9 days of cleanup dredging.
1st OSI Verification survey			30-Aug			Sunday Survey
2nd OSI Verification survey			2-Sep			
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA			2-Sep			Map develped in evening and e-mailed to EPA in order to core the next morning.
EPA Concurrence to collect cores			3-Sep			concurrence at 7:30 mtg
Collect / Process Cores			3-Sep			
Number of Regular cores	7	9	6	9	9	
Number of Shoreline Cores	1	2	1	0	1	
Cores to Lab			5-Sep			
Sample Results - dDMS			6-Sep			
Tri+ Required Action Map presented to EPA			8-Sep			stats/ map generated on labor day (9/7).
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA			8-Sep			1 day delay . lab did not work labor day weekend.
Total PCBs at Depth AID1 Final Action Map Presented to EPA			14-Sep			near shore core discussion. GE made manual adjustsments
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map			14-Sep			

Table 2.6-6
Approximate CU Acceptance Timeline for CU 02

Action	CU2					Comments
	CU2-1	CU2-2	CU2-3	CU2-4	CU2-5	
Re-Dredge Pass 2						
Redredge Map (Residual)	14-Sep					
Residual Design Complete - Provided to Contractor	15-Sep					
Contractor Begins Residual Bulk Pass Removal	15-Sep					385-6 and the 345-7.
Contractor Ends Residual Dredge Pass Bulk Removal	22-Sep					
Contractor Ends Residual Cleanup Bulk Pass Removal	23-Sep					
1st OSI Verification survey	24-Sep					
2nd OSI Verification survey	Not Required					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	25-Sep					
EPA Concurrence to collect cores	25-Sep					
Collect / Process Cores	25-Sep					
Number of Regular cores	1	6	3	7	7	
Number of Shoreline Cores	0	0	0	0	1	
Cores to Lab	26-Sep					
Sample Results - dDMS	28-Sep					
Tri+ Required Action Map presented to EPA	28-Sep					
Notify Lab to run add'l segments - AQ	28-Sep					
Additional Sampling Results	30-Sep					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	30-Sep					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	3-Oct					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	3-Oct					
Re-Dredge Pass 3						
Redredge Map (Residual)	5-Oct					
Residual Design Complete - Provided to Contractor	4-Oct					
Contractor Begins Residual Bulk Pass Removal	5-Oct					
Contractor Ends Residual Dredge Pass Bulk Removal	7-Oct					
Contractor Ends Residual Cleanup Bulk Pass Removal	8-Oct					
1st OSI Verification survey	8-Oct					
2nd OSI Verification survey	Not Required					

Table 2.6-6
Approximate CU Acceptance Timeline for CU 02

Action	CU2					Comments
	CU2-1	CU2-2	CU2-3	CU2-4	CU2-5	
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA			12-Oct			
EPA Concurrence to collect cores			7-Oct			
Collect / Process Cores			8-Oct			
Number of Regular cores	0	0	0	3	2	
Number of Shoreline Cores	0	0	0	0	0	
Cores to Lab			8-Oct			
Sample Results - dDMS			9-Oct			
Tri+ Required Action Map presented to EPA			9-Oct			
Final Action Map presented to EPA			9-Oct			
EPA Concurrence on Final Action Map			10-Oct			
Backfill / Capping						
Partial Backfill Cap prism provided to Contractor			10-Oct			
CU Form 1 - EPA Approval			11-Oct			
Backfill Cap Design Provided to Contractor			12-Oct			
Contractor begins Backfill / Capping			12-Oct			
Contractor ends bulk Isolation Layer Cap Type B placement			20-Oct			
Contractor ends fine placement Isolation Layer Cap Type B			21-Oct			
1st OSI Verification survey - Cap Isolation Layer			21-Oct			CU2-1, CU2-2 had high spots in nav channel. CU2-3, CU2-4 & CU2-5 acceptable.
review Cap Acceptance Map with EPA and NYSCC			22-Oct			notified K4 of touch work via e-mail.
Contractor ends fine placement Isolation Layer Cap Type B			26-Oct			
2nd OSI Verification survey - Cap Isolation Layer			27-Oct			
review 2nd Isolation Layer Cap Acceptance Map with EPA and NYSCC			28-Oct			
EPA / NYSCC isolation layer concurrence			28-Oct			
Contractor ends bulk Armor Stone Cap Type B placement - CU2 South			3-Nov			
1st OSI Verification survey - Cap Armor Stone Layer (CU2 South)			4-Nov			
CM notified Contractor of additional placement - CU2 South			4-Nov			
Contractor Placed Additional Armor Stone (CU2 South)			5-Nov			

Table 2.6-6
Approximate CU Acceptance Timeline for CU 02

Action	CU2					Comments
	CU2-1	CU2-2	CU2-3	CU2-4	CU2-5	
Contractor ends bulk Armor Stone Cap Type B placement - CU2 North	5-Nov					
1st OSI Verification survey - Cap Armor Stone Layer (CU2 North)	6-Nov					
Cap Acceptance Map (Armor Stone Layer) provided to EPA	6-Nov					
EPA Concurrence of Cap Armor Stone Layer - CU2 South	6-Nov					
2nd OSI Verification survey - Cap Armor Stone Layer (CU2 South)	6-Nov					
Revised CU2 South Armor Stone Cap Acceptance Map	9-Nov					
EPA Concurrence of CU2 South Armor Stone Cap Acceptance Map	9-Nov					
GE / EPA discuss armor stone placement in Nav Channel - CU2 North	9-Nov					given Nav Channel restrictions, EPA approves Type "N" stone for fine placement
GE / Contractor discuss armor stone placement in Nav Channel - CU2 North	9-Nov					Monday 3:00 mtg.
Contractor Places additional armor stone in Nav Channel - CU2 North	10-Nov					
2nd OSI Verification survey - Cap Armor Stone Layer (CU2 North)	11-Nov					
Revised CU2 North Armor Stone Cap Acceptance Map	12-Nov					
Survey Bond Creek	5-Nov					
Bond Creek Summary Spreadsheet	8-Nov					
Develop Bond Creek Acceptance Drawing	11-Nov					
Cap Acceptance Map (Armor Stone Layer) provided to EPA	12-Nov					
EPA Concurrence of Cap Armor Stone Layer all of CU2	12-Nov					
EPA Concurrence of Bond Creek RFW	13-Nov					
Contractor ends bulk backfill placement	13-Nov					
Contractor ends fine backfill placement	13-Nov					
1st OSI Verification survey	14-Nov					
2nd OSI Verification survey	Not Required					
Develop Backfill Acceptance Drawing	16-Nov					
EPA Acceptance of Backfill Acceptance Drawing	17-Nov					
Prepare Record Drawings	18-Nov					

Table 2.6-6
Approximate CU Acceptance Timeline for CU 02

Action	CU2					Comments
	CU2-1	CU2-2	CU2-3	CU2-4	CU2-5	
Draft Backfill / Cap Acceptance Package provided to EPA for review			18-Nov			
Address EPA comments to Draft Package			19-Nov			
CU Form 2 - EPA Approval [ACTUAL]						

Table 2.6-7
Approximate CU Acceptance Timeline for CU 03

Action	CU3					Comments
	CU3-1	CU3-2	CU3-3	CU3-4	CU3-5	
Inventory Dredging						
Contractor Begins Inventory Removal			13-Jul			
Contractor Ends Inventory Bulk removal			7-Aug			
Contractor Ends Inventory clean-up			8-Aug			
1st OSI Verification survey			9-Aug			
2nd OSI Verification survey			Not Required			
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA			10-Aug			
EPA Concurrence to collect cores			10-Aug			
Collect / Process Cores			8/12 - 8/17/09			GPS issues with near shore samples.
Number of Regular cores	7	7	11	6	9	
Number of Shoreline Cores	2	3	2	1	0	
Cores to Lab			8/14 & 8/17/2009			
Sample Results - dDMS [Tri+ surface]			20-Aug			lab at capacity with CU7 cores. Lab had QA/QC issues with CU7, delaying CU3 results by 2 days.
Sample Results - dDMS [Total PCBs at depth]			22-Aug			
Notify Lab to run add'l segments - AQ			20-Aug			
Additional Sampling Results			22-Aug			lab at capacity with all CU7 cores.
Progress Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA			22-Aug			
Notify Lab to run 24" - 48" core [5 cores / 12 segments]			22-Aug			
Additional Sampling Results			24-Aug			additional time for cores to thaw
Total PCBs at Depth AID1 Final Action Map Presented to EPA			24-Aug			
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map			24-Aug			

Table 2.6-7
Approximate CU Acceptance Timeline for CU 03

Action	CU3					Comments
	CU3-1	CU3-2	CU3-3	CU3-4	CU3-5	
Re-Dredge Pass 1						
Redredge Map (Residual)	25-Aug					
Temporary Prism - main channel	25-Aug					new dredge prism does not include engineering considerations along shoreline. To be issued at a later date.
Contractor Begins Inventory Pass #2 Removal	25-Aug					
Inventory Dredge Pass #2 Design Complete - Provided to Contractor	1-Sep					Includes provisions for shoreline stabilization.
Contractor Ends Inventory Dredge Pass #2 Bulk Removal	16-Sep					
Contractor Ends Cleanup Inventory Bulk Pass #2 Removal	17-Sep					*updated based on EPA draft review of data compilation report.*
1st OSI Verification survey	18-Sep					
2nd OSI Verification survey	Not Required					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	21-Sep					
EPA Concurrence to collect cores	18-Sep					
Collect / Process Cores	20-Sep					*updated based on EPA draft review of data compilation report.*
Number of Regular cores	7	7	11	6	9	
Number of Shoreline Cores	2	3	2	1	0	
Cores to Lab	22-Sep					
Sample Results - dDMS	23-Sep					
Tri+ Required Action Map presented to EPA	23-Sep					lab results posted in the evening.
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	24-Sep					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	25-Sep					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	25-Sep					

Table 2.6-7
Approximate CU Acceptance Timeline for CU 03

Action	CU3					Comments
	CU3-1	CU3-2	CU3-3	CU3-4	CU3-5	
Re-Dredge Pass 2						
Redredge Map (Residual)	27-Sep					
Residual Design Complete - Provided to Contractor	25-Sep					
Contractor Begins Residual Bulk Pass Removal	28-Sep					
Contractor Ends Residual Dredge Pass Bulk Removal	7-Oct					
Contractor Ends Residual Cleanup Bulk Pass Removal	8-Oct					
1st OSI Verification survey	8-Oct					
2nd OSI Verification survey	Not Required					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	10-Oct					
EPA Concurrence to collect cores	7-Oct					
Collect / Process Cores	8-Oct					
Number of Regular cores						
Number of Shoreline Cores						
Cores to Lab	9-Oct					
Sample Results - dDMS	10-Oct					
Tri+ Required Action Map presented to EPA	10-Oct					
Notify Lab to run add'l segments - AQ	Not Required					
Additional Sampling Results	Not Required					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	Not Required					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	Not Required					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	Not Required					
Backfill / Capping						
Partial Backfill Cap Plan provided to Contractor	14-Oct					
CU Form 1 - EPA Approval	13-Oct					
Backfill Cap design surfaces complete - provided to K4	15-Oct					
Contractor begins Backfill / Capping	15-Oct					
Contractor ends bulk Cap Type A placement	24-Oct					
Contractor Ends fine placement Cap Type A	27-Oct					
1st OSI Verification Cap survey	28-Oct					

Table 2.6-7
Approximate CU Acceptance Timeline for CU 03

Action	CU3					Comments
	CU3-1	CU3-2	CU3-3	CU3-4	CU3-5	
Draft Cap Acceptance Map presented to EPA	28-Oct					
EPA concurrence of Cap Acceptance Map	28-Oct					Additional Type 2 material to be placed for Low Velocity Cap in northern portion.
Contractor ends bulk Backfill placement	6-Nov					
Contractor ends fine Backfill placement	7-Nov					
1st OSI Verification Backfill survey	8-Nov					
Develop Nav Channel Elevation Drawing	9-Nov					
Develop Backfill Acceptance Drawing	10-Nov					
CM issue prism for portion of Nav Channel	10-Nov					
Contractor begins / completes backfill of Nav Channel	11-Nov					
2nd OSI Verification Backfill survey	12-Nov					
Develop Revised Backfill Acceptance and Nav Channel Elevation Drawings	13-Nov					
EPA Concurrence of Backfill Acceptance Drawing	13-Nov					
Prepare Record Drawings	13-Nov					
EPA Review of Form 2 package	16-Nov					
CU Form 2 - EPA Approval [ACTUAL]						

Table 2.6-8
Approximate CU Acceptance Timeline for CU 04

Action	CU 4					Comments
	CU4-1	CU4-2	CU4-3	CU4-4	CU4-5	
Inventory Dredging						
Contractor Begins Inventory Removal	16-Jul					
Dredging halted due to Exceedances						CU4 dredging activites shut down due to exceedances.
Contractor Resumes Inventory Removal	18-Aug					
Contractor Ends Inventory Bulk removal	27-Sep					CU18 to be dredged first. Water and air quality exceedances, as well as fog and waiting on scow have resulted in delays.
Contractor Ends Inventory clean-up	Not Required					
1st OSI Verification survey	27-Sep					
2nd OSI Verification survey	Not Required					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	28-Sep					
EPA Concurrence to collect cores	27-Sep					
Collect / Process Cores	28-Sep					
Number of Regular cores	11	7	9	6	7	
Number of Shoreline Cores	0	0	0	1	1	
Cores to Lab	28-Sep					
Sample Results - dDMS	30-Sep					
Tri+ Required Action Map presented to EPA	Not Required					
Notify Lab to run add'l segments - AQ	28-Sep					
Additional Sampling Results	Not Required					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	30-Sep					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	3-Oct					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	3-Oct					

Table 2.6-8
Approximate CU Acceptance Timeline for CU 04

Action	CU 4					Comments
	CU4-1	CU4-2	CU4-3	CU4-4	CU4-5	
Re-Dredge Pass 1						
Redredge Map (Residual)	5-Oct					
Inventory Dredge Pass #2 Design Complete - Provided to Contractor	6-Oct					
Contractor Begins Inventory Pass #2 Removal	8-Oct					
Contractor Ends Inventory Dredge Pass #2 Bulk Removal	17-Oct					
Contractor Ends Cleanup Inventory Bulk Pass #2 Removal	20-Oct					
1st OSI Verification survey	21-Oct					*updated based on EPA draft review of data compilation report.*
2nd OSI Verification survey	Not Required					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	24-Oct					*updated based on EPA draft review of data compilation report.*
EPA Concurrence to collect cores	21-Oct					
Collect / Process Cores	19-Oct	20-Oct	22-Oct			
Number of Regular cores	11	7	9	6	7	
Number of Shoreline Cores	0	0	0	1	1	
Cores to Lab	19-Oct	20-Oct	22-Oct			
Sample Results - dDMS	21-Oct		23-Oct			
Tri+ Required Action Map presented to EPA	23-Oct					
Notify Lab to run add'l segments - AQ	23-Oct					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	25-Oct					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	26-Oct					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	26-Oct					
Re-Dredge Pass 2						
Redredge Map (Residual)	25-Oct					
Residual Design Complete - Provided to Contractor	24-Oct					
Contractor Begins Residual Bulk Pass Removal	24-Oct					
Contractor Ends Residual Dredge Pass Bulk Removal	26-Oct					did not complete residual pass due to schedule restraints.
Contractor Ends Residual Cleanup Bulk Pass Removal	Not completed					
1st OSI Verification survey	27-Oct					

Table 2.6-8
Approximate CU Acceptance Timeline for CU 04

Action	CU 4					Comments
	CU4-1	**CU4-2**	**CU4-3**	**CU4-4**	**CU4-5**	
2nd OSI Verification survey	Not Required					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	29-Oct					
EPA Concurrence to collect cores	26-Oct					
Collect / Process Cores	28-Oct					CU1 cores collected first.
Number of Regular cores	2	3	2	0	0	
Number of Shoreline Cores	0	0	0	0	0	
Cores to Lab	28-Oct					
Sample Results - dDMS	29-Oct					
Tri+ Required Action Map presented to EPA	29-Oct					
Notify Lab to run add'l segments - AQ	Not Required					
Additional Sampling Results	Not Required					
Total PCBs at Depth ArD1 Required Action Map / Core Data Sum Table Presented to EPA	Not Required					
Total PCBs at Depth ARD1 Final Action Map Presented to EPA	29-Oct					
EPA comments to Final Action Map	30-Oct					
GE Address EPA comments; Revised Final Action Map	30-Oct					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	30-Oct					
Backfill / Capping						
Draft Backfill Cap Plan presented to EPA	31-Oct					
Partial Backfill Plan and Surfaces provided to K4	31-Oct					discussion of 15% volumes.
Complete Backfill and Cap prisms provided to K4	5-Nov					
Draft Form 1 package provided to EPA	3-Nov					
EPA Comments	3-Nov					
Address EPA Comments	3-Nov					
CU Form 1 - EPA Approval	4-Nov					
Contractor begins Backfill / Capping	4-Nov					Contractor opted not to start immediately.

Table 2.6-8
Approximate CU Acceptance Timeline for CU 04

Action	CU 4					Comments
	CU4-1	CU4-2	CU4-3	CU4-4	CU4-5	
Contractor completes majority of Type "A" medium to high velocity Cap			16-Nov			
OSI Cap Type "A" verification survey			17-Nov			
Contractor completes Cap Type "B" low velocity caps			16-Nov			
OSI Cap Type "A" verification survey - Low Velocity Cap			17-Nov			
Develop Draft maps for majority of Cap Type "A" med/high velocity cap, Cap Type "B" med & High velocity Isolation & Cap type B low velocity Cap			17-Nov			
EPA concurrence of majority of Cap Type "A" med/high velocity cap, Cap Type "B" med & High velocity Isolation & Cap type B low velocity Cap			17-Nov			
Contractor ends Type "A" Layer Cap placement			17-Nov			
1st OSI Verification Type "A" Cap survey			18-Nov			
Contractor ends Fine Type "A" Cap placement			Not Required			
Contractor Ends Armor Stone Cap Placement in Type B caps medium and High Velocity			19-Nov			
1st OSI Verification Armor Stone Tyep "B" Cap survey			20-Nov			
Near Shore backfill survey			20-Nov			
Contractor ends bulk Backfill placement			18-Nov			
Contractor ends Fine Backfill placement			19-Nov			
1st OSI Verification Backfill survey			19-Nov			
2nd OSI Verification Backfill survey			Not Required			
Develop Draft Backfill Acceptance Drawing			20-Nov			
EPA Concurrence of Draft Backfill Acceptance Drawing			20-Nov			
Cap Acceptance Drawing			21-Nov			
EPA Concurrence of Cap Acceptance Drawing			21-Nov			
EPA Concurrence of Backfill Acceptance Drawing			23-Nov			
Prepare Record Drawings			23-Nov			
EPA Review of Form 2 package			23-Nov			
Address EPA comments to Draft Package			24-Nov			
CU Form 2 - EPA Approval [ACTUAL]						

Table 2.6-9
Approximate CU Acceptance Timeline for CU 05

Action	CU 5					Comments
	CU5-1	CU5-2	CU5-3	CU5-4	CU5-5	
Inventory Dredging						
Contractor Begins Inventory Removal	9-Jun					
Contractor Ends Inventory Bulk removal	10-Jul					estimated date.
Contractor Ends Inventory clean-up	14-Jul					
1st OSI Verification survey						
2nd OSI Verification survey	15-Jul					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	16-Jul					
GIS Map with Probe Locations	*17-Jul*					
CU5 Probing (EPA Team participated)	*18-Jul*					
GIS Map summarizing Probe Results	*19-Jul*					
GIS Map showing sediment (>1 ft) in bedrock areas.	*21-Jul*					
EPA Concurrence to collect cores	*21-Jul*					
Collect / Process Cores	7/22 - 7/24					
Number of Regular cores	7	8	8	8	9	
Number of Shoreline Cores	0					
Cores to Lab	7/23 - 7/24					
Sample Results - dDMS	7/25 - 7/26					
Tri+ Required Action Map presented to EPA	26-Jul					
Notify Lab to run add'l segments - AQ	26-Jul					
Additional Sampling Results	27-Jul					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	31-Jul					
EPA requests GE to run analyses on all cores.	31-Jul					
Total PBCs at Depth presented to EPA	4-Aug					
Revised Total PBCs at Depth presented to EPA	*5-Aug*					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	5-Aug					

Table 2.6-9
Approximate CU Acceptance Timeline for CU 05

Action	CU 5					Comments
	CU5-1	CU5-2	CU5-3	CU5-4	CU5-5	
Re-Dredge Pass 1						
Redredge Map (Residual)	5-Aug					
Inventory Dredge Pass #2 Design Complete - Provided to Contractor	5-Aug					
Contractor Begins Inventory Pass #2 Removal	5-Aug					
Dredge EPA test locations.	*13-Aug*					
EPA provides written direction regarding rock delineated areas	*15-Aug*					*via e-mail.*
Revised Re-dredge Thickness By Area Map showing 20' offset.	*18-Aug*					
Revised dredge prism to K4	*19-Aug*					*reflects 20' rock offsets.*
Revised Re-dredge Thickness By Area Map	20-Aug					dredge additional 15" area, based on lab QA/QC correction.
EPA concurrence on revised prism	20-Aug					
Revised dredge prism to K4	21-Aug					
Contractor Ends Inventory Dredge Pass #2 Bulk Removal	25-Aug					forecast 20 day dredge period (assumes more ineffective time due to summer flows)
Contractor Ends Cleanup Inventory Bulk Pass #2 Removal	27-Aug					
1st OSI Verification survey	28-Aug					
2nd OSI Verification survey	NOT REQUIRED					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	28-Aug					
EPA Concurrence to collect cores	28-Aug					
Collect / Process Cores	29-Aug					
Number of Regular cores	7	8	8	8	9	
Number of Shoreline Cores	0					
Cores to Lab	29-Aug					
Sample Results - dDMS	30-Aug					
Tri+ Required Action Map presented to EPA	30-Aug					
Notify Lab to run add'l segments	31-Aug					7 core segments on eastern portion of CU

Table 2.6-9
Approximate CU Acceptance Timeline for CU 05

Action	CU 5					Comments
	CU5-1	CU5-2	CU5-3	CU5-4	CU5-5	
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA			1-Sep			
Total PCBs at Depth AID1 Final Action Map Presented to EPA			2-Sep			
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map			2-Sep			
Re-Dredge Pass 2						
Redredge Map (Residual)			2-Sep			
Temporary Prism issued to Contractor			3-Sep			18" section NE portion of CU
Contractor Begins Residual Bulk Pass Removal			3-Sep			began late evening
Residual Design Complete - Provided to Contractor			8-Sep			GE decided to dredge additional nodes.
Contractor Ends Residual Dredge Pass Bulk Removal			11-Sep			includes 3 day holiday weekend
Contractor Ends Residual Cleanup Bulk Pass Removal			12-Sep			
1st OSI Verification survey			13-Sep			
2nd OSI Verification survey			16-Sep			K4 completed shoaling between survey and coring.
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA			14-Sep			
EPA Concurrence to collect cores			14-Sep			
Collect / Process Cores			14-Sep			
Number of Regular cores	0	0	5	3	1	
Number of Shoreline Cores			0			
Cores to Lab			15-Sep			
Sample Results - dDMS			16-Sep			
Tri+ Required Action Map presented to EPA			16-Sep			
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA			NOT REQUIRED			
Total PCBs at Depth AID1 Final Action Map Presented to EPA			NOT REQUIRED			

Table 2.6-9
Approximate CU Acceptance Timeline for CU 05

Action	CU 5					Comments
	CU5-1	CU5-2	CU5-3	CU5-4	CU5-5	
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	NOT REQUIRED					
Backfill / Capping						
Partial Backfill Cap Design / provided to Contractor	12-Sep	12-Sep	pending EPA decision			
EPA decision on placing backfill over bedrock	*18-Sep*					*received verbal guidance on Monday 9/14*
EPA discussions on 15% placement in sediment areas	*9/19 - 9/21*					*discussed at 3 daily data meetings.*
Finalize Backfill / Cap drawing - review with EPA	*22-Sep*					
Backfill Cap Design complete and provided to Contractor	*12-Sep*	*12-Sep*	*24-Sep*			
CU Form 1 - EPA Approval	28-Sep					
Contractor begins Backfill / Capping	13-Sep	13-Sep	25-Sep			
Type 2 Backfill Survey - Western Lobe	N/R	2-Oct	N/R			
Contractor notifies CM Capping Complete	1-Oct					
Cap Survey #1	2-Oct					cap thickness failed.
Contractor Ends Cleanup Capping	3-Oct					
Cap Survey #2	4-Oct					cap thickness passed.
Contractor ends Backfill bulk placement	22-Sep	22-Sep	13-Oct			
Contractor ends Backfill fine placement	23-Sep	23-Sep	14-Oct			
1st OSI Verification survey	15-Oct					
2nd OSI Verification survey	NOT REQUIRED					
Prepare Record Drawings	17-Oct					
Review Backfill Acceptance drawing with EPA	17-Oct					
Draft Form 2 package provided to EPA for review	18-Oct					
EPA Review of Form 2 package	19-Oct					
CU Form 2 - EPA Approval [ACTUAL]						

Table 2.6-10
Approximate CU Acceptance Timeline for CU 06

Action	CU 6					Comments
	CU6-1	CU6-2	CU6-3	CU6-4	CU6-5	
Inventory Dredging						
Contractor Begins Inventory Removal	11-Jun					
Contractor Ends Inventory Bulk removal	22-Jun					
Contractor Ends Inventory clean-up	28-Jul					
1st OSI Verification survey	23-Jul					*updated based on EPA draft review of data compilation report.*
2nd OSI Verification survey	26-Jul					*12-08-09 tracking spreadsheet had 7/28 date using OSI 7/26 survey with 7/28 Cashman survey patches. This data can be provided upon request.
3rd OSI Verification survey	31-Jul					*updated based on EPA draft review of data compilation report.*
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	29-Jul					
GIS Map with Probe Locations	*18-Jul*					*EPA requested GE probe CU6 to determine sediment depths.*
CU5 Probing (EPA Team participated)	*20-Jul*					
GIS Map summarizing Probe Results	*22-Jul*					
Revised GIS Map showing delineated rock areas and probing results.	*27-Jul*					
EPA Concurrence to collect cores	28-Jul					
Collect / Process Cores	7/29 - 7/31					
Number of Regular cores	8	7	8	7	10	
Number of Shoreline Cores	0					
Cores to Lab	31-Jul					
Sample Results - dDMS	4-Aug					
Tri+ Required Action Map presented to EPA	3-Aug					
Notify Lab to run add'l segments - AQ	3-Aug					

Table 2.6-10
Approximate CU Acceptance Timeline for CU 06

Action	CU 6					Comments
	CU6-1	CU6-2	CU6-3	CU6-4	CU6-5	
Additional Sampling Results	4-Aug					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	5-Aug					
Specialized Map B	6-Aug					
EPA requests GE to run analyses on all cores.						
Total PCBs at Depth AID1 Final Action Map Presented to EPA	8-Aug					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	10-Aug					
EPA provide Test Locations of Rock Delineated Areas	11-Aug					
Redredge Map (Residual)	12-Aug					
Revised Specialized Map B to EPA (w/clay delineation)	13-Aug					
EPA provide 2nd Map of Test locations within Rock delineated areas.	14-Aug					
Re-Dredge Pass 1						
Revised Redredge Map (Inventory Pass #2)	*14-Aug*					*received additional test locations from EPA on 8/14 AM meeting. Unaware additional locations were being requested. This impacted transmittal of CU6 revised prism to Dredging Contrator ~1 day.*
Dredge EPA test locations.	*17-Aug*					*started in AM.*
Inventory Dredge Pass #2 Design Complete - Provided to Contractor	14-Aug					
Contractor Begins Inventory Pass #2 Removal	15-Aug					
EPA provides written direction regarding rock delineated areas	19-Aug					*via e-mail.*
Revised Re-dredge Thickness By Area Map showing 20' offset.	19-Aug					*prepared in advanced of written notification.*

Table 2.6-10
Approximate CU Acceptance Timeline for CU 06

Action	CU 6					Comments
	CU6-1	CU6-2	CU6-3	CU6-4	CU6-5	
Revised dredge prism to K4			20-Aug			with 20' offsets of rock delineated areas.
Contractor Ends Inventory Dredge Pass #2 Bulk Removal			4-Sep			Based 9/1 K4 4-week rolling schedule.
Contractor Ends Cleanup Inventory Bulk Pass #2 Removal			5-Sep			assumes 2 day cleanup period (3 days labor day weekend of no dredging).
1st OSI Verification survey			6-Sep			weekend survey
2nd OSI Verification survey			NOT REQUIRED			
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA			8-Sep			
EPA Concurrence to collect cores			8-Sep			
Collect / Process Cores			9-Sep			
Number of Regular cores	8	7	8	7	10	
Number of Shoreline Cores			0			
Cores to Lab			9-Sep			
Sample Results - dDMS			11-Sep			
Tri+ Required Action Map presented to EPA			12-Sep			
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA			14-Sep			
Revised Total PCBs at Depth AID1 Required Action Map Presented to EPA			15-Sep			additional 1 day delay, due to included areas to be capped per discussion at daily date mtg.
Total PCBs at Depth AID1 Final Action Map Presented to EPA			16-Sep			
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map			16-Sep			

Table 2.6-10
Approximate CU Acceptance Timeline for CU 06

Action	CU 6					Comments
	CU6-1	CU6-2	CU6-3	CU6-4	CU6-5	
Re-Dredge Pass 2						
Redredge Map (Residual)	15-Sep					
Residual Design Complete - Provided to Contractor	16-Sep					
Contractor Begins Residual Bulk Pass Removal	17-Sep					
Contractor Ends Residual Dredge Pass Bulk Removal	22-Sep					shorter duration due to small area of re-dredging.
Contractor Ends Residual Cleanup Bulk Pass Removal	23-Sep					
1st OSI Verification survey	24-Sep					
2nd OSI Verification survey	NOT REQUIRED					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	28-Sep					
EPA Concurrence to collect cores	23-Sep					
Collect / Process Cores	24-Sep					
Number of Regular cores	1	0	0	1	1	
Number of Shoreline Cores	0	0	0	0	0	
Cores to Lab	25-Sep					
Sample Results - dDMS	26-Sep					
Tri+ Required Action Map presented to EPA	28-Sep					
Notify Lab to run add'l segments - AQ	NOT REQUIRED					
Additional Sampling Results	NOT REQUIRED					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	NOT REQUIRED					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	NOT REQUIRED					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	30-Sep					EPA NYC reps wanted to discuss 15% backfill in person on 9/30.
Backfill / Capping						
Backfill Cap Plan provided to Contractor	2-Oct					
CU Form 1 - EPA Approval	28-Sep					

Table 2.6-10
Approximate CU Acceptance Timeline for CU 06

Action	CU 6					Comments
	CU6-1	CU6-2	CU6-3	CU6-4	CU6-5	
Cap Surfaces provided to Contractor	3-Oct					
Backfill Cap Design complete and provided to Contractor	7-Oct					
Contractor begins Backfill / Capping	4-Oct					
Contractor notifies CM Capping Complete	10-Oct					
Cap Survey #1	11-Oct					
Contractor ends Cap fine placement	12-Oct					
Cap Survey #2	13-Oct					
Review Cap survey Map with EPA	15-Oct					
EPA Cap survey concurrence	16-Oct					
Contractor ends bulk backfill placement	20-Oct					
Contractor ends fine backfill placement	21-Oct					
1st Backfill survey	22-Oct					
Contractor starts to place additional backfill	22-Oct					
Contractor completes placing additional backfill	24-Oct					
2nd Backfill survey	24-Oct					
Prepare Record Drawings	25-Oct					
Draft Backfill / Cap Acceptance Package provided to EPA for review	26-Oct					
Address EPA comments to Draft Package	27-Oct					
CU Form 2 - EPA Approval [ACTUAL]						

Table 2.6-11
Approximate CU Acceptance Timeline for CU 07

Action	CU 7					Comments
	CU7-1	CU7-2	CU7-3	CU7-4	CU7-5	
Inventory Dredging						
Contractor Begins Inventory Removal	10-Jul					
Contractor Ends Inventory Bulk removal	8-Aug					same dates due to presence of clay in many areas (Limited cleanup dredging).
Contractor Ends Inventory clean-up	8-Aug					
1st OSI Verification survey						
2nd OSI Verification survey	9-Aug					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	10-Aug					
EPA Concurrence to collect cores	10-Aug					
Collect / Process Cores	8/11 - 8/12					
Number of Regular cores	10	7	8	9	6	
Number of Shoreline Cores	1	1	0	1	0	
Cores to Lab	8/11 - 8/12					
Sample Results - dDMS	8/13 - 8/20					Significant QC issues at lab.
Progress Tri+ Required Action Map shown to EPA (13/41 cores)	13-Aug					
Tri+ Required Action Map presented to EPA	20-Aug					QC issues at lab.
Notify Lab to run add'l segments - AQ	13-Aug					
Additional Sampling Results	20-Aug					QC issues at lab.
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	20-Aug					6" - 24" segments.
Total PCBs at Depth AID1 Final Action Map Presented to EPA	22-Aug					includes 24" - 48" segments (6 cores, 11 segments)
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	24-Aug					
Re-Dredge Pass 1						
Redredge Map (Residual)	24-Aug					
Inventory Dredge Prism Pass #2 Complete - Provided to Contractor	24-Aug					Interim Prism - trimmed out shoreline areas. Complete design to be completed at a later date.

Table 2.6-11
Approximate CU Acceptance Timeline for CU 07

Action	CU 7					Comments
	CU7-1	CU7-2	CU7-3	CU7-4	CU7-5	
Contractor Begins Inventory Pass #2 Removal	25-Aug					
Contractor Ends Inventory Dredge Pass #2 Bulk Removal	10-Sep					Based 9/1 K4 4-week rolling schedule.
Contractor Ends Cleanup Inventory Bulk Pass #2 Removal	11-Sep					assume 3 day period.
1st OSI Verification survey	13-Sep					Sunday Survey
2nd OSI Verification survey	16-Sep					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	17-Sep					
EPA Concurrence to collect cores	14-Sep					K4 did completed shoaling between OSI first and second survey.
Collect / Process Cores	15-Sep					
Number of Regular cores	10	7	8	9	6	
Number of Shoreline Cores	1	1	0	1	0	
Cores to Lab	17-Sep					
Sample Results - dDMS	18-Sep					
Tri+ Required Action Map presented to EPA	18-Sep					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	21-Sep					
Revised Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	21-Sep					e-mailed in evening to EPA
Total PCBs at Depth AID1 Final Action Map Presented to EPA	22-Sep					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	22-Sep					
Re-Dredge Pass 2						
Redredge Map (Residual)	23-Sep					
Residual Design Complete - Provided to Contractor	24-Sep					
Contractor Begins Residual Bulk Pass Removal	25-Sep					
Contractor Ends Residual Dredge Pass Bulk Removal	10-Oct					
Contractor Ends Residual Cleanup Bulk Pass Removal	11-Oct					
1st OSI Verification survey	11-Oct					*updated based on EPA draft review of data compilation report.*

Table 2.6-11
Approximate CU Acceptance Timeline for CU 07

Action	CU 7					Comments
	CU7-1	CU7-2	CU7-3	CU7-4	CU7-5	
2nd OSI Verification survey	Not Required					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	13-Oct					*updated based on EPA draft review of data compilation report.*
EPA Concurrence to collect cores	11-Oct					
Collect / Process Cores	11-Oct					
Number of Regular cores						
Number of Shoreline Cores						
Cores to Lab	12-Oct					
Sample Results - dDMS	13-Oct					
Tri+ Required Action Map presented to EPA	13-Oct					
Notify Lab to run add'l segments - AQ	13-Oct					
Additional Sampling Results	14-Oct					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	14-Oct					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	14-Oct					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	Not Required					
Re-Dredge Pass 3						
Redredge Map (Residual)	19-Oct					
Residual Design Complete - Provided to Contractor	16-Oct					
Contractor Begins Residual Bulk Pass Removal	17-Oct					
Contractor Ends Residual Dredge Pass Bulk Removal	17-Oct					
Contractor Ends Residual Cleanup Bulk Pass Removal	18-Oct					*updated based on EPA draft review of data compilation report.*
1st OSI Verification survey	19-Oct					
2nd OSI Verification survey	Not Required					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	20-Oct					
EPA Concurrence to collect cores	16-Oct					
Collect / Process Cores	18-Oct					

Table 2.6-11
Approximate CU Acceptance Timeline for CU 07

Action	CU 7					Comments
	CU7-1	CU7-2	CU7-3	CU7-4	CU7-5	
Number of Regular cores			1			
Number of Shoreline Cores			1			
Cores to Lab			18-Oct			
Sample Results - dDMS			19-Oct			
Tri+ Required Action Map presented to EPA			19-Oct			
Notify Lab to run add'l segments - AQ			19-Oct			
Additional Sampling Results			20-Oct			
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA			20-Oct			
Total PCBs at Depth AID1 Final Action Map Presented to EPA			20-Oct			
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map			20-Oct			
Backfill / Capping						
Draft Backfill Cap Plan presented to EPA			15-Oct			
Partial Backfill Plan and Surfaces provided to K4			17-Oct			
Complete Backfill and Cap prisms provided to K4			20-Oct			
Draft Form 1 package provided to EPA			22-Oct			
EPA Comments			23-Oct			
CU Form 1 - EPA Approval			24-Oct			
Revised backfill and Cap surface Complete and provided to Contractor			24-Oct			
Contractor begins Backfill / Capping			18-Oct			
Contractor ends bulk Cap placement			27-Oct			
1st OSI Verification survey			28-Oct			
Draft Cap Acceptance Map provided to EPA			29-Oct			
EPA Concurrence of Cap Acceptance Map			29-Oct			GE stated touchup work of Type 1 cap is still required and will be placed during placement of Type 2 15% backfill.

Table 2.6-11
Approximate CU Acceptance Timeline for CU 07

Action	CU 7					Comments
	CU7-1	CU7-2	CU7-3	CU7-4	CU7-5	
Contractor ends bulk placement - CU7 west	25-Oct					
1st OSI Verification survey	25-Oct					
2nd OSI Verification survey	Not Required					
CU7 West Backfill Acceptance Map	30-Oct					
EPA Concurrence of Backfill Acceptance Map - CU7 West	31-Oct					
Contractor Ends Bulk Backfill Placement and Type 1 Cap - CU7 Eaast	7-Nov					
Contractor Ends Fine Backfill Placement and Type 1 Cap - CU7 Eaast	8-Nov					
1st OSI Verification survey	9-Nov					
2nd OSI Verification survey	Not Required					
Backfill Acceptance Map	11-Nov					CU3 Backfill Acceptance Maps developed on 11/10.
Prepare Record Drawings	11-Nov					
EPA Concurrence of Backfill Acceptance Map	12-Nov					
Draft Backfill / Cap Acceptance Package provided to EPA for review	17-Nov					
Address EPA comments to Draft Package	18-Nov					
CU Form 2 - EPA Approval [ACTUAL]						

Table 2.6-12
Approximate CU Acceptance Timeline for CU 08

Action	CU 8					Comments
	CU8-1	CU8-2	CU8-3	CU8-4	CU8-5	
Inventory Dredging						
Contractor Begins Inventory Removal	27-Jul					
Contractor Ends Inventory Bulk removal	29-Aug	19-Aug				
Contractor Ends Inventory clean-up	2-Sep	20-Aug				
1st OSI Verification survey	---	16-Aug	---	16-Aug	---	*updated based on EPA draft review of data compilation report.*
2nd OSI Verification survey	---	---	19-Aug	---	19-Aug	
3rd OSI Verification survey	19-Aug	---	---	---	---	
4th OSI Verification Survey	23-Aug	Not required				
5th OSI Verification Survey	3-Sep	Not required				Final AID1 survey is a merged surface since CU8-2 through CU8-5 has already been sampled.
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	20-Aug					
EPA Concurrence to collect cores	20-Aug					
Collect / Process Cores	5-Sep	18-Aug	21-Aug	18-Aug	21-Aug	
Number of Regular cores	6	11	7	8	8	
Number of Shoreline Cores	13	0	4	1	0	
Cores to Lab	5-Sep					
Sample Results - dDMS	6-Sep					
Tri+ Required Action Map presented to EPA	8-Sep					
Notify Lab to run add'l segments - AQ	6-Sep					
Additional Sampling Results	8-Sep					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	8-Sep					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	9-Sep					
Rev 1Total PCBs at Depth AID1 Final Action Map Presented to EPA	10-Sep					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	10-Sep					

Table 2.6-12
Approximate CU Acceptance Timeline for CU 08

Action	CU 8					Comments
	CU8-1	CU8-2	CU8-3	CU8-4	CU8-5	
Re-Dredge Pass 1						
Redredge Map (Residual)	10-Sep					
Temporary Prism to Contractor (main channel)	9-Sep					
Inventory Dredge Pass #2 Design Complete - Provided to Contractor	13-Sep					2 day delay due to building prism side slopes with numerous islands (computer crashing)
Contractor Begins Inventory Pass #2 Removal	10-Sep					
Contractor Ends Inventory Dredge Pass #2 Bulk Removal	16-Sep					Based on K4 e-mail schedule + 1 day float
Contractor Ends Cleanup Inventory Bulk Pass #2 Removal	19-Sep	17-Sep				
1st OSI Verification survey	20-Sep	18-Sep				
2nd OSI Verification survey	Not Required					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	22-Sep					
EPA Concurrence to collect cores	19-Sep					
Collect / Process Cores	20-Sep					
Number of Regular cores	6	11	7	8	8	
Number of Shoreline Cores	13	0	4	1	0	
Cores to Lab	21-Sep	20-Sep				
Sample Results - dDMS	21-Sep					lab results posted in evening.
Tri+ Required Action Map presented to EPA	22-Sep					
Notify Lab to run add'l segments	22-Sep					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	24-Sep					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	24-Sep					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	24-Sep					
Re-Dredge Pass 2						
Partial Redredge Map (Residual)	28-Sep					
Partial Dredge Prism (western portion)	24-Sep					
Contractor Begins Residual Bulk Pass Removal (partial)	25-Sep					
Tree Removal - sand bar	30-Sep					

Table 2.6-12
Approximate CU Acceptance Timeline for CU 08

Action	CU 8					Comments
	CU8-1	CU8-2	CU8-3	CU8-4	CU8-5	
Residual Design Complete - Provided to Contractor			1-Oct			
Contractor Begins Residual Bulk Pass Removal			2-Oct			
Contractor Ends Residual Dredge Pass Bulk Removal			12-Oct			
Contractor Ends Residual Cleanup Bulk Pass Removal			13-Oct			
1st OSI Verification survey			13-Oct			
2nd OSI Verification survey			Not Required			
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA			14-Oct			
EPA Concurrence to collect cores			12-Oct			
Collect / Process Cores			13-Oct			
Number of Regular cores	12	1	1	1	3	
Number of Shoreline Cores	2	0	0	0	0	
Cores to Lab			13-Oct			
Sample Results - dDMS			14-Oct			
Tri+ Required Action Map presented to EPA			14-Oct			
Notify Lab to run add'l segments - AQ			14-Oct			
Additional Sampling Results			14-Oct			
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA			15-Oct			
Total PCBs at Depth AID1 Final Action Map Presented to EPA			15-Oct			
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map			16-Oct			
Re-Dredge Pass 3						
Redredge Map			18-Oct			
Dredge Prism issued to K4			17-Oct			Sand bar area
Contractor Begins Residual Bulk Pass Removal			18-Oct			
Dredge Prism issued to K4			21-Oct			thin east channel below sand bar
Contractor Ends Residual Dredge Pass Bulk Removal			23-Oct			
Contractor Ends Residual Cleanup Bulk Pass Removal			24-Oct			
1st OSI Verification survey			25-Oct			
2nd OSI Verification survey			Not Required			

Table 2.6-12
Approximate CU Acceptance Timeline for CU 08

Action	CU 8					Comments
	CU8-1	CU8-2	CU8-3	CU8-4	CU8-5	
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	24-Oct					
EPA Concurrence to collect cores	23-Oct					
Collect / Process Cores	24-Oct					
Number of Regular cores	8	0	0	1	2	
Number of Shoreline Cores	2	0	0	0	0	
Cores to Lab	24-Oct					
Sample Results - dDMS	25-Oct					
Tri+ Required Action Map presented to EPA	25-Oct					
Notify Lab to run add'l segments - AQ	25-Oct					
Additional Sampling Results	26-Oct					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	26-Oct					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	26-Oct					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	27-Oct					
Backfill / Capping						
Partial backfill Prism issued to K4	20-Oct					west side where a 385 can be put to use.
Contractor begins Backfill CU8 - west	21-Oct					
backfill prism CU8 West	25-Oct					
Draft Backfill Cap Plan	27-Oct					
Complete Backfill Cap Plan	28-Oct					
Draft Form 1 Package for EPA review	27-Oct					
CU Form 1 - EPA Approval	29-Oct					
Cap surface Complete and provided to Contractor	28-Oct					
Cap Design Provided to Contractor - CU8 East	29-Oct					
Contractor ends bulk Backfill placement - CU8 west	8-Nov					
Contractor ends fine Backfill placement - CU8 west	9-Nov					
1st OSI Verification backfill survey - CU8 West	10-Nov					
2nd OSI Verification backfill survey - CU8 West	Not Required					
Develop CU8 West Backfill Acceptance Map	14-Nov					

Table 2.6-12
Approximate CU Acceptance Timeline for CU 08

Action	CU 8					Comments
	CU8-1	CU8-2	CU8-3	CU8-4	CU8-5	
EPA Concurrence of CU8 Backfill Acceptance Map	14-Nov					
Contractor ends bulk Backfill placement	17-Nov					
Contractor ends fine Backfill placement	18-Nov					
1st OSI Verification Cap and remaining Backfill survey	19-Nov					
2nd OSI Verification Cap and remaining Backfill survey	Not Required					
near shore / RFW Survey	3-Dec					near shore completed last with mini barges.
Contractor begins bulk Cap placement	29-Oct					
Contractor end Isolation Layer "A" medium velocity cap CU8 South	11-Nov					
1st OSI Isolation Layer "A" Verification survey CU8 south	12-Nov					
2nd OSI Isolation Layer "A" Verification survey CU8 south	Not Required					
Contractor end Type "B" Low Velocity Cap	13-Nov					
OSI Verification Survey - Type "B" Low Velocity Cap	14-Nov					
Contractor end Isolation Layer "A" medium velocity cap CU8	15-Nov					
1st OSI Isolation Layer "A" Verification survey CU8 North & majority of Low Velocity Cap	15-Nov					
Develop Draft Backfill and Cap Acceptance Drawings	18-Nov					
EPA Concurrence of Draft Backfill and Cap Acceptance Drawings	19-Nov					
Prepare Record Drawings	24-Nov					Final Form 2 packages for CU2, CU3, CU7 and CU18 developed concurrently in this 5 day timeframe.
EPA Review of Form 2 package	30-Nov					Thanksgiving day weekend delayed draft review.
review comments with EPA representative.	1-Dec					
Address EPA comments to Draft Package	2-Dec					
Contractor completes near shore backfill placement	3-Dec					
Land Survey of Near shore backfill	4-Dec					
CU Form 2 - EPA Approval [ACTUAL]						

Table 2.6-13
Approximate CU Acceptance Timeline for CU 17

Action	CU 17					Comments
	CU17-1	CU17-2	CU17-3	CU17-4	CU17-5	
Inventory Dredging						
Contractor Begins Inventory Removal	25-Jun					
Contractor Ends Inventory Bulk removal	20-Jul					
Contractor Ends Inventory clean-up	21-Jul					
1st OSI Verification survey	12-Jul					
2nd OSI Verification survey	7/22 (CU17 includes Dredging Contractor partial survey data as transmitted to EPA)					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	24-Jul					
EPA Concurrence to collect cores	24-Jul					
Collect / Process Cores	7/7 - 7/25 *(acres 1 & 2 done first)*					
Number of Regular cores	8	11	7	8	6	
Number of Shoreline Cores	0	0	0	0	0	
Cores to Lab	25-Jul					
Sample Results - dDMS	26-Jul					
Tri+ Required Action Map presented to EPA	26-Jul					
Notify Lab to run add'l segments - AQ	27-Jul					
Additional Sampling Results	29-Jul					
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	30-Jul					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	1-Aug					
Revised Final Action Map	3-Aug					changed DOC layer in 1 area per EPA request
EPA Concurrence of *Revised* Total PCBs at Depth AID1 Final Action Map	3-Aug					
Re-Dredge Pass 1						
Redredge Map (Residual)	4-Aug					
Inventory Dredge Pass #2 Design Complete - Provided to Contractor	4-Aug					prism includes all engineering adjustsments / resurfacing along shoreline.
Contractor Begins Inventory Pass #2 Removal	5-Aug					
Contractor Ends Inventory Dredge Pass #2 Bulk Removal	22-Aug					based on review of K4 QA/QC drawings and Inspector feedback
Contractor Ends Cleanup Inventory Bulk Pass #2 Removal	25-Aug					
1st OSI Verification survey	26-Aug					
2nd OSI Verification survey	Not Required					

Table 2.6-13
Approximate CU Acceptance Timeline for CU 17

Action	CU 17					Comments
	CU17-1	CU17-2	CU17-3	CU17-4	CU17-5	
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	27-Aug					
EPA Concurrence to collect cores	27-Aug					
Collect / Process Cores	8/28 - 8/29					
Number of Regular cores	8	11	7	8	6	
Number of Shoreline Cores	0	0	0	0	0	
Cores to Lab	30-Aug					
Sample Results - dDMS	31-Aug					
Tri+ Required Action Map presented to EPA	31-Aug					
Notify Lab to run add'l segments	31-Aug					
Lab Results	1-Sep					results in evening
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	3-Sep					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	4-Sep					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	4-Sep					
Re-Dredge Pass 2						
Redredge Map (Residual)	4-Sep					
Residual Design Complete - Provided to Contractor	4-Sep					
Contractor Begins Residual Bulk Pass Removal	4-Sep					started dredging late evening
Contractor Ends Residual Dredge Pass Bulk Removal	14-Sep					includes 3 day holiday weekend
Contractor Ends Residual Cleanup Bulk Pass Removal	14-Sep					
1st OSI Verification survey	15-Sep					
2nd OSI Verification survey	Not Required					
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	16-Sep					
EPA Concurrence to collect cores	16-Sep					
Collect / Process Cores	16-Sep					started coring late afternoon.
Number of Regular cores						
Number of Shoreline Cores						
Cores to Lab	17-Sep					
Sample Results - dDMS	18-Sep					
Tri+ Required Action Map presented to EPA	18-Sep					entire CU is compliant
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	Not Required					
Total PCBs at Depth AID1 Final Action Map Presented to EPA	Not Required					
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	Not Required					

Table 2.6-13
Approximate CU Acceptance Timeline for CU 17

Action	CU 17					Comments
	CU17-1	CU17-2	CU17-3	CU17-4	CU17-5	
Backfill / Capping						
Backfill Cap prism complete and provided to Contractor	12-Sep	12-Sep	20-Sep			
CU Form 1 - EPA Approval	23-Sep					
Backfill Cap Design Provided to Contractor	20-Sep					
Contractor begins Backfill / Capping	21-Sep					
Contractor ends bulk placement	9-Oct					
Contractor ends fine placement	11-Oct					
1st OSI Verification survey	12-Oct					
2nd OSI Verification survey	Not Required					
Backfill / Cap Acceptance Drawings provided to EPA	14-Oct					
EPA Review of Form 2 package	15-Oct					
Prepare Record Drawings	16-Oct					
CU Form 2 - EPA Approval [ACTUAL]						

Table 2.6-14
Approximate CU Acceptance Timeline for CU 18

Action	CU 18						Comments
	CU18-1	CU18-2	CU18-3	CU18-4	CU18-5	CU18-6	
Inventory Dredging							
Contractor Begins Inventory Removal	21-Jul						
Contractor Ends Inventory Bulk removal	24-Sep	17-Sep					dredging shutdowns due to exceedances
Contractor Ends Inventory clean-up	25-Sep	18-Sep					*updated based on EPA draft review of data compilation report.*
1st OSI Verification survey	26-Sep	19-Sep					
2nd OSI Verification survey	Not Required						
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	28-Sep						
EPA Concurrence to collect cores	23-Sep						Coring in CU2 through CU6 initially.
Collect / Process Cores	24-Sep						
Number of Regular cores	8	8	5	10	8	9	
Number of Shoreline Cores	0	0	0	0	0	0	
Cores to Lab	26-Sep						
Sample Results - dDMS	28-Sep						
Tri+ Required Action Map presented to EPA	28-Sep						
Notify Lab to run add'l segments - AQ	26-Sep						
Additional Sampling Results	29-Sep						
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	29-Sep						
Total PCBs at Depth AID1 Final Action Map Presented to EPA	1-Oct						
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	1-Oct						
Re-Dredge Pass 1							
Redredge Map (Residual)	5-Oct						
Inventory Dredge Pass #2 Design Complete - Provided to Contractor	2-Oct						
Contractor Begins Inventory Pass #2 Removal	4-Oct						
Contractor Ends Inventory Dredge Pass #2 Bulk Removal	20-Oct						
Contractor Ends Cleanup Inventory Bulk Pass #2 Removal	23-Oct						
1st OSI Verification survey	23-Oct						
2nd OSI Verification survey	Not Required						
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	24-Oct						
EPA Concurrence to collect cores	20-Oct						

Table 2.6-14
Approximate CU Acceptance Timeline for CU 18

Action	CU 18						Comments
	CU18-1	CU18-2	CU18-3	CU18-4	CU18-5	CU18-6	
Collect / Process Cores	20-Oct	22-Oct	23-Oct				
Number of Regular cores	8	8	5	10	8	9	
Number of Shoreline Cores	0	0	0	0	0	0	
Cores to Lab	23-Oct						
Sample Results - dDMS	24-Oct						
Tri+ Required Action Map presented to EPA	24-Oct						
Additional Sampling Results	Not Required						
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	Not Required						
Total PCBs at Depth AID1 Final Action Map Presented to EPA	Not Required						
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	Not Required						
Re-Dredge Pass 2							
Redredge Map (Residual)	26-Oct						
Residual Design Complete - Provided to Contractor	24-Oct						
Contractor Begins Residual Bulk Pass Removal	24-Oct						
Contractor Ends Residual Dredge Pass Bulk Removal	24-Oct						
Contractor Ends Residual Cleanup Bulk Pass Removal	24-Oct						
1st OSI Verification survey	25-Oct						
2nd OSI Verification survey	Not Required						
Elevation Acceptance Map / Sediment Removal Map / Proposed Core Location Map Presented to EPA	26-Oct						
EPA Concurrence to collect cores	24-Oct						
Collect / Process Cores	25-Oct						
Number of Regular cores	0	0	0	0	0	1	
Number of Shoreline Cores	0	0	0	0	0	0	
Cores to Lab	25-Oct						
Sample Results - dDMS	26-Oct						
Tri+ Required Action Map presented to EPA	26-Oct						
Notify Lab to run add'l segments - AQ	Not Required						
Additional Sampling Results	Not Required						
Total PCBs at Depth AID1 Required Action Map / Core Data Sum Table Presented to EPA	26-Oct						
Total PCBs at Depth AID1 Final Action Map Presented to EPA	26-Oct						

Table 2.6-14
Approximate CU Acceptance Timeline for CU 18

Action	CU 18						Comments
	CU18-1	CU18-2	CU18-3	CU18-4	CU18-5	CU18-6	
EPA Concurrence of Total PCBs at Depth AID1 Final Action Map	27-Oct						
Backfill / Capping							
Partial backfill Prism issued to K4 (CU18-5 & CU18-6)	26-Oct						
Draft Backfill & Cap Plan	26-Oct						
Complete Backfill Cap Plan	27-Oct						
Draft Form 1 Package for EPA review	28-Oct						
CU Form 1 - EPA Approval	29-Oct						
Backfill Cap Design complete and provided to Contractor	31-Oct						
Contractor begins Backfill / Capping	29-Oct						Contractor opted not to start backfill for a couple days.
Contractor ends bulk Cap placement	9-Nov						
Contractor ends Cap fine placement	10-Nov						
1st OSI Verification Cap survey	12-Nov						
2nd OSI Verification Cap survey	Not Required						
Develop Cap Acceptance Drawing	13-Nov						
EPA Concurrence of Cap Acceptance Drawing	13-Nov						
Contractor ends bulk Backfill placement	12-Nov						
Contractor ends fine Backfill placement	14-Nov						
1st OSI Verification survey	15-Nov						
2nd OSI Verification survey	Not Required						
Develop Backfill Acceptance Drawing	16-Nov						
EPA Concurrence of backfill Acceptance Drawing	16-Nov						
Prepare Record Drawings	17-Nov						
Backfill / Cap Acceptance Drawings provided to EPA	17-Nov						
EPA Review of Form 2 package	18-Nov						
CU Form 2 - EPA Approval [ACTUAL]							

Appendix II-G

Memorandum from Harry Zahakos to Scott Blaha - GE Regarding Adjustments and Pro-rating of Phase 1 Mass-Based PCB Load Criteria. Dated September 19, 2008

MEMORANDUM

TO:	Scott Blaha – GE	**DATE:**	September 19, 2008
FROM:	Harry Zahakos	**RE:**	Adjustments and Pro-rating of Phase 1 Mass-Based PCB Load Criteria
CC:	John Connolly – QEA	**JOB#:**	GENfd1:122

Introduction

The Resuspension Performance Standard issued by the U.S. Environmental Protection Agency (EPA) establishes three action levels – Evaluation, Control, and Standard Levels – for near-field and far-field resuspension monitoring and response actions, with specific criteria for each level (EPA 2004). The far-field Evaluation and Control Levels include criteria based on the loads of polychlorinated biphenyls (PCBs) due to resuspension related to dredging. The Control Level criteria are a net PCB load increase for the Phase 1 dredging season of 65 kilograms (kg) of Total PCBs or 22 kg of Tri+ PCBs and a seven-day running average load of 600 grams per day (g/d) of Total PCBs or 200 g/d or Tri+ PCBs. The Evaluation Level includes seven-day running average load criteria at one-half of the Control Level criteria – i.e., 300 g/d of Total PCBs or 100 g/d of Tri+ PCBs.

The Resuspension Standard allows for adjustments of the annual Phase 1 PCB load loss criterion and the daily load loss criteria if the targeted Phase 1 production differs from the assumptions on which those criteria were based (EPA 2004, Volume 2, p. 97). In addition, the Critical Phase 1 Design Elements (CDE), which is an attachment to the Consent Decree, provides that the annual Phase 1 load criterion will be pro-rated to each dredge area in Phase 1 (EPA and GE 2005, Appendix B, Attachment A, Section 2.2). This memorandum describes the PCB load criteria adjustments for Phase 1 of the Remedial Action. It also describes the pro-rated dredge area-specific load values for Phase 1, which will be used in tracking the cumulative PCB mass released against the annual Phase 1 load criteria.

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Annual Load Adjustment

The Resuspension Standard notes that the far-field net PCB seasonal load criterion of 65 kg Total PCBs for Phase 1 was based on the assumption that one-tenth of the total PCB inventory assumed to be subject to removal would be targeted for removal in Phase 1, and it indicates that that criterion may be adjusted if the targeted Phase 1 mass removal differs from that assumption (EPA 2004, Volume 2, pp. 95, 97). In fact, as shown in the Phase 1 and Phase 2 Dredge Area Delineation Reports (QEA 2004, QEA 2007), the final estimate of the PCB mass be removed in Phase 1 is 20,300 kg, which represents 18% of the total inventory of 113,100 kg. This can be used to adjust seasonal load loss by applying Equation 4-9 from the Resuspension Standard (EPA 2004, Volume 2, p. 97):

$$S_{tot} = \frac{m}{M} * 650 \tag{1}$$

where:

S_{tot}	=	Maximum total allowable far-field PCB mass for Phase 1;
m	=	Total PCB mass to be dredged in Phase 1 (20,300 kg); and
M	=	Total PCB mass to be dredged in the remediation (113,100 kg).

Accordingly, the annual allowable load of Total PCBs for Phase 1 should be adjusted to 117 kg. As with the original Phase 1 annual load criterion, the annual allowable load of Tri+ PCBs would be set to one-third of that value at 39 kg.

Daily Load Adjustment

Given these adjustments to the annual Phase 1 load criteria, the seven-day running average daily load criteria for Phase 1 will correspondingly be adjusted by dividing the annual criteria by an assumed dredging season of 108 days, which is the annual Phase 1 Control Level load criterion in the Resuspension Standard (65 kg) divided by the daily Control Level load criterion in that standard (600 g/day). These adjustments result in seven-day running average load criteria, for the Control Level, of 1,083 g/d of Total PCBs and 361 g/day of Tri+ PCBs. As in the Resuspension Standard, the seven-day running average load criteria for the Evaluation Level will be one-half of the Control Level criteria.

Pro-Rated PCB Load Values

In addition, in accordance with the CDE, the adjusted total seasonal PCB mass criteria for Phase 1 will be pro-rated among the dredge areas in Phase 1, so as to allow the cumulative PCB mass flux to be charted against the annual Control Level criteria for the entire season. Such pro-ration is appropriate because, as shown by the Phase 1 resuspension modeling, PCB resuspension and transport will vary based predominantly on local sediment conditions and PCB mass. Dredging of local areas with high PCB inventory may cause exceedances of the seven-day PCB load criteria even though the total seasonal PCB mass remains well below the annual Control Level criteria.

The pro-ration of the annual Phase 1 load criteria among dredge area has been made at the scale of the Phase 1 Certification Units (CUs), which are shown on Figure 1. The method outlined below relies on estimates of the far-field PCB mass due to resuspension in each of the Phase 1 CUs; these estimates represent the relative potential for dredging in each CU to result in PCB transport to the far-field stations. The resulting pro-rated CU-specific values consist of load criteria that are specific to the sediment areas being dredged while still maintaining the total Control Level load criteria for the entire season. As such, they can be used to track the cumulative PCB mass released against the annual Phase 1 load criteria.

Approach

The Phase 1 model results show that far-field PCB mass is closely correlated to the PCB mass associated with the silt and clay (Class 1) component of the dredged sediments. Based on this observation, a screening-level modeling approach was used to estimate the mass of far-field transportable PCB for each CU. This approach is similar to that used in Attachment G to the Phase 2 Intermediate Design Report (Phase 2 IDR Attachment G; QEA 2008); an effective PCB mass has been estimated based on the PCB concentration of the dredged sediments and the mass of the Class 1 component of the dredged sediments. It is also assumed that this effective PCB mass is directly proportional to the far-field PCB mass. Further discussion of this screening-level modeling approach is given in the Phase 2 IDR Attachment G (QEA 2008).

The effective PCB mass for the Phase 1 dredge areas was calculated in a manner similar to the procedure presented in Attachment F of the Phase 1 Final Design Report (Phase 1 FDR Attachment F; QEA 2006). The sediment properties and PCB concentrations have been defined at the scale of the elements (grid cells) used in the Phase 1 resuspension model (QEA 2005, QEA 2006). For each grid cell, the effective PCB mass (EM_k) has been calculated as follows:

$$EM_k = D_k * F_k^1 * C_k^1 \qquad (2)$$

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where:

k = model cell index;

D_k = dredge sediment mass in model cell k;

F_k^1 = fraction of Class 1 sediment in model cell k; and

C_k^1 = PCB concentration (Total or Tri+) of sediment in cell k on sediment Class 1.

The Total PCB concentration of sediment on sediment Class 1 and the fraction of Class 1 sediment by grid cell are shown in Figure F-3-5 and Figure F-3-2, respectively, of the Phase 1 FDR Attachment F.

The total effective PCB mass for a given CU (EM_i) is calculated simply by adding the individual model cells that comprise a CU.

$$EM_i = \sum_k EM_k \tag{3}$$

where:

i = CU index

Using these total effective masses for each CU, a maximum load of resuspended mass per CU (S_i) can be calculated by pro-ration.

$$S_i = S_{tot} * \frac{EM_i}{\sum_i EM_i} \tag{4}$$

where:

S_{tot} = maximum total allowable far-field PCB mass for Phase 1 (117 kg Total PCB or 39 kg Tri+ PCB)

These CU-specific load values (for Total PCBs and Tri+ PCBs) will allow charting of the total mass transported during the Phase 1 dredging against the seasonal Control Level load criteria.

Daily measurements of the far-field PCB concentration and average flow can be used to compute a daily mass transported. When two or more dredges are operating simultaneously in different

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CUs, the far-field mass associated with a particular CU will be estimated by apportioning the total far-field mass among the active CUs being dredged based on the relative predicted total PCB mass releases.

In the event that the adjusted seven-day average daily Control Level load criteria are exceeded, the mass released can be compared to the pro-rated value(s) for the CU(s) being addressed, and the cumulative mass load released from all CUs up to that time can be compared to the cumulative allowable mass load up to that time based on the pro-rated values. In that way, it can be determined whether the exceedance of the daily load criteria would be expected to result in an exceedance of the overall Phase 1 Control Level load criteria.

Results

The estimated Total PCB and Tri+ PCB mass per CU are shown in Table 1. Also shown are the pro-rated intra-seasonal Control Level load values (for Total PCBs and Tri+ PCBs) for each CU. As expected, these values are widely variable, ranging from 0.3 kg for CU 1, which represents the dredging of NTIP01 with the least effective PCB mass, to 20.5 kg of Total PCBs for CU 18, which is represents dredging of the southern portion of EGIA01B and contains the highest effective PCB inventory. As shown in Table 1, these CU-specific load limits cumulatively add up to the adjusted total allowable Control Level load for Phase 1 (assuming that all CUs are completed) of 117 kg of Total PCBs and 39 kg of Tri+ PCBs. The effect of implementing resuspension control devices was not considered in this analysis.

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Table 1. CU-specific load values based on pro-ration of annual Phase 1 Control Level load criteria.

CU	Volume Dredged (yd^3)	Effective PCB Mass (kg)	Total PCB CU-Specific Load Limits (kg)	Tri+ PCB CU-Specific Load Limits (kg)
CU 1	12,700	24	0.3	0.3
CU 2	14,900	1299	15.1	5.2
CU 3	27,500	1092	12.7	4.2
CU 4	19,600	1471	17.1	5.8
CU 5	9,400	110	1.3	0.5
CU 6	8,300	31	0.4	0.3
CU 7	15,400	283	3.3	1.3
CU 8	14,700	321	3.7	1.2
CU 9	15,900	127	1.5	0.6
CU 10	11,000	65	0.8	0.5
CU 11	11,400	242	2.8	0.9
CU 12	14,000	210	2.4	1.1
CU 13	11,900	158	1.8	0.7
CU 14	16,300	546	6.4	2.4
CU 15	20,200	572	6.7	2.4
CU 16	12,200	169	2.0	0.9
CU 17	11,800	1571	18.3	5.3
CU 18	18,000	1764	20.5	5.4
Totals 26	**5,200**	**11,760**	**117**	**39**

References

Environmental Protection Agency (EPA), 2004. *Engineering Performance Standards Hudson River PCBs Superfund Site, Volume 2: Technical Basis of the Performance Standard for Dredging Resuspension.* Prepared by Malcolm Pirnie, Inc. and TAMS Consultants, Inc. for U.S. Army Corps of Engineers, Kansas City District on behalf of U.S. Environmental Protection Agency, Region 2. April 2004.

EPA and General Electric Company (GE), 2005. Consent Decree in *United States v. General Electric Company*, No. 1:05-CV-1270, lodged in United States District Court for the Northern District of New York on October 6, 2005; entered by Court on November 2, 2006. Appendix B, *Statement of Work (SOW) for Remedial Action and Operation, Maintenance and Monitoring*, Attachment A, *Critical Phase 1 Design Elements*

Quantitative Environmental Analysis, LLC (QEA), 2008. *Phase 2 Intermediate Design Report, Attachment G - Dredge Resuspension Modeling.* Prepared for General Electric Company, Albany, NY. May 2008.

QEA, 2007. *Phase 2 Dredge Area Delineation Report.* Prepared for General Electric Company, Albany, NY. December 2007.

QEA, 2006. *Phase 1 Final Design Report, Attachment F - Dredge Resuspension Modeling.* Prepared for General Electric Company, Albany, NY. March 2006.

QEA, 2005. *Phase 1 Intermediate Design Report, Attachment E - Dredge Resuspension Modeling.* Prepared for General Electric Company, Albany, NY. August 2005.

QEA, 2004. *Phase 1 Dredge Area Delineation Report.* Prepared for General Electric Company, Albany, NY. January 2004.

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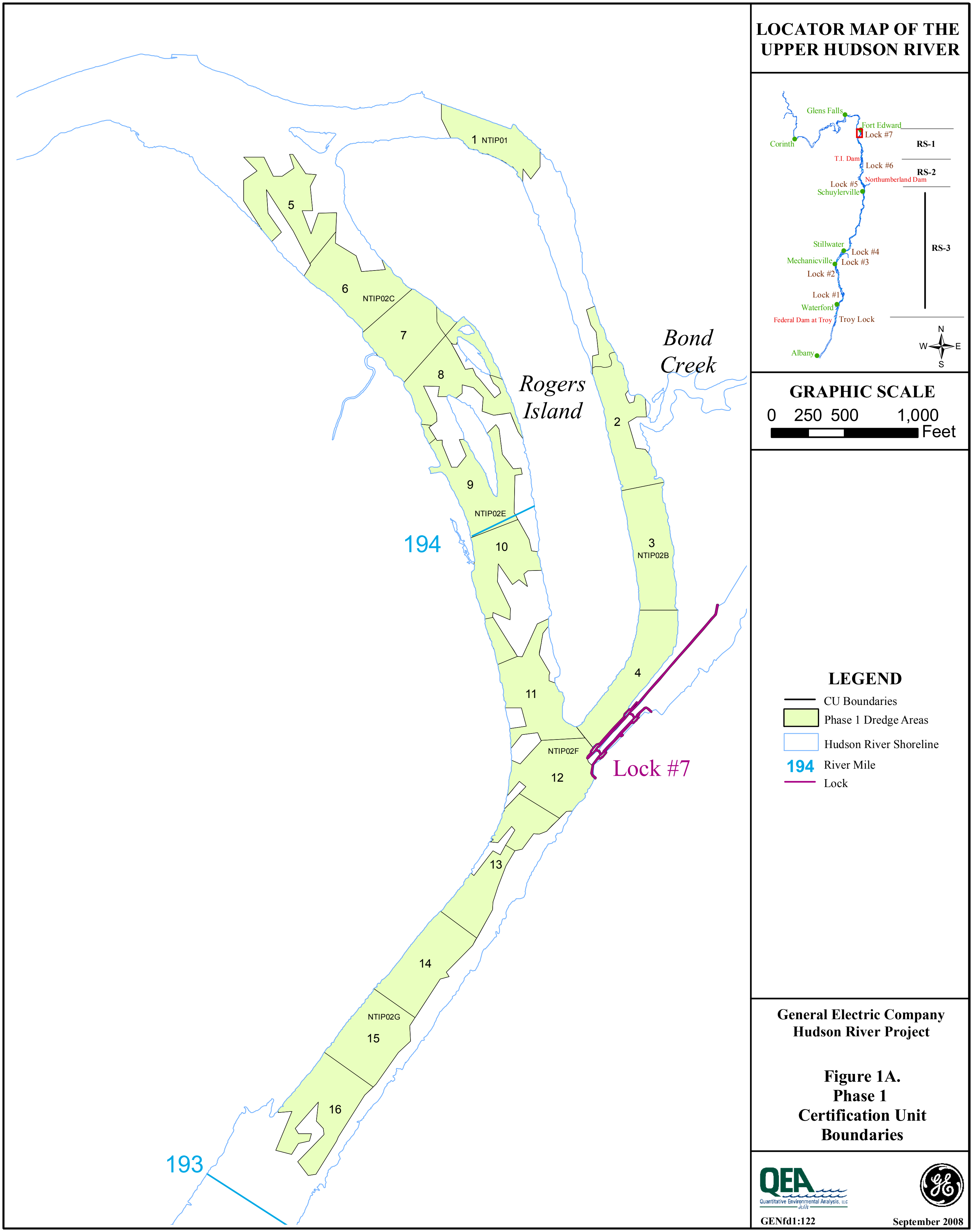

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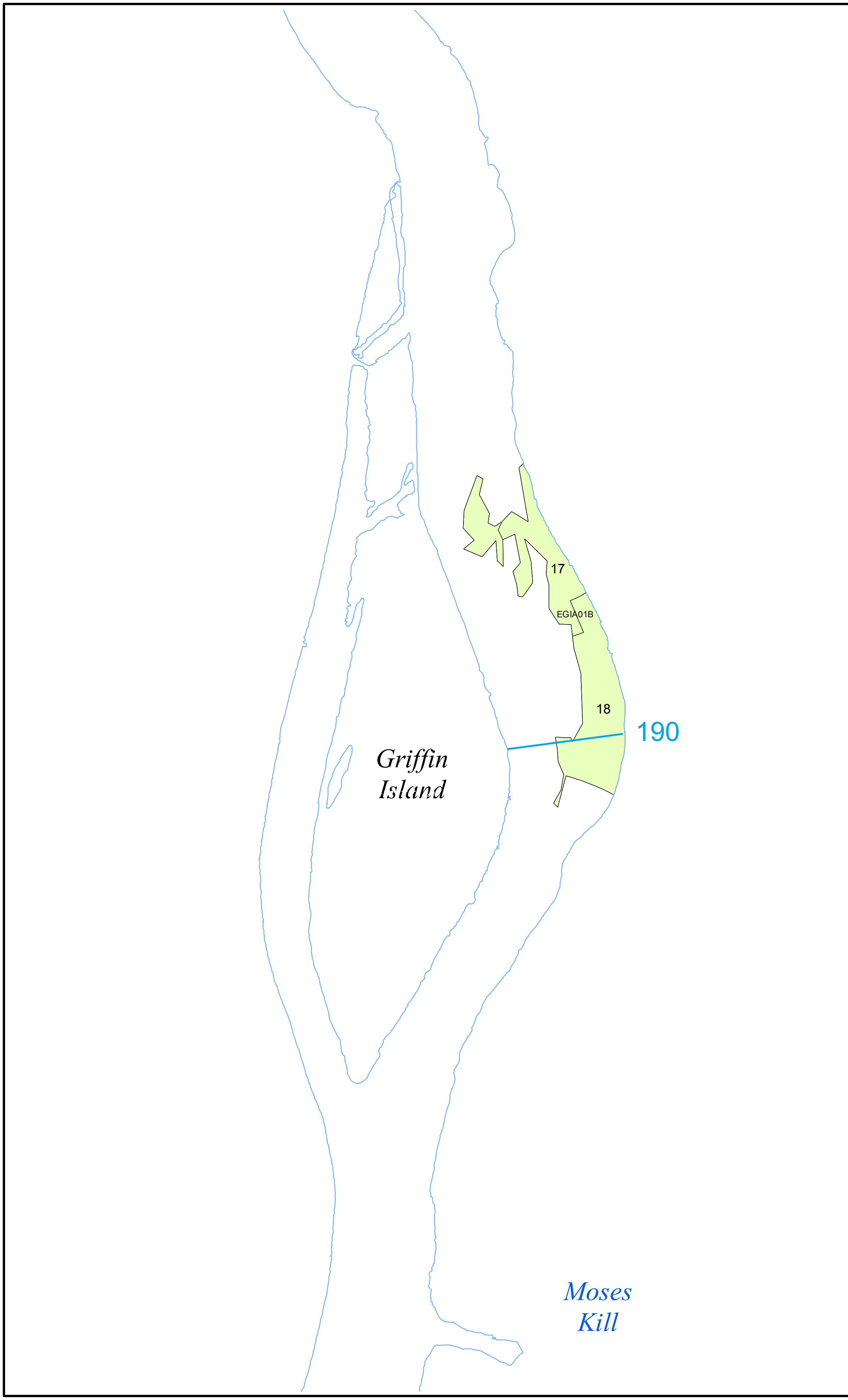
Figure 1A.
Phase 1
Certification Unit
Boundaries

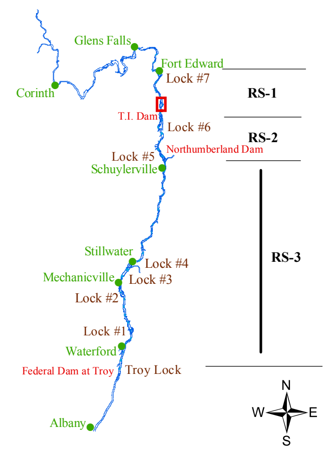
GENfd1:122

September 2008

RRC - GENid2\GIS\Phase_1_Delineation_of_CU_Boundaries_091808



LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 250 500 1,000 Feet

LEGEND

- CU Boundaries
- Phase 1 Dredge Areas
- Hudson River Shoreline
- 194 River Mile
- Lock

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Figure 1B.
Phase 1
Certification Unit
Boundaries

Quantitative Environmental Analysis, LLC

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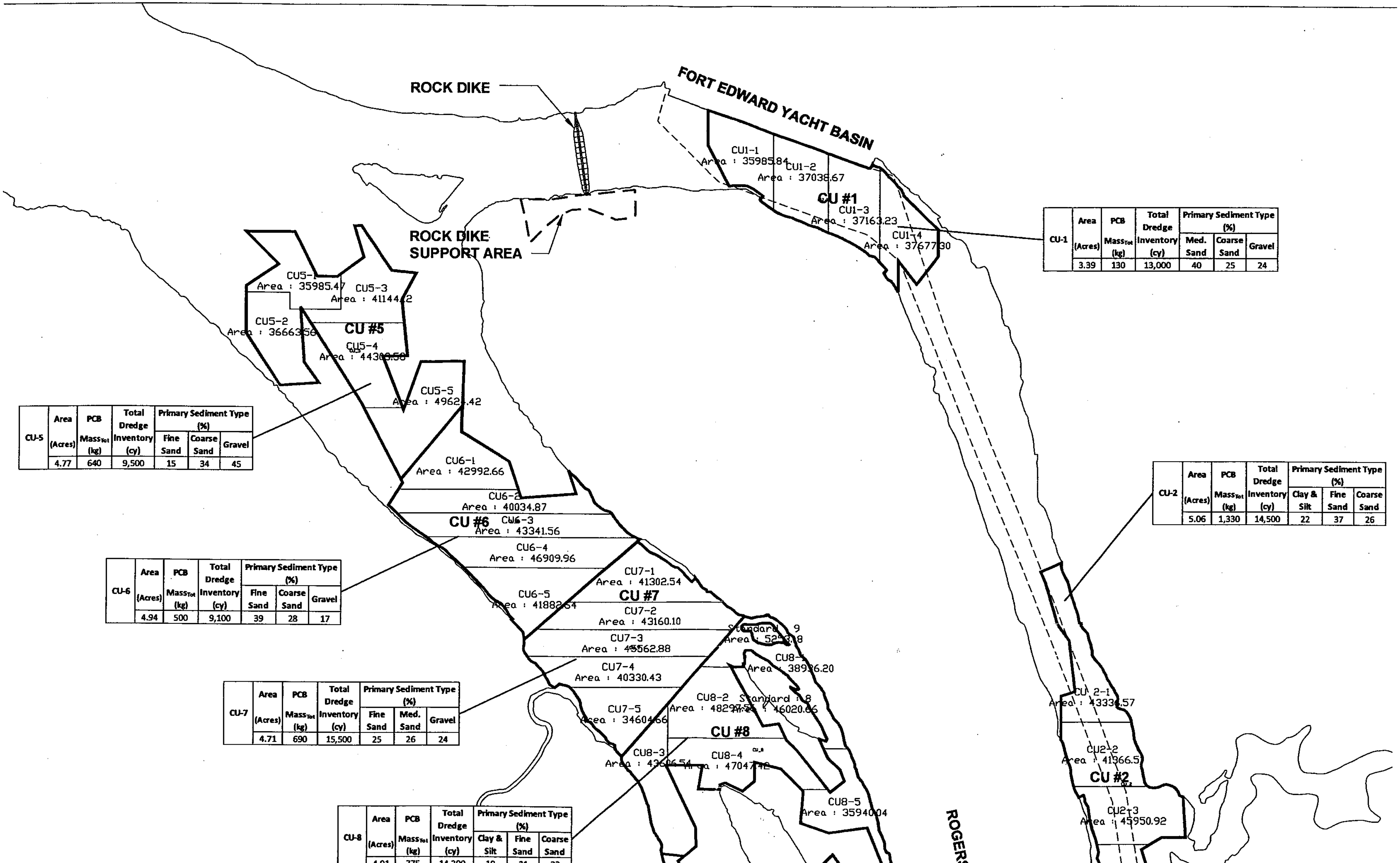
Appendix II-H

Parsons Figure 1

Phase 1 Certification Unit Locations and Summary Info Hudson River PCBs Superfund Site.

Prepared by Parsons for General Electric, Fort Edward, NY. Job 442209.01401, June 15, 2009.



CU-1	Area (Acres)	PCB $Mass_{Tot}$ (kg)	Total Dredge Inventory (cy)	Primary Sediment Type (%) Med. Sand	Coarse Sand	Gravel
	3.39	130	13,000	40	25	24

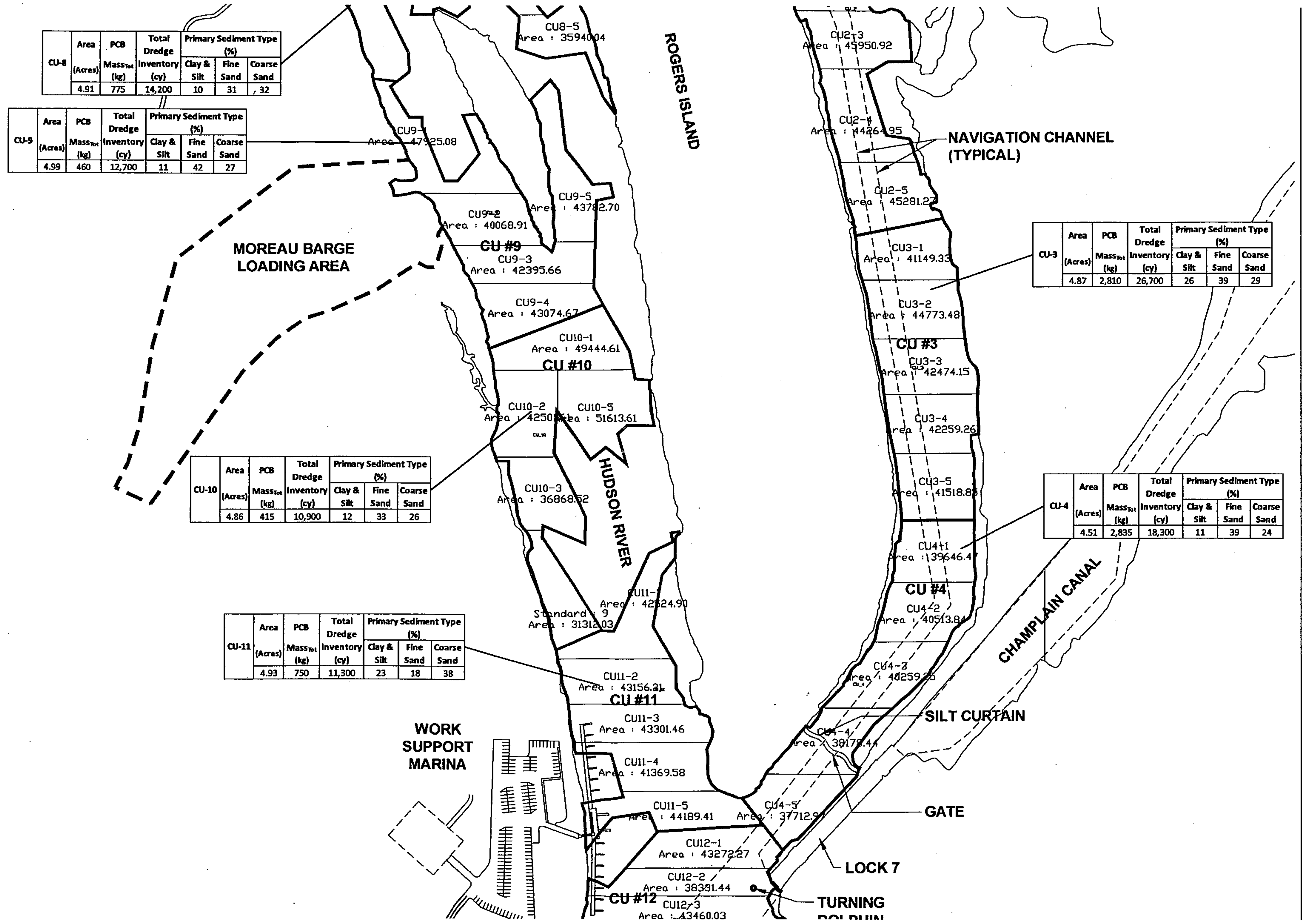
CU-2	Area (Acres)	PCB $Mass_{Tot}$ (kg)	Total Dredge Inventory (cy)	Primary Sediment Type (%) Clay & Silt	Fine Sand	Coarse Sand
	5.06	1,330	14,500	22	37	26

CU-5	Area (Acres)	PCB $Mass_{Tot}$ (kg)	Total Dredge Inventory (cy)	Primary Sediment Type (%) Fine Sand	Coarse Sand	Gravel
	4.77	640	9,500	15	34	45

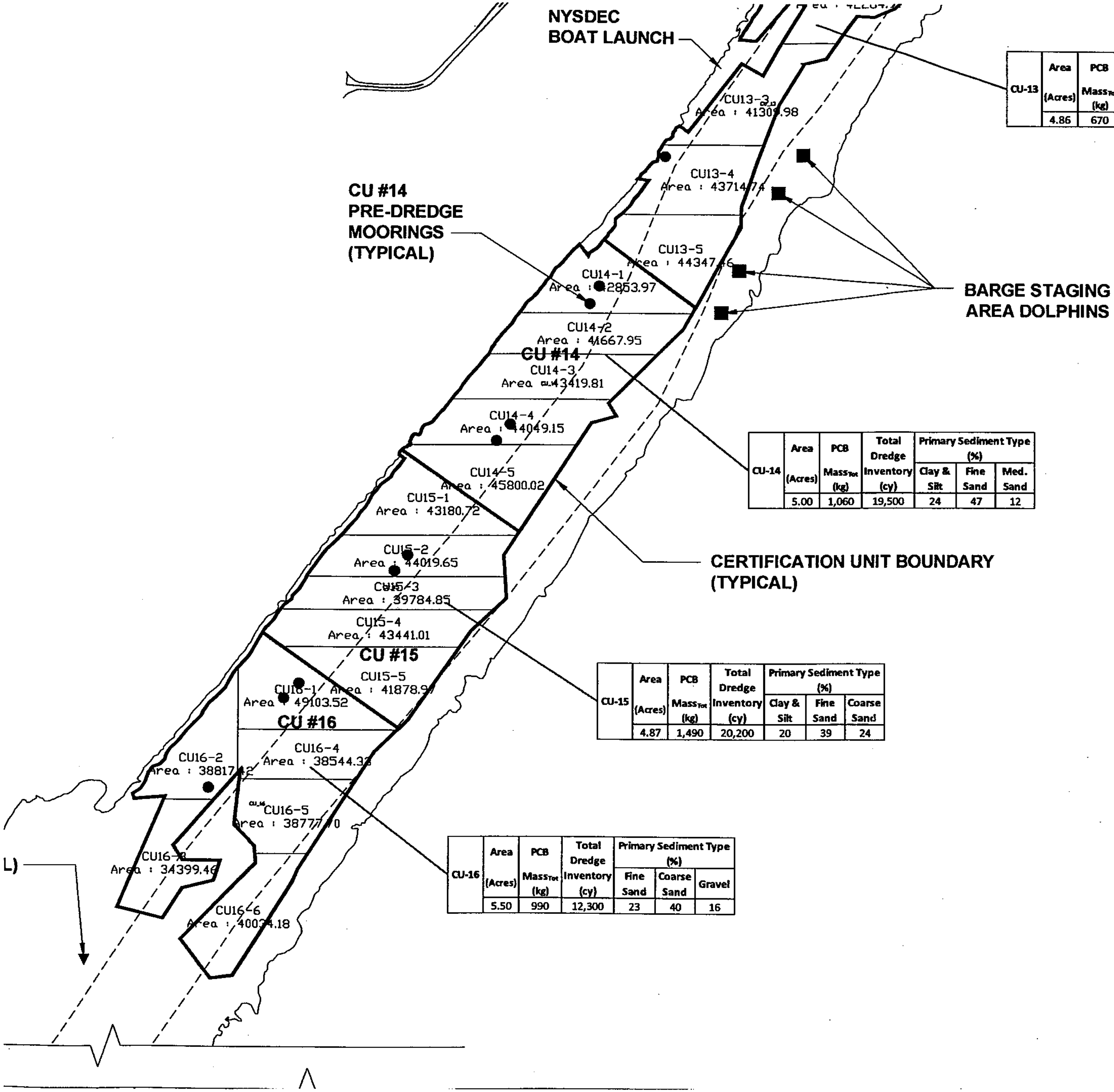
CU-6	Area (Acres)	PCB $Mass_{Tot}$ (kg)	Total Dredge Inventory (cy)	Primary Sediment Type (%) Fine Sand	Coarse Sand	Gravel
	4.94	500	9,100	39	28	17

CU-7	Area (Acres)	PCB $Mass_{Tot}$ (kg)	Total Dredge Inventory (cy)	Primary Sediment Type (%) Fine Sand	Med. Sand	Gravel
	4.71	690	15,500	25	26	24

CU-8	Area (Acres)	PCB $Mass_{Tot}$ (kg)	Total Dredge Inventory (cy)	Primary Sediment Type (%) Clay & Silt	Fine Sand	Coarse Sand
	4.91	775	14,200	10	31	32



CU	Area (Acres)	PCB Mass$_{Tot}$ (kg)	Total Dredge Inventory (cy)	Primary Sediment Type (%) Clay & Silt	Fine Sand	Coarse Sand
CU-8	4.91	775	14,200	10	31	32
CU-9	4.99	460	12,700	11	42	27
CU-10	4.86	415	10,900	12	33	26
CU-11	4.93	750	11,300	23	18	38
CU-3	4.87	2,810	26,700	26	39	29
CU-4	4.51	2,835	18,300	11	39	24

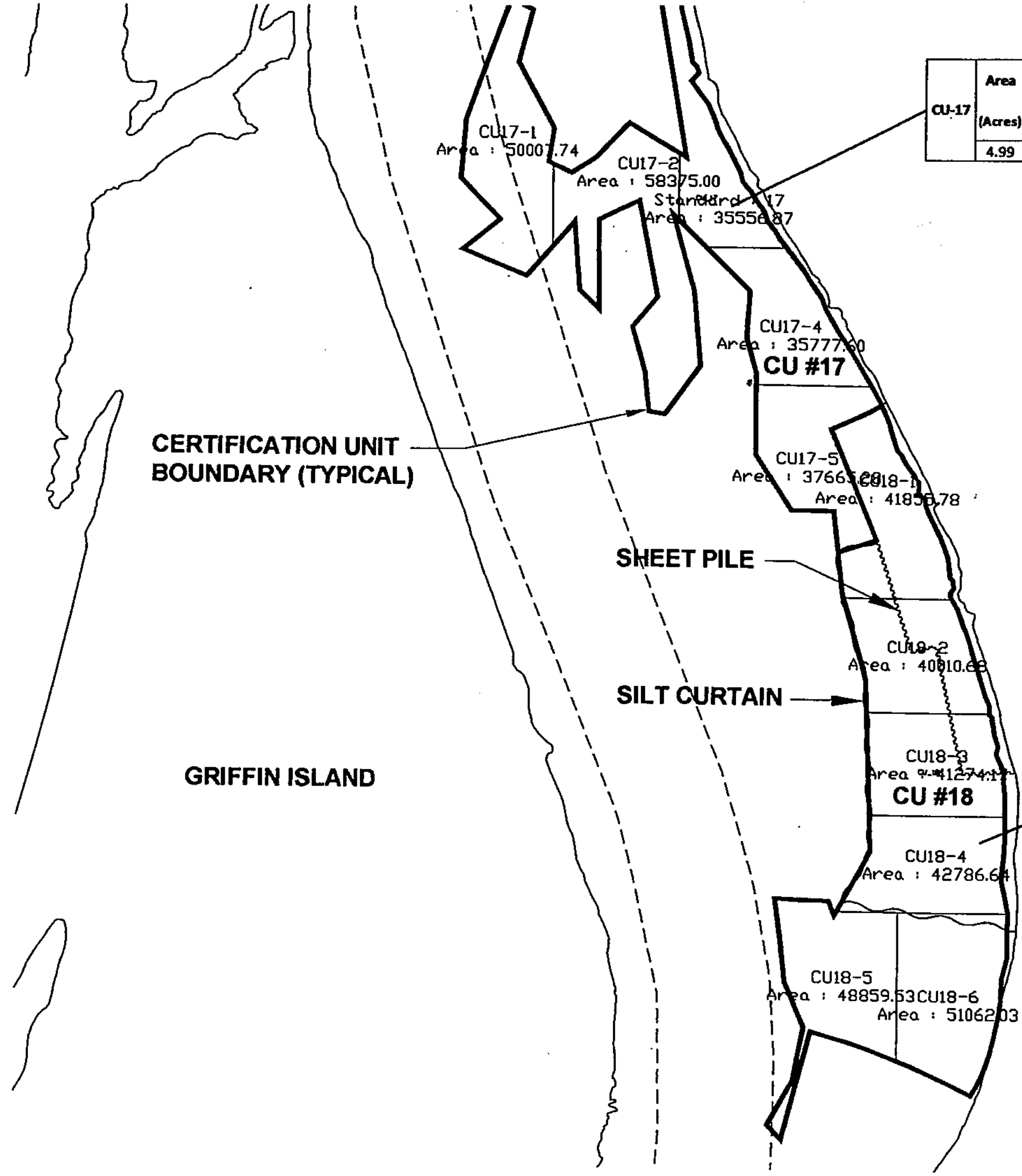


	Area	PCB	Total Dredge	Primary Sediment Type (%)		
CU-13	(Acres)	$Mass_{Tot}$ (kg)	Inventory (cy)	Clay & Silt	Fine Sand	Gravel
	4.86	670	12,500	16	21	28

	Area	PCB	Total Dredge	Primary Sediment Type (%)		
CU-14	(Acres)	$Mass_{Tot}$ (kg)	Inventory (cy)	Clay & Silt	Fine Sand	Med. Sand
	5.00	1,060	19,500	24	47	12

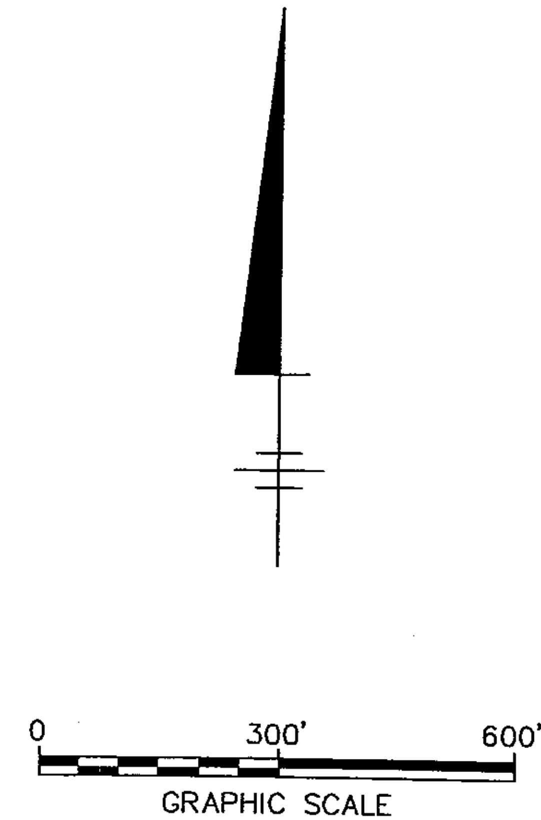
	Area	PCB	Total Dredge	Primary Sediment Type (%)		
CU-15	(Acres)	$Mass_{Tot}$ (kg)	Inventory (cy)	Clay & Silt	Fine Sand	Coarse Sand
	4.87	1,490	20,200	20	39	24

	Area	PCB	Total Dredge	Primary Sediment Type (%)		
CU-16	(Acres)	$Mass_{Tot}$ (kg)	Inventory (cy)	Fine Sand	Coarse Sand	Gravel
	5.50	990	12,300	23	40	16



	Area (Acres)	PCB Mass$_{Tot}$ (kg)	Total Dredge Inventory (cy)	Primary Sediment Type (%)		
				Clay & Silt	Fine Sand	Med. Sand
CU-17	4.99	1,350	11,300	49	31	9

	Area (Acres)	PCB Mass$_{Tot}$ (kg)	Total Dredge Inventory (cy)	Primary Sediment Type (%)		
				Clay & Silt	Fine Sand	Coarse Sand
CU-18	6.10	1,940	18,200	59	29	6



LEGEND:

- ● CU #14 PRE-DREDGE MOORINGS
- ▼ MOORINGS FOR ENTIRE PHASE 1 DREDGING

NOTE:

CLAY & SILT IS LISTED UNDER PRIMARY SEDIMENT TYPES WHEN > THAN 10% BY VOLUME.

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DRAWING TITLE
PHASE 1 CERTIFICATION UNIT LOCATIONS AND SUMMARY INFO
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY JHG	CHECKED BY MG	DRAWING NO. FIGURE 1	SCALE AS SHOWN
DATE 6/15/09	APPROVED BY MG		JOB 442209.01401

Appendix II-I

Hudson River PCBs Superfund Site - Resuspension Performance Standard Exceedance of 7-Day Running Average Control Level Criteria - Engineering Evaluation Report. Report submitted by GE to EPA. July 15, 2009.

John G. Haggard
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July 15, 2009

Doug Garbarini, Chief
Special Projects Branch
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(3 paper copies – 1 unbound; 1 CD-ROM)

Re: Hudson River PCBs Superfund Site – Resuspension Performance Standard Exceedance of 7-Day Running Average Control Level Criteria– Engineering Evaluation Report

Dear Mr. Garbarini:

General Electric has prepared the enclosed Engineering Evaluation Report to assess the exceedances of the 7-day running average Control Level criteria for far-field net PCB loads of Total and Tri+ PCBs that began on June 14-15, 2009 and are continuing to date. The report documents GE's analysis of PCB loads and potential causes of these continuing exceedances, and describes the measures that GE has implemented to control PCB loads resulting from resuspension.

Throughout Phase 1, as documented in the report, GE has employed best management practices in an effort to control PCB resuspension associated with dredging operations. GE has implemented these measures in lock-step with EPA's oversight of the project, seeking the Agency's input and concurrence on evaluation and implementation of all reasonably available measures to limit PCB loss to the water column. These practices include operational controls affecting tug and dredging operations, advanced control of bucket swing times, control of movement of barges and sizes of equipment, sheen containment, flow-related operational restrictions, and ongoing training to ensure adherence to best management practices.

Despite these best efforts, PCB loads remain elevated, leading to ongoing exceedances of the Control Level for 7-day average daily PCB loads for both Total and Tri+ PCBs. GE expects this trend to continue and possibly accelerate as dredging moves into areas of higher PCB concentration and production rates continue to ramp up.

In addition to reviewing the 7-day average PCB loads, GE has evaluated the cumulative net mass of PCBs passing the monitoring stations in relation to the Phase 1 Control Levels for total load of 117 kg (Total PCBs) and 39 kg (Tri+ PCBs). As discussed in the report, to date about 98 kg of Total PCBs have passed the Thompson Island station and about 58 kg have passed the Lock 5 station.

In light of these data, GE estimates that the Phase 1 Control Levels for Total PCB and Tri+ PCB mass will be exceeded in the near future, possibly within the next one to two weeks at Thompson Island. Of great significance, if loading rates continue at the levels seen in the last few weeks or rise, the total load for Phase 1 dredging project will exceed the Control Level by several fold.

GE will continue to work closely with EPA to address these issues, but at this point, short of greatly reducing the amount of sediment removal during Phase 1, GE is not aware of any potentially viable engineering practices that should be considered for Phase 1 that GE has not already implemented. If EPA is aware of any such practices that are consistent with the scope of Phase 1 set out in the Consent Decree, we ask you to bring them to our attention.

We understand that EPA is well aware of these facts, not just from receipt of daily and cumulative data reports but also from daily briefings and other meetings in which this issue has been specifically addressed. At this point, however, GE needs clear direction from EPA whether to continue with the current schedule for Phase 1 dredging in light of the imminent exceedance of the Control Levels for total PCB loads. Unlike certain concentration-based limits, there is no immediate requirement in the Engineering Performance Standards to cease dredging when the load limits are exceeded. However, the limits were established by EPA for specific reasons, in particular to limit the net increase of PCB load to the lower river caused by the dredging project, and so GE needs to clearly understand EPA's views on this important issue.

Please contact me to discuss these matters further or if you have any questions regarding the enclosed report.

Sincerely,

John G. Haggard
Manager, Site Evaluation and Remediation Program

Enclosure

cc:

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U.S. Department of Justice
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July 14, 2009

RESUSPENSION PERFORMANCE STANDARD
EXCEEDANCE OF 7-DAY RUNNING AVERAGE CONTROL LEVEL CRITERIA
ENGINEERING EVALUATION REPORT
HUDSON RIVER PROJECT PHASE 1 DREDGING OPERATIONS

Introduction

This Engineering Evaluation Report has been prepared by General Electric (GE) pursuant to the Phase 1 Performance Standards Compliance Plan (PSCP) to assess the exceedances of the 7-day running average Control Level criteria for far-field net PCB loads of Total and Tri+ PCBs that began on June 14-15, 2009 and are continuing to date. As described in detail below, the PCB loads that have been calculated for far-field stations downstream of the dredging areas have, since that date, exceeded those criteria, which are set out in the Phase 1 PSCP based on the Resuspension Performance Standard established by EPA for the Phase 1 dredging project, on all but the most recent days. This report presents the data supporting that conclusion and provides GE's most current understanding and analysis of the factors that are most likely contributing to the exceedances. It also describes GE's ongoing implementation of best management practices to attempt to limit downstream PCB loads, and assesses other available means to control resuspension of PCBs to the water column, as well as ongoing analyses to better understand the processes that are contributing to the exceedances.

The available data and analysis have significance that go beyond the 7-day running averages. EPA's Resuspension Performance Standards also include Control Levels for total PCB loads for the Phase 1 project. As discussed in the report and as GE has discussed with EPA, the PCB loads for the Phase 1 project for both Total and Tri+ PCBs (calculated as discussed below) will exceed applicable Control Levels within the next one- to two-week period of dredging at some of the monitoring stations, even though only about 20% of the sediment volume targeted for Phase 1 will have been removed. Based on current trends in PCB loading, GE expects that if Phase 1 dredging continues according to the current schedule (which includes increased production levels and dredging in areas of higher PCB concentrations), the total PCB load will exceed the Control Standards several-fold at all or some of the monitoring stations.

Background

Resuspension Performance Standard and PSCP Requirements

EPA's Resuspension Performance Standard contains both concentration-based and mass-based limits on PCBs released to the water column during Phase 1 dredging. Since Phase 1 dredging began, there have been no exceedances of the concentration-based limits.

In terms of mass-based limits, the Resuspension Performance Standard criteria for downstream PCB loads include metrics for a running 7-day average daily net load and a maximum net load loss for Phase 1. The net load is the load beyond what would be expected if dredging was not occurring and is meant to estimate the additional PCBs added as a result of the dredging project. The metric values set forth in that standard have been adjusted, with EPA-approval, based on the targeted Phase 1 removal volume, as described in the Phase 1 PSCP. The adjusted values for these load criteria are shown in the table below:

Performance Metric	Evaluation Level		Control Level	
	Tri+ PCB	Total PCB	Tri+ PCB	Total PCB
7-day Average Net PCB Load	180 g/d	541 g/d	361 g/d	1,080 g/d
Phase 1 Dredging Net PCB Load			39 kg	117 kg

This report is triggered by exceedance of the Control Levels for the 7-day average net PCB load of 361 g/d Tri+ PCBs and 1,080 g/d Total PCBs. It additionally discusses implications for the annual Control Levels for Phase 1 dredging net PCB load of 39 kg Tri+ PCBs and 117 kg Total PCBs.

EPA was initially notified of the exceedance of the Total PCB 7-day average daily load Control Level on June 14, 2009, and has been kept continually apprised of the continuing exceedances through weekly reports, daily data review meetings and weekly EPA progress meetings.

The EPA-approved PSCP requires that, in the case of an exceedance of a Control Level criterion under the Resuspension Performance Standard, GE must: (a) conduct an engineering evaluation, including investigations as appropriate, in an effort to determine the cause of the exceedance; (b) evaluate potential engineering solutions; (c) develop a proposed engineering solution (unless the EPA field representative determines that no such solution is necessary); and (d) submit to EPA an Engineering Evaluation Report, which presents the results of the investigative engineering evaluation and the evaluation of potential engineering solutions and sets forth the proposed engineering solution (if any) and a proposed schedule for implementing that solution – or, if the solution would not require a modification of the Phase 1 Final Design Report or the Remedial Action Work Plan for Phase 1 Dredging and Facility Operations, documentation of implementation of the solution. These requirements are addressed in the later sections of this Engineering Evaluation Report.

Monitoring of PCB Concentrations

Under the Phase 1 Remedial Action Monitoring Quality Assurance Project Plan (RAM QAPP), PCB concentrations are measured at a number of locations at least 1 mile downstream of the dredging operations, which are referred to as “far-field stations.”

This monitoring program includes daily PCB measurements at three far-field stations, located at Thompson Island, Lock 5 (Schuylerville), and Waterford. From the beginning of Phase 1 through July 6, 2009, the analytical method used to measure PCBs at Thompson Island (PCB Method 508) did not measure PCBs at the homolog level, but rather only provided a Total PCB result, and thus cannot be used to determine the concentrations of Tri+ PCBs. As a result, only Total PCBs have been reported for the Thompson Island station. At the other two far-field stations (and for Thompson Island after July 7), the analytical method used, the modified Green Bay Method (mGBM), measures both Total PCBs and PCB homologs and thus allows for determination of Tri+ PCB concentration, as well as Total PCB concentration.

Calculation of Net Load

The average gross PCB mass (i.e., PCB load) passing each far-field monitoring station is computed for each sample collection period by multiplying the measured PCB concentration (either Total PCB or Tri+ PCB) by the average river flow. The river flow is computed from the 15-minute flows reported by the USGS for the Fort Edward, Batten Kill and Waterford gaging stations using the following equations:

> Flow at Thompson Island = Flow at Fort Edward + 0.44 Flow on Batten Kill at Battenville
>
> Flow at Lock 5 = Flow at Fort Edward + 0.48 Flow on Batten Kill at Battenville
>
> Flow at Waterford = Flow at Waterford gage

It should be noted that USGS will be recalculating the correction factor used at the Fort Edward gaging station to account for the change in water level at that location due to the installation of the rock dike. When the correction factor has been issued, GE will recalculate the load at Thomson Island Dam and Lock 5 to account for the difference.

The portion of the PCB load attributed to the dredging project, termed the net PCB load, is estimated by subtracting a baseline load from the gross PCB load. The baseline load is estimated from the data collected during the Baseline Monitoring Program, which occurred in the years prior to dredging. Various methods of analysis have been evaluated and discussed between EPA and GE and a final method for setting baseline load has not been established. In the interim, the upper 95% confidence limit of the mean baseline PCB load for a each calendar month (e.g., May, June, etc.) is used as the baseline load for that month. The values for each station are shown below.

Summary of baseline Total and Tri+ PCB loads for the automated far field stations

Month	Thompson Island		Lock 5		Waterford	
	Total PCB Load (g/day)	Tri+ PCB Load (g/day)	Total PCB Load (g/day)	Tri+ PCB Load (g/day)	Total PCB Load (g/day)	Tri+ PCB Load (g/day)
May	610	182	809	259	748	291
June	664	235	902	343	882	402
July	646	246	948	413	846	425
August	321	130	439	208	419	243
September	264	99	306	122	338	158
October	544	184	597	214	687	291
November	428	97	533	153	699	285

The most accurate methodology for calculating baseline loads is not fully resolved; GE is continuing to investigate methods for calculating baseline load and will continue to work with EPA on that issue.

Ongoing and Projected Exceedances of Phase 1 Control Levels for PCB Load

Based on the data and methods described above, GE has calculated the 7-day average net PCB load for the relevant time period at the Thompson Island, Lock 5 (Schuylerville) and Waterford monitoring stations. The results for Total PCB are shown in Figure 1. These results show that at Thompson Island, the 7-day average PCB load has been above the Evaluation Level consistently and has been above the Control Level for 47 of 58 days and continuously from June 14 to July 11. The PCB load is lower at the Lock 5 and Waterford stations, but also has frequently exceeded the performance standard. At Lock 5, the PCB load has been above the Evaluation Level for 45 days and the Control Level for 26 days. At Waterford, the PCB load has been above the Evaluation Level for 36 days and in excess of the Control Level for 22 days.

The results for the 7-day average net load of Tri+ PCBs at Lock 5 and Waterford are shown in Figure 2. (As noted above, Tri+ PCBs were not measured at Thompson Island through July 6, due to use of a different PCB method at that station.) At Lock 5, the Tri+ PCB load has been routinely above the Evaluation Level and above the Control Level for 43 days and every day from June 15 to July 6. The situation is similar at Waterford where the Control Level was exceeded for 33 days and every day from June 18 to July 3.

In addition to reviewing the 7-day average PCB loads, GE has assessed the cumulative net mass of PCBs passing the monitoring stations in relation to the Phase 1 Control Levels for total load of 117 kg (Total PCBs) and 39 kg (Tri+ PCBs). Based on the data and methodology described above, those calculations are shown in Figure 3, current through July 9, 2009. To date, about 98 kg of Total PCBs have passed the Thompson Island station and about 58 kg and 52 kg have passed the Lock 5 and Waterford stations, respectively. In terms of Tri+ PCBs, about 33 kg have passed Lock 5, and about 28 kg have passed Waterford. As discussed above, the results for Waterford are still undergoing review based on evaluation of the best methodology for calculating baseline loads.

This analysis shows that the total loads relating to Phase 1 operations are rapidly approaching the annual Control Levels. GE has projected the dates at which the Control Levels will likely be exceeded based on the net PCB load rates calculated using the above-described methodology. Based on a net daily PCB load at Thompson Island of about 2.0 kg/d Total PCBs (see Figure 1), the Phase 1 Control Level for PCB load (Total PCBs) will be reached at that location in about 10 days.

The Phase 1 Control Level for Total PCBs will be reached somewhat later at the Lock 5 station because of the lower cumulative mass and lower daily PCB load. At Waterford, where the load has been about 0.5 kg/d, a continuation of the present condition might result in the Control Level being reached in about 18 weeks, depending on baseline load calculations. At Lock 5, 33 kg of Tri+ PCBs have passed and the recent loading rate of about 0.35 kg/d will cause the Control Level for Tri+ PCBs to be reached in about 17 days.

GE notes that CUs with higher PCB concentrations are targeted for dredging in the coming weeks. As a result, GE expects the PCB load to increase during that period. As a result, the calculations presented above – which are based on recent PCB load rates – may overstate the amount of time before Control Levels are reached.

The PCB loads presented above result from removal of approximately 20% of the sediment volume targeted for removal in Phase 1. If PCB loading as described above continues at the levels seen in the last few weeks or rises, the full Phase 1 dredging project will likely cause an exceedance of the Control Level for total load by several fold.

Description of Investigative Engineering Evaluation

GE has conducted a detailed investigation to assess the potential causes of these continuing exceedances. The investigation has consisted of several distinct tasks:

1. a review of the work activities and vessel movements in the Phase 1 dredge areas;
2. an analysis of the average PCB concentrations in the areas dredged;
3. an analysis of the relationship between river flow and PCB load;
4. an analysis of the relationship between TSS and PCB load;

Results of each of these tasks is discussed in the next section of this report, followed by a conclusion of the overall results of the investigation.

Results of Investigative Engineering Evaluation

In summary, GE has evaluated the relationship among numerous variables likely to affect PCB loads and re-suspension (e.g., timing of dredging and debris removal, use of support equipment like tugs, sediment removal rates, PCB mass removal rates and river flow), but given the interplay among these factors, has not yet been able to discern a strong relationship between PCB load and any single variable. Flows above certain levels and PCB removal rates are suspected to be important. As monitoring continues, additional studies are undertaken, and production ramps up, we expect to better understand the factors controlling the PCB loading. This section provides a summary of the analysis performed to date.

1. Review of dredging and related activities

Debris Removal

Removal of targeted debris began on May 15, 2009. Two debris removal rigs have operated in Phase 1 dredge areas removing debris with mechanical excavators outfitted with a grapple attachment. Figure 4 shows the number of debris targets removed during the period May 15 through June 16, 2009, including the debris targets shown in the Contract Drawings (referred to on the figure as "design debris") as well as additional targets identified by the dredging contractor.

Removed debris consisted of large and medium sized wooden objects, sunken logs, fallen trees, large and medium sized metal objects and other objects of various sizes. Debris removal commenced in CU 9 in the West Channel of Rogers Island, and then moved to CU 5, CU 6, CU 1, CU 7, CU 8, CU 2, CU 10, CU 3, CU 4, CU 17, CU 18, CU 11, CU 12, CU 13, CU 14, CU 15 and CU 16. The number of debris targets identified by the contractor was greatest in the northern CUs in the West and East Channels of Rogers Island, where shallow water depths allowed the contractor to spot debris from above the waterline. As debris removal activities moved into CUs with greater water depths, the amount of contractor-identified debris targets dropped significantly. In total, 385 debris targets identified during design and approximately 536 debris targets identified in the field by the contractor were removed.

Inventory Dredging

Inventory dredging began on May 15, 2009 in CU 9, with one 385 dredge and one 320 dredge; this is considered the beginning of an initial two-week test of dredging techniques. The 385 dredge uses a 5 cubic yard (cy) enclosed environmental clamshell bucket while the 320 dredge uses a 1 cy enclosed environmental clamshell bucket. Sediment encountered in CU 9 was small wooden debris, coarse sand and gravel. During the two-week test, it was established that the dredging equipment functioned as planned, but that high river flows and large intra-day river flow fluctuations made it difficult to use the larger 385 dredge in the shallow areas of the West Channel. Following discussions between EPA and GE, adjustments were made to the dredging operations, including establishing a 7,000 cfs river flow limit for dredging in the West Channel and restricting equipment to lighter 320 dredges with shallower draft mini-hopper barges.

At the end of the two-week test, dredging began in CUs 1 and 2 using two 385 dredges, and production rates began to increase. The sediment in CUs 1 and 2 consisted of finer sands and silts within a wood debris matrix. At least half of all the dredged sediment in both CUs consisted of wood debris. During the week of June 7, dredging began in CUs 5 and 6 with three additional 320 dredges using mini hopper barges. The mini hopper barges were loaded in the shallow waters of CUs 5 and 6 and transported south to deeper water in CU 10 where they were off-loaded to a hopper barge using a 385 dredge.

Shale bedrock was encountered in both CUs 5 and 6 with pockets of medium sized debris, boulders, cobbles, gravel and coarse sand in between the bedrock. High flows above 7,000 cfs were experienced throughout the month of June causing work cessations in the West Channel. When practical during periods of high flow, dredges were relocated from the West Channel to CU 12 to allow dredging to continue. During the week of June 14, an additional 320 dredge was brought in to work in CUs 1 and 2. In the week of June 21, an additional 385 dredge was mobilized to work in CU 17 where fine grained silts and sands with small quantities of wood debris were encountered.

In the week of July 5, 2009, dredging began in CU 3 with a 385 dredge and in CU 7 with a 320 dredge. The sediment in CU 3 has consisted of finer sands and silts within a wood debris matrix. Similar to CUs 1 and 2, the wood debris accounts for at least half of the volume of material in the CU 3 areas removed thus far. An additional 385 dredge was brought into service in CU 17, bringing the total number of active dredges to ten.

A summary of the number of dredges, areas dredged and volume dredged by week follows.

Week	CUs Dredged	Average # of Dredges	Cubic Yards Removed	Comments
5/10 to 5/16	9	2	400	High flows and large fluctuations shut down dredging
5/17 to 5/23	9	2	200	Dredging began with new flow limit (7000 cfs) and tug boat best management practices
5/24 to 5/30	9	3	1,000	Additional 320 dredge added
5/31 to 6/6	1, 2, 9	4	5,100	Dredging in East Channel began with 385 dredges in CUs 1 and 2
6/7 to 6/13	1, 2, 5, 6, 9	7	8,100	Dredging began in CUs 5 and 6 with three additional 320 dredges
6/14 to 6/20	1, 2, 5, 6, 12	8	10,200	Additional 320 dredge added and dredges redeployed due to high flows in West Channel

6/21 to 6/27	1, 2, 5, 6, 12, 17	8	9,400	Dredging began in CU 17 with an additional 385 dredge
6/28 to 7/4	1, 2, 5, 6, 17	9	6,200	Three 385 dredges and six 320 dredges in 5 CUs
7/5 to 7/11	1, 2, 3, 5, 6, 7, 17	10	11,000 (estimated)	Dredging began in CU 3 and an additional 385 dredge was added to CU 17

Figure 5 provides a 7-day running average of daily inventory removal rates to the week ending July 4, 2009. The figure shows total removal and also the amounts attributable to removal in the East Channel of Rogers Island (CUs 1 and 2) and the open river areas (CUs 5, 6, 9, 12, and 17). While this figure indicates that, as a general matter, an increase in sediment removal coincides with an increase in PCB loading, the data are not sufficient to draw any firm conclusions about a relationship between production rate and PCB loads.

2. Analysis of PCB concentrations in areas dredged

The PCB concentration of the sediments being dredged is an obvious factor that might affect PCB load. A total of 18 CUs have been targeted for inventory sediment removal during the Phase 1 dredging season. The 18 CUs account for 264,500 cy of inventory sediment removal with average Total PCB concentrations in those sediments ranging from 12 ppm (CU 1) to 289 ppm (CU 17) and average Tri+ PCB concentrations ranging from 10 ppm (CU 1) to 66 ppm (CU 4). The average Total PCB concentration for Phase 1 CUs is 111 ppm and the average Tri+ PCB concentration is 32 ppm.

To date, removal of inventory sediment has occurred in CUs 1, 2, 5, 6, 9, 12 and 17 with a total of approximately 40,600 cy of target inventory sediment removed. Of these CUs, only CUs 3, 6 and 17 have PCB concentrations above the average concentrations for Phase 1 CUs. 16,400 cy of inventory sediment has been removed from these higher concentration CUs; the remainder of the sediment removed to date has come from CUs with lower than average PCB concentrations.

Inventory dredging will begin shortly in CUs 3, 7 and 18. CUs 3 and 18 have some of the highest PCB concentrations found in Phase 1 dredge areas.

The PCB concentrations, inventory sediment volumes and status of the different Phase 1 CUs are shown below, with numbers accurate to the week ending July 4, 2009.

Summary of PCB Concentrations, Inventory Volumes and Dredging Status, by CU

CU	Average PCB Tri+ by volume (ppm)	Average PCB Tot by volume (ppm)	Total Inventory Sediment (cy)	Inventory Sediment Removed as of 7/4/09 (cy)	Current Dredging Status on 7/4/09
CU 1	10	12	13,000	10,700 (82%)	Inventory Cleanup
CU 2	35	122	14,500	10,400 (72%)	Inventory Removal
CU 3	55	217	26,700	0	Next Inventory CU
CU 4	66	254	18,300	0	Inactive
CU 5	22	66	9,500	6,600 (69%)	Inventory Removal
CU 6	42	114	9,100	2,100 (24%)	Inventory Removal
CU 7	25	72	15,500	0	Next Inventory CU
CU 8	23	81	14,200	0	Inactive
CU 9	18	51	12,700	4,900 (39%)	Inactive
CU 10	17	34	10,900	0	Inactive
CU 11	22	68	11,300	0	Inactive
CU 12	25	47	14,800	2,000 (14%)	Inactive
CU 13	20	60	12,500	0	Inactive
CU 14	33	110	19,500	0	Inactive
CU 15	32	106	20,200	0	Inactive
CU 16	33	85	12,300	0	Inactive
CU 17	63	289	11,300	3,900 (35%)	Inventory Removal
CU 18	42	217	18,200	0	Next Inventory CU
All	32 (Avg)	111 (Avg)	264,500	40,600 (15%)	

At this point, the data are not sufficient to draw any clear conclusions about the nature of the relationship between PCB concentrations and load. More detailed analyses are planned in an effort to define PCB concentration on a sub-CU scale so as to better match the concentrations of the sediment being dredged and PCB load. The combination of this refined analysis and the additional data generated in the coming weeks should provide greater insights about the relationship between PCB concentration and PCB load.

3. Analysis of the relationship between river flow and net load

One of the factors evaluated in GE's investigation is the possible relationship between river flow and PCB net load. 15-minute average flows at Fort Edward throughout the Phase 1 dredging period are shown in Figure 6. The review of the flow data against historical data shows that, on average, flows during this period have run above typical seasonal levels, due to higher than normal rainfall that has caused the Black River – Hudson River Regulating District to increase the duration of the releases from the Sacandaga Reservoir during this period.

Early in the project, GE in consultation with EPA revised certain dredging practices to account for high flows and large intraday fluctuations of river flows. As set forth in the PSCP, dredging was to be halted when flows exceeded 10,000 cfs, measured at the Fort Edward gauging station. The installation of the rock dike in the East Channel of Rogers Island functioned as intended to reduce flows in that channel to facilitate working in that narrow area; however, the West Channel did not have the protection of the rock dike and was subject to the high flows. Based on high load levels during the early dredging period, GE and EPA agreed that dredging in the West Channel would be halted when flows exceeded 7,000 cfs (subsequently adjusted to 8,000 cfs then adjusted again to 8,500 cfs during daylight hours and 8,000 cfs at night).

Those efforts as well as the other best management practices put into effect during that time period, appeared to have some initial success, as loads dropped in the next few weeks. However, as noted earlier, PCB loads have exceeded the Control Levels for PCB load consistently since mid-June.

Based on all the data, GE's initial analysis indicates that while there may be some relationship between flow and load, the data to date do not indicate a strong relationship. River flow likely influences net PCB load because it can affect the fate of sediments disturbed by the dredging operation. The higher velocities experienced at higher flow can cause greater movement of sediments disturbed or resuspended by the dredging operations and provide greater opportunity for PCBs to desorb from the sediments and be transported downstream. Some of the high net loads in May do occur at higher river flow and the low net loads between June 7th and June 11th coincide with lower river flows. However, there are also days where higher loads occur at lower flows and lower loads occur at higher flows. Overall, there is substantial variability in PCB concentration within narrow flow ranges as seen in Figure 7. This variability likely reflects the other factors that affect net PCB load, including dredging rate, sediment PCB concentrations, sediment type, debris, etc. These factors confound efforts to detect the impact of river flow on net PCB load. As the project progresses, the greater data set should provide an opportunity to sort out the influence of the various factors.

4. Analysis of the relationship between TSS and load

GE has reviewed the available data to evaluate whether there is a relationship between near-field total suspended solids (TSS) and far-field PCB loads. Data from the initial period of dredging showed some elevation in TSS levels, although well below EPA's TSS performance standard, which were associated with exceeding the Control Level for the 7-day running average Total PCB load in the period of May 16-19, 2009 (dredging was halted before the end of the 7-day period). GE's initial analysis indicated that the elevated TSS may have been caused by vessel movements in shallow water stirring up sediments during periods of high flows.

GE provided an Engineering Evaluation Report to EPA on May 21, 2009 summarizing the data and evaluating the possible cause of the exceedance. As a result, GE recommended and, with EPA concurrence, implemented a series of best management practices to reduce sediment disturbance, including the following:

- using lighter 320 dredge units and mini-hopper barges in the shallow areas of CU 9 (the West Channel);
- halting dredging operations in CU 9 when flows go above 7,000 cfs (subsequently adjusted to 8,000 cfs); and
- limiting the engine speed of tugs operating near dredge units to less than 1,000 rpm, using additional tugs (rather than increasing speed) when greater tug force is required.

(Note that subsequently the river flow limitation on dredging of 8,000 cfs was expanded to CUs 5 and 6, which are also located in the West Channel, and was later modified for those CUs to require dredging to cease when the river flow exceeds 8,500 cfs during daylight hours and 8,000 cfs at night.)

GE also proposed to conduct a near-field PCB transect monitoring program to better understand PCB loadings associated with debris removal, dredging, and support equipment operations. Following EPA approval, GE implemented that program.

The transect monitoring program included sampling downstream of silt curtains. The analysis was intended to demonstrate if the reductions in TSS associated with the silt curtains also reduced PCB loading.

Pursuant to the program, GE conducted near-field water column monitoring for PCBs along three transects within the Northern Thompson Island Pool (NTIP). Transects were located just downstream of the silt curtain spanning the East Channel of Rogers Island, the downstream section of the West Channel of Rogers Island, and downstream of CU 16 at approximate river mile 193.2 (in NTIP). Water samples were collected at equally spaced nodes along each transect using a multiple aliquot depth integrating sampler, consistent with the Baseline Monitoring Program (BMP) methodology. Transects were sampled on four separate days in late May: May 22, 25, 26, and 28. Flow measurements or flow estimates were made on May 26 to allow calculation of PCB mass loadings. Sampling and analysis results from these near-field PCB transects were summarized in a memo to the EPA dated June 11, 2009.

Additionally, on June 19, two transect composite PCB samples were collected, one 30 meters upstream and one 30 meters downstream of the silt curtain located at the downstream end of the East Channel of Rogers Island. These samples consisted of a composite of vertically integrated samples collected at five nodes along transects perpendicular to river flow using the multiple aliquot depth integrating sampler. Samples collected from the downstream transect were collected from the same five node locations as the samples collected in late May. The sampling results from June 19, 2009 were as follows:

Composite Sample Location	PCB (ng/L)	TSS (mg/L)
30m Upstream Silt Curtain	2,260	10.7
30m Downstream Silt Curtain	1,950	5.5

Data collected from the near-field PCB transect monitoring conducted in late May suggest that the West Channel was the primary source of PCB loading at the time of sampling. Loads measured at the NTIP transect were generally consistent with project-related loading measured at Thompson Island Dam. The rock dike in the East Channel appears to be effective, reducing flow from approximately 35% to <2% of the total river flow. Hence, despite elevated PCB concentrations, loadings from the East Channel of Rogers Island represent a small proportion of the total project-related loading.

Dissolved PCB analyses performed during the May 22 sampling event indicate that the bulk of the PCBs (80%) leaving the project areas are in the dissolved form. This fact likely explains why the samples collected upstream and downstream of the silt curtain on June 19 indicate that the silt curtain, although controlling a portion of the solids load, only provides a minimal reduction in PCB load from the East Channel of Rogers Island.

In addition to the results of these sampling activities, GE notes that current TSS levels in the river are low and have generally averaged 2.2 mg/L and 4.2 mg/L at the near-field buoy and transect locations, respectively. Nonetheless, as reported above, net PCB loading is high.

Taken as a whole, these data and evaluations indicate two conclusions. First, the majority of the PCBs being transported from dredge areas are in dissolved form, and not associated with TSS. Second and closely related to the first conclusion, silt curtains are not expected to be particularly effective in reducing PCB loads, since silt curtains do not impede the movement of PCBs in dissolved form.

GE notes that additional analysis will shed further light on these conclusions. In particular, dredging inside silt curtains is scheduled to begin shortly in CU 18. It is expected that this will provide good conditions to further evaluate silt curtain effectiveness, due to the width of the river at that location, the relatively high PCB concentrations found within the silt curtained area, and the size of the silt curtained area.

Investigative Engineering Evaluation – Preliminary Conclusions and Further Evaluation

The data summarized above indicate that far-field PCB load may be related to several factors, including PCB concentrations in the areas dredged, production rate, and river flow. Other conditions such as sediment type, bucket closure, and dredging location may also be important. GE will continue to evaluate all factors as data are accumulated.

As noted above, the far-field PCBs are mostly in dissolved form. As a result, control strategies that rely on particulate control (e.g., silt curtains) are not likely to significantly reduce PCB loading.

The upcoming special studies should providing further information about the mechanisms of PCB release and travel. The Near-field PCB Release Mechanism study, scheduled to begin on July 13, will compare dissolved-phase and particulate-phase PCB releases associated with dredging in CUs 17 and 18 and later in CU 10. The Non-Target Downstream Area Contamination special study will evaluate the amount of resuspended particulate material resulting from dredging operations that settles in downstream areas. As part of the Non-Target Downstream Area Contamination special study, sediment traps were placed downstream of CU 18 on July 9.

Review of Dredging Best Management Practices in Place

Before evaluating whether there are additional controls that might reduce PCB loading, this section summarizes the best management practices currently in place or under evaluation. Some of these were noted earlier, resulting from the initial efforts to control TSS through vessel movement and related operational controls.

Throughout the course of the dredging work and this exceedance period, GE has developed a number of best management practices with the express goal of minimizing sediment resuspension. All of these practices have been implemented after detailed review and discussion with EPA. These practices include the following:

a. <u>Tug speed limits</u>. Tug boats captains have been instructed to minimize their engine speed to 1,000 rpm in an effort to minimize the potential for tugboat wheel wash sediment erosion. If tugs need additional power, the captains have been instructed to request aid from additional tugboats rather than increasing their engine speeds beyond 1,000 rpm. This practice has been in effect since May 19 and appears to have reduced wheel or propeller wash sediment erosion considerably.

b. <u>Tug orientation</u>. When dredging equipment is required to operate near shorelines or in other shallow water areas, the tugboat that is assisting the equipment is placed at the location with the deepest water, i.e., with the stern pointed towards the center of the channel.

c. <u>Restriction of tug use areas</u>. The use of tug boats has been minimized in CUs with shallow water where feasible. For example, carpenter barges outfitted with outboard engines are being used in lieu of tugs to move mini-hopper barges in CUs 5 and 6. When tug boats do need to be used in shallow water

CUs, the dredging contractor attempts to limit that use to times when flows exceed 6,500 cfs, so that the tug propellers are further away from the river bottom.

d. Control of bucket swing times. Dredge operators vary their bucket swing times to minimize resuspension of sediment. First, they slowly place the bucket into the sediment and slowly close the bucket. The bucket is also slowly raised through the water column. As soon as the bucket clears the surface of the water, the speed is increased to move the bucket into the barge hopper as quickly as possible. This has reduced sediment releases from the buckets, as evidenced by a reduction in visible plumes in the immediate vicinity of the dredging operations.

e. Movement of dredge spuds. The practice of “walking” dredges using their spuds has been minimized to the extent possible. This minimizes the number of times and the extent to which spuds disturb the sediment.

f. Bucket closure. The dredging contractor has added side plates to one of the 5 cy dredge buckets to test if this reduces sediment loss when digging in areas with small debris by reducing the possibility that debris will impede bucket closure. To test the side plates the dredging contractor first used the bucket to unload mini-hopper barges from CUs 5 and 6. This has allowed the dredging contractor to observe the affect of side plates when digging material containing debris. The results have been discouraging: the side plates have been ineffective at shearing the debris and have resulted in poorer bucket closure than without the side plates. Based on this experience GE will not be proposing to install side plates on the other buckets and will remove the side plates from the test bucket.

   The dredging contractor will continue to review the performance of the enclosed environmental buckets and may propose to test other modifications in the future.

g. Pace of debris removal. The removal of large debris, cobbles and small boulders is done in a slow and deliberate manner to minimize the resuspension of surrounding sediment. This appears to reduce the occurrence of visible plumes in the vicinity of debris removal operations.

h. Sheen containment. When sheens are observed during dredging operations, they are contained as quickly as possible using containment booms and absorbent pads. This has had limited success due to the oil not absorbing to conventional absorbent pads. The dredging contractor has contacted a number of specialist vendors and is obtaining samples of different absorbent materials to test for effectiveness.

i. Movement of hopper barges. Hopper barge movements are delayed until there is sufficient water to move the barges with minimal sediment resuspension. This has been particularly effective in reducing single event resuspension of sediment.

j. Use of multiple tugs to move hopper barges. Two or more tugs are now routinely used to move loaded hopper barges. This minimizes the need to operate tugs at higher engine speeds.

k. Flow-related restrictions. Only light equipment (i.e., 320 dredges and mini-hoppers) can be used in the West Channel of Rogers Island, and operations in the West Channel have been curtailed to periods when flows are less than specified flow levels – currently 8,500 cfs during the day and 8,000 cfs at night.

l. Ongoing training. The dredging contractor has instituted an additional dredge operator and tugboat captain training and review program to ensure that dredge operators and tug captains are following the guidelines for careful dredging and maneuvering of the equipment, including implementation of the practices discussed above.

On a cumulative basis, the best management practices described above have likely reduced PCB loads associated with dredging. However, most of these practices have been in effect for several weeks, and PCB loads remain high during the same period. Nonetheless, these measures will remain in place.

Description and Results of Evaluation of Potential Engineering Solutions

As discussed above, as Phase 1 has progressed, GE has continued to review and implement potential engineering solutions in close consultation with EPA. A review of the potential engineering solutions listed in Section 2.5.4 of the approved Phase 1 PSCP shows that all of the listed potential solutions have been implemented and are currently being used except for the following:

- modifying the thickness of dredge cuts,
- installing the contingent resuspension controls (which consist primarily of silt curtains at specified locations),
- installing silt curtains in other locations, and
- reducing sediment removal rates or temporarily ceasing dredging operations.

The viability of these potential approaches is discussed below.

- Dredge cuts. Thus far, the depth of cut in most dredge areas has matched or has been less than the ideal depth of cut of the various dredges employed (approximately 18" for the 385 dredge and 6" for the 320 dredge). As a result, further reducing the thickness of dredge cuts does not appear to be a workable option in such areas and there is no reason to believe it would reduce overall PCB loading. In fact, having shallower bites will result in more bucket bites overall; and since buckets are not closing fully this could increase the PCB loss rate. However, as the dredging contractor moves into the deeper depth of cuts in CUs 3, 4 and 17, GE will discuss with EPA whether to modify the thickness of dredge cuts in an effort to identify it is an effective method for reducing sediment resuspension.

- Contingent resuspension controls/silt curtains. As discussed above, the installation of silt curtains, either where specified as contingent resuspension controls or in other areas, is not considered to be an effective method to address the issue of downstream PCB load. Since the majority of PCBs in the water column appears to be in the dissolved phase (as noted above), silt curtains are not expected to be effective in reducing the movement of PCBs downstream. There is also a risk that the additional vessel movement needed to move and reposition silt curtains could increase resuspension. As noted earlier, planned dredging in CU 18 will provide a more robust set of conditions to evaluate the effectiveness of silt curtains in limiting PCB loads.

- Productivity limits. During non-work periods thus far (e.g., Sundays and holidays) it has been observed that PCBs measured at the far-field stations have been considerably reduced. As a result, significantly reducing the rate of sediment removal or temporarily ceasing dredging operations would likely reduce PCB load substantially, but would result in lower dredging productivity that would exacerbate the production shortfall that has already occurred.

In addition to these potential approaches, GE is continuing to evaluate certain other modifications, as described above. These include the evaluation of potential modifications to the dredge buckets, as well as the evaluation of the availability and effectiveness of different absorbent booms. Additionally, GE is continuing to conduct the additional analytical studies described above, including evaluating the relationship between PCB mass being removed in the sediments and PCB loading, as well as the special studies described earlier.

Description of Proposed Actions

As discussed above, GE has not identified any engineering solutions, other than significantly reducing productivity rates, that are likely to result in a significant decrease in PCB loading rates or to significantly retard the progression of the PCB loads to and past the annual Phase 1 Control Levels for total PCB load. Nevertheless, there are some actions that GE proposes to take (without changing the target productivity) in an effort to reduce the PCB load. Specifically, GE proposes the following:

1. Continue use of the best management practices described earlier to minimize resuspension of PCBs associated with particular activities;

2. Consider with EPA the efficacy of modifying the thickness of dredge cuts in deeper cut areas (greater then 2 feet of sediment removal depth) to identify if this is an effective method to control resuspension of PCBs;
3. Evaluate additional modifications to buckets to allow them to close more completely;
4. Evaluate the availability and effectiveness of different absorbent booms to better control surface sheens; and
5. Conduct additional evaluation of the use of silt curtains to reduce PCB loading during dredging in CU 18.

Despite these actions, the Control Levels for total load will likely be exceeded in the near term, at least at Thompson Island and Lock 5. In this situation, the only realistic way to keep from exceeding the annual load limits would be to scale back the amount of sediments removed during Phase 1. However, that approach will obviously result in failure to achieve productivity standards.

Proposed Schedule for Implementing Proposed Actions

GE will continue to use best management practices, and proposes to implement items 2 through 5 in the prior section over the next several weeks. In addition, GE plans to discuss potential changes in the dredging schedule and target production volumes with EPA as soon as possible.

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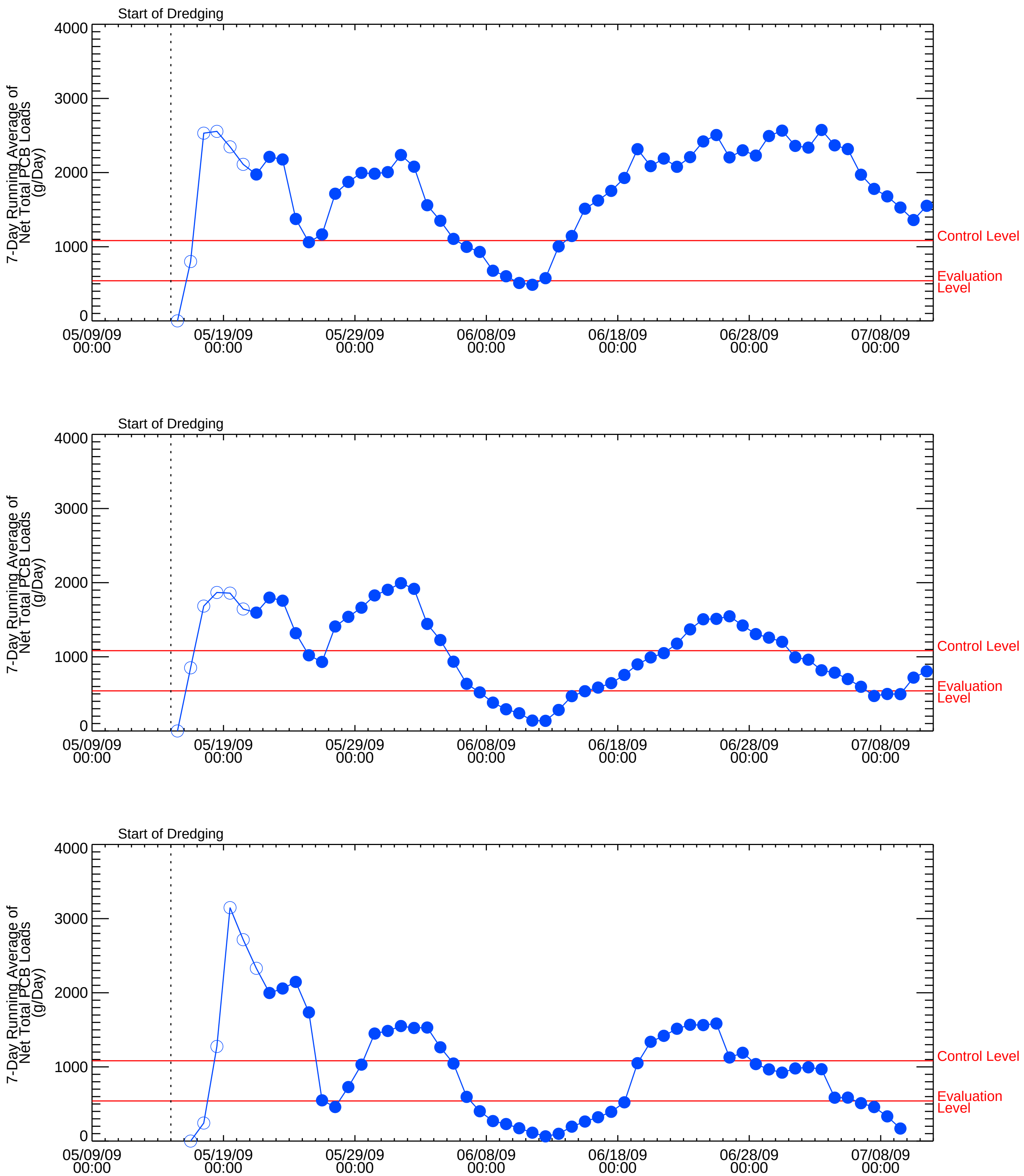

Figure 1. Temporal profiles of 7-day average net Total PCB flux at Thompson Island, Lock 5, and Waterford stations.

○ < 7 days in average
● 7 days in average

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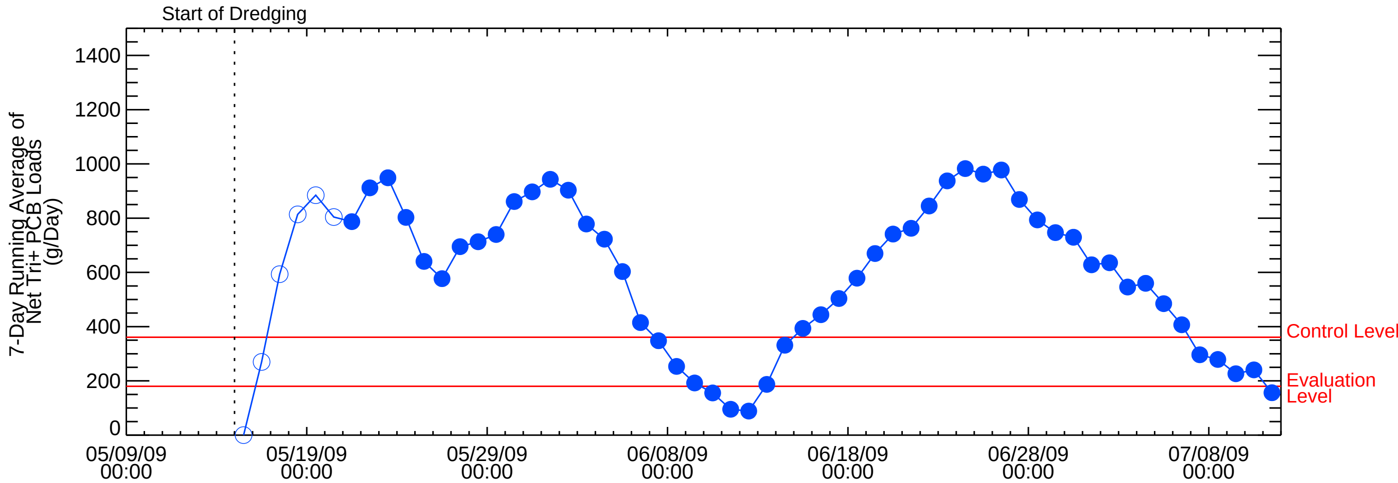


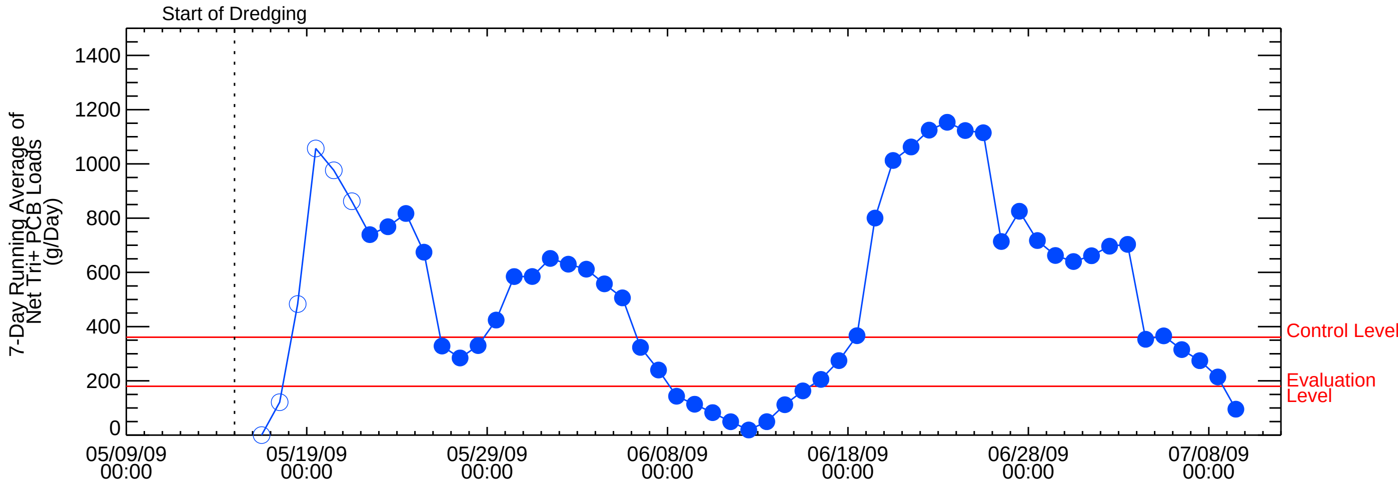
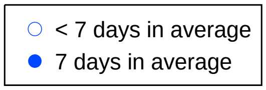
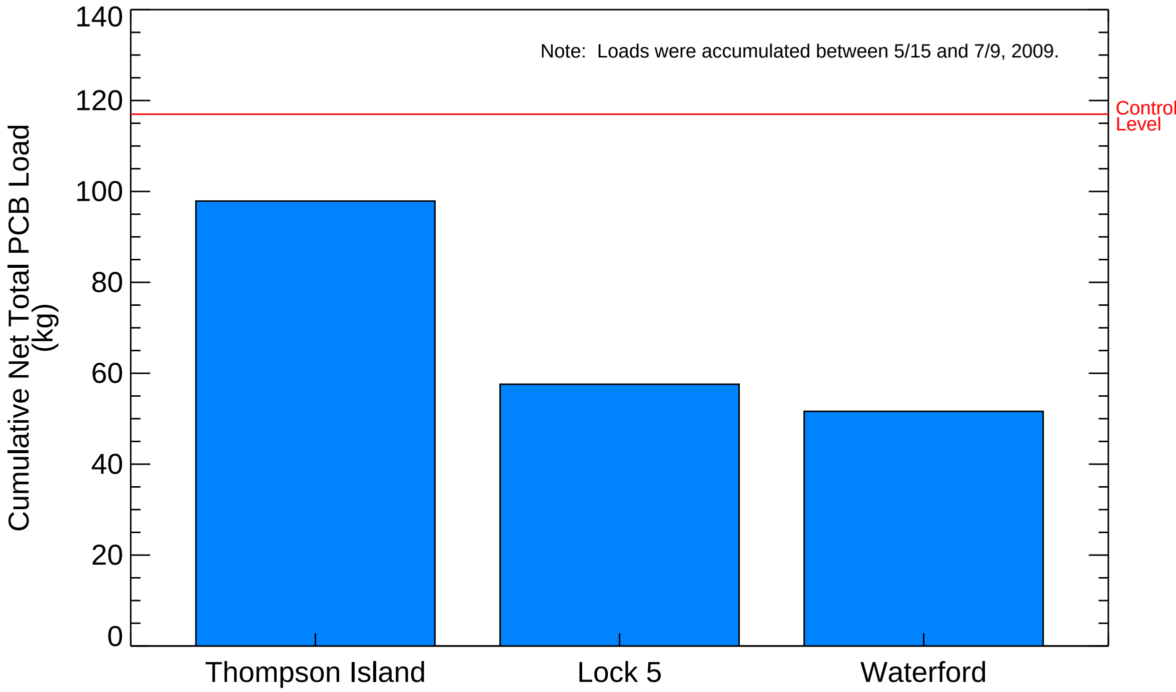


Figure 2. Temporal profiles of 7-day average net Tri+ PCB flux at Lock 5 and Waterford stations.





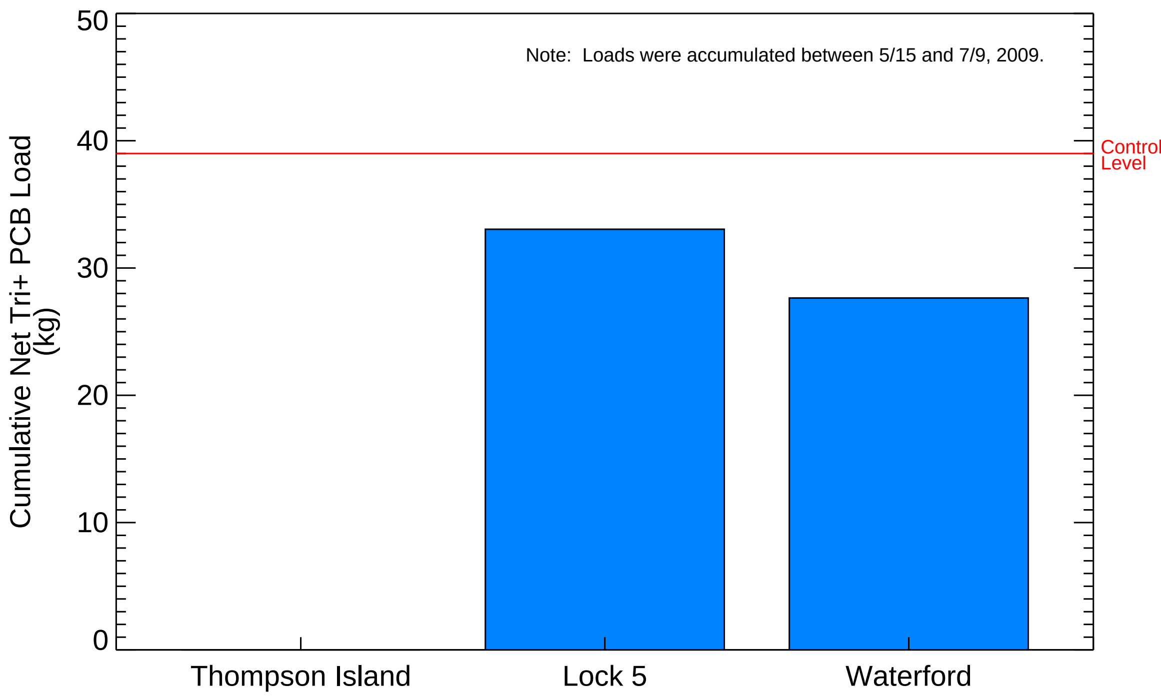


Figure 3. Comparison of cumulative net Total PCB and Tri+ PCB mass passing automated far field stations.

Figure 4   Targeted Debris Removal in Phase 1 Dredge Areas

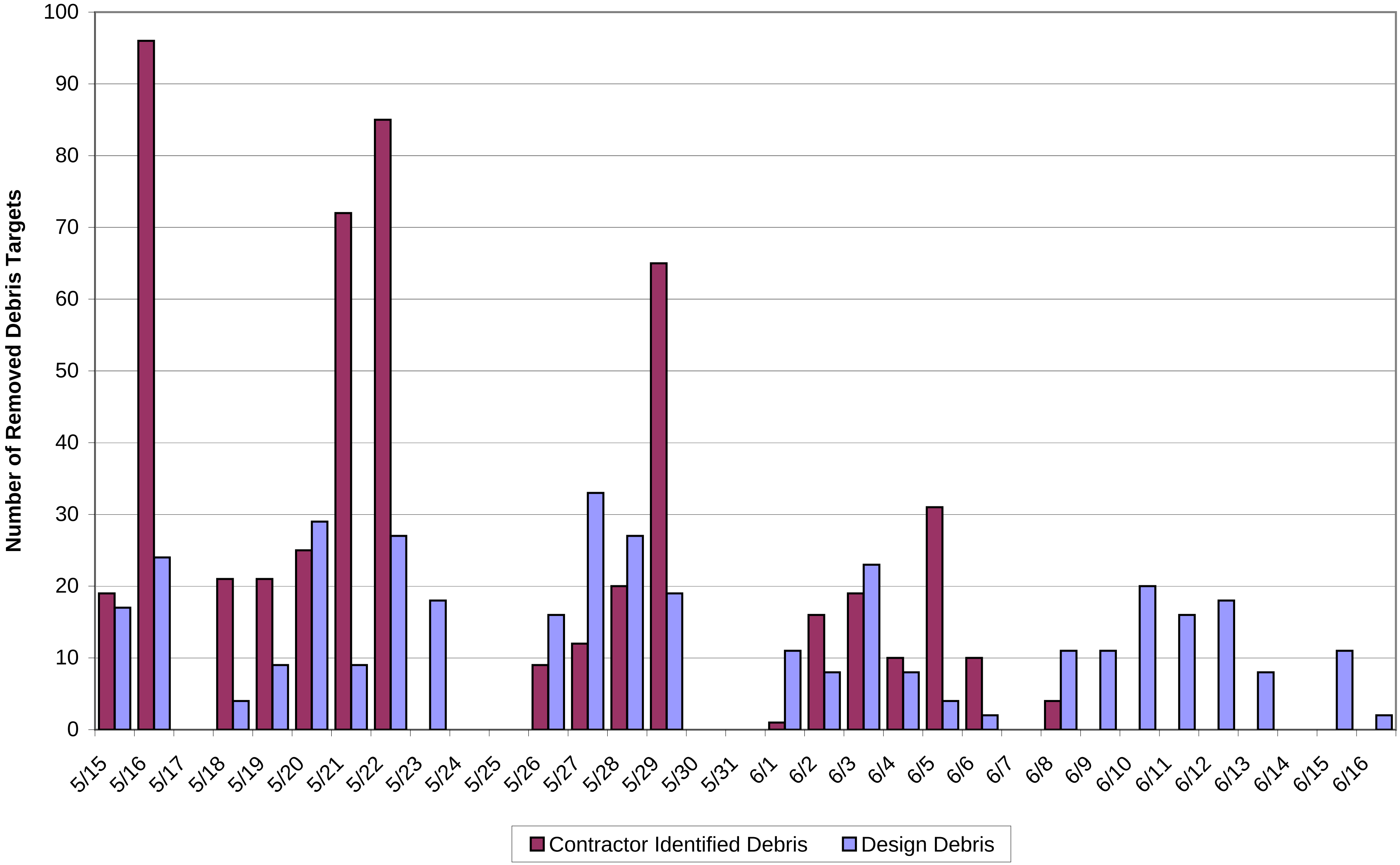
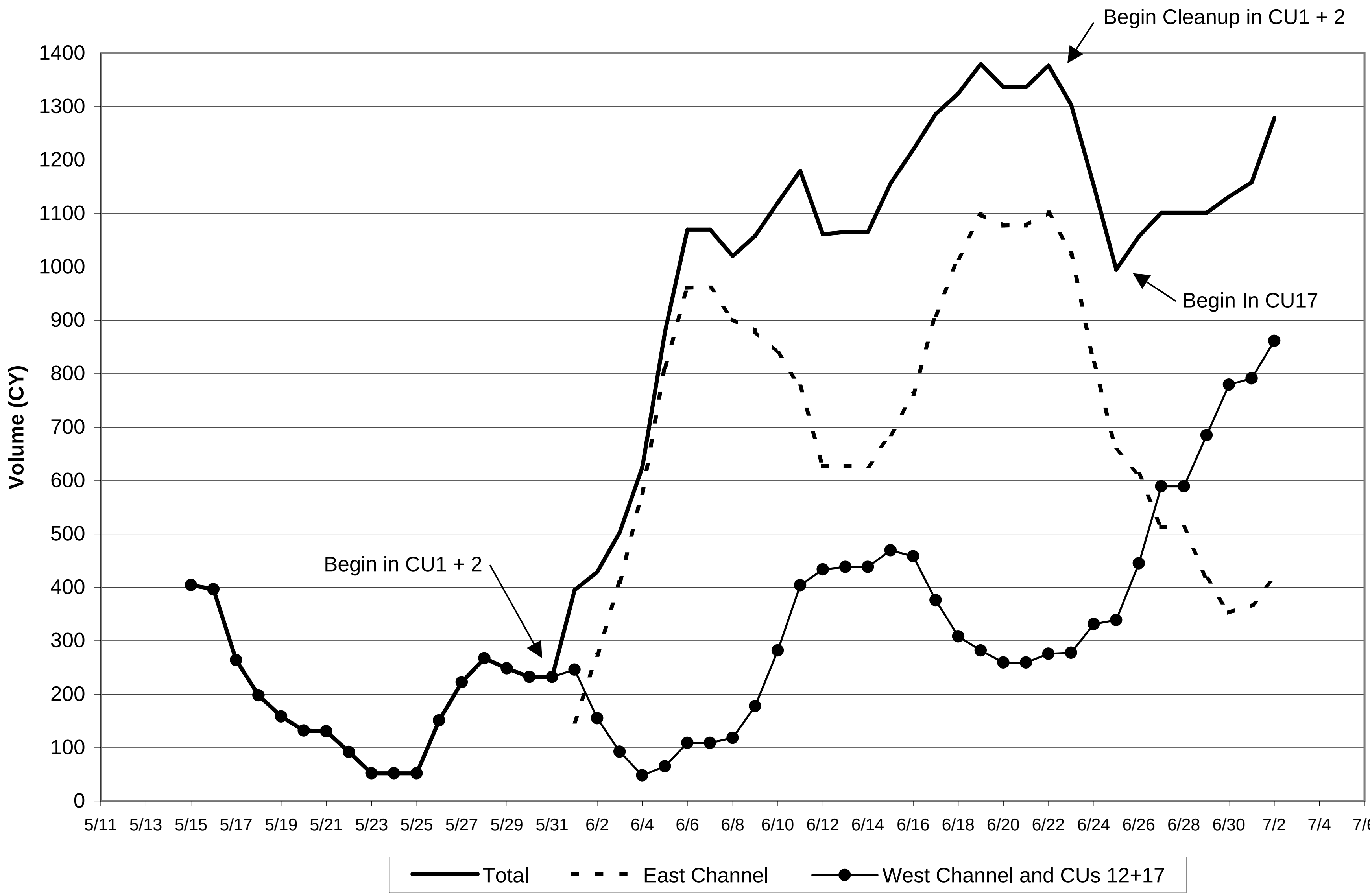


Figure 5 7-Day Running Average of Daily Inventory Removal



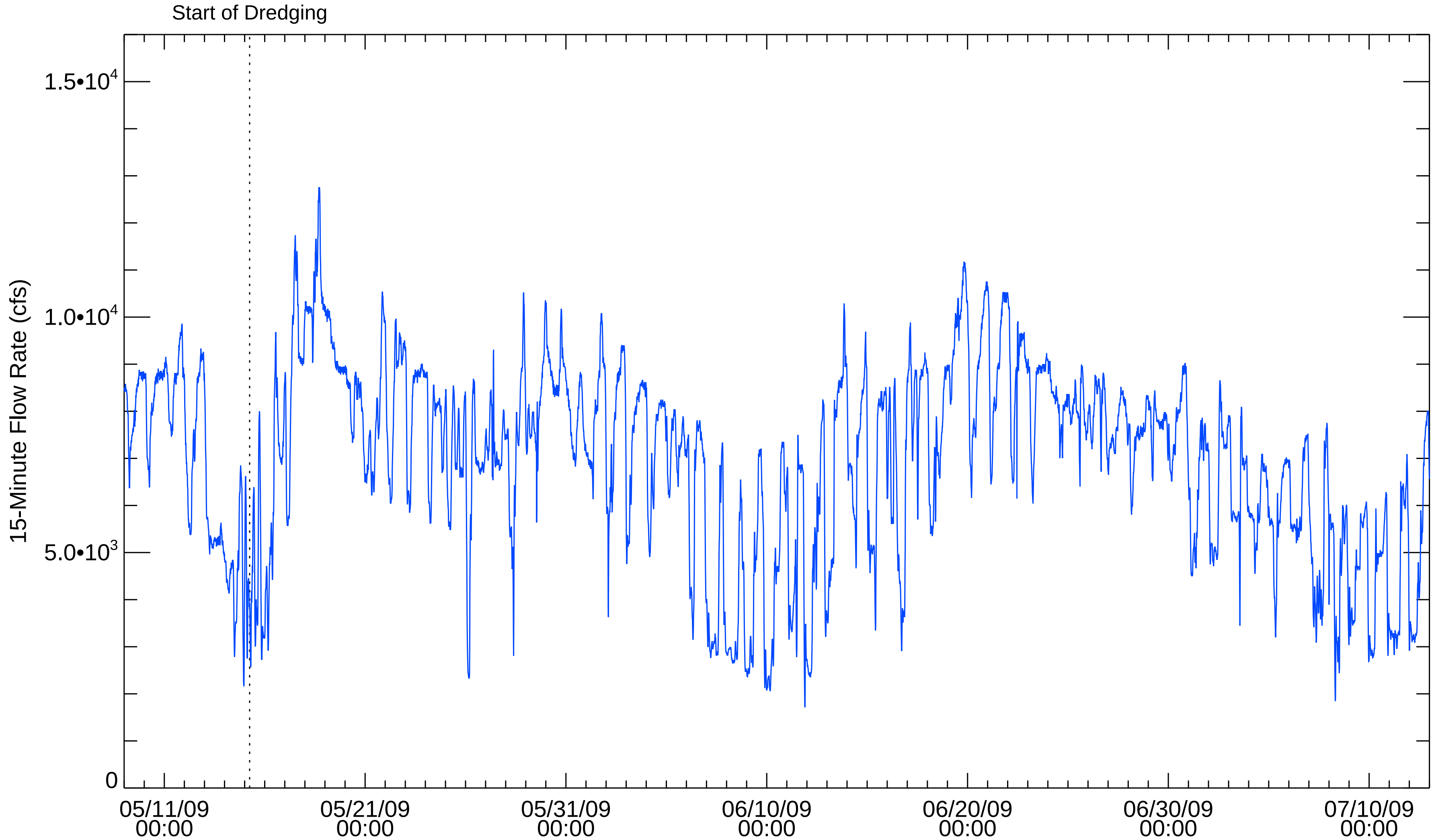


Figure 6. Real-time flows at Thompson Island.

Note: Flow (TI) = Q(Fort Edward) + 0.44 x Q(Batten Kill)

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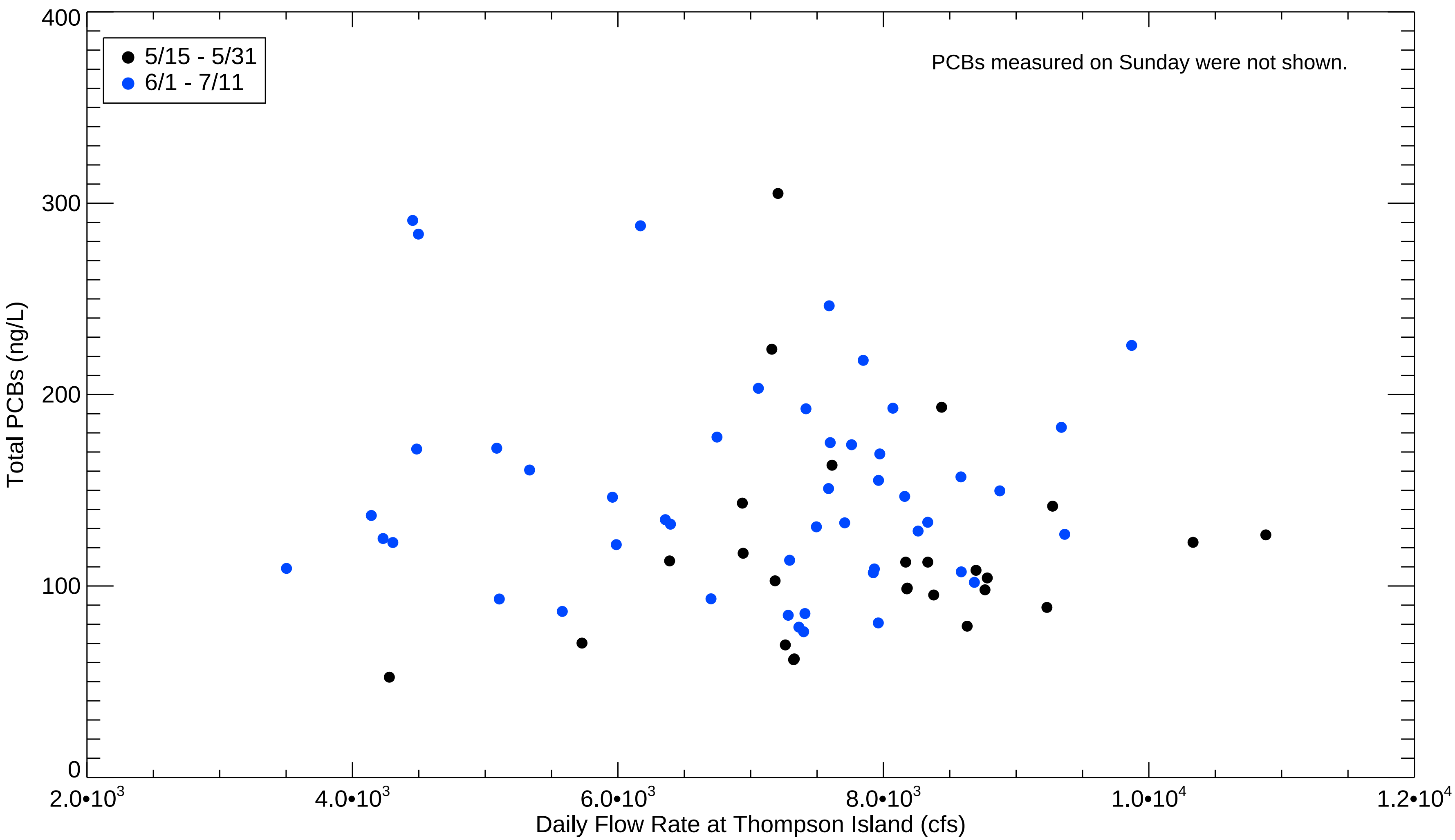

Figure 7. Comparison of Total PCBs and daily flow rate at Thomspon Island station.

Notes: Non-detects set to 1/2 MDL. Duplicate data averaged. Flows were averaged over the same period that composites were sampled.
Used 12hr composite as a 24hr composite for computing loads if the other 12hr composite was not available within the same day.

APPENDIX II-J

APPLICABILITY OF SSAP CORES FOR ESTIMATION OF PCB MASS IN UNEXPECTED INVENTORY:

THE THOMPSON ISLAND DAM 2009

Appendix II-J

APPLICABILITY OF SSAP CORES FOR ESTIMATION OF PCB MASS IN UNEXPECTED INVENTORY:

THE THOMPSON ISLAND DAM 2009

March 5, 2010

Prepared for:

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Introduction

GE planned to remove 144,439 cubic yards (cy) of sediment from dredged certification units (CUs) in the Phase I project (Table D-11). Design dredging cut lines did not in general capture actual depths of contamination (DoC), due to:

1. Uncertainty in measured DoC due to incomplete penetration of the contaminated layer by SSAP cores.
2. Failure to follow EPA recommendations to validate DoC extrapolation models.
3. Failure to "hedge" the design cut lines (through incorporation of a dredging overcut) to compensate for spatial variability and uncertainty in the DoC interpolation models.

As a result, all 10 CUs required at least 3 dredging passes with up to 5 passes in CU-1. The total volume of contaminated sediment and mass of total and Tri-plus PCBs removed were reported by GE and EPA.

GE and EPA reported removal of similar volumes of contaminated sediments: 286,354 cy and 267,804 cy, respectively, with a relative percent difference (RPD; 2xDifference/Sum) of just 7 percent. Conversely, GE and EPA estimated the mass of PCB removed to be 16,320 kg and 20,020 kg, respectively, resulting in an RPD of over 20 percent and an absolute difference of 3,700 kg.

Although seemingly small, determination/achievement of compliance with the Residuals and Resuspension Standards is sensitive to this difference. Therefore it is important to resolve discrepancies in GE and EPA mass estimates. Understanding the root cause of differences between these mass estimates is important in order to interpret loading data to the Lower Hudson River and compliance with the Resuspension Standard. The following is an analysis of a likely source of bias in the mass estimates.

Potential Root Causes

1) Low bias of PCB concentration in SSAP samples near and below the design cut lines.
2) Differences in handling of bulk density.
3) Order of operations in mass calculations—product of averages vs. sum of products.
4) Weighted vs. un-weighted averaging.

Bias in SSAP Samples to Characterize Unexpected Inventory

EPA and GE base their mass calculations on different sets of PCB concentration data. GE uses a combination of post-dredging core samples and SSAP cores collected prior to dredging in forming the basis for setting cut lines. Regardless of calculation methods, a difference in the distribution of PCB concentrations among the two data sets would necessarily cause problems with reconciliation of any other steps in the process. Therefore this report focuses on an investigation of potential biases associated with SSAP PCB data.

Residuals Samples are Unbiased

Because the post-dredging samples were collected from the nodes of a regularly spaced grid, and because the post-dredging samples fully penetrate the 6-inch contaminated layer below the design cut lines, the un-weighted arithmetic average of PCB concentration in post-dredging core samples is an unbiased estimator of the concentration within the 6-inch interval below the design cut lines. These samples are sufficient to estimate mass of PCBs in unexpected inventory below the design cut lines. Because post-dredging core data are based on a relatively large (N=40) unbiased systematic sample, inclusion of other sources of unbiased data should result in little or no change in the estimated mean concentration. The primary benefit of inclusion of other sample data would be to improve precision of the estimated sample mean. If the SSAP data are also unbiased to the PCB concentrations in unexpected inventory their inclusion should not change estimates of concentration substantively.

Because of the prevalence of up to several feet of unexpected PCB inventory found below the design cut lines it is clear that DoC, as inferred from the SSAP cores, was frequently understated. Because the SSAP cores frequently do not fully penetrate the PCB-contaminated layer, one should expect that SSAP samples would be biased low.

Because the post-dredging core data are known to be representative (unbiased) of the concentration in the 6-inch layer of unexpected inventory, SSAP data should not be included in the mass estimation procedure without first demonstrating that they are equally unbiased. This can be investigated statistically to provide evidence of the nature of potential bias in SSAP cores particularly when used to estimate concentration of PCBs below the design cut lines.

If both the SSAP and the post-dredging core samples are unbiased to the true mean of PCB concentration in sediments below the design cut lines there should be no systematic differences between concentration in the SSAP and post-dredging sample data within the same CUs. To investigate this hypothesis, SSAP core segments with average depth (*i.e.*, centroid of the core section) within the 6-inch horizon below the first pass design elevation were compared with corresponding post-dredging cores from the same depth interval.

These subsets of data were grouped by CU and summarized as boxplots in Figure 1. In all 10 CUs dredged in 2009 the median (horizontal red line) PCB concentration for SSAP cores is less than that for the corresponding post-dredging core distribution. Under the null hypothesis of equal median concentrations the probability of observing fully 100 percent of the medians from the SSAP population below that of the post-dredging population is $0.5^{10} = 1/1000$. This strongly suggests that the SSAP data are not representative of PCB concentrations in the 6-inch layer of unexpected inventory directly below the design cut lines.

Acceptability of Complete Cores

One might conjecture that this bias is primarily due to the incomplete subset of the cores in hopes that the complete SSAP cores (*i.e.*, high confidence cores) might be suitable for application to estimation of mass of PCBs removed. To investigate this question incomplete cores were removed from the data and the distributions were again compared (Figure 2). Removal of the incomplete cores actually increases the magnitude of the bias, so calculations that preferentially incorporate complete cores would be expected to accentuate the degree to which mass may be understated when the SSAP cores are incorporated into the analysis.

Magnitude of the Bias

To quantify the magnitude of the bias, geometric means (appropriate for right skewed data) were calculated for the post-dredging and SSAP samples and the ratio of the geometric means was calculated for each CU based on all SSAP data as well as the complete core subset. For complete cores, ratios varied from 4:1 in CU-7 to 55:1 in CU-4, with an overall ratio of geometric means of 15:1. For complete and incomplete cores combined, the ratios ranged from approximately 1:1 at CU-1 to 20:1 at CU-18 with an overall ratio of approximately 7:1 for all CUs combined. These ratios demonstrate that use of SSAP cores would create a statistically significant and materially substantive low bias in estimates of PCB concentration and by extension PCB mass in unexpected inventory below design cut lines.

Source of the Bias

A high proportion of SSAP cores did not fully penetrate the PCB-contaminated layer. This is a form of right censoring of the PCB concentration distribution. At depths below the design cut lines, low concentration samples (complete cores) are over represented in the sample population because higher concentration PCB values in the population are unobservable due to incompleteness of cores—by definition a core is incomplete if the bottom sample exceeds 1 mg/kg.

The likelihood that an individual location would be incomplete is a function of the thickness of the sediment deposit—the deeper the deposit the greater the likelihood that the core does not penetrate the PCB-contaminated layer. Combining this with the fact that deeper deposits represent the depositional areas and contain more highly contaminated sediments than thinner deposits, the net effect is that unobserved core sections are likely to have higher concentrations than those that were observed in the bottoms of nearby complete cores. Figure 3 shows a hypothetical group of 7 cores and how observable core sections preferentially sample the lower concentration fraction of the unexpected PCB inventory.

In Figure 3 there are 7 cores, 4 of which are complete and three of which are incomplete. The data are laid out horizontally as if the core was on a table with surface elevations at the left and sediment depth increasing to the right. The designed dredging cut line is shown as a pink-shaded column, observable core sections below the dredge cut line are shaded green, and unobservable (*i.e.*, censored) observations are shaded gray. Because the complete cores, by definition, have observed clean sections below the DoC elevation, they are observable. In contrast, incomplete cores have concentrations greater than 1 mg/kg below their deepest recovered sections that are unobservable. Therefore the low concentration fraction of the population is over represented by the observable complete cores retained in the mass estimation analysis. The bottom two rows of the table compare the "observed" average concentration with the true (observed and unobserved sections) average of PCB in the sediment layer. This example illustrates the bias in estimated concentration that is likely. This is consistent with results seen in practice comparing SSAP and post-dredging core samples above.

Spatial Heterogeneity

One might suggest that differences between averages based on SSAP and post-dredging core samples could be due to spatial heterogeneity induced by the lack of collocation of samples. Both SSAP and post-dredging core sampling plans are based on regular systematic grids and therefore should both be representative of the concentrations within the CU. Any biases introduced by spatial variation of PCBs within CUs would require that the high concentration values were preferentially located at the nodes of one design while the low concentrations would necessarily be located at the spatially-intermingled nodes of the other design—in effect PCB concentrations distributed in an 'egg carton' pattern. This is really not a plausible situation. Additionally it is also implausible that lack of collocation might produce a bias between SSAP and post-dredging core samples that is consistently negative across all CUs.

Material Importance of the Bias

Because GE has understated concentration by combining SSAP cores with post-dredging core samples, the mass of PCBs in unexpected inventory is understated. Because aspects of the Resuspension Standard, as well as estimates of remedial efficiency depend on these estimates, this mistake in mass estimation is propagated into calculations intended to evaluate efficiency of removal of deeper layers of PCB-contaminated sediment as well as compliance with the Resuspension Standard.

GE stated that the percentage of mass removed declines rapidly with successive dredging passes (*i.e.*, with depth). Because the bias in the SSAP cores increases with depth (*i.e.*, likelihood of incomplete cores increases with thickness of the sediment deposit) it is fully expected that the difference between SSAP and post-dredging core PCB concentrations would increase with depth. This suggests that the apparent reduction in percentage mass removed identified by GE may actually be in part a spurious consequence that the bias in SSAP and post-dredging core samples increases with depth.

This can be investigated by comparing the RPD between EPA and GE estimates as they relate to successive dredging passes. Figure 4 shows that RPDs between EPA and GE mass estimates increase with each dredging pass, ranging from around 10 percent in the first dredge pass to nearly 60 percent by the fourth dredge pass. This may be due to the bias in the SSAP data described above.

GE argues that dredging beyond the first or perhaps second pass is inefficient based on these mass estimates, which unlike EPAs estimates, decline substantially on a per unit volume basis with increasing depth. This understatement of PCB mass is likely due to:

1. Biased estimates of the efficiency of moving deeper sediment deposits.
2. Cloud issues related to evaluation of compliance with the Resuspension Standard.
3. Understating potential benefits of the active remedy.
4. Understating the extent to which DoC delineations failed to accurately target the DoC.

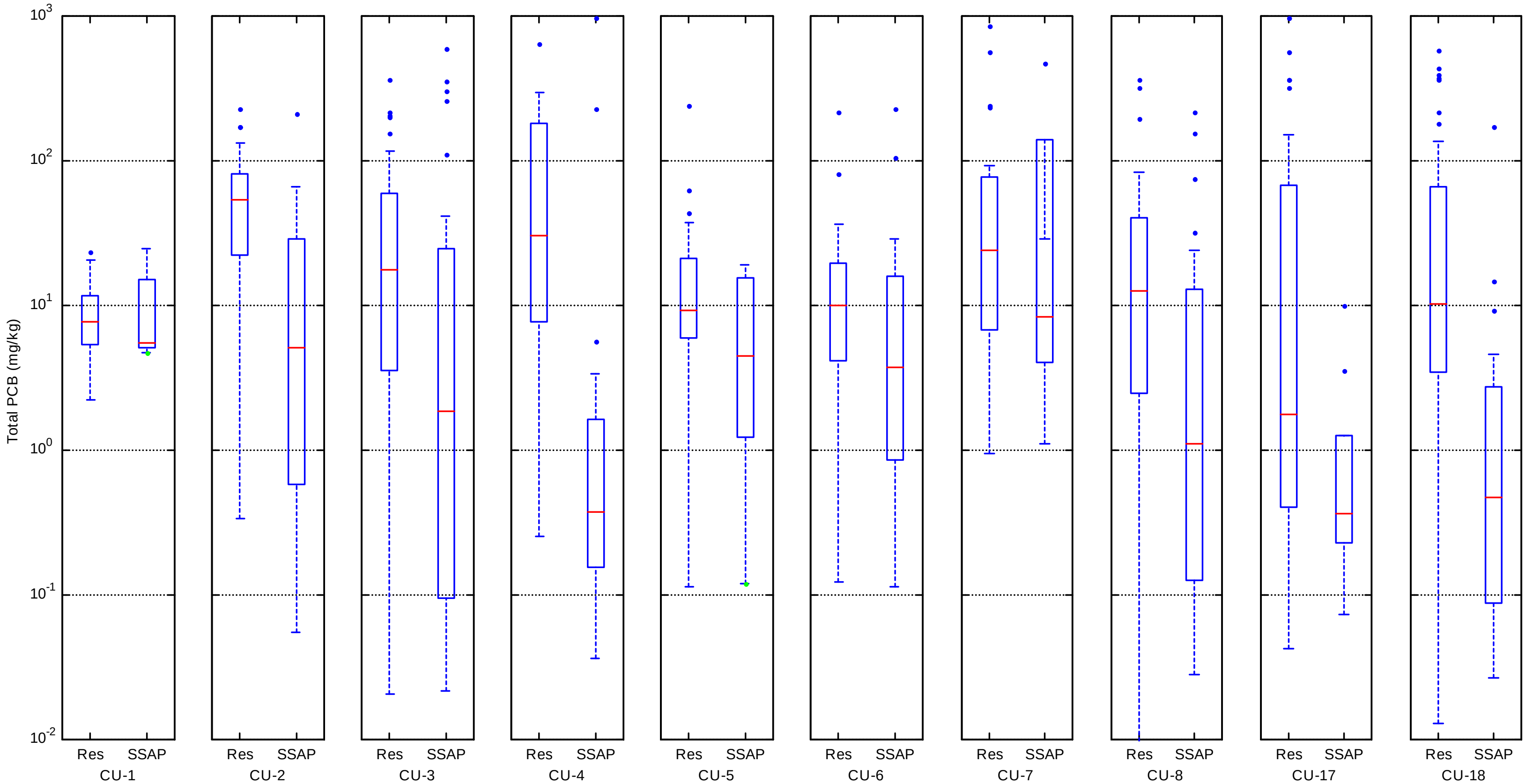

Figure 1. Boxplots of total PCB comparing residual and SSAP cores with centroids within the first six inch interval below the design elevation in Phase-I dredging units, upper Hudson River, NY. Red lines represent the median concentration, the boxes represent the 25th and 75th percentiles and the "whiskers" are the lesser of 1.5 times the box length (inter-quartile range) and the maximum PCB value. Median PCB concentration in SSAP cores was lower than in Residual cores in all 10 certification units.

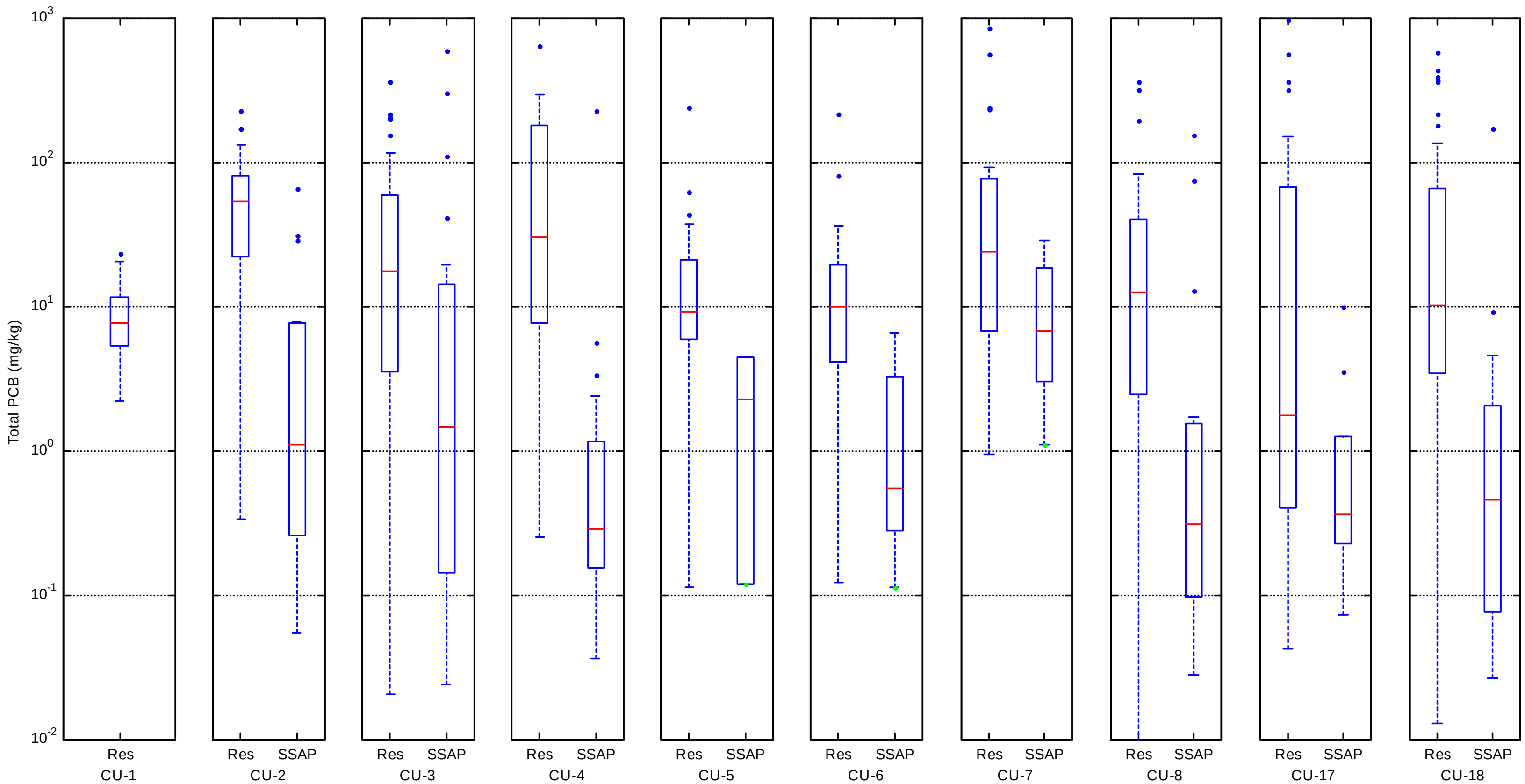

Figure 2. Boxplots of total PCB comparing residual and complete SSAP cores with centroids within the first six inch interval below the design elevation in Phase-I dredging units, upper Hudson River, NY. Red lines represent the median concentration, the boxes represent the 25th and 75th percentiles and the "whiskers" are the lesser of 1.5 times the box length (inter-quartile range) and the maximum PCB value. Median PCB concentration in SSAP cores was lower than in Residual cores in all 10 certification units.

Bias Associated with SSAP Cores for Estimating Post Dredging Mass

						First Pass	Second Pass	Third Pass
Core Type	0 to 6	6 to 12	12-18	18-24		24 to 30	30 to 36	36 to 42
1--Complete	30	10	5	1	D	0.5	0.5	0.1
2—Incomplete	20	12	10	1	R	**10**	**5**	**1**
3—Complete	10	5	2	1	E	0.2	0.75	0.1
4—Complete	20	10	4	1	D	0.3	0.5	0.1
5--Increasing Profile	5	10	Double Depth		G	**15**	**10**	**5**
6--Increasing Profile	10	20	Double Depth		E	**10**	**5**	**1**
7—Complete	10	5	6	1		0.6	0.1	0.1
True Average						**5.2**	**3.1**	**1.1**
Apparent Estimate						**0.4**	**0.5**	**0.1**

Only complete SSAP cores are available to inform average

Excluded from estimate because the core is incomplete and sample is unobservable

Figure 3. Illustration of bias resulting from hypothetical group of complete and incomplete cores.

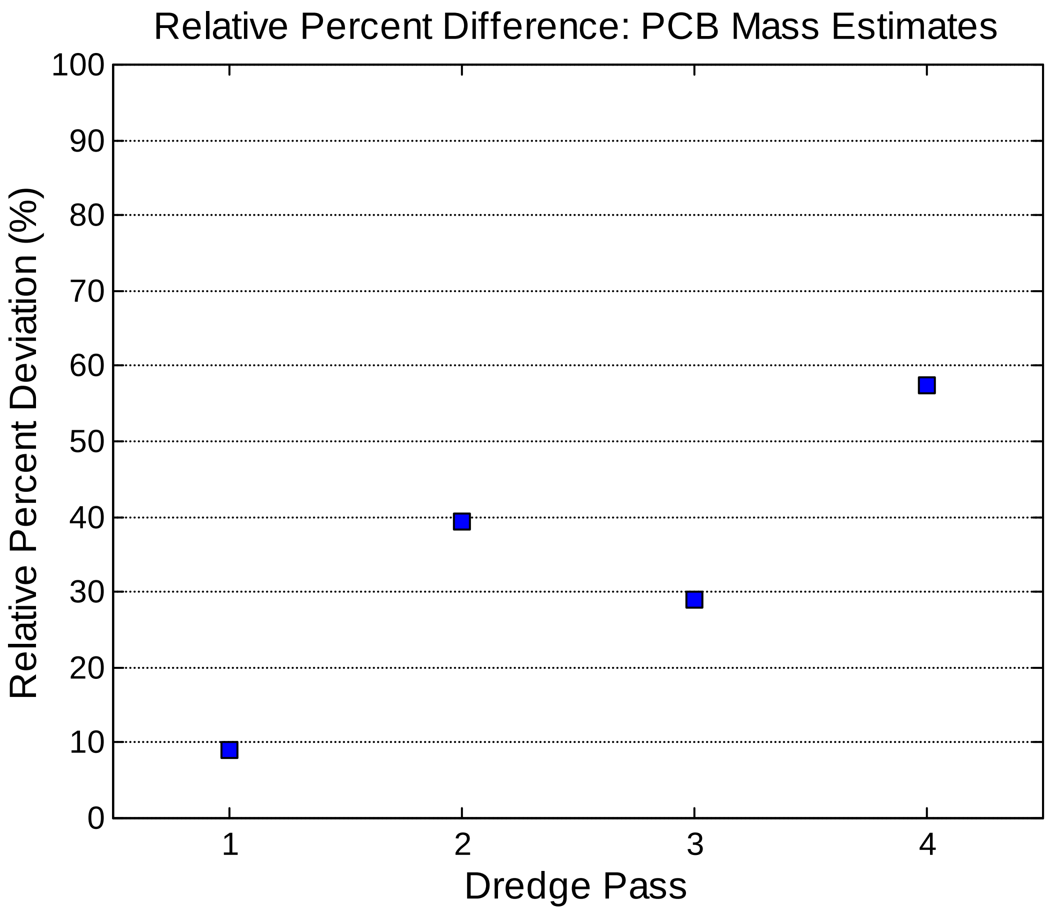

Figure 4. Relative percent difference between GE and EPA estimates as a function of dredge pass.

Table 1. Geometric mean concentrations in residual samples and SSAP samples within the unexpected inventory below the first pass design elevations in Phase I certification units dredged in 2009 in the Upper Hudson River.

	Residual Cores			Complete SSAP Cores		
Certification Unit	Count	Geometric Mean (mg/kg)		Count	Geometric Mean (mg/kg)	Ratio: Residual: SSAP
1	43	2.05		0	ND	ND
2	40	41.76		15	1.70	24.62
3	47	12.26		23	1.61	7.62
4	42	27.02		20	0.49	55.02
5	28	9.92		2	0.73	13.50
6	30	7.38		5	0.79	9.30
7	41	21.89		4	6.08	3.60
8	52	8.00		15	0.60	13.37
17	39	4.08		10	0.57	7.20
18	43	11.61		27	0.51	22.98
Overall	405	12.19		121	0.84	14.59

CHAPTER III PRODUCTIVITY APPENDICES

Appendix III-A

Ullage Tables for Hopper Scows (as Received from GE)

Box Jumbo Hopper Barge
Approximate Loadings

Draft	Displacement	Load Weight		Load Volume (CY)											
(ft)	(Short Tons)	(Lbs.)	(Tons)	80 pcf	85 pcf	90 pcf	95 pcf	100 pcf	105 pcf	110 pcf	115 pcf	120 pcf	125 pcf	130 pcf	175 pcf
1.00	207	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.00	420	426,000	213	197	186	175	166	158	150	143	137	131	126	121	90
3.00	632	850,000	425	394	370	350	331	315	300	286	274	262	252	242	180
4.00	845	1,276,000	638	591	556	525	497	473	450	430	411	394	378	364	270
5.00	1,057	1,700,000	850	787	741	700	663	630	600	572	548	525	504	484	360
6.00	1,159	1,904,000	952	881	830	784	742	705	672	641	613	588	564	542	403
7.00	1,271	2,128,000	1,064	985	927	876	830	788	751	716	685	657	631	606	450
8.00	1,693	2,972,000	1,486	1,376	1,295	1,223	1,159	1,101	1,048	1,001	957	917	881	847	629
9.00	1,909	3,404,000	1,702	1,576	1,483	1,401	1,327	1,261	1,201	1,146	1,096	1,051	1,009	970	720
10.00	2,122	3,830,000	1,915	1,773	1,669	1,576	1,493	1,419	1,351	1,290	1,233	1,182	1,135	1,091	811
11.00	2,335	4,256,000	2,128	1,970	1,854	1,751	1,659	1,576	1,501	1,433	1,371	1,314	1,261	1,213	901

* Fresh Water Displacement

Rake Jumbo Hopper Barge
Approximate Loadings

Draft	Displacement	Load Weight		Load Volume (CY)											
(ft)	(Short Tons)	(Lbs.)	(Tons)	80 pcf	85 pcf	90 pcf	95 pcf	100 pcf	105 pcf	110 pcf	115 pcf	120 pcf	125 pcf	130 pcf	175 pcf
1.00	181	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.00	371	380,000	190	176	166	156	148	141	134	128	122	117	113	108	80
3.00	564	766,000	383	355	334	315	299	284	270	258	247	236	227	218	162
4.00	760	1,158,000	579	536	505	477	451	429	408	390	373	357	343	330	245
5.00	959	1,556,000	778	720	678	640	607	576	549	524	501	480	461	443	329
6.00	1,159	1,956,000	978	906	852	805	763	724	690	659	630	604	580	557	414
7.00	1,361	2,360,000	1,180	1,093	1,028	971	920	874	832	795	760	728	699	672	499
8.00	1,565	2,768,000	1,384	1,281	1,206	1,139	1,079	1,025	976	932	891	854	820	789	586
9.00	1,771	3,180,000	1,590	1,472	1,386	1,309	1,240	1,178	1,122	1,071	1,024	981	942	906	673
10.00	1,979	3,596,000	1,798	1,665	1,567	1,480	1,402	1,332	1,268	1,211	1,158	1,110	1,065	1,025	761
11.00	2,189	4,016,000	2,008	1,859	1,750	1,653	1,566	1,487	1,417	1,352	1,293	1,240	1,190	1,144	850

* Fresh Water Displacement

Appendix III-B

Weekly Productivity Summary Report (as Received from GE)

Table 1 Weekly Productivity Summary Report

Report Date: 11/4/2009

Reporting Period				Design Dredging Efforts[1]			Residual Dredging Efforts			Barge Transport			Sediment Processing and Shipping[2,3]			
				Design Dredging Locations	Actual Dredging Time[4]	Estimated Gross Volume Dredged[5]	Residual Dredging Locations	Actual Dredging Time[4]	Estimated Gross Volume Dredged[5]	Number of Off-loaded Barges	Average Volume per Barge[6]	Avg Off-load Time per Barge	Estimated Tonnage of material processed[7]	Tonnage of material shipped off site	Estimated Tonnage of material staged on-site[8]	Volume of water treated & returned to Canal
Week	Dates			CUs	Hours	CY	CUs	Hours	CY	#	CY	Hours	Tons	Tons	Tons	MGals
1	5/6/2009	to	5/9/2009	N1, N2	39	474	0	0	0	0	0	0	0	0	0	0.00
2	5/10/2009	to	5/16/2009	N1, N2, 9	125	1,333	0	0	0	3	602	10	1,330	0	1,330	0.39
3	5/17/2009	to	5/23/2009	9	78	231	0	0	0	3	77	6	1,200	0	2,530	0.54
4	5/24/2009	to	5/30/2009	9	126	1,031	0	0	0	4	258	6	1,300	0	3,830	0.40
5	5/31/2009	to	6/6/2009	1, 2, 9	320	5,084	0	0	0	14	363	4	4,656	0	8,486	1.31
6	6/7/2009	to	6/13/2009	1, 2, 5, 6, 9	616	8,144	0	0	0	16	509	5	8,502	0	16,988	2.75
7	6/14/2009	to	6/20/2009	1, 2, 5, 6, 12	674	10,193	0	0	0	27	378	5	13,318	0	30,306	3.01
8	6/21/2009	to	6/27/2009	1, 2, 5, 6, 12, 17	858	9,346	0	0	0	28	334	4	12,231	8,447	34,090	1.83
9	6/28/2009	to	7/4/2009	1, 2, 5, 6, 17	617	6,236	0	0	0	25	249	4	10,013	8,366	35,737	3.81
10	7/5/2009	to	7/11/2009	1, 2, 3, 5, 6, 7, 17	1,142	14,905	0	0	0	35	426	3	13,480	0	49,217	3.45
11	7/12/2009	to	7/18/2009	1, 2, 3, 4, 5, 6, 7, 17	1,103	17,651	0	0	0	36	490	3	18,160	0	67,377	4.30
12	7/19/2009	to	7/25/2009	1, 2, 3, 6, 7, 8, 17, 18	1,352	19,740	0	0	0	34	581	4	22,432	0	89,809	4.27
13	7/26/2009	to	8/1/2009	1, 3, 6, 7, 8, 17, 18	1,242	20,158	0	0	0	34	593	4	24,525	0	114,334	4.30
14	8/2/2009	to	8/8/2009	1, 3, 5, 7, 8, 17, 18	833	14,454	0	0	0	29	498	5	22,321	0	136,655	6.35
15	8/9/2009	to	8/15/2009	1, 2, 3, 5, 8, 18	1,053	11,169	0	0	0	22	508	4	16,054	0	152,709	4.36
16	8/16/2009	to	8/22/2009	1, 2, 4, 5, 6, 8, 17	1,092	15,352	0	0	0	39	394	3	24,543	0	177,252	5.11
17	8/23/2009	to	8/29/2009	1, 2, 3, 4, 5, 6, 7, 17, 18	1,260	18,194	0	0	0	34	535	3	19,896	0	197,149	5.91
18	8/30/2009	to	9/5/2009	1, 2, 3, 4, 5, 6, 7, 8, 18	853	12,200	0	0	0	26	469	4	18,746	0	215,895	3.86
19[9]	9/6/2009	to	9/12/2009	1, 3, 4, 5, 6, 7, 8, 17, 18	1,024	19,478	0	0	0	28	696	3	16,432	16,652	215,675	3.14
20	9/13/2009	to	9/19/2009	1, 3, 4, 5, 6, 7, 8, 18	1,108	17,960	0	0	0	34	531	3	18,171	0	233,846	3.85
21	9/20/2009	to	9/26/2009	2, 3, 4, 6, 18	406	11,068	7, 8	135	1,876	29	446	5	19,290	16,784	236,352	3.13
22	9/27/2009	to	10/3/2009	1, 2, 3, 8	694	12,611	7	99	2,358	30	499	5	18,861	8,430	246,783	4.85
23	10/4/2009	to	10/10/2009	1, 2, 3, 4, 8, 18	559	15,687	7	119	1,834	29	604	4	17,384	16,709	247,458	3.81
24	10/11/2009	to	10/17/2009	1, 4, 7, 18	544	11,739	8	44	245	31	387	4	18,989	8,382	258,065	4.09
25	10/18/2009	to	10/24/2009	1, 4, 8, 18	342	10,896	8	95	1,518	36	345	3	18,253	16,765	259,553	3.73
26	10/25/2009	to	10/31/2009	1, 4	64	2,923	0	0	0	20	412	7	11,367	8,392	262,528	5.21
Total Phase 1 Dredging Season to Date				N/A	18,125	288,257	N/A	491	7,831	646	374	4	371,455	108,927	--	87.75

Notes:

1. In accordance with the approved Performance Standards Compliance Plan, design dredging includes access dredging (N), dredging to remove targeted inventory and associated overcut and side slope removal. In addition, based on agreement with EPA, design dredging also includes dredging to remove additional inventory sediment identified by the residual sampling program.
2. Estimated volumes and weights reflect sediment removed during both design and residual dredging, including debris.
3. Concentration of PCBs in the processed sediment are given in Table 4.
4. Actual dredging time represents the cumulative hours that all dredges working on the project were available to dredge during the week in question.
5. Gross volume of dredged material is an estimate based on hydrographic survey, sediment barge drafts, or number of bucket bites compared to the river surface elevation used in the Phase 1 Final Design Report.
6. Volume calculated by dividing the estimated gross volume of dredged material including both design and residual material (calculated per note 5) by the number of off-loaded barges during that week.
7. Tonnage of material processed is an estimate based on the mass of filter cake (number of filter press drops), coarse material and debris (number of truckloads moved to staging area).
8. Tonnage of material staged on-site is an estimate based on the tonnage of processed sediment minus the tonnage of sediment shipped off site (rail scale reading).
9. Estimated gross volume dredged for the week ending 9/12/09 includes areas in CU 8 and CU 1 that had been dredged in previous weeks but had not been surveyed until that week. This results in inflated estimated dredge quantity and average volume per scow numbers for the week.
10. Phase 1 dredging ended on October 27, 2009. The volumes and volume allocations in this table represent the best estimate at the time that this report was issued. It is anticipated that final volumes and volume allocations will be provided in the October 2009 RA Monthly Report.

Table 2 Design Dredging Hours and Volume By Day

Report Date: 11/4/2009

		Design Dredging Information		
		Actual Dredging Time[1,5]	Number of Active Dredges[2,5]	Estimated Total Gross Volume Dredged[3,4,5,6,7]
Day	Date	Hours	#	CY
Sun	September 27, 2009	99	5	1,873
Mon	September 28, 2009	125	7	2,361
Tue	September 29, 2009	125	7	2,353
Wed	September 30, 2009	121	7	2,277
Thurs	October 1, 2009	103	7	1,940
Fri	October 2, 2009	109	7	2,066
Sat	October 3, 2009	111	7	2,099
Sun	October 4, 2009	0	0	0
Mon	October 5, 2009	130	7	3,356
Tue	October 6, 2009	127	7	3,265
Wed	October 7, 2009	105	7	2,722
Thurs	October 8, 2009	120	7	3,105
Fri	October 9, 2009	96	6	2,487
Sat	October 10, 2009	100	6	2,585
Sun	October 11, 2009	74	5	1,518
Mon	October 12, 2009	82	5	1,678
Tue	October 13, 2009	92	4	1,870
Wed	October 14, 2009	95	5	1,944
Thurs	October 15, 2009	94	4	1,911
Fri	October 16, 2009	69	3	1,406
Sat	October 17, 2009	81	4	1,656
Sun	October 18, 2009	68	4	1,924
Mon	October 19, 2009	78	5	2,206
Tue	October 20, 2009	87	5	2,482
Wed	October 21, 2009	67	5	1,907
Thurs	October 22, 2009	64	5	1,827
Fri	October 23, 2009	40	5	1,128
Sat	October 24, 2009	33	4	941
Sun	October 25, 2009	42	2	1,326
Mon	October 26, 2009	40	2	1,480
Tue	October 27, 2009	24	1	116
Wed	October 28, 2009			
Thurs	October 29, 2009			
Fri	October 30, 2009			
Sat	October 31, 2009			

Notes:
1. Actual dredging time represents the cumulative hours that all dredges working on the project were available to dredge during the day in question.
2. Includes any dredge used for transferring sediment from mini-barges to regular sediment barges.
3. Daily volumes are estimates based on the dredging contractor's reported volume and the estimated volume for the week in Table 1.
4. Gross volume of dredged material is an estimate based on hydrographic survey, sediment barge drafts, or number of bucket bites.
5. Dredging time, number of dredges and daily volume estimates for the weeks beginning 7/19, 7/26, and 8/2 have been adjusted to include numbers previously considered as residual dredging.
6. Additional 985 cy was credited week ending 8/15/2009 for removed volume inside the sheeting at CU 18 not previously surveyed.
7. Estimated gross volume dredged for the week ending 9/12/09 includes areas in CU 8 and CU 1 that had been dredged in previous weeks but had not been surveyed until that week. This results in inflated daily estimated dredge volumes for the week.
8. Phase 1 dredging ended on October 27, 2009. The volumes in this table represent the best estimate at the time that this report was issued.

Phase 1 Productivity Report

Table 3 Delays Encountered in the Project[1]

Report Date: 11/4/2009

Reporting Period				Reason for Lost Time with potential to affect target dredging productivity in Table 4-1 of RAWP #3	Time Lost (if known)[2]
Week	Dates				Hours
1	5/6/2009	to	5/9/2009	None	
2	5/10/2009	to	5/16/2009	1. Abnormally high fluctuation of river flows was experienced on May 15 and 16, 2009. The river flows rapidly increased to peaks approaching 10,000 cfs, then rapidly dropped to close to 2,000 cfs. Due to the unpredictable nature and magnitude of these fluctuations, river activities including inventory dredging and debris removal were suspended during the afternoon of May 16, 2009 and did not resume that day. 2. The number of actual debris targets encountered in CU9 was much greater than estimated in the approved final design. This resulted in greater than expected debris removal times.	19 Unknown
3	5/17/2009	to	5/23/2009	1. Based on the Engineering Evaluation Report, provided to EPA on May 21, 2009, dredging work in CU 9 is not occurring when the river flow is in excess of 7,000 cfs. River flows in excess of 7,000 cfs were experienced on May 18, 19, 20, 21, 22 and 23, 2009. During these periods of high flow, no dredging work occurred.	354
4	5/24/2009	to	5/30/2009	1. Based on the Engineering Evaluation Report, provided to EPA on May 21, 2009, dredging work in CU 9 is not occurring when the river flow is in excess of 7,000 cfs. River flows in excess of 7,000 cfs were experienced on May 26, 27, 28, 29, and 30, 2009. During these periods of high flow, no dredging work occurred.	234
5	5/31/2009	to	6/6/2009	1. Based on the Engineering Evaluation Report, provided to EPA on May 21, 2009, dredging work in CU 9 is not occurring when the river flow is in excess of 7,000 cfs. River flows in excess of 7,000 cfs were experienced on June 1, 2, 3, 4, and 5, 2009. During these periods of high flow, no dredging work occurred in CU 9. On June 5, 2009, given the experience with the movement of the mini-hoppers and 320 dredges, EPA agreed with GE's proposal to raise the river flow restriction for dredging in CU 9 to 8,000 cfs. 2. A shortage of empty hopper barges was experienced this week resulting in lost time for the active dredge barges. The shortage resulted from the barge loading rate temporarily exceeding the offloading rate at the processing facility. The process facility is ramping up and is currently training for the second shift. The shortage of barges is also related to both the increased dredged volume (use of two 5-CY dredges in CUs 1 and 2) and the periods of low river flows experienced this week. Shallower water, resulting from lower river flows, require that barges in CU-1 could only be partially filled, thereby requiring more barges to transport the dredged sediments.	49 29
6	6/7/2009	to	6/13/2009	1. Based on the Engineering Evaluation Report provided to EPA on May 21, 2009 and GE's revised proposal to EPA on June 5, 2009, dredging work in CUs 5, 6, and 9 is not occurring when the river flow is in excess of 8,000 cfs. River flows in excess of 8,000 cfs were experienced on June 13, 2009. During this periods of high flow, no dredging work occurred in CUs 5, 6, or 9. 2. A shortage of empty hopper barges continued to be experienced this week, resulting in lost time for the active dredges. As in the prior week, the shortage resulted from the barge loading rate temporarily exceeding the offloading rate at the processing facility. Training for the second shift at the process facility was conducted with the second shift starting on June 13. In CU-1 shallower water, resulting from lower river flows, require that barges in CU-1 could only be partially filled approximately 1/3, then moved to CU-2 for topping off. This increases time required for barge movements in the east channel. Due to high fluctuation in river flows the hopper barge supporting the mini-hoppers for CU-5 and CU-6 has been located in the deeper water in CU-10 instead of in CU-7, increasing the mini-hopper transit times for off-load.	34 156
7	6/14/2009	to	6/20/2009	1. Based on the Engineering Evaluation Report provided to EPA on May 21, 2009 and GE's revised proposal to EPA on June 5, 2009, dredging work in CUs 5, 6, and 9 is not occurring when the river flow is in excess of 8,000 cfs. River flows in excess of 8,000 cfs were experienced on June 17, 18, 19 and 20, 2009. During these periods, no dredging work occurred in CUs 5 or 6. Additionally, river flows in excess of 10,000 cfs were experienced on June 19 and 20, 2009. During these periods, no dredging work occurred in CUs 1, 2 and 12 in addition to CUs 5 and 6. 2. A shortage of empty hopper barges continued to be experienced this week, resulting in lost time for the active dredges. As described for the prior week, the shortage resulted partly from the barge loading rate temporarily exceeding the offloading rate at the processing facility and partly from barge transport inefficiencies associated with partial loading of scows due to shallow depths in CU-1 and increased mini-hopper transit times due to the transfer location being moved to CU 10.	118 83

Table 3 Delays Encountered in the Project[1]

Report Date: 11/4/2009

Reporting Period				Reason for Lost Time with potential to affect target dredging productivity in Table 4-1 of RAWP #3	Time Lost (if known)[2]
Week	Dates				Hours
8	6/21/2009	to	6/27/2009	1. Based on the Engineering Evaluation Report provided to EPA on May 21, 2009 and GE's revised proposal to EPA on June 19, 2009, dredging work in CUs 5 and 6 is not occurring when the river flow is in excess of 8,500 cfs during daylight hours and in excess of 8,000cfs at all other times. River flows in excess of 8,000 cfs were experienced on June 22, 23, 24, 25 and 26, 2009. During these periods, no dredging work occurred in CUs 5 or 6. In anticipation of the high flow event experienced at the beginning of the week, three dredges were moved out of the West Channel of Rogers Island to CUs 2 and 12, then moved back when the high flows subsided. Time associated with moving equipment due to high flows is included here.	194
				2. A shortage of empty hopper barges continued to be experienced this week, resulting in lost time for the active dredges. This shortage was due to longer than anticipated mini-hopper transit times to the transfer locations in CU 10 and 12, congestion in the East Channel of Rogers Island due to the increased number of dredges working there during the high flow period and reduced tug availability to remove loaded scows during periods when dredges were being moved to productive locations due to river flow fluctuations.	184
				3. Bed-rock was encountered above the target elevations in CUs 5 and 6. Dredging over bed-rock areas reduces productivity; instead of removing sediment, the dredge operator has to carefully scrape the surface of the bed-rock to establish if sediment is present. Additionally, CUs 5 and 6 are located in shallow areas and the dredging contractor anticipated being able to dredge its way into those areas, thus creating the necessary water depth to use larger and more productive equipment. However, this has not been possible due to the presence of bed-rock, resulting in the use of smaller equipment and lower productivity.	unknown
				4. Pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 5 and 6. This has resulted in difficulties in getting full closure of the dredge bucket as the wood debris is large enough to hold the bucket open but too small to pick up with a debris rig. This has resulted in the dredge operators having to complete additional passes with the dredge bucket in these areas to achieve the required grade, which in turn has lead to reduced productivity. Additionally the presence of significant small debris has made it difficult to achieve a consistent, level post-dredge surface, resulting in an increased number of high spots that the dredging contractor has had to redredge to achieve the required elevations. This has further reduced productivity.	unknown
9	6/28/2009	to	7/4/2009	1. Based on the Engineering Evaluation Report provided to EPA on May 21, 2009 and GE's revised proposal to EPA on June 19, 2009, dredging work in CUs 5 and 6 is not occurring when the river flow is in excess of 8,500 cfs during daylight hours and in excess of 8,000cfs at all other times. River flows in excess of the flow limits were experienced on June 29 and 30, 2009 and July 2, 2009. During these periods, no dredging work occurred in CUs 5 or 6.	72
				2. A shortage of empty mini-hopper scows continued to be experienced this week, resulting in lost time for the active dredges. This shortage was due to the dredge production in CUs 5 and 6 outpacing the available number of mini-hopper scows available on the project, longer than anticipated mini-hopper transit times to the transfer locations in CU 10 and 12, and congestion in the East Channel of Rogers Island.	175
				3. As described last week, bed-rock was encountered above the target elevations in CUs 2, 5 and 6. For the reasons detailed in last week's report this has reduced dredge productivity significantly in these areas.	unknown
				4. As described last week, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 5 and 6. For the reasons detailed in last week's report this has reduced dredge productivity significantly in these areas.	unknown
10	7/5/2009	to	7/11/2009	1. A shortage of empty mini-hopper scows continued to be experienced this week, resulting in lost time for the active dredges. This shortage was due to the dredge production in CUs 5, 6 and 7 outpacing the available number of mini-hopper scows available on the project, longer than anticipated mini-hopper transit times to the transfer locations in CU 10. Congestion in the East Channel of Rogers Island limits the ability to move hopper barges. Movement of hopper barges in the East Channel of Rogers Island requires that all dredging activities cease and move to the side while the hopper is moved past.	190
				2. As described two weeks ago, bed-rock was encountered above the target elevations in CUs 2, 5, 6 and 17. For the reasons detailed in the report from two weeks ago this has reduced dredge productivity significantly in these areas.	unknown
				3. As described two weeks ago, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 3, 5 and 6. Similar quantities of wood debris are being found in CUs 3 and 7. For the reasons detailed in the report from two weeks ago this has reduced dredge productivity significantly in these areas.	unknown
				4. Inclement weather was experienced this week, causing lost time. The dredging contractor and processing facility operations contractor had to shut down operations and seek shelter during lightning storms and the dredging contractor was unable to operate river craft during certain time periods due to dense river fog reducing visibility.	29

Table 3 Delays Encountered in the Project[1]

Report Date: 11/4/2009

Reporting Period				Reason for Lost Time with potential to affect target dredging productivity in Table 4-1 of RAWP #3	Time Lost (if known)[2]
Week	Dates				Hours
11	7/12/2009	to	7/18/2009	1. A shortage of empty hopper barges was experienced this week, resulting in lost time for the active dredge barges. The shortage resulted from the barge loading rate temporarily exceeding the off-loading rate at the processing facility. This was due to increased depth of available sediment in CUs 3 and 4 and the use of the 385 dredges loading hopper barges more quickly than in past weeks. In addition, a shortage of empty mini-hopper scows continued to be experienced this week, resulting in lost time for the active dredges. This shortage was due to the dredge production in CUs 5, 6 and 7 outpacing the number of mini-hopper scows available on the project, as well as longer than anticipated mini-hopper transit times to the transfer locations in CU 10. Further, congestion in the East Channel of Rogers Island continues to limit the ability to move hopper barges. Movement of hopper barges in the East Channel of Rogers Island requires that all dredging activities cease and move to the side while the hopper barge is moved past.	489
				2. As described previously, bedrock was encountered above the target elevations in CUs 2, 5, 6 and 17. For the reasons detailed above for the week of June 21-27, 2009, the encountering of bedrock reduces dredge productivity significantly in the areas where bedrock is present.	unknown
				3. GE previously proposed an approach for residual sampling in bedrock areas, under which the dredging contractor would probe the area to determine whether sediments are present at greater than six inches in thickness and, if not, would abandon the planned sediment coring locations in those delineated bedrock areas. With EPA's verbal approval, GE implemented this approach through probing in bedrock areas in CU 5 and did not begin coring. However, EPA subsequently advised GE that this approach was not acceptable and that full coring in such areas would be required. As a result, the time that GE spent conducting the probing was lost and resulted in a delay in initiating the CU certification process.	unknown
				4. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 3, 5 and 6. Similar quantities of wood debris are being found in CUs 3 and 7. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				5. Inclement weather was experienced again this week, causing lost time. The dredging contractor and processing facility operations contractor had to shut down operations and seek shelter during lightning storms, and the dredging contractor was unable to operate river craft during certain time periods due to dense river fog reducing visibility.	4
12	7/19/2009	to	7/25/2009	1. A shortage of empty hopper barges was experienced this week, resulting in lost time for the active dredge barges. The shortage resulted from the barge loading rate temporarily exceeding the off-loading rate at the processing facility. This was due to depth of available sediment in CU 3, which resulted in the 385 dredge loading hopper barges more quickly than in some earlier weeks. In addition, a shortage of empty mini-hopper scows continued to be experienced this week, resulting in lost time for the active dredges. This shortage was due to the dredge production in CUs 6 and 7 outpacing the number of mini-hopper scows available on the project, as well as longer than anticipated mini-hopper transit times to the transfer locations in CU 10. Further, congestion in the East Channel of Rogers Island continues to limit the ability to move hopper barges. Movement of hopper barges in the East Channel of Rogers Island requires that all dredging activities cease and move to the side while the hopper barge is moved past.	322
				2. As described previously, areas of bucket refusal due to bedrock or cobbles was encountered above the target elevations in CUs 2, 5, 6 and 17. For the reasons detailed above for the week of June 21-27, 2009, the encountering of bedrock or cobbles reduces dredge productivity significantly in the areas where bedrock or cobbles is present.	unknown
				3. As described previously, the time that GE spent conducting the probing of bedrock and bucket refusal areas in CU 5 and CU 6 was lost and resulted in a delay in initiating the CU acceptance process. GE has since completed collecting core samples in CUs 2 and 5 and began the collection of core samples in CU 6. The CU acceptance process associated with areas of bedrock and/or bucket refusal has not be established, this continues to be delay work in CUs 2, 5 and 6.	unknown
				4. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 3, 5 and 6. Similar quantities of wood debris are being found in CUs 3, 7, 8. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				5. In response to exceedances of criteria in the PCB air quality performance standard, GE has taken several actions that have affected production this week. These actions have included: not dredging in CU 4, adding additional water to hopper barges being loaded in CU 3, and deploying containment and sorbent booms in the vicinity of and around dredges operating in CUs 3, 17 and 18.	unknown

Table 3 Delays Encountered in the Project[1]

Report Date: 11/4/2009

Reporting Period				Reason for Lost Time with potential to affect target dredging productivity in Table 4-1 of RAWP #3	Time Lost (if known)[2]
Week	Dates				Hours
13	7/26/2009	to	8/1/2009	1. A shortage of empty hopper barges was experienced this week, resulting in lost time for the active dredge barges. The shortage resulted from the barge loading rate temporarily exceeding the off-loading rate at the processing facility. This was due to depth of available sediment in CU 3 and CU 18, which resulted in the 385 dredge loading hopper barges more quickly than in some earlier weeks. In addition, a shortage of empty mini-hopper scows continued to be experienced this week, resulting in lost time for the active dredges. This shortage was due to the dredge production in CUs 7 and 8 outpacing the number of mini-hopper scows available on the project, as well as longer than anticipated mini-hopper transit times to the transfer locations in CU 10. Further, congestion in the East Channel of Rogers Island continues to limit the ability to move hopper barges. Movement of hopper barges in the East Channel of Rogers Island requires that all dredging activities cease and move to the side while the hopper barge is moved past.	399
				2. As described previously, areas of bucket refusal due to bedrock or cobbles were encountered above the target elevations in CUs 3, 7 and 8. For the reasons detailed above for the week of June 21-27, 2009, the encountering of bedrock or cobbles reduces dredge productivity significantly in such areas.	unknown
				3. As described above, areas of bucket refusal due to the presence of bedrock or cobbles has been encountered in CUs 2, 3, 5, 6, 7, and 8. In these areas the dredging contractor has been unable to achieve the required elevations. Following the process provided in Section 2.8 of the approved RAWP #3 GE submitted a letter to EPA on July 8, 2009 that proposed a procedure to address bedrock areas. At this time, GE has yet to receive a response from EPA that provides either an approval of GE's proposed procedure or an alternative procedure. GE is unable to complete the CU acceptance process and the associated design, planning and dredging activities in bucket refusal areas.	unknown
				4. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 3, 5 and 6. Similar quantities of wood debris are being found in CUs 3, 7, 8. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				5. In response to exceedances of criteria in the PCB air quality performance standard, GE has taken several actions that have affected production this week. These actions have included: not dredging in CU 4, adding additional water to hopper barges being loaded in CU 3, installing wind screens on mini-hopper barges used in CU 6 and CU 18, and deploying containment and sorbent booms in the vicinity of and around dredges operating in CUs 3, 17 and 18.	unknown
				6. Inclement weather was experienced this week, causing lost time. The dredging contractor was unable to operate river craft during certain time periods due to dense river fog reducing visibility and also due to elevated river flows.	32
14	8/2/2009	to	8/8/2009	1. A shortage of empty hopper barges was experienced this week, resulting in lost time for the active dredge barges. The shortage resulted from the barge loading rate temporarily exceeding the off-loading rate at the processing facility. This was due to depth of available sediment in CUs 3, 17 and 18, which resulted in the 385 dredges loading hopper barges more quickly than in some earlier weeks. In addition, a shortage of empty mini-hopper scows continued to be experienced this week, resulting in lost time for the active dredges. This shortage was due to the dredge production in CUs 5, 7 and 8 outpacing the number of mini-hopper scows available on the project, as well as longer than anticipated mini-hopper transit times to the transfer locations in CU 10.	302
				2. As described above, areas of bucket refusal due to the presence of bedrock or cobbles has been encountered in CUs 2, 3, 5, 6, 7, and 8. In these areas the dredging contractor has been unable to achieve the required elevations. Following the process provided in Section 2.8 of the approved RAWP #3 GE submitted a letter to EPA on July 8, 2009 that proposed a procedure to address bedrock areas. At this time, GE has yet to receive a response from EPA that provides either an approval of GE's proposed procedure or an alternative procedure. GE is unable to complete the CU acceptance process and the associated design, planning and dredging activities in bucket refusal areas.	unknown
				3. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 3, 5 and 6. Similar quantities of wood debris are being found in CUs 3, 7, 8. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				4. In response to exceedances of criteria in the PCB air quality performance standard, GE has continued to take several actions that have affected production this week. These actions have included: not dredging in CU 4, adding additional water to hopper barges being loaded in CU 3, CU 17 and CU 18, installing wind screens on mini-hopper barges used in CU 8 and CU 18, and deploying containment and sorbent booms in the vicinity of and around dredges operating in CUs 3, 17 and 18.	unknown
				5. Inclement weather was experienced this week causing lost time. The dredging contractor was unable to operate river craft during certain time periods due to dense river fog reducing visibility and also due to elevated river flows.	183
				6. In response to a directive received from EPA on August 7, 2009 relating to concerns about PCB concentrations in the river, GE shut down sediment removal operations in the river at 18:30 on the same day. No dredging work occurred during the remainder of the week.	343

Table 3 Delays Encountered in the Project[1]

Report Date: 11/4/2009

Reporting Period				Reason for Lost Time with potential to affect target dredging productivity in Table 4-1 of RAWP #3	Time Lost (if known)[2]
Week	Dates				Hours
15	8/9/2009	to	8/15/2009	1. As described above, areas of bucket refusal due to the presence of bedrock or cobbles has been encountered in CUs 2, 3, 5, 6, 7, and 8. In these areas the dredging contractor has been unable to achieve the required elevations. Following the process provided in Section 2.8 of the approved RAWP #3 GE submitted a letter to EPA on July 8, 2009 that proposed a procedure to address bedrock areas. At this time, GE has received a response from EPA regarding dredging bucket refusal areas in CUs 2, 5 and 6. Until GE has a final resolution with EPA regarding placement of backfill or cap GE will be unable to complete the CU acceptance process and the associated backfill / cap design, and planning activities in bucket refusal areas.	unknown
				2. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 3, 5 and 6. Similar quantities of wood debris are being found in CUs 3, 7, 8. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				3. In response to exceedances of criteria in the PCB air quality performance standard, GE has continued to take several actions that have affected production this week. These actions have included: not dredging in CU 4, adding additional water to hopper barges being loaded in CU 3, CU 17 and CU 18, installing wind screens on mini-hopper barges used in CU 8 and CU 18, and deploying containment and sorbent booms in the vicinity of and around dredges operating in CUs 3, 17 and 18.	unknown
				4. Inclement weather was experienced this week causing lost time. The dredging contractor was unable to operate river craft during certain time periods due to dense river fog reducing visibility.	10
				5. On August 14, 2009, the dredging contractor encountered and removed two submerged wooden beams adjacent to the eastern shore of the East Channel of Rogers Island. The wooden beams are thought to be elements of a historic fort located near to that location. The dredge was moved away from that location and continued to work. A no dredge zone has been established by EPA that runs 30' from the 119' elevation along the eastern shore of the East Channel of Rogers Island from Old Fort Road to the entrance of Bond Creek. It is not known at this time when dredging can resume in this zone.	unknown
				6. In response to a directive received from EPA on August 7, 2009 relating to concerns about PCB concentrations in the river, GE shut down sediment removal operations in the river at 18:30 on the same day. GE provided EPA with a start-up plan on August 11, 2009. The plan detailed a phased start-up that reduced the total number of dredges and the number of locations to be dredged. This resulted in lower than planned production this week.	576
				7. On August 12, 2009, representatives from EPA and GE conducted field dredging tests of areas selected by EPA within bucket refusal areas in CU 5. The dredging tests were conducted using dredges 320-13 and 320-14. During the tests; these dredges and associated equipment were not used for dredging; this reduced the production of those dredges on that day.	5
				8. GE is also implementing a number of recommendations made by EPA on August 7, 2009 to address PCB resuspension concerns, including the use of containment and absorbent booms at all dredges and minimization of bucket decanting. These actions have affected productivity.	unknown

Phase 1 Productivity Report

Table 3 Delays Encountered in the Project[1]

Report Date: 11/4/2009

Reporting Period				Reason for Lost Time with potential to affect target dredging productivity in Table 4-1 of RAWP #3	Time Lost (if known)[2]
Week	Dates				Hours
16	8/16/2009	to	8/22/2009	1. As described above, areas of bucket refusal due to the presence of bedrock or cobbles has been encountered in CUs 2, 3, 5, 6, 7, and 8. In these areas the dredging contractor has been unable to achieve the required elevations. Following the process provided in Section 2.8 of the approved RAWP #3 GE submitted a letter to EPA on July 8, 2009 that proposed a procedure to address bedrock areas. At this time, GE has received a response from EPA regarding dredging bucket refusal areas in CUs 2, 5 and 6. Until GE has a final resolution with EPA regarding placement of backfill or cap GE will be unable to complete the CU acceptance process and the associated backfill / cap design, and planning activities in bucket refusal areas.	unknown
				2. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 3, 5 and 6. Similar quantities of wood debris are being found in CUs 3, 7, 8. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				3. In response to exceedances of criteria in the PCB air quality performance standard, GE has continued to take several actions that have affected production this week. These actions have included: not dredging in CU 4, adding additional water to hopper barges being loaded in CU 3, CU 17 and CU 18, installing wind screens on mini-hopper barges used in CU 8 and CU 18, and deploying containment and sorbent booms in the vicinity of and around dredges operating in CUs 3, 17 and 18.	unknown
				4. Inclement weather was experienced this week causing lost time. The dredging contractor halted operations during periods of thunderstorms	22
				5. On August 14, 2009, the dredging contractor encountered and removed two submerged wooden beams adjacent to the eastern shore of the East Channel of Rogers Island. The wooden beams are thought to be elements of a historic fort located near to that location. The dredge was moved away from that location and continued to work. A no dredge zone has been established by EPA that runs 30' from the 119' elevation along the eastern shore of the East Channel of Rogers Island from Old Fort Road to the entrance of Bond Creek. It is not known at this time when dredging can resume in this zone.	unknown
				6. GE is also implementing a number of recommendations made by EPA on August 7, 2009 to address PCB resuspension concerns, including the use of containment and absorbent booms at all dredges and minimization of bucket decanting. These actions have affected productivity.	unknown
				7. A shortage of empty hopper barges was experienced this week, resulting in lost time for the active dredge barges. The shortage resulted from three different elements: 1. the barge loading rate temporarily exceeded the off-loading rate at the processing facility. This was due to depth of available sediment in CUs 1, 2, 4 and 17, which resulted in the 385 dredges loading hopper barges more quickly than in some earlier weeks. 2. a shortage of empty mini-hopper scows continued to be experienced this week, resulting in lost time for the active dredges. This shortage was due to the dredge production in CUs 5, 6 and 8 outpacing the number of mini-hopper scows available on the project, as well as longer than anticipated mini-hopper transit times to the transfer locations in CU 10. 3.A number of hopper barges were taken out of service this week so that cracks and holes could be repaired. This reduced the total number of hopper barges on the project that were available for work	614
				8. EPA has directed that all mini-hopper barges be covered with tarps during transit operations. Testing of tarp prototypes and use of tarps on the mini-hopper barges has slowed transport operations and reduced productivity in CUs where mini-hoppers are used.	unknown

Table 3 Delays Encountered in the Project[1]

Report Date: 11/4/2009

Reporting Period				Reason for Lost Time with potential to affect target dredging productivity in Table 4-1 of RAWP #3	Time Lost (if known)[2]
Week	Dates				Hours
17	8/23/2009	to	8/29/2009	1. As described above, areas of bucket refusal due to the presence of bedrock or cobbles has been encountered in CUs 2, 3, 5, 6, 7, and 8. In these areas the dredging contractor has been unable to achieve the required elevations. Following the process provided in Section 2.8 of the approved RAWP #3 GE submitted a letter to EPA on July 8, 2009 that proposed a procedure to address bedrock areas. At this time, GE has received a response from EPA regarding dredging bucket refusal areas in CUs 2, 5 and 6. In accordance with EPA direction, transition areas between dredge material and bucket refusal areas were redredged, but this is a very low productivity process. Further, until GE has a final resolution with EPA regarding placement of backfill or cap, GE will be unable to complete the CU acceptance process and the	unknown
				2. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 3, 5, 6, 7 and 8. This week significant quantities of wood were found when dredging re-started in CU 4. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				3. In response to exceedances of criteria in the PCB air quality performance standard, GE has continued to take several actions that have affected production this week. These actions have included: limited dredging in high concentration areas in CU 4, adding additional water to hopper barges being loaded in CUs 2, 3, 4, 17 and 18, and installing wind screens on mini-hopper barges used in CU 2 and CU 6.	unknown
				4. On August 14, 2009, the dredging contractor encountered and removed two submerged wooden beams adjacent to the eastern shore of the East Channel of Rogers Island. The wooden beams are thought to be elements of a historic fort located near to that location. The dredge was moved away from that location and continued to work. A no dredge zone has been established by EPA that runs 30' from the 119' elevation along the eastern shore of the East Channel of Rogers Island from Old Fort Road to the entrance of Bond Creek. It is not known at this time when dredging can resume in this zone.	unknown
				5. GE is also implementing a number of recommendations made by EPA on August 7, 2009 to address PCB resuspension concerns, including the use of containment and absorbent booms at all dredges and minimization of bucket decanting. These actions have affected productivity.	unknown
				6. A shortage of empty hopper barges was experienced this week, resulting in lost time for the active dredge barges. The shortage resulted from three different elements: First, the barge loading rate temporarily exceeded the off-loading rate at the processing facility. This was due to depth of available sediment in CUs 1, 2, 4, 17 and 18, which resulted in the 385 dredges loading hopper barges more quickly than in some earlier weeks. Second, a shortage of empty mini-hopper scows continued to be experienced this week, resulting in lost time for the active dredges. This shortage was due to the dredge production in CUs 5, 6 and 7 outpacing the number of mini-hopper scows available on the project, as well as longer than anticipated mini-hopper transit times to the transfer locations in CU 10. Third, a substantial number of hopper barges were taken out of service this week so that cracks and holes could be repaired. This reduced the total number of hopper barges on the project that were available for work	476
				7. EPA directed that dredging in CU 4 initially be limited to only those sediment removal units (SRUs) having PCB concentrations less than 200 ppm. This direction was later revised so that dredging could take place in SRUs having a PCB concentration greater than 200 ppm, but with the stipulation that barges could only be loaded to the first four foot of draft from SRUs with PCB concentrations higher than 200 ppm and that the remaining barge draft is to be filled from areas in CU 3, CU 4 or CU 11 having PCB concentrations less than 200 ppm. These directives affected productivity in CU 4.	unknown

Table 3 Delays Encountered in the Project[1]

Report Date: 11/4/2009

Reporting Period				Reason for Lost Time with potential to affect target dredging productivity in Table 4-1 of RAWP #3	Time Lost (if known)[2]
Week	Dates				Hours
18	8/30/2009	to	9/5/2009	1. As described above, areas of bucket refusal due to the presence of bedrock or cobbles has been encountered in CUs 2, 3, 5, 6, 7, and 8. In these areas, the dredging contractor has been unable to achieve the required elevations. Following the process provided in Section 2.8 of the approved RAWP #3 GE submitted a letter to EPA on July 8, 2009 that proposed a procedure to address bedrock areas. At this time, GE has received a response from EPA regarding dredging bucket refusal areas in CUs 2, 5 and 6. In accordance with EPA direction, transition areas between dredge material and bucket refusal areas were redredged, but this is a very low productivity process. Further, until GE has a final resolution with EPA regarding placement of backfill or cap, GE will be unable to complete the CU acceptance process and the associated backfill / cap design and planning activities in bucket refusal areas.	unknown
				2. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 3, 4, 5, 6, 7 and 8. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				3. In response to exceedances of criteria in the PCB air quality performance standard, GE has continued to take several actions that have affected production this week. These actions have included: limited dredging in high concentration areas in CU 4, adding additional water to hopper barges being loaded in CUs 2, 3, 4 and 18, and installing wind screens on mini-hopper barges used in CU 2 and CU 6.	unknown
				4. On August 14, 2009, the dredging contractor encountered and removed two submerged wooden beams adjacent to the eastern shore of the East Channel of Rogers Island. These beams are believed to be an historical resource, As a result, a no dredge zone has been established by EPA that runs 30' from the 119' elevation along the eastern shore of the East Channel of Rogers Island from Old Fort Road to the entrance of Bond Creek. It is not known at this time when dredging can resume in this zone.	unknown
				5. GE is also implementing a number of recommendations made by EPA on August 7, 2009 to address PCB resuspension concerns, including the use of containment and absorbent booms at all dredges in CUs 1, 2, 3, 4, 17 and 18 and minimization of bucket decanting. These actions have affected productivity.	unknown
				6. A shortage of empty mini-hopper and regular hopper barges was experienced this week, resulting in lost time for the active dredge barges. The shortage of mini-hopper barges was due to the dredge production in CUs 5, 6, 7 and 8 outpacing the number of mini-hopper barges available on the project, as well as longer than anticipated mini-hopper transit times to the transfer locations in CU 11. The shortage of regular hopper barges was due to an average of eight hopper barges being taken out of service due to internal hopper damage. In addition, investigative measures are being taken to reduce the potential for damage to the hopper barges, and some of those measures have increased the off-loading time at the processing facility.	504
				7. EPA directed that dredging in CU 4 initially be limited to only those sediment removal units (SRUs) having PCB concentrations less than 200 ppm. This direction was later revised so that dredging could take place in SRUs having a PCB concentration greater than 200 ppm, but with the stipulation that barges could only be loaded to the first four foot of draft from SRUs with PCB concentrations higher than 200 ppm and that the remaining barge draft is to be filled from areas in CU 3, CU 4 or CU 11 having PCB concentrations less than 200 ppm. These directives affected productivity in CU 4 this week.	unknown
				8. Inclement weather was experienced this week causing lost time. The dredging contractor halted operations during periods of thick fog.	68
				9. Of the nine CUs dredged this week, planned inventory removal occurred in only CUs 4, 8 and 18. Dredging in the remaining six CUs consisted of 2nd and 3rd passes of extra inventory removal that typically have lower cut thicknesses than past dredge cuts requiring dredges to move more frequently. This reduced productivity this week.	unknown

Phase 1 Productivity Report

Table 3 Delays Encountered in the Project[1]

Report Date: 11/4/2009

Reporting Period				Reason for Lost Time with potential to affect target dredging productivity in Table 4-1 of RAWP #3	Time Lost (if known)[2]
Week	Dates				Hours
19	9/6/2009	to	9/12/2009	1. As described above, areas of bucket refusal due to the presence of bedrock or cobbles has been encountered in CUs 2, 3, 5, 6, 7, and 8. In these areas, the dredging contractor has been unable to achieve the required elevations. Following the process provided in Section 2.8 of the approved RAWP #3 GE submitted a letter to EPA on July 8, 2009 that proposed a procedure to address bedrock areas. At this time, GE has received a response from EPA regarding dredging bucket refusal areas in CUs 2, 5 and 6. In accordance with EPA direction, transition areas between dredge material and bucket refusal areas were redredged, but this is a very low productivity process. Further, until GE has a final resolution with EPA regarding placement of backfill or cap, GE will be unable to complete the CU acceptance process and the associated backfill / cap design and planning activities in bucket refusal areas	unknown
				2. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 3, 4, 5, 6, 7 and 8. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				3. In response to exceedances of criteria in the PCB air quality performance standard, GE has continued to take several actions that have affected production this week. These actions have included: limited dredging in high concentration areas in CU 4, and adding additional water to hopper barges being loaded in CUs 3, 4 and 18.	unknown
				4. GE is also implementing a number of recommendations made by EPA on August 7, 2009 to address PCB resuspension concerns, including the use of containment and absorbent booms at all dredges in CUs 1, 3, 4, 17 and 18 and minimization of bucket decanting. These actions have affected productivity.	unknown
				5. A shortage of empty mini-hopper and regular hopper barges was experienced this week, resulting in lost time for the active dredge barges. The shortage of mini-hopper barges was due to the dredge production in CUs 5, 6, 7 and 8 outpacing the number of mini-hopper barges available on the project, as well as longer than anticipated mini-hopper transit times to the transfer locations in CU 11. The shortage of regular hopper barges was due to an average of four hopper barges being taken out of service due to internal hopper damage. In addition, investigative measures are being taken to reduce the potential for damage to the hopper barges, and some of those measures have increased the off-loading time at the processing facility.	321
				6. EPA directed that dredging in CU 4 initially be limited to only those sediment removal units (SRUs) having PCB concentrations less than 200 ppm. This direction was later revised so that dredging could take place in SRUs having a PCB concentration greater than 200 ppm, but with the stipulation that barges could only be loaded to the first four foot of draft from SRUs with PCB concentrations higher than 200 ppm and that the remaining barge draft is to be filled from areas in CU 3, CU 4 or CU 11 having PCB concentrations less than 200 ppm. These directives affected productivity in CU 4 this week. On September 8, 2009 EPA concurred that barges in CU 4 could be loaded to a 7 foot draft.	unknown
				7. Inclement weather was experienced this week causing lost time. The dredging contractor halted operations during periods of thick fog.	34
				8. Of the nine CUs dredged this week, planned inventory removal occurred in only CUs 4, 8 and 18. Dredging in the remaining six CUs consisted of 2nd and 3rd passes of extra inventory removal that typically have lower cut thicknesses than past dredge cuts requiring dredges to move more frequently. This reduced productivity this week.	unknown
				9. In response to a directive received from EPA on September 11, 2009 relating to PCB concentrations in the river, GE shut down sediment removal operations in CU 4 and CU 18. This resulted in lower than planned production this week.	61

Table 3 Delays Encountered in the Project[1]

Report Date: 11/4/2009

Reporting Period				Reason for Lost Time with potential to affect target dredging productivity in Table 4-1 of RAWP #3	Time Lost (if known)[2]
Week	Dates				Hours
20	9/13/2009	to	9/19/2009	1. As described above, areas of bucket refusal due to the presence of bedrock or cobbles have been encountered in CUs 2, 3, 5, 6, 7, and 8. In these areas, the dredging contractor has been unable to achieve the required elevations. Following the process provided in Section 2.8 of the approved RAWP #3 GE submitted a letter to EPA on July 8, 2009 that proposed a procedure to address bedrock areas. At this time, GE has received a response from EPA regarding dredging bucket refusal areas in CUs 2, 5 and 6. In accordance with EPA direction, transition areas between dredge material and bucket refusal areas were redredged, but this is a very low productivity process. GE has received verbal direction from EPA regarding placement of backfill or cap in these areas; however, until GE has a final written resolution with EPA regarding placement of backfill or cap, GE will be unable to complete the CU acceptance process and the associated backfill / cap design and planning activities in bucket refusal areas.	unknown
				2. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 3, 4, 5, 6, 7 and 8. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				3. In response to exceedances of criteria in the PCB air quality performance standard, GE has continued to take several actions that have affected production this week. These actions have included: adding additional water to hopper barges being loaded in CUs 3, 4 and 18, and prioritizing the unloading of those barges.	unknown
				4. GE is also implementing a number of recommendations made by EPA on August 7, 2009 to address PCB resuspension concerns, including the use of containment and absorbent booms at all dredges in CUs 1, 3, 4, 17 and 18 and minimization of bucket decanting. These actions have affected productivity.	unknown
				5. A shortage of empty mini-hopper and regular hopper barges was experienced this week, resulting in lost time for the active dredge barges. The shortage of mini-hopper barges was due to the dredge production in CUs 5, 6, 7 and 8 outpacing the number of mini-hopper barges available on the project, as well as longer than anticipated mini-hopper transit times to the transfer locations in CU 11. The shortage of regular hopper barges was due in part to an average of two hopper barges being taken out of service due to internal hopper damage and in part to the supply of loaded barges to the processing facility exceeding the facility's capacity to off-load them.	314
				6. Of the nine CUs dredged this week, planned inventory removal occurred in only CUs 4, 8 and 18. Dredging in the remaining five CUs consisted of 2nd and 3rd passes of extra inventory removal that typically have lower cut thicknesses than past dredge cuts requiring dredges to move more frequently. This reduced productivity this week.	unknown
				7. In response to a directive received from EPA on September 11, 2009 relating to PCB concentrations in the river, GE shut down sediment removal operations in CU 4 and CU 18 on that day. Sediment removal operations were re-started but restricted to only dredging CU 4 or 18 individually and not simultaneously. This resulted in lower than planned production this week.	42
21	9/20/2009	to	9/26/2009	1. As described above, areas of bucket refusal due to the presence of bedrock or cobbles have been encountered in CUs 2, 3, 5, 6, 7, and 8. In these areas, the dredging contractor has been unable to achieve the required elevations. Following the process provided in Section 2.8 of the approved RAWP #3 GE submitted a letter to EPA on July 8, 2009 that proposed a procedure to address bedrock areas. At this time, GE has received a response from EPA regarding dredging bucket refusal areas in CUs 2, 5 and 6. In accordance with EPA direction, transition areas between dredge material and bucket refusal areas were redredged, but this is a very low productivity process. GE has received verbal direction from EPA regarding placement of backfill or cap in these areas; however, until GE has a final written resolution with EPA regarding placement of backfill or cap, GE will be unable to complete the CU acceptance process and the associated backfill / cap design and planning activities in bucket refusal areas.	unknown
				2. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 3, 4, 5, 6, 7 and 8. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				3. In response to exceedances of criteria in the PCB air quality performance standard, GE has continued to take several actions that have affected production this week. These actions have included: adding additional water to hopper barges being loaded in CUs 3, 4 and 18, and prioritizing the unloading of those barges.	unknown
				4. GE is also implementing a number of recommendations made by EPA on August 7, 2009 to address PCB resuspension concerns, including the use of containment and absorbent booms at all dredges in CUs 1, 3, 4, 17 and 18 and minimization of bucket decanting. These actions have affected productivity.	unknown
				5. A shortage of empty mini-hopper and regular hopper barges was experienced this week, resulting in lost time for the active dredge barges. The shortage of mini-hopper barges was due to the dredge production in CUs 5, 6, 7 and 8 outpacing the number of mini-hopper barges available on the project, as well as longer than anticipated mini-hopper transit times to the transfer locations in CU 11. The shortage of regular hopper barges was due in part to an average of two hopper barges being taken out of service due to internal hopper damage and in part to the supply of loaded barges to the processing facility exceeding the facility's capacity to off-load them.	195
				6. Of the seven CUs dredged this week, planned inventory removal occurred in only CUs 4 and 18. Dredging in the remaining five CUs consisted of 2nd and 3rd passes of extra inventory removal that typically have lower cut thicknesses than past dredge cuts requiring dredges to move more frequently. This reduced productivity this week.	unknown

Table 3 Delays Encountered in the Project[1]

Report Date: 11/4/2009

Reporting Period				Reason for Lost Time with potential to affect target dredging productivity in Table 4-1 of RAWP #3	Time Lost (if known)[2]
Week	Dates				Hours
22	9/27/2009	to	10/3/2009	1. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, 2, 3, 4, 5, 6, 7 and 8. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				2. In response to exceedances of criteria in the PCB air quality performance standard, GE has continued to take several actions that have affected production this week. These actions have included: adding additional water to hopper barges being loaded in CUs 2, 3 and 8, and prioritizing the unloading of those barges.	unknown
				3. GE is also implementing a number of recommendations made by EPA on August 7, 2009 to address PCB resuspension concerns, including the use of containment and absorbent booms at all dredges in CUs 1, 2, and 3 and minimization of bucket decanting. These actions have affected productivity.	unknown
				4. Dredging of clay was not contemplated based on agreement that once clay was observed in the bucket, no further dredging was required. Clay areas were delineated during the initial inventory dredging. Redredging of these areas to remove thin veneers of sediment over an irregular clay surface is being required as part of CU acceptance, resulting in a significant amount of clay being excavated. A high percentage of clay in sediment barges has resulted in much longer barge unloading times at the processing facility. Unloading high percentages of clay takes approximately twice the amount of time as it takes to unload a barge containing no clay. Extensive clay areas have been encountered in CUs 2, 3, 7 and 8. This has resulted in delay to the dredging operations due to a shortage of empty sediment barges.	335
				5. Of the five CUs dredged this week, no planned inventory removal occurred. Dredging in the five CUs consisted of 2nd, and 3rd passes of extra inventory removal or 1st residual pass that typically have lower cut thicknesses than past dredge cuts requiring dredges to move more frequently. This reduced productivity this week.	unknown
23	10/4/2009	to	10/10/2009	1. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, and 4 this week. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				2. In response to exceedances of criteria in the PCB air quality performance standard, GE has continued to take several actions that have affected production this week. These actions have included: adding additional water to hopper barges being loaded in CUs 2, 3 and 8, and prioritizing the unloading of those barges.	unknown
				3. GE is also implementing a number of recommendations made by EPA on August 7, 2009 to address PCB resuspension concerns, including the use of containment and absorbent booms at all dredges in CUs 1, 2, and 3 and minimization of bucket decanting. These actions have affected productivity.	unknown
				4. Dredging of clay was not contemplated based on agreement that once clay was observed in the bucket, no further dredging was required. Clay areas were delineated during the initial inventory dredging. Redredging of these areas to remove thin veneers of sediment over an irregular clay surface is being required as part of CU acceptance, resulting in a significant amount of clay being excavated. A high percentage of clay in sediment barges has resulted in much longer barge unloading times at the processing facility. Unloading high percentages of clay takes approximately twice the amount of time as it takes to unload a barge containing no clay. Extensive clay areas have been encountered in CUs 2, 3, 7 and 8. This has resulted in delay to the dredging operations due to a shortage of empty sediment barges.	265
				5. Of the six CUs dredged this week, no planned inventory removal occurred. Dredging in the five CUs consisted of 2nd, and 3rd passes of extra inventory removal or 1st residual pass that typically have lower cut thicknesses than past dredge cuts requiring dredges to move more frequently. This reduced productivity this week.	unknown
				6. High river flows impacted dredging operations this week. The dredging contractor halted operations during periods of high river flows.	16
24	10/11/2009	to	10/17/2009	1. As described previously, pervasive wood debris was encountered in the sediment throughout CUs 1, and 4 this week. For the reasons detailed above for the week of June 21-27, 2009, the finding of pervasive wood debris reduces dredge productivity significantly in such areas.	unknown
				2. GE is also implementing a number of recommendations made by EPA on August 7, 2009 to address PCB resuspension concerns, including the use of containment and absorbent booms at all dredges in CUs 1, 4 and 8. These actions have affected productivity	unknown
				3. Dredging of clay was not contemplated based on agreement that once clay was observed in the bucket, no further dredging was required. Clay areas were delineated during the initial inventory dredging. Redredging of these areas to remove thin veneers of sediment over an irregular clay surface is being required as part of CU acceptance, resulting in a significant amount of clay being excavated. A high percentage of clay in sediment barges has resulted in much longer barge unloading times at the processing facility. Unloading high percentages of clay takes approximately twice the amount of time as it takes to unload a barge containing no clay. Extensive clay areas have been encountered in CUs 7 and 8. This has resulted in delay to the dredging operations due to a shortage of empty sediment barges	179
				4. Of the five CUs dredged this week, no planned inventory removal occurred. Dredging in the five CUs consisted of 2nd, and 3rd passes of extra inventory removal or 1st residual pass that typically have lower cut thicknesses than past dredge cuts requiring dredges to move more frequently. This reduced productivity this week.	unknown
				5. CUs in the East Channel have only recently been approved for backfill/capping. Due to the lateness of the season, backfill/cap operations in CU 2 and CU 3 are being performed concurrently with dredging operations in CU 4 and CU 1. The high volume of marine traffic in the restricted width East Channel requires numerous moves of dredges to allow passage of barges. This reduced productivity this week	unknown

Phase 1 Productivity Report

Table 3 Delays Encountered in the Project[1]

Report Date: 11/4/2009

Reporting Period				**Reason for Lost Time with potential to affect target dredging productivity in Table 4-1 of RAWP #3**	**Time Lost (if known)[2]**
Week	Dates				Hours
25	10/18/2009	to	10/24/2009	1. As described previously, wood debris was encountered in the sediment throughout CUs 1 and 4 this week. For the reasons detailed above for the week of June 21-27, 2009, the finding of wood debris reduced dredge productivity in such areas.	unknown
				2. GE was also implementing a number of recommendations made by EPA on August 7, 2009 to address PCB resuspension concerns, including the use of containment and absorbent booms at all dredges in CUs 1, 4 and 18. These actions affected productivity	unknown
				3. Of the four CUs dredged this week, no planned inventory removal occurred. Dredging in the four CUs consisted of extra inventory removal passes or residual passes that typically have lower cut thicknesses than original inventory cuts, requiring dredges to move more frequently. This reduced productivity this week..	unknown
				4. Due to a large regional rain event on October 24, 2009, the Champlain Canal between lock C7 and C8 had a raised water elevation that resulted in reduced bridge clearance. Vessel movement to the processing facility was restricted due to this event. This has the potential to affect productivity this week.	unknown
				5. CUs in the East Channel have only recently been approved for backfill/capping. Due to the lateness of the season, backfill/cap operations in CU 2 and CU 3 were being performed concurrently with dredging operations in CU 4 and CU 1. The high volume of marine traffic in the restricted width East Channel required numerous moves of dredges to allow passage of barges. This reduced productivity this week	unknown
26	10/25/2009	to	10/31/2009	1. As described previously, wood debris was encountered in the sediment in CU 1 this week. For the reasons detailed above for the week of June 21-27, 2009, the finding of wood debris reduced dredge productivity in such areas.	unknown
				2. Of the two CUs dredged this week, no planned inventory removal occurred. Dredging in the two CUs consisted of extra inventory removal passes or residual passes that typically have lower cut thicknesses than original inventory cuts, requiring dredges to move more frequently. This reduced productivity this week..	unknown
				3. Due to a significant regional rain event on October 24, 2009, the Champlain Canal system was closed on October 25th and 26th, 2009. Vessel movements to the Processing Facility and river operations were restricted due to this event. This affected productivity this week	unknown

Notes:
1. Lost time identified in this table does not necessarily constitute delays in the performance of CD obligations requiring notification under CD Paragraph 77.
2. The time lost estimates in this column represent only the known cumulative time lost for all dredges affected by the events during the week in question. The events listed may cause additional delays and impacts to work in future weeks.

Table 4 PCBs in Processed Material

Report Date: 11/4/2009

Sample Date	PCB Concentration (mg/kg)[1]							
Material Type	Dredged Material	Coarse Material						Filter Cake
Sample Location	Barge	Trommel Reject (5/8"+)	Wood Debris (Trommel)	Intermediate Screen	Hydrocylone 1	Hydrocyclone 2	Average[2]	Filter Press Roll Off
6/25/2009	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	41 [3]	117 [3]
7/1/2009	10.7	Not Sampled	Not Sampled	12	31	9.5	17.5	38
7/3/2009	14.4	Not Sampled	Not Sampled	8.5	9.5	6.9	8.3	41
7/7/2009	47	Not Sampled	Not Sampled	9.1	23.3	28.1	20.2	49
7/10/2009	16.8	Not Sampled	Not Sampled	19	20.5	14	17.8	47
7/13/2009	29.3	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	288
7/17/2009	132	Not Sampled	Not Sampled	45.3	35.7	20.8	33.9	276
7/20/2009	23.0	21.6	12.8	2.7	152	158	69.4	Not Sampled
7/24/2009	129 & 53	92.0	99.0	108	74	61	86.8	445
7/28/2009	200	4.06	48.4	33.8	Not Sampled	21.9	27.0	137
7/31/2009	999	2.37	93	6.68	21.6	15.6	27.9	121
8/4/2009	213	45	29.3	46.8	51	44	43.2	190
8/7/2009	108	74	48.9	16.3	21.4	22.8	36.68	211
8/11/2009	624	103	449	322	102	96	214.4	454
8/12/2009	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	144
8/14/2009	5.4	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled
8/18/2009	104	19.4	6.7	19.2	35.5	9.0	17.96	220
8/21/2009	204	15.2	43.4	15.3	68	89	46.18	327
8/24/2009	26.6	141	101	86.5	45.5	48	84.4	355
8/28/2009	26.3	12.9	126	19.7	33	41	46.5	211
9/1/2009	106	30	114	59	28.1	30.4	52.3	93
9/4/2009	14.5	55	447	35.9	147	185	174.0	47
9/8/2009	92	6.4	35.6	10.9	68	36.3	31.4	184
9/11/2009	875	106	154	73	173	139	129.0	496
9/15/2009	42.9	353	184	362	310	312	304.2	153
9/18/2009	24.5	26.1	244	82	60	84	99.2	16.4
9/22/2009	24.8	26.8	22.9	55	115	113.4	66.6	152.1
9/25/2009	173	53	81	11.9	100	129	75.0	262
9/29/2009	78	29.3	91.6	81	26.8	27.5	51.2	25.7
10/6/2009	2.87	10.8	Not Sampled	13.7	52	28.6	26.3	77.4
10/9/2009	42.8	85.2	6.3	56	51	123	64.3	41.2
10/13/2009	32	34	15	55.5	43	47	38.9	99
10/20/2009	64.6	51.2	34.7	15	27.3	63	38.2	56
10/23/2009	46	9.0	20.9	72	51	49	40.4	149
10/27/2009	115	59	143	66	92	48	81.6	108

Notes:
1. The PCB mass in the processed material cannot be accurately estimated.
2. The coarse material average is the arithmetic average of the PCB concentration in material discharged from the trommel, intermediate screen and hydrocyclones.
3. On 6/25/09, 13 coarse stockpile and 11 filter cake samples were collected. The average is given.
4. On 7/24/09, 2 different barges were sampled

Appendix III-C

Lock C7 Raw Lockage Data, 2009 (as Received from GE)

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
04/08/09	10:50	South	09-C0053		EPA/GE Dredging Project	1					
04/08/09	10:50	South	09-C0052		EPA/GE Dredging Project	1					
04/09/09	7:50	North	09-C0053		EPA/GE Dredging Project	1					
04/09/09	9:05	North			Other Government	1	CASHMAN TUG HULL#136(NOT NAMED)				
04/14/09	8:40	North	09-C0043		EPA/GE Dredging Project	1					
04/14/09	8:55	South	09-C0049		EPA/GE Dredging Project	1					
04/14/09	13:20	South	09-C0043		EPA/GE Dredging Project	1					
04/14/09	15:30	North	09-C0049		EPA/GE Dredging Project	1					
04/14/09	15:30	North	09-C0076		EPA/GE Dredging Project	1					
04/15/09	7:50	North	09-C0055		EPA/GE Dredging Project	1					
04/15/09	8:05	South	09-C0076		EPA/GE Dredging Project	1					
04/15/09	10:25	South	09-C0055		EPA/GE Dredging Project	1					
04/16/09	10:05	South	09-C0052		EPA/GE Dredging Project	1					
04/16/09	13:10	North	09-C0053		EPA/GE Dredging Project	1					
04/16/09	14:05	South			Other Government	1	CASHMAN TUG HULL#137				
04/16/09	14:05	South	09-C0055		EPA/GE Dredging Project	1					
04/16/09	14:05	South	09-C0049		EPA/GE Dredging Project	1					
04/16/09	14:15	North			Other Government	1	CASHMAN TUG HULL#137				
04/16/09	15:05	North	09-C0049		EPA/GE Dredging Project	1					
04/17/09	10:40	North	09-C0055		EPA/GE Dredging Project	1					
04/17/09	13:10	South	09-C0055		EPA/GE Dredging Project	1					
04/21/09	13:15	North	09-C0055		EPA/GE Dredging Project	1					
04/21/09	14:30	South	09-C0055		EPA/GE Dredging Project	1					
04/23/09	9:55	North	09-C0055		EPA/GE Dredging Project	1					
04/23/09	11:50	South	09-C0055		EPA/GE Dredging Project	1					
04/24/09	7:25	North	09-C0048		EPA/GE Dredging Project	1					
04/24/09	7:25	North	09-C0076		EPA/GE Dredging Project	1					
04/24/09	11:20	North	09-C0053		EPA/GE Dredging Project	1					
04/24/09	11:20	North			Canal Corporation Vessel	1	BUOY BOAT 154				
04/24/09	12:00	South	09-C0076		EPA/GE Dredging Project	1					
04/24/09	12:00	South	09-C0048		EPA/GE Dredging Project	1					
04/24/09	12:30	North			Canal Corporation Vessel	1	WORK BOAT WJ				
04/24/09	12:30	North			Canal Corporation Vessel	1	SPS 51				
04/24/09	12:30	North			Canal Corporation Vessel	1	TUG ERIE				
04/24/09	13:00	South			Canal Corporation Vessel	1	TUG ERIE				
04/24/09	13:20	North	09-C0044		EPA/GE Dredging Project	1					
04/24/09	14:30	South	09-C0045		EPA/GE Dredging Project	1					
04/24/09	14:30	South	09-C0044		EPA/GE Dredging Project	1					
04/27/09	7:40	North	09-C0055		EPA/GE Dredging Project	1					
04/27/09	10:20	South	09-C0049		EPA/GE Dredging Project	1					
04/27/09	11:40	North	09-C0049		EPA/GE Dredging Project	1					
04/27/09	14:00	North	09-C0055		EPA/GE Dredging Project	1					
04/29/09	13:30	North			Canal Corporation Vessel	1	TUG GRAND ERIE				
05/01/09	11:00	North	09-C0049		EPA/GE Dredging Project	1					
05/01/09	11:00	North	09-C0077		EPA/GE Dredging Project	1					
05/01/09	11:25	North	09-C0055		EPA/GE Dredging Project	1					
05/01/09	11:25	North	09-C0077		EPA/GE Dredging Project	1					
05/01/09	13:25	South	09-C0055		EPA/GE Dredging Project	1					
05/01/09	14:10	North	09-20491	832824	Pleasure	1	EVASION				
05/01/09	14:55	North	09-20041	802850	Pleasure	1	TRUE WIND				
05/01/09	14:55	North	09-20492	827370	Pleasure	1	SEA PROVIDENCE				
05/01/09	16:00	North	09-C0049		EPA/GE Dredging Project	1					
05/01/09	16:45	North			Commercial	1		341	Marine Highway - Margot	CG276023	09-C0013
05/01/09	17:50	South			Commercial	1		27	Marine Highway - Margot	CG276023	09-C0013
05/01/09	18:15	North	09-20493	827967	Pleasure	1	BYE BYE BLUES				
05/01/09	19:20	North			Commercial	1		290	Brake - Gotham	CG1070376	09-C0036
05/01/09	20:30	South			Commercial	1		295	Brake - Gotham	CG1070376	09-C0036
05/02/09	9:50	North	09-20494	818413	Pleasure	1	ATTITUDE				
05/02/09	9:50	North	09-20496	CT36AR	Pleasure	1	LUDICROUS				
05/02/09	9:50	North	09-20495	816557	Pleasure	1	JAYA				
05/02/09	9:50	North	15276	FL7102DP	Pleasure	1					
05/02/09	17:50	North	09-C0048		EPA/GE Dredging Project	1					
05/02/09	18:25	North			Commercial	1		342	Marine Highway - Margot	CG276023	09-C0013
05/02/09	19:50	South			Commercial	1		28	Marine Highway - Margot	CG276023	09-C0013
05/02/09	19:50	South	09-C0048		EPA/GE Dredging Project	1					
05/03/09	8:50	North			Commercial	1		413	Brake - Gotham	CG1070376	09-C0036
05/03/09	10:20	South			Commercial	1		296	Brake - Gotham	CG1070376	09-C0036
05/03/09	13:50	North	09-20498	1192498	Pleasure	1	SOUVENIR				
05/04/09	8:30	North			Commercial	1		343	Marine Highway - Margot	CG276023	09-C0013
05/04/09	9:50	South			Commercial	1		349	Marine Highway - Margot	CG276023	09-C0013
05/04/09	10:30	South	09-20921		Pleasure	1	BETTY ANN				
05/04/09	13:35	North			Commercial	1		291	Brake - Gotham	CG1070376	09-C0036
05/04/09	14:30	North	09-S0723		Pleasure	1					
05/04/09	14:45	South			Commercial	1		292	Brake - Gotham	CG1070376	09-C0036
05/04/09	15:40	South	09-C0077		EPA/GE Dredging Project	1					
05/04/09	16:10	North	09-C0077		EPA/GE Dredging Project	1					
05/05/09	8:40	South	09-C0077		EPA/GE Dredging Project	1					
05/05/09	9:05	North	09-C0077		EPA/GE Dredging Project	1					
05/05/09	9:25	South	09-S0723		Pleasure	1					
05/05/09	9:35	North	15626	NY3783UT	Pleasure	1					
05/05/09	10:05	North			Commercial	1		348	Marine Highway - Margot	CG276023	09-C0013
05/05/09	10:25	South			Canal Corporation Vessel	1	SPS 51				
05/05/09	11:15	South			Other Government	1	CASHMAN PATTY BESS				
05/05/09	11:15	South			Commercial	1		347	Marine Highway - Margot	CG276023	09-C0013
05/05/09	11:15	South	09-C0078		EPA/GE Dredging Project	1					
05/05/09	13:25	South			Canal Corporation Vessel	1	WORK BOAT WJ				

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
05/05/09	15:20	North	15626	NY3783UT	Pleasure	1					
05/05/09	18:40	North			Commercial	1		293	Brake - Gotham	CG1070376	09-C0036
05/05/09	19:35	South			Commercial	1		26	Brake - Gotham	CG1070376	09-C0036
05/06/09	7:55	South			Canal Corporation Vessel	1	TUG GRAND ERIE				
05/06/09	9:25	North	09-20201	828895	Pleasure	1	DESTINEE				
05/06/09	9:40	South			Canal Corporation Vessel	1	BUOY BOAT 154				
05/06/09	10:15	North	09-C0043		EPA/GE Dredging Project	1					
05/06/09	11:00	North	09-20501	82033	Pleasure	1	OPHELIE				
05/06/09	11:00	North	09-20502	827324	Pleasure	1	MYCHTA				
05/06/09	11:25	South	09-C0043		EPA/GE Dredging Project	1					
05/06/09	12:40	North	09-C0043		EPA/GE Dredging Project	1					
05/06/09	13:00	North	09-20504	827635	Pleasure	1	LAVALO				
05/06/09	13:20	North	09-20503	10E13780	Pleasure	1	FOR PETE'S SAKE				
05/06/09	13:55	South	09-C0043		EPA/GE Dredging Project	1					
05/06/09	17:15	North	09-20043		Pleasure	1					
05/06/09	18:20	North	09-C0055		EPA/GE Dredging Project	1					
05/06/09	21:20	South	09-C0055		EPA/GE Dredging Project	1					
05/07/09	11:45	North	09-C0055		EPA/GE Dredging Project	1					
05/07/09	12:50	North	09-20505	CT5720A	Pleasure	1	PEGGY'S COVE				
05/07/09	13:25	South	09-C0055		EPA/GE Dredging Project	1					
05/07/09	14:55	North	09-C0078		EPA/GE Dredging Project	1					
05/07/09	16:15	North	09-S0877		Pleasure	1	STICKLESS				
05/07/09	16:30	South	09-C0078		EPA/GE Dredging Project	1					
05/07/09	18:15	North	09-C0055		EPA/GE Dredging Project	1					
05/07/09	20:15	South	09-C0055		EPA/GE Dredging Project	1					
05/08/09	11:00	North	09-C0044		EPA/GE Dredging Project	1					
05/08/09	11:55	South	09-20922	NH7725FP	Pleasure	1	ANTIQUITY				
05/08/09	13:50	South	09-C0044		EPA/GE Dredging Project	1					
05/08/09	16:30	North	09-C0055		EPA/GE Dredging Project	1					
05/08/09	17:00	South	09-20923		Pleasure	1					
05/08/09	19:15	South	09-C0055		EPA/GE Dredging Project	1					
05/09/09	12:25	North	09-20044		Pleasure	1					
05/09/09	12:25	North	09-20045		Pleasure	1					
05/09/09	13:00	North	09-10086		Pleasure	1					
05/09/09	13:35	North	09-S0176		Pleasure	1					
05/09/09	13:55	North	09-C0076		EPA/GE Dredging Project	1					
05/09/09	13:55	North	09-C0078		EPA/GE Dredging Project	1					
05/09/09	14:35	South	09-C0078		EPA/GE Dredging Project	1					
05/09/09	14:35	South	09-C0076		EPA/GE Dredging Project	1					
05/09/09	14:55	North	09-C0076		EPA/GE Dredging Project	1					
05/09/09	14:55	North	09-C0055		EPA/GE Dredging Project	1					
05/09/09	14:55	North	09-C0078		EPA/GE Dredging Project	1					
05/09/09	15:55	South	09-C0078		EPA/GE Dredging Project	1					
05/09/09	15:55	South	09-C0076		EPA/GE Dredging Project	1					
05/09/09	16:10	South	09-C0055		EPA/GE Dredging Project	1					
05/10/09	8:30	North	09-C0076		EPA/GE Dredging Project	1					
05/10/09	8:30	North	09-C0043		EPA/GE Dredging Project	1					
05/10/09	11:30	South	09-C0076		EPA/GE Dredging Project	1					
05/10/09	11:30	South	09-C0043		EPA/GE Dredging Project	1					
05/10/09	15:10	North	09-20506		Pleasure	1	LICORNE				
05/11/09	11:45	South	09-C0049		EPA/GE Dredging Project	1					
05/11/09	11:45	South	09-C0046		EPA/GE Dredging Project	1					
05/11/09	11:45	South	09-C0051		EPA/GE Dredging Project	1					
05/11/09	12:10	North	09-20481	NY2496FS	Pleasure	1					
05/11/09	12:25	South	09-20481	NY2496FS	Pleasure	1					
05/11/09	14:35	North	09-C0043		EPA/GE Dredging Project	1					
05/11/09	15:15	South	09-C0043		EPA/GE Dredging Project	1					
05/11/09	16:25	North	09-20507		Pleasure	1	ARGOS				
05/11/09	16:30	North	09-20508		Pleasure	1	MARY				
05/11/09	16:30	North	09-20507		Pleasure	1	GILIGAN				
05/11/09	16:30	North	09-20510		Pleasure	1	MAD URO				
05/11/09	17:05	South	09-S0026		Pleasure	1	TUG 44				
05/11/09	19:10	North	09-C0049		EPA/GE Dredging Project	1					
05/11/09	19:10	North	09-C0078		EPA/GE Dredging Project	1					
05/11/09	19:10	North	09-C0055		EPA/GE Dredging Project	1					
05/11/09	19:10	North	09-C0043		EPA/GE Dredging Project	1					
05/11/09	19:10	North	09-C0076		EPA/GE Dredging Project	1					
05/11/09	19:55	South	09-C0076		EPA/GE Dredging Project	1					
05/11/09	19:55	South	09-C0078		EPA/GE Dredging Project	1					
05/12/09	8:05	South	09-C0055		EPA/GE Dredging Project	1					
05/12/09	9:00	North			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
05/12/09	12:25	North	09-20511		Pleasure	1	DREAMCHASER				
05/12/09	12:35	South			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
05/12/09	13:25	North	09-20515		Pleasure	1	SILVER PEARL				
05/12/09	14:15	North			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
05/12/09	14:40	North	09-20513		Pleasure	1	BRIO				
05/12/09	14:40	North	09-20514		Pleasure	1	MYSTIC				
05/12/09	15:20	North	09-20512		Pleasure	1	SCHIMITTY				
05/12/09	15:40	North	09-C0055		EPA/GE Dredging Project	1					
05/12/09	16:35	North	09-20516		Pleasure	1	EMPRESS OF QUEBEC				
05/12/09	17:25	North	09-S0026		Pleasure	1	TUG 44				
05/12/09	18:45	South	09-C0055		EPA/GE Dredging Project	1					
05/13/09	8:45	North		NY4017EH	Other Government	1	EPA OVERSIGHT				
05/13/09	9:15	South		NY4017EH	Other Government	1	EPA OVERSIGHT				
05/13/09	10:00	North	UPT-15676	NY9008MA	Pleasure	1	SPECIAL K				
05/13/09	10:15	South			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
05/13/09	10:30	North	09-C0047		EPA/GE Dredging Project	1					
05/13/09	11:15	South	09-C0047		EPA/GE Dredging Project	1					
05/13/09	11:30	North	09-20517		Pleasure	1	LOUISE3				
05/13/09	12:25	North	09-C0049		EPA/GE Dredging Project	1					
05/13/09	14:25	North			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
05/13/09	15:45	North			Other Government	1	HRF 2				
05/13/09	16:30	South			Other Government	1	HRF 2				
05/13/09	17:15	North	09-C0055		EPA/GE Dredging Project	1					
05/13/09	19:30	South	09-C0055		EPA/GE Dredging Project	1					
05/14/09	8:15	North	09-C0057		EPA/GE Dredging Project	1					
05/14/09	8:55	North	09-20518	N/A	Pleasure	1	LA DETENTE				
05/14/09	9:10	South	09-C0057		EPA/GE Dredging Project	1					
05/14/09	11:00	South	09-10101	824691	Pleasure	1	SENSATION 1				
05/14/09	11:15	North	09-C0055		EPA/GE Dredging Project	1					
05/14/09	11:55	North	09-S0738	1142166	Pleasure	1	IRISH ROVER				
05/14/09	12:30	North	09-C0059		EPA/GE Dredging Project	1					
05/14/09	13:50	North	09-C0047		EPA/GE Dredging Project	1					
05/14/09	15:25	South	09-C0055		EPA/GE Dredging Project	1					
05/14/09	17:30	South	09-C0049		EPA/GE Dredging Project	1					
05/14/09	19:10	South	09-C0078		EPA/GE Dredging Project	1					
05/14/09	19:45	South	09-C0059		EPA/GE Dredging Project	1					
05/14/09	19:45	South	09-C0077		EPA/GE Dredging Project	1					
05/14/09	19:45	South	09-C0047		EPA/GE Dredging Project	1					
05/15/09	5:45	North	09-C0077		EPA/GE Dredging Project	1					
05/15/09	5:45	North	09-C0049		EPA/GE Dredging Project	1					
05/15/09	6:40	South	09-C0077		EPA/GE Dredging Project	1					
05/15/09	6:40	South	09-C0049		EPA/GE Dredging Project	1					
05/15/09	9:40	South			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
05/15/09	11:35	North	09-20520	1134895	Pleasure	1	SPLENDOUR				
05/15/09	13:25	North	09-20522	801209	Pleasure	1	MNEVA				
05/15/09	13:25	North	09-20523	1121900	Pleasure	1	CARPE DIEM IV				
05/15/09	13:25	North	09-20521	831388	Pleasure	1	RIO				
05/15/09	13:25	North	09-20579	826923	Pleasure	1	GIZMO				
05/15/09	14:00	North	09-20524	858290	Pleasure	1	CHARLEEN				
05/15/09	14:00	North	09-20525	565573562	Pleasure	1	LABELLE HELME				
05/15/09	14:25	North			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
05/15/09	15:30	North	09-C0047		EPA/GE Dredging Project	1					
05/15/09	17:00	South	09-C0047		EPA/GE Dredging Project	1					
05/15/09	21:50	North	09-C0047		EPA/GE Dredging Project	1					
05/15/09	22:55	South	09-C0047		EPA/GE Dredging Project	1					
05/16/09	7:20	North	09-20526		Pleasure	1	WIND DANCE IV				
05/16/09	8:40	North	09-C0076		EPA/GE Dredging Project	1					
05/16/09	9:55	South	09-C0076		EPA/GE Dredging Project	1					
05/16/09	9:55	South	09-S0026		Pleasure	1	TUG 44				
05/16/09	13:00	North	09-S0179		Pleasure	1					
05/16/09	14:10	North	09-C0061		Hire	1					
05/16/09	15:20	South	09-10102		Pleasure	1	AU TRE MIAD				
05/16/09	16:10	North	09-20529		Pleasure	1	POSITANO				
05/16/09	16:35	North	09-20528		Pleasure	1	MISTY				
05/16/09	16:35	North	09-C0047		EPA/GE Dredging Project	1					
05/16/09	20:00	South	09-C0042		EPA/GE Dredging Project	1					
05/16/09	20:00	South	09-C0043		EPA/GE Dredging Project	1					
05/16/09	20:00	South	09-C0047		EPA/GE Dredging Project	1					
05/17/09	8:35	North	09-20202		Pleasure	1					
05/17/09	10:35	South	09-C0061		Hire	1					
05/17/09	12:20	North	UPT-15678		Pleasure	1	MODERATION III				
05/17/09	14:00	North	09-S0026		Pleasure	1	TUG 44				
05/17/09	14:00	North	09-20533		Pleasure	1					
05/17/09	15:40	North	09-20532		Pleasure	1	DYAD				
05/18/09	8:40	South			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
05/18/09	10:35	North			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
05/18/09	12:45	North	09-C0048		EPA/GE Dredging Project	1					
05/18/09	13:50	South	09-C0048		EPA/GE Dredging Project	1					
05/18/09	14:10	North	09-C0078		EPA/GE Dredging Project	1					
05/18/09	14:40	North	UPT-15726		Pleasure	1					
05/18/09	14:40	North	09-20534		Pleasure	1					
05/18/09	17:00	South	09-C0078		EPA/GE Dredging Project	1					
05/18/09	17:55	North	09-C0076		EPA/GE Dredging Project	1					
05/18/09	17:55	North	09-C0078		EPA/GE Dredging Project	1					
05/18/09	17:55	North	09-C0076		EPA/GE Dredging Project	1					
05/18/09	19:45	South	09-C0079		EPA/GE Dredging Project	1					
05/18/09	19:45	South	09-C0076		EPA/GE Dredging Project	1					
05/18/09	19:45	South	09-C0078		EPA/GE Dredging Project	1					
05/18/09	20:20	North	09-C0078		EPA/GE Dredging Project	1					
05/18/09	22:20	South	09-C0078		EPA/GE Dredging Project	1					
05/19/09	5:25	North	09-C0078		EPA/GE Dredging Project	1					
05/19/09	5:25	North	09-C0077		EPA/GE Dredging Project	1					
05/19/09	8:05	South	09-C0078		EPA/GE Dredging Project	1					
05/19/09	8:05	South	09-C0077		EPA/GE Dredging Project	1					
05/19/09	8:30	North	09-20535		Pleasure	1	DL1738PL				
05/19/09	9:05	North	09-C0077		EPA/GE Dredging Project	1					
05/19/09	12:25	South	09-S0835	NY2790MG	Pleasure	1					
05/19/09	13:40	South	09-C0077		EPA/GE Dredging Project	1					
05/19/09	14:05	North	09-S0835	NY2790MB	Pleasure	1					
05/19/09	14:55	North	09-20538		Pleasure	1	TRUE CHAMP				
05/19/09	15:30	North	09-20536		Pleasure	1					

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05/19/09	15:30	North	09-20537		Pleasure	1					
05/19/09	15:55	North	09-C0047		EPA/GE Dredging Project	1					
05/19/09	18:10	South	09-C0053		EPA/GE Dredging Project	1					
05/19/09	18:10	South	09-C0047		EPA/GE Dredging Project	1					
05/19/09	18:30	North	09-C0047		EPA/GE Dredging Project	1					
05/19/09	19:25	South	09-C0047		EPA/GE Dredging Project	1					
05/20/09	10:15	North	09-20539		Pleasure	1	CYRIUS				
05/20/09	10:55	North	09-20926		Pleasure	1	PERSEVERANCE				
05/20/09	13:05	North	09-C0047		EPA/GE Dredging Project	1					
05/20/09	15:25	South	09-C0047		EPA/GE Dredging Project	1					
05/21/09	1:20	North	09-C0078		EPA/GE Dredging Project	1					
05/21/09	1:20	North	09-C0044		EPA/GE Dredging Project	1					
05/21/09	3:05	South	09-C0044		EPA/GE Dredging Project	1					
05/21/09	3:05	South	09-C0078		EPA/GE Dredging Project	1					
05/21/09	9:55	North	09-C0044		EPA/GE Dredging Project	1					
05/21/09	10:40	North	09-20541	1393537	Pleasure	1	AZIMUL				
05/21/09	11:35	South	09-C0044		EPA/GE Dredging Project	1					
05/21/09	11:50	North	09-C0043		EPA/GE Dredging Project	1					
05/21/09	11:50	North	09-C0048		EPA/GE Dredging Project	1					
05/21/09	12:45	North	09-20540		Pleasure	1	LAZULA				
05/21/09	14:35	South	09-S0040	NJ9440GP	Pleasure	1	HUNNY BUNNY 3				
05/21/09	15:25	South	09-C0043		EPA/GE Dredging Project	1					
05/21/09	16:30	North	09-C0049		EPA/GE Dredging Project	1					
05/21/09	16:30	North	09-C0043		EPA/GE Dredging Project	1					
05/21/09	17:00	North	09-C0076		EPA/GE Dredging Project	1					
05/21/09	17:15	South	09-S0026		Pleasure	1	TUG 44				
05/21/09	20:40	South	09-C0043		EPA/GE Dredging Project	1					
05/21/09	20:40	South	09-C0076		EPA/GE Dredging Project	1					
05/21/09	21:05	North	09-C0076		EPA/GE Dredging Project	1					
05/21/09	23:10	South	09-C0076		EPA/GE Dredging Project	1					
05/21/09	23:10	South	09-C0049		EPA/GE Dredging Project	1					
05/22/09	9:55	North	09-C0078		EPA/GE Dredging Project	1					
05/22/09	11:00	South	09-C0078		EPA/GE Dredging Project	1					
05/22/09	12:00	North	09-20543	DO5346X	Pleasure	1	LIBERTY				
05/22/09	12:40	North	09-C0078		EPA/GE Dredging Project	1					
05/22/09	14:05	North	09-S1156		Pleasure	1	HOTSPUR				
05/22/09	14:25	South	09-C0078		EPA/GE Dredging Project	1					
05/22/09	14:45	North	09-20544		Pleasure	1	ISLAND GIRL				
05/22/09	15:05	North	UPT-15679	NY7162BE	Pleasure	1	STEELIN AWAY				
05/22/09	15:40	North	09-C0078		EPA/GE Dredging Project	1					
05/22/09	15:40	North	09-C0076		EPA/GE Dredging Project	1					
05/22/09	15:40	North	09-C0079		EPA/GE Dredging Project	1					
05/22/09	17:40	South	09-C0103		EPA/GE Dredging Project	1					
05/22/09	17:40	South	09-C0079		EPA/GE Dredging Project	1					
05/22/09	17:40	South	09-C0078		EPA/GE Dredging Project	1					
05/22/09	17:55	North	09-S0026		Pleasure	1	TUGG 44				
05/22/09	19:30	South	09-20928	1160289	Pleasure	1	RUNS ON WATER				
05/22/09	20:25	North			Employee / Retiree	1	N/A				
05/22/09	20:25	North	09-20548	833083	Pleasure	1	MAGY				
05/23/09	9:35	North	09-C0049		EPA/GE Dredging Project	1					
05/23/09	10:40	South	09-C0049		EPA/GE Dredging Project	1					
05/23/09	11:05	North	UPT-15680		Pleasure	1	BIGGER ATTITUDE				
05/23/09	12:30	North	09-C0077		EPA/GE Dredging Project	1					
05/23/09	12:30	North	09-S0604		Pleasure	1	ALL HOURS				
05/23/09	12:30	North	09-C0043		EPA/GE Dredging Project	1					
05/23/09	13:00	North	09-C0049		EPA/GE Dredging Project	1					
05/23/09	14:00	North	09-20546		Pleasure	1					
05/23/09	14:15	North	09-S0018		Pleasure	1	JENNY LYNN				
05/23/09	14:15	North	09-20545		Pleasure	1	BRINIA				
05/23/09	14:25	South	09-C0043		EPA/GE Dredging Project	1					
05/23/09	15:00	South	09-C0077		EPA/GE Dredging Project	1					
05/23/09	15:00	South	09-C0049		EPA/GE Dredging Project	1					
05/23/09	15:20	North	09-S0736		Pleasure	1					
05/23/09	15:45	North	09-20552		Pleasure	1					
05/23/09	15:45	North	09-S0512		Pleasure	1	DIXIE				
05/23/09	15:45	North	09-20551		Pleasure	1					
05/23/09	16:10	North	09-C0049		EPA/GE Dredging Project	1					
05/23/09	16:10	North	09-C0077		EPA/GE Dredging Project	1					
05/23/09	16:25	South	09-S0512		Pleasure	1	DIXIE				
05/23/09	17:40	South	09-C0049		EPA/GE Dredging Project	1					
05/23/09	17:40	South	09-C0077		EPA/GE Dredging Project	1					
05/23/09	18:05	South	09-S0736		Pleasure	1					
05/23/09	18:20	North	09-C0043		EPA/GE Dredging Project	1					
05/23/09	18:55	North	09-C0077		EPA/GE Dredging Project	1					
05/23/09	18:55	North	09-C0049		EPA/GE Dredging Project	1					
05/23/09	19:25	South	09-C0043		EPA/GE Dredging Project	1					
05/23/09	20:15	South	09-C0077		EPA/GE Dredging Project	1					
05/23/09	20:15	South	09-C0049		EPA/GE Dredging Project	1					
05/24/09	10:05	South	09-S0018		Pleasure	1	JENNY LIND				
05/24/09	10:30	South	09-20929	VT1341R	Pleasure	1					
05/24/09	13:30	North	09-20555		Pleasure	1	ABITION				
05/24/09	14:00	North	09-S0754		Pleasure	1	SUMMER SLOPES				
05/24/09	15:30	North	09-20557		Pleasure	1	VANILLA				
05/25/09	7:55	South	09-S0877	FL8403JT	Pleasure	1	STICKLESS				
05/25/09	10:05	North	09-20681		Pleasure	1	TERRA NOVA				
05/25/09	11:15	South	09-S0026		Pleasure	1	TUG 44				

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05/25/09	11:30	North	09-S0319	NY2261UX	Pleasure	1	STUDIO "C"				
05/25/09	12:00	South	09-S0604		Pleasure	1	ALL HOURS				
05/25/09	13:10	North	09-C0101		EPA/GE Dredging Project	1					
05/25/09	13:10	North	UPT-15627		Pleasure	1	RED DEVEL				
05/25/09	13:10	North	UPT-15628	NY1259UT	Pleasure	1					
05/25/09	15:00	North	09-C0101		EPA/GE Dredging Project	1					
05/25/09	15:00	North	09-C0104		EPA/GE Dredging Project	1					
05/25/09	15:00	North	09-20047		Pleasure	1	BELLE VERDI				
05/25/09	15:00	North	09-20559		Pleasure	1	HORIZON				
05/25/09	15:00	North	UPT-15277		Pleasure	1	FIGHTING IRISH				
05/25/09	15:00	North	09-C0042		EPA/GE Dredging Project	1					
05/25/09	15:25	North	09-S0026		Pleasure	1	TUG 44				
05/25/09	16:10	South	09-C0104		EPA/GE Dredging Project	1					
05/25/09	17:55	South	UPT-15627		Pleasure	1					
05/25/09	17:55	South	UPT-15628		Pleasure	1					
05/26/09	8:45	North	09-20683		Pleasure	1					
05/26/09	8:45	North	09-C0104		EPA/GE Dredging Project	1					
05/26/09	8:45	North	09-20682		Pleasure	1	MYSTIC				
05/26/09	8:45	North		CT 6111AE	Other Government	1	OCEAN SURVEY ECHO				
05/26/09	9:20	North	09-20684		Pleasure	1	SEGWA				
05/26/09	9:45	South	09-C0104		EPA/GE Dredging Project	1					
05/26/09	10:30	North		NY4017EH	Other Government	1	USEPA OVERSIGHT 1				
05/26/09	11:25	South		NY4017EH	Other Government	1	USEPA OVERSIGHT 1				
05/26/09	11:25	South		CT6111AE	Other Government	1	OCEANSURVEY ECHO1				
05/26/09	13:10	North	09-C0043		EPA/GE Dredging Project	1					
05/26/09	13:10	North	09-C0078		EPA/GE Dredging Project	1					
05/26/09	13:30	North	09-20048		Pleasure	1	FREE TO BE				
05/26/09	14:05	North	09-20686		Pleasure	1	PARADISE FOUND				
05/26/09	14:05	North	09-C0044		EPA/GE Dredging Project	1					
05/26/09	14:25	North	09-20685	828891	Pleasure	1	KAIKEI				
05/26/09	14:45	South	09-C0043		EPA/GE Dredging Project	1					
05/26/09	14:45	South	09-C0078		EPA/GE Dredging Project	1					
05/26/09	16:40	South	09-C0042		EPA/GE Dredging Project	1					
05/27/09	9:30	North	09-20687		Pleasure	1	MANIKOUTAI				
05/27/09	11:00	South			Pleasure - No motor	1					
05/27/09	11:00	South			Pleasure - No motor	1	KAYAKS(2)				
05/27/09	12:20	North	09-20688	FL7272	Pleasure	1					
05/27/09	12:20	North	09-C0047		EPA/GE Dredging Project	1					
05/27/09	13:00	South			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
05/27/09	13:45	North			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
05/27/09	14:15	South	09-C0047		EPA/GE Dredging Project	1					
05/27/09	14:55	North	09-20689		Pleasure	1	QUASAR				
05/27/09	15:25	North	09-C0078		EPA/GE Dredging Project	1					
05/27/09	15:25	North	09-C0105		EPA/GE Dredging Project	1					
05/27/09	15:45	North	09-20960		Pleasure	1	SENSATION II				
05/27/09	16:10	North	09-C0104		EPA/GE Dredging Project	1					
05/27/09	16:50	North	09-S1226		Pleasure	1	MAINE VISION				
05/27/09	17:05	South	09-C0078		EPA/GE Dredging Project	1					
05/27/09	17:05	South	09-C0105		EPA/GE Dredging Project	1					
05/27/09	17:55	South	09-C0104		EPA/GE Dredging Project	1					
05/27/09	18:10	North	09-20691		Pleasure	1	MERIDIEN V				
05/28/09	1:05	North	09-C0078		EPA/GE Dredging Project	1					
05/28/09	1:05	North	09-C0105		EPA/GE Dredging Project	1					
05/28/09	3:10	South	09-C0105		EPA/GE Dredging Project	1					
05/28/09	3:10	South	09-C0078		EPA/GE Dredging Project	1					
05/28/09	3:40	North	09-C0104		EPA/GE Dredging Project	1					
05/28/09	6:05	South	09-C0104		EPA/GE Dredging Project	1					
05/28/09	8:05	North	09-20692		Pleasure	1	THIRD WATCH				
05/28/09	11:25	North	09-C0078		EPA/GE Dredging Project	1					
05/28/09	11:25	North	09-C0045		EPA/GE Dredging Project	1					
05/28/09	14:35	North			Canal Corporation Vessel	1	SPS 51				
05/28/09	17:10	South	09-C0045		EPA/GE Dredging Project	1					
05/28/09	17:10	South	09-C0078		EPA/GE Dredging Project	1					
05/28/09	17:30	North	09-C0104		EPA/GE Dredging Project	1					
05/28/09	18:45	North	09-C0105		EPA/GE Dredging Project	1					
05/28/09	18:45	North	09-C0078		EPA/GE Dredging Project	1					
05/28/09	18:45	North	09-C0055		EPA/GE Dredging Project	1					
05/28/09	20:00	South	09-C0104		EPA/GE Dredging Project	1					
05/28/09	21:30	South	09-C0078		EPA/GE Dredging Project	1					
05/28/09	21:30	South	09-C0105		EPA/GE Dredging Project	1					
05/29/09	8:15	South	09-C0055		EPA/GE Dredging Project	1					
05/29/09	8:35	South			Canal Corporation Vessel	1	SPS 51				
05/29/09	9:25	North	09-C0078		EPA/GE Dredging Project	1					
05/29/09	10:15	South	09-C0078		EPA/GE Dredging Project	1					
05/29/09	11:35	North	09-20693		Pleasure	1	JUSTE CIEL				
05/29/09	13:10	North	09-S0607	NY1728P	Pleasure	1					
05/29/09	13:40	North	09-C0078		EPA/GE Dredging Project	1					
05/29/09	14:05	North	09-20694		Pleasure	1	OSPREY				
05/29/09	14:55	North	09-20431		Pleasure	1	MIDNIGHT SUN 2				
05/29/09	15:20	North	09-20181		Pleasure	1	MICHALKA				
05/29/09	16:30	South	09-C0078		EPA/GE Dredging Project	1					
05/29/09	17:35	North	09-C0101		EPA/GE Dredging Project	1					
05/29/09	18:20	South	09-C0101		EPA/GE Dredging Project	1					
05/29/09	18:40	North	09-C0105		EPA/GE Dredging Project	1					
05/29/09	20:50	South	09-C0105		EPA/GE Dredging Project	1					
05/30/09	2:10	North	09-C0078		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
05/30/09	3:55	South	09-C0078		EPA/GE Dredging Project	1					
05/30/09	10:05	North	09-20695		Pleasure	1	SOOTSUS AT SEA				
05/30/09	10:25	North	09-20696		Pleasure	1	WHISPER				
05/30/09	13:30	South	09-S0607	NY1728BP	Pleasure	1					
05/30/09	13:45	North	09-C0105		EPA/GE Dredging Project	1					
05/30/09	14:55	North	09-10087		Pleasure	1					
05/30/09	15:40	South	09-C0105		EPA/GE Dredging Project	1					
05/30/09	15:50	North	09-20697		Pleasure	1					
05/30/09	18:15	North	09-20049		Pleasure	1	MOOVIN				
05/30/09	19:25	North	09-C0105		EPA/GE Dredging Project	1					
05/30/09	19:25	North	09-C0045		EPA/GE Dredging Project	1					
05/30/09	21:35	South	09-C0045		EPA/GE Dredging Project	1					
05/30/09	21:35	South	09-C0105		EPA/GE Dredging Project	1					
05/31/09	9:45	North	09-C0078		EPA/GE Dredging Project	1					
05/31/09	9:45	North	09-C0049		EPA/GE Dredging Project	1					
05/31/09	10:30	South	09-C0078		EPA/GE Dredging Project	1					
05/31/09	12:30	North	09-20698		Pleasure	1	LA BOUDEUSE				
05/31/09	14:40	South	09-20931		Pleasure	1	MOLLY CODDLE 2				
05/31/09	15:10	North	09-20699		Pleasure	1	LEELOO				
05/31/09	15:10	North	09-20700		Pleasure	1	LA NOUBA				
05/31/09	17:50	North	09-S0764		Pleasure	1	WAVE DANCER				
06/01/09	8:40	North	09-20562		Pleasure	1	CARBO				
06/01/09	11:20	North	09-C0079		EPA/GE Dredging Project	1					
06/01/09	11:20	North	09-C0078		EPA/GE Dredging Project	1					
06/01/09	12:15	North	09-20050		Pleasure	1	PAMMELLA				
06/01/09	12:45	North	09-20561		Pleasure	1	NUTMEG				
06/01/09	13:15	North	09-10385		Pleasure	1	REENIE ROO				
06/01/09	13:30	South	09-C0078		EPA/GE Dredging Project	1					
06/01/09	13:30	South	09-C0079		EPA/GE Dredging Project	1					
06/01/09	14:20	North	09-C0042		EPA/GE Dredging Project	1					
06/01/09	15:15	North	09-20563	806149	Pleasure	1	CATHARE				
06/01/09	15:30	South	09-C0042		EPA/GE Dredging Project	1					
06/01/09	18:00	North	09-C0105		EPA/GE Dredging Project	1					
06/01/09	18:00	North	09-C0079		EPA/GE Dredging Project	1					
06/01/09	19:45	South	09-C0079		EPA/GE Dredging Project	1					
06/01/09	19:45	South	09-C0105		EPA/GE Dredging Project	1					
06/02/09	5:20	North	09-C0078		EPA/GE Dredging Project	1					
06/02/09	5:20	North	09-C0079		EPA/GE Dredging Project	1					
06/02/09	6:55	South	09-C0078		EPA/GE Dredging Project	1					
06/02/09	6:55	South	09-C0079		EPA/GE Dredging Project	1					
06/02/09	11:25	South	09-20932	NY9504FJ	Pleasure	1	ZENDIGO				
06/02/09	11:45	North	09-S0727	NY3738UT	Pleasure	1					
06/02/09	13:15	North	09-20564	NJ8251GH	Pleasure	1	LA PIANO				
06/02/09	13:50	North	09-C0079		EPA/GE Dredging Project	1					
06/02/09	13:50	North	09-C0078		EPA/GE Dredging Project	1					
06/02/09	16:30	North	09-C0046		EPA/GE Dredging Project	1					
06/02/09	17:15	South	09-C0078		EPA/GE Dredging Project	1					
06/02/09	17:15	South	09-C0079		EPA/GE Dredging Project	1					
06/02/09	17:45	South	09-S0727		Pleasure	1					
06/02/09	18:10	South	09-C0046		EPA/GE Dredging Project	1					
06/02/09	19:55	North	09-C0105		EPA/GE Dredging Project	1					
06/02/09	19:55	North	09-C0078		EPA/GE Dredging Project	1					
06/02/09	21:45	South	09-C0078		EPA/GE Dredging Project	1					
06/03/09	1:15	North	09-C0078		EPA/GE Dredging Project	1					
06/03/09	1:15	North	09-C0077		EPA/GE Dredging Project	1					
06/03/09	3:15	South	09-C0077		EPA/GE Dredging Project	1					
06/03/09	3:15	South	09-C0078		EPA/GE Dredging Project	1					
06/03/09	8:20	South			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
06/03/09	11:00	North	09-C0078		EPA/GE Dredging Project	1					
06/03/09	11:00	North	09-C0077		EPA/GE Dredging Project	1					
06/03/09	12:30	South	09-20934		Pleasure	1	EXILES				
06/03/09	13:10	South	09-C0078		EPA/GE Dredging Project	1					
06/03/09	13:10	South	09-C0077		EPA/GE Dredging Project	1					
06/03/09	13:30	North	09-10384		Pleasure	1	MYSTERIOUS WAYS				
06/03/09	13:50	South	09-20933		Pleasure	1	JOLLIE BRISE				
06/03/09	14:05	North	09-10215		Pleasure	1	STILL BUSY				
06/03/09	15:45	North	09-C0105		EPA/GE Dredging Project	1					
06/03/09	15:45	North	09-C0104		EPA/GE Dredging Project	1					
06/03/09	17:45	South	09-C0104		EPA/GE Dredging Project	1					
06/03/09	17:45	South	09-C0105		EPA/GE Dredging Project	1					
06/03/09	23:00	North	09-C0042		EPA/GE Dredging Project	1					
06/04/09	0:20	South	09-C0042		EPA/GE Dredging Project	1					
06/04/09	2:00	North	09-C0078		EPA/GE Dredging Project	1					
06/04/09	2:00	North	09-C0077		EPA/GE Dredging Project	1					
06/04/09	3:50	South	09-C0078		EPA/GE Dredging Project	1					
06/04/09	3:50	South	09-C0077		EPA/GE Dredging Project	1					
06/04/09	7:55	North	09-C0103		EPA/GE Dredging Project	1					
06/04/09	7:55	North	09-C0043		EPA/GE Dredging Project	1					
06/04/09	8:55	North	09-20567		Pleasure	1	WINDIFEROUS				
06/04/09	9:45	South	09-C0049		EPA/GE Dredging Project	1					
06/04/09	9:45	South	09-C0044		EPA/GE Dredging Project	1					
06/04/09	9:45	South	09-C0103		EPA/GE Dredging Project	1					
06/04/09	9:45	South	09-C0043		EPA/GE Dredging Project	1					
06/04/09	10:45	North	09-C0077		EPA/GE Dredging Project	1					
06/04/09	10:45	North	09-C0105		EPA/GE Dredging Project	1					
06/04/09	12:50	North	09-20566		Pleasure	1	MARALISA				

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06/04/09	12:50	North	09-20567		Pleasure	1	FOILE'D				
06/04/09	12:50	North	09-20569		Pleasure	1	GUYANNE				
06/04/09	13:45	South	09-C0105		EPA/GE Dredging Project	1					
06/04/09	13:45	South	09-C0077		EPA/GE Dredging Project	1					
06/04/09	13:55	North	09-C0043		EPA/GE Dredging Project	1					
06/04/09	14:10	South	09-10103		Pleasure	1	ROXANNE				
06/04/09	14:25	North	09-20568		Pleasure	1	AFFICIONADO				
06/04/09	15:00	South	09-C0043		EPA/GE Dredging Project	1					
06/04/09	15:20	North	09-20570	VT5405L	Pleasure	1	PLUMPUPPET				
06/04/09	16:10	North	09-10088		Pleasure	1	ADIOS 2				
06/04/09	17:10	North	09-C0104		EPA/GE Dredging Project	1					
06/04/09	17:10	North	09-C0105		EPA/GE Dredging Project	1					
06/04/09	18:00	North	09-20571	49D8678	Pleasure	1	MAYA BELLA				
06/04/09	18:00	North	09-20572	818307	Pleasure	1	K-2				
06/04/09	18:45	South	09-C0104		EPA/GE Dredging Project	1					
06/04/09	18:45	South	09-C0105		EPA/GE Dredging Project	1					
06/04/09	19:15	North	09-C0103		EPA/GE Dredging Project	1					
06/04/09	20:50	South	09-C0103		EPA/GE Dredging Project	1					
06/05/09	0:40	North	09-C0078		EPA/GE Dredging Project	1					
06/05/09	0:40	North	09-C0042		EPA/GE Dredging Project	1					
06/05/09	3:15	South	09-C0042		EPA/GE Dredging Project	1					
06/05/09	3:15	South	09-C0078		EPA/GE Dredging Project	1					
06/05/09	10:15	North	09-10702		Pleasure	1	TRANSITION				
06/05/09	12:45	North	09-20573		Pleasure	1	SEA GULL				
06/05/09	12:45	North	09-20574		Pleasure	1	HERON				
06/05/09	14:20	North	09-C0045		EPA/GE Dredging Project	1					
06/05/09	14:20	North	09-C0078		EPA/GE Dredging Project	1					
06/05/09	14:20	North	09-C0077		EPA/GE Dredging Project	1					
06/05/09	14:45	North	09-10089	645825	Pleasure	1	VOYAGER				
06/05/09	15:45	North	09-C0043		EPA/GE Dredging Project	1					
06/05/09	15:45	North	09-10090	CT996BA	Pleasure	1					
06/05/09	16:25	North	09-20575		Pleasure	1	LA LOUPIOTE				
06/05/09	16:50	South	09-C0078		EPA/GE Dredging Project	1					
06/05/09	16:50	South	09-C0077		EPA/GE Dredging Project	1					
06/05/09	17:30	South	09-C0045		EPA/GE Dredging Project	1					
06/05/09	17:30	South	09-C0043		EPA/GE Dredging Project	1					
06/05/09	20:35	North	09-C0104		EPA/GE Dredging Project	1					
06/05/09	20:35	North	09-C0105		EPA/GE Dredging Project	1					
06/05/09	22:50	South	09-C0105		EPA/GE Dredging Project	1					
06/05/09	22:50	South	09-C0104		EPA/GE Dredging Project	1					
06/06/09	2:15	North	09-C0078		EPA/GE Dredging Project	1					
06/06/09	2:15	North	09-C0042		EPA/GE Dredging Project	1					
06/06/09	5:15	South	09-C0042		EPA/GE Dredging Project	1					
06/06/09	5:15	South	09-C0078		EPA/GE Dredging Project	1					
06/06/09	7:45	North	09-C0045		EPA/GE Dredging Project	1					
06/06/09	8:20	South	09-20935		Pleasure	1	SOLEDAD IV				
06/06/09	9:25	South	09-C0045		EPA/GE Dredging Project	1					
06/06/09	9:55	North	09-20576		Pleasure	1	DESTINY				
06/06/09	10:10	South	09-S0026		Pleasure	1	TUG 44				
06/06/09	10:40	North	09-C0042		EPA/GE Dredging Project	1					
06/06/09	10:40	North	09-C0078		EPA/GE Dredging Project	1					
06/06/09	11:45	North	09-C0045		EPA/GE Dredging Project	1					
06/06/09	12:10	South	09-C0042		EPA/GE Dredging Project	1					
06/06/09	12:10	South	09-C0078		EPA/GE Dredging Project	1					
06/06/09	12:35	South	09-20936		Pleasure	1	MOSTLY LOVE				
06/06/09	13:35	South	09-C0045		EPA/GE Dredging Project	1					
06/06/09	14:25	North	09-20577		Pleasure	1	INFINITY				
06/06/09	15:25	North	09-C0104		EPA/GE Dredging Project	1					
06/06/09	15:25	North	09-C0105		EPA/GE Dredging Project	1					
06/06/09	17:00	North	09-S0605		Pleasure	1					
06/06/09	17:45	South	09-C0105		EPA/GE Dredging Project	1					
06/06/09	17:45	South	09-C0104		EPA/GE Dredging Project	1					
06/06/09	18:20	North	09-C0043		EPA/GE Dredging Project	1					
06/06/09	18:45	South	09-S0605		Pleasure	1					
06/06/09	18:55	North	09-20578		Pleasure	1					
06/06/09	19:55	North	09-C0104		EPA/GE Dredging Project	1					
06/06/09	19:55	North	09-C0077		EPA/GE Dredging Project	1					
06/06/09	20:15	South	09-C0043		EPA/GE Dredging Project	1					
06/06/09	23:00	South	09-C0104		EPA/GE Dredging Project	1					
06/06/09	23:00	South	09-C0077		EPA/GE Dredging Project	1					
06/07/09	8:45	North	09-20579		Pleasure	1	TREEHOUSE				
06/07/09	11:15	South	09-10090		Pleasure	1	AMERICAN DREAM				
06/07/09	12:30	North	09-S0726		Pleasure	1	RED DEVEL				
06/07/09	12:30	North	UPT-15629	NY1259UT	Pleasure	1					
06/07/09	13:15	North	09-C0077		EPA/GE Dredging Project	1					
06/07/09	13:15	North	09-C0078		EPA/GE Dredging Project	1					
06/07/09	14:05	North	UPT-15278		Pleasure	1	JADE VII				
06/07/09	14:50	South	09-C0077		EPA/GE Dredging Project	1					
06/07/09	14:50	South	09-C0078		EPA/GE Dredging Project	1					
06/07/09	15:10	North	09-S0026		Pleasure	1	TUG 44				
06/07/09	16:20	South	09-10104		Pleasure	1	LANDSEER				
06/07/09	16:35	North	09-20581		Pleasure	1	TREFOIL				
06/07/09	16:45	South	UPT-15629		Pleasure	1	PONTOON				
06/07/09	16:45	South	09-S0726		Pleasure	1	RED DEVIL				
06/07/09	17:20	North	09-20580		Pleasure	1	HIGHER GROUND				
06/07/09	17:20	North	09-20582		Pleasure	1	ZEPHYR				

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06/07/09	18:20	North	09-C0078		EPA/GE Dredging Project	1					
06/07/09	18:20	North	09-C0077		EPA/GE Dredging Project	1					
06/07/09	20:35	South	09-C0078		EPA/GE Dredging Project	1					
06/07/09	20:35	South	09-C0077		EPA/GE Dredging Project	1					
06/07/09	21:20	North	09-20583		Pleasure	1	MARIE CLARE				
06/08/09	8:35	South	09-20937	NY4463FR	Pleasure	1	ELIXIR				
06/08/09	9:05	North	09-C0077		EPA/GE Dredging Project	1					
06/08/09	9:05	North	09-C0078		EPA/GE Dredging Project	1					
06/08/09	9:20	South			Canal Corporation Vessel	1	SPS 51				
06/08/09	9:35	North			Canal Corporation Vessel	1	SPS 51				
06/08/09	10:35	South	09-C0077		EPA/GE Dredging Project	1					
06/08/09	10:35	South	09-C0078		EPA/GE Dredging Project	1					
06/08/09	11:00	South	09-S0014	VT 1898P	Pleasure	1	TIME OFF				
06/08/09	11:50	North	09-20054		Pleasure	1	TIKI TIKI				
06/08/09	13:40	North			Other Government	1	OVERSIGHT 2				
06/08/09	14:20	South			Other Government	1	OVERIGHT 2				
06/08/09	16:15	North	09-C0045		EPA/GE Dredging Project	1					
06/08/09	17:05	North	09-20585		Pleasure	1	CALLISTA LLL				
06/08/09	17:05	North	09-20584		Pleasure	1	RAKSHA				
06/08/09	17:40	North	09-C0078		EPA/GE Dredging Project	1					
06/08/09	17:40	North	09-C0077		EPA/GE Dredging Project	1					
06/08/09	18:10	South	09-C0045		EPA/GE Dredging Project	1					
06/08/09	21:10	South	09-C0077		EPA/GE Dredging Project	1					
06/08/09	21:10	South	09-C0078		EPA/GE Dredging Project	1					
06/09/09	12:50	North	09-C0078		EPA/GE Dredging Project	1					
06/09/09	12:50	North	09-C0077		EPA/GE Dredging Project	1					
06/09/09	13:30	North	09-S0019		Pleasure	1					
06/09/09	13:30	North	09-20586		Pleasure	1	NAMAKA				
06/09/09	13:55	North	09-20587		Pleasure	1					
06/09/09	14:25	North	09-20587		Pleasure	1	THE GREAT ESCAPE				
06/09/09	14:50	South	09-C0077		EPA/GE Dredging Project	1					
06/09/09	14:50	South	09-C0078		EPA/GE Dredging Project	1					
06/09/09	20:30	North	09-20588		Pleasure	1					
06/09/09	21:00	North	09-C0105		EPA/GE Dredging Project	1					
06/09/09	21:00	North	09-C0078		EPA/GE Dredging Project	1					
06/09/09	23:00	South	09-C0078		EPA/GE Dredging Project	1					
06/09/09	23:00	South	09-C0105		EPA/GE Dredging Project	1					
06/09/09	23:25	North	09-C0104		EPA/GE Dredging Project	1					
06/10/09	1:10	South	09-C0104		EPA/GE Dredging Project	1					
06/10/09	2:10	North	09-C0077		EPA/GE Dredging Project	1					
06/10/09	2:10	North	09-C0078		EPA/GE Dredging Project	1					
06/10/09	4:00	South	09-C0078		EPA/GE Dredging Project	1					
06/10/09	4:00	South	09-C0077		EPA/GE Dredging Project	1					
06/10/09	8:40	North	09-20589		Pleasure	1	MIA				
06/10/09	11:45	North	09-C0045		EPA/GE Dredging Project	1					
06/10/09	12:25	North	09-C0078		EPA/GE Dredging Project	1					
06/10/09	12:25	North	09-C0104		EPA/GE Dredging Project	1					
06/10/09	13:10	South			Canal Corporation Vessel	1	SPS 51				
06/10/09	13:45	South	09-10105		Pleasure	1					
06/10/09	13:45	South	09-10106		Pleasure	1					
06/10/09	13:45	South	09-C0045		EPA/GE Dredging Project	1					
06/10/09	14:00	North	09-S0920		Pleasure	1	TARWATHIE				
06/10/09	14:25	South	09-C0078		EPA/GE Dredging Project	1					
06/10/09	14:25	South	09-C0104		EPA/GE Dredging Project	1					
06/10/09	14:35	North			Canal Corporation Vessel	1	SPS 51				
06/10/09	15:00	South	09-10006		Pleasure	1	ACTARUS				
06/10/09	15:10	South	09-20939		Pleasure	1					
06/10/09	15:45	North	09-C0078		EPA/GE Dredging Project	1					
06/10/09	15:45	North	09-C0104		EPA/GE Dredging Project	1					
06/10/09	17:10	South	09-10006	PA9127CZ	Pleasure	1	CHAMPAGNE TASTES				
06/10/09	17:45	South	09-C0104		EPA/GE Dredging Project	1					
06/10/09	17:45	South	09-C0078		EPA/GE Dredging Project	1					
06/10/09	21:30	North	09-C0042		EPA/GE Dredging Project	1					
06/10/09	22:25	North	09-C0078		EPA/GE Dredging Project	1					
06/10/09	22:25	North	09-C0104		EPA/GE Dredging Project	1					
06/10/09	23:50	South	09-C0042		EPA/GE Dredging Project	1					
06/11/09	0:30	South	09-C0104		EPA/GE Dredging Project	1					
06/11/09	0:45	North	09-C0077		EPA/GE Dredging Project	1					
06/11/09	2:00	South	09-C0077		EPA/GE Dredging Project	1					
06/11/09	2:00	South	09-C0078		EPA/GE Dredging Project	1					
06/11/09	10:35	North	09-C0077		EPA/GE Dredging Project	1					
06/11/09	10:35	North	09-C0078		EPA/GE Dredging Project	1					
06/11/09	11:50	North	09-10042	NY8297JX	Pleasure	1	DANISWAN				
06/11/09	11:50	North	09-20590		Pleasure	1	ABIGAIL				
06/11/09	12:15	South	09-C0077		EPA/GE Dredging Project	1					
06/11/09	12:15	South	09-C0078		EPA/GE Dredging Project	1					
06/11/09	13:10	North	09-C0102		EPA/GE Dredging Project	1					
06/11/09	13:35	South	09-S0837		Pleasure	1	HAPPY DRAGON				
06/11/09	14:05	South	09-C0102		EPA/GE Dredging Project	1					
06/11/09	15:05	North	09-C0076		EPA/GE Dredging Project	1					
06/11/09	16:30	North	09-20591		Pleasure	1	UDLURIAQ				
06/11/09	16:30	North	09-20592		Pleasure	1	JIPSY TIME				
06/11/09	16:30	North	09-C0078		EPA/GE Dredging Project	1					
06/11/09	17:30	North	09-10531		Pleasure	1	JOLIE JULIE				
06/11/09	18:00	South	09-C0078		EPA/GE Dredging Project	1					
06/11/09	18:00	South	09-C0076		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
06/11/09	18:30	South	09-S0319		Pleasure	1	STUDIO "C"				
06/11/09	20:40	North	09-C0046		EPA/GE Dredging Project	1					
06/11/09	21:15	North	09-C0104		EPA/GE Dredging Project	1					
06/11/09	21:15	North	09-C0078		EPA/GE Dredging Project	1					
06/11/09	23:05	South	09-C0046		EPA/GE Dredging Project	1					
06/11/09	23:40	South	09-C0078		EPA/GE Dredging Project	1					
06/11/09	23:40	South	09-C0104		EPA/GE Dredging Project	1					
06/12/09	8:40	North	09-C0042		EPA/GE Dredging Project	1					
06/12/09	10:10	South	09-C0042		EPA/GE Dredging Project	1					
06/12/09	11:10	North	09-C0077		EPA/GE Dredging Project	1					
06/12/09	11:10	North	09-C0078		EPA/GE Dredging Project	1					
06/12/09	13:50	South	09-C0077		EPA/GE Dredging Project	1					
06/12/09	13:50	South	09-C0078		EPA/GE Dredging Project	1					
06/12/09	15:30	North	09-20057	1149692	Pleasure	1	SWEET DREAMS				
06/12/09	17:50	North	09-C0078		EPA/GE Dredging Project	1					
06/12/09	17:50	North	09-C0077		EPA/GE Dredging Project	1					
06/12/09	19:25	South	09-C0078		EPA/GE Dredging Project	1					
06/12/09	19:25	South	09-C0077		EPA/GE Dredging Project	1					
06/12/09	21:00	North	09-C0049		EPA/GE Dredging Project	1					
06/12/09	21:00	North	09-C0042		EPA/GE Dredging Project	1					
06/12/09	22:25	North	09-C0105		EPA/GE Dredging Project	1					
06/12/09	23:35	South	09-C0049		EPA/GE Dredging Project	1					
06/12/09	23:35	South	09-C0042		EPA/GE Dredging Project	1					
06/13/09	0:30	South	09-C0105		EPA/GE Dredging Project	1					
06/13/09	0:55	North	09-C0105		EPA/GE Dredging Project	1					
06/13/09	2:35	South	09-C0105		EPA/GE Dredging Project	1					
06/13/09	11:25	South	09-10088		Pleasure	1	ADIOS II				
06/13/09	12:30	North	09-S0078	8333593	Pleasure	1	REAL MOUNTIE				
06/13/09	12:30	North	09-10104	VT9476P	Pleasure	1	LANDSEER				
06/13/09	12:40	South	09-S0026		Pleasure	1	TUG 44				
06/13/09	14:00	North	09-S0026		Pleasure	1	TUG 44				
06/13/09	15:00	South	09-20941		Pleasure	1	SWALLOW				
06/13/09	17:30	North	09-C0077		EPA/GE Dredging Project	1					
06/13/09	17:30	North	09-C0078		EPA/GE Dredging Project	1					
06/13/09	19:20	South	09-C0077		EPA/GE Dredging Project	1					
06/13/09	19:20	South	09-C0078		EPA/GE Dredging Project	1					
06/13/09	20:50	North	09-C0104		EPA/GE Dredging Project	1					
06/13/09	22:35	South	09-C0104		EPA/GE Dredging Project	1					
06/14/09	1:45	North	09-C0049		EPA/GE Dredging Project	1					
06/14/09	1:45	North	09-C0042		EPA/GE Dredging Project	1					
06/14/09	4:35	South	09-C0042		EPA/GE Dredging Project	1					
06/14/09	4:35	South	09-C0049		EPA/GE Dredging Project	1					
06/14/09	11:10	North	09-C0102		EPA/GE Dredging Project	1					
06/14/09	11:10	North	09-C0076		EPA/GE Dredging Project	1					
06/14/09	11:10	North	09-C0103		EPA/GE Dredging Project	1					
06/14/09	12:00	South	09-C0102		EPA/GE Dredging Project	1					
06/14/09	13:25	North	09-S0929		Pleasure	1	NEPHELE				
06/14/09	13:45	South	09-C0076		EPA/GE Dredging Project	1					
06/14/09	13:45	South	09-C0103		EPA/GE Dredging Project	1					
06/14/09	15:10	North	09-C0077		EPA/GE Dredging Project	1					
06/14/09	15:10	North	09-C0076		EPA/GE Dredging Project	1					
06/14/09	15:35	North	09-20593		Pleasure	1	FIDDLEHEAD				
06/14/09	15:45	South	09-10107		Pleasure	1					
06/14/09	16:45	South	09-C0076		EPA/GE Dredging Project	1					
06/14/09	16:45	South	09-C0077		EPA/GE Dredging Project	1					
06/14/09	18:20	North	09-C0077		EPA/GE Dredging Project	1					
06/14/09	19:15	South	09-C0077		EPA/GE Dredging Project	1					
06/14/09	20:25	North	09-C0077		EPA/GE Dredging Project	1					
06/14/09	20:25	North	09-C0042		EPA/GE Dredging Project	1					
06/14/09	22:15	South	09-C0042		EPA/GE Dredging Project	1					
06/14/09	22:15	South	09-C0077		EPA/GE Dredging Project	1					
06/15/09	4:25	North	09-C0045		EPA/GE Dredging Project	1					
06/15/09	4:25	North	09-C0078		EPA/GE Dredging Project	1					
06/15/09	6:00	South	09-C0078		EPA/GE Dredging Project	1					
06/15/09	6:00	South	09-C0045		EPA/GE Dredging Project	1					
06/15/09	7:00	North	09-C0045		EPA/GE Dredging Project	1					
06/15/09	7:00	North	09-C0078		EPA/GE Dredging Project	1					
06/15/09	8:20	South	09-C0045		EPA/GE Dredging Project	1					
06/15/09	8:20	South	09-C0078		EPA/GE Dredging Project	1					
06/15/09	9:20	North	09-20594		Pleasure	1	ELIJA				
06/15/09	14:15	North	09-20595		Pleasure	1	FINAL DECISION				
06/15/09	14:45	North	09-C0042		EPA/GE Dredging Project	1					
06/15/09	15:40	North			Canal Corporation Vessel	1	TUG URGER				
06/15/09	15:40	North	09-20596		Pleasure	1					
06/15/09	15:55	South	09-S0839		Pleasure	1					
06/15/09	15:55	South	09-C0042		EPA/GE Dredging Project	1					
06/15/09	16:20	North	09-C0078		EPA/GE Dredging Project	1					
06/15/09	16:20	North	09-C0045		EPA/GE Dredging Project	1					
06/15/09	16:45	North	09-C0123		EPA/GE Dredging Project	1					
06/15/09	17:50	South	09-C0078		EPA/GE Dredging Project	1					
06/15/09	17:50	South	09-C0045		EPA/GE Dredging Project	1					
06/15/09	18:20	South	09-C0123		EPA/GE Dredging Project	1					
06/16/09	0:55	North	09-C0078		EPA/GE Dredging Project	1					
06/16/09	0:55	North	09-C0045		EPA/GE Dredging Project	1					
06/16/09	4:50	South	09-C0078		EPA/GE Dredging Project	1					
06/16/09	4:50	South	09-C0045		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
06/16/09	9:45	North	09-C0078		EPA/GE Dredging Project	1					
06/16/09	9:45	North	09-C0045		EPA/GE Dredging Project	1					
06/16/09	10:05	North	09-C0042		EPA/GE Dredging Project	1					
06/16/09	11:00	South	09-C0078		EPA/GE Dredging Project	1					
06/16/09	11:00	South	09-C0045		EPA/GE Dredging Project	1					
06/16/09	11:30	South	09-C0042		EPA/GE Dredging Project	1					
06/16/09	12:25	North	09-C0078		EPA/GE Dredging Project	1					
06/16/09	12:25	North	09-C0045		EPA/GE Dredging Project	1					
06/16/09	12:55	North	09-C0124		EPA/GE Dredging Project	1					
06/16/09	14:00	South	09-C0078		EPA/GE Dredging Project	1					
06/16/09	14:00	South	09-C0045		EPA/GE Dredging Project	1					
06/16/09	14:25	South	09-C0124		EPA/GE Dredging Project	1					
06/16/09	15:35	North	09-C0045		EPA/GE Dredging Project	1					
06/16/09	15:35	North	09-C0078		EPA/GE Dredging Project	1					
06/16/09	16:40	North	09-S0014		Pleasure	1	TIME OFF				
06/16/09	17:00	South	09-C0078		EPA/GE Dredging Project	1					
06/16/09	17:00	South	09-C0045		EPA/GE Dredging Project	1					
06/16/09	17:45	North	09-C0078		EPA/GE Dredging Project	1					
06/16/09	17:45	North	09-C0045		EPA/GE Dredging Project	1					
06/16/09	19:00	North	09-20597		Pleasure	1	SALLY FORTH				
06/16/09	22:00	South	09-C0078		EPA/GE Dredging Project	1					
06/16/09	22:00	South	09-C0045		EPA/GE Dredging Project	1					
06/17/09	2:15	North	09-C0049		EPA/GE Dredging Project	1					
06/17/09	3:10	North	09-C0105		EPA/GE Dredging Project	1					
06/17/09	3:35	South	09-C0049		EPA/GE Dredging Project	1					
06/17/09	5:05	North	09-C0078		EPA/GE Dredging Project	1					
06/17/09	5:05	North	09-C0045		EPA/GE Dredging Project	1					
06/17/09	7:20	South	09-C0105		EPA/GE Dredging Project	1					
06/17/09	8:10	South	09-20943		Pleasure	1	FRIZZANTE				
06/17/09	8:35	South	09-C0078		EPA/GE Dredging Project	1					
06/17/09	8:35	South	09-C0045		EPA/GE Dredging Project	1					
06/17/09	9:15	North	09-10107	VT1157G	Pleasure	1					
06/17/09	9:15	North	09-S0055		Pleasure	1	SATIN DOLL				
06/17/09	11:00	North	UPT-15682	NY9971BF	Pleasure	1					
06/17/09	12:25	North	09-C0047		EPA/GE Dredging Project	1					
06/17/09	12:25	North	09-C0076		EPA/GE Dredging Project	1					
06/17/09	12:55	North			Canal Corporation Vessel	1	WORK BOAT WJ				
06/17/09	12:55	North			Canal Corporation Vessel	1	ROW BOAT (FT. EDWARD - 90261)				
06/17/09	13:30	North	09-C0045		EPA/GE Dredging Project	1					
06/17/09	13:30	North	09-C0042		EPA/GE Dredging Project	1					
06/17/09	13:55	North	09-20598		Pleasure	1	FAHRENHEIT				
06/17/09	14:25	North	09-C0123		EPA/GE Dredging Project	1					
06/17/09	15:25	South	09-C0123		EPA/GE Dredging Project	1					
06/17/09	15:50	South	09-C0077		EPA/GE Dredging Project	1					
06/17/09	15:50	South	09-C0047		EPA/GE Dredging Project	1					
06/17/09	16:15	South	09-C0042		EPA/GE Dredging Project	1					
06/17/09	16:15	South	09-C0045		EPA/GE Dredging Project	1					
06/17/09	16:30	South	09-20944		Pleasure	1					
06/17/09	17:10	North	09-C0045		EPA/GE Dredging Project	1					
06/17/09	17:10	North	09-C0042		EPA/GE Dredging Project	1					
06/17/09	17:30	North	09-20599		Pleasure	1	IZZYR				
06/17/09	18:30	South	09-C0045		EPA/GE Dredging Project	1					
06/17/09	18:30	South	09-C0042		EPA/GE Dredging Project	1					
06/17/09	20:50	North	09-C0045		EPA/GE Dredging Project	1					
06/17/09	20:50	North	09-C0049		EPA/GE Dredging Project	1					
06/17/09	21:10	North	09-C0123		EPA/GE Dredging Project	1					
06/17/09	22:25	South	09-C0049		EPA/GE Dredging Project	1					
06/17/09	22:25	South	09-C0045		EPA/GE Dredging Project	1					
06/17/09	22:45	South	09-C0123		EPA/GE Dredging Project	1					
06/18/09	2:30	North	09-C0122		EPA/GE Dredging Project	1					
06/18/09	3:10	North	09-C0049		EPA/GE Dredging Project	1					
06/18/09	3:10	North	09-C0045		EPA/GE Dredging Project	1					
06/18/09	4:40	South	09-C0045		EPA/GE Dredging Project	1					
06/18/09	4:40	South	09-C0049		EPA/GE Dredging Project	1					
06/18/09	5:10	South	09-C0122		EPA/GE Dredging Project	1					
06/18/09	5:45	North	09-C0049		EPA/GE Dredging Project	1					
06/18/09	5:45	North	09-C0045		EPA/GE Dredging Project	1					
06/18/09	7:45	South	09-C0049		EPA/GE Dredging Project	1					
06/18/09	7:45	South	09-C0045		EPA/GE Dredging Project	1					
06/18/09	9:55	North	09-C0049		EPA/GE Dredging Project	1					
06/18/09	9:55	North	09-C0042		EPA/GE Dredging Project	1					
06/18/09	11:50	South	09-C0042		EPA/GE Dredging Project	1					
06/18/09	11:50	South	09-C0049		EPA/GE Dredging Project	1					
06/18/09	19:30	North	09-C0077		EPA/GE Dredging Project	1					
06/18/09	19:30	North	09-C0078		EPA/GE Dredging Project	1					
06/18/09	21:25	South	09-C0077		EPA/GE Dredging Project	1					
06/18/09	21:25	South	09-C0078		EPA/GE Dredging Project	1					
06/19/09	0:20	North	09-C0122		EPA/GE Dredging Project	1					
06/19/09	1:20	South	09-C0122		EPA/GE Dredging Project	1					
06/19/09	2:00	North	09-C0123		EPA/GE Dredging Project	1					
06/19/09	3:10	North	09-C0049		EPA/GE Dredging Project	1					
06/19/09	3:10	North	09-C0042		EPA/GE Dredging Project	1					
06/19/09	4:35	South	09-C0123		EPA/GE Dredging Project	1					
06/19/09	7:10	South	09-C0042		EPA/GE Dredging Project	1					
06/19/09	7:10	South	09-C0049		EPA/GE Dredging Project	1					
06/19/09	7:20	North	09-C0123		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
06/19/09	11:50	North	09-20600		Pleasure	1	TUTTABELLA				
06/19/09	12:55	South	09-20945	1198907	Pleasure	1	BUTTERFLY				
06/19/09	13:15	South	09-C0123		EPA/GE Dredging Project	1					
06/19/09	15:05	South	09-S0055	WV81432	Pleasure	1	SATIN DOLL				
06/19/09	15:55	North	09-20602		Pleasure	1	MISS MELINA				
06/19/09	17:50	North	09-C0075		Tour Non-sleep aboard	1	EMITA II				
06/19/09	17:50	North	09-20601		Pleasure	1	ANDROS				
06/19/09	19:20	North	09-C0122		EPA/GE Dredging Project	1					
06/19/09	19:20	North	09-C0049		EPA/GE Dredging Project	1					
06/19/09	21:35	South	09-C0122		EPA/GE Dredging Project	1					
06/19/09	21:35	South	09-C0049		EPA/GE Dredging Project	1					
06/19/09	22:40	North	09-C0049		EPA/GE Dredging Project	1					
06/19/09	22:40	North	09-C0122		EPA/GE Dredging Project	1					
06/19/09	23:10	North	09-C0077		EPA/GE Dredging Project	1					
06/19/09	23:10	North	09-C0078		EPA/GE Dredging Project	1					
06/20/09	1:50	South	09-C0122		EPA/GE Dredging Project	1					
06/20/09	1:50	South	09-C0049		EPA/GE Dredging Project	1					
06/20/09	2:35	South	09-C0078		EPA/GE Dredging Project	1					
06/20/09	2:35	South	09-C0077		EPA/GE Dredging Project	1					
06/20/09	3:40	North	09-C0122		EPA/GE Dredging Project	1					
06/20/09	3:40	North	09-C0049		EPA/GE Dredging Project	1					
06/20/09	4:05	North	09-C0078		EPA/GE Dredging Project	1					
06/20/09	5:05	South	09-C0078		EPA/GE Dredging Project	1					
06/20/09	5:55	South	09-C0049		EPA/GE Dredging Project	1					
06/20/09	5:55	South	09-C0122		EPA/GE Dredging Project	1					
06/20/09	8:05	North	09-C0049		EPA/GE Dredging Project	1					
06/20/09	8:05	North	09-C0042		EPA/GE Dredging Project	1					
06/20/09	10:10	South	09-C0049		EPA/GE Dredging Project	1					
06/20/09	10:10	South	09-C0042		EPA/GE Dredging Project	1					
06/20/09	11:20	South	09-S0840		Pleasure	1					
06/20/09	11:50	North	09-S0756		Pleasure	1					
06/20/09	12:10	South	09-S0026		Pleasure	1	TUG 44				
06/20/09	14:55	North	09-C0123		EPA/GE Dredging Project	1					
06/20/09	15:40	North	09-C0042		EPA/GE Dredging Project	1					
06/20/09	15:40	North	09-C0124		EPA/GE Dredging Project	1					
06/20/09	16:25	South	09-C0123		EPA/GE Dredging Project	1					
06/20/09	17:05	North	09-S0026		Pleasure	1	TUG 44				
06/20/09	17:35	South	09-C0042		EPA/GE Dredging Project	1					
06/20/09	17:35	South	09-C0124		EPA/GE Dredging Project	1					
06/20/09	18:10	North	09-C0078		EPA/GE Dredging Project	1					
06/20/09	18:10	North	09-C0077		EPA/GE Dredging Project	1					
06/20/09	20:05	South	09-S0756		Pleasure	1					
06/20/09	22:10	South	09-C0078		EPA/GE Dredging Project	1					
06/20/09	22:10	South	09-C0077		EPA/GE Dredging Project	1					
06/21/09	2:30	North	09-C0042		EPA/GE Dredging Project	1					
06/21/09	2:30	North	09-C0104		EPA/GE Dredging Project	1					
06/21/09	4:55	South	09-C0042		EPA/GE Dredging Project	1					
06/21/09	4:55	South	09-C0104		EPA/GE Dredging Project	1					
06/21/09	8:35	North			Other Government	1	COAST GUARD				
06/21/09	8:55	South	09-C0104		EPA/GE Dredging Project	1					
06/21/09	8:55	South	09-C0048		EPA/GE Dredging Project	1					
06/21/09	8:55	South	09-C0042		EPA/GE Dredging Project	1					
06/21/09	9:10	North	09-20603		Pleasure	1	LORELEI				
06/21/09	9:25	South	09-C0075		Tour Non-sleep aboard	1	EMIYA 2				
06/21/09	10:50	North	09-20605		Pleasure	1	MALOYA				
06/21/09	13:40	North	09-20604		Pleasure	1	KATHRYN				
06/21/09	14:10	North	09-C0048		EPA/GE Dredging Project	1					
06/21/09	15:00	North	09-C0124		EPA/GE Dredging Project	1					
06/21/09	15:00	North	09-C0077		EPA/GE Dredging Project	1					
06/21/09	15:20	South	09-10108		Pleasure	1	LE BERGAMOTE				
06/21/09	16:30	North	09-C0061		Hire	1	FABIENE SUSAN				
06/21/09	16:50	South	09-C0124		EPA/GE Dredging Project	1					
06/21/09	16:50	South	09-C0077		EPA/GE Dredging Project	1					
06/21/09	17:05	North	09-S0943		Pleasure	1	CANDOR				
06/22/09	3:35	North	09-C0123		EPA/GE Dredging Project	1					
06/22/09	5:10	South	09-C0123		EPA/GE Dredging Project	1					
06/22/09	8:00	South	09-10109		Pleasure	1	LADY OF DOVER				
06/22/09	8:50	South	09-20946		Pleasure	1	INCOGNITO V				
06/22/09	9:35	North	09-20606	NY1073DE	Pleasure	1	WILLOW				
06/22/09	10:20	North	09-C0042		EPA/GE Dredging Project	1					
06/22/09	10:20	North	09-C0124		EPA/GE Dredging Project	1					
06/22/09	11:05	North	09-C0076		EPA/GE Dredging Project	1					
06/22/09	12:30	South	09-C0124		EPA/GE Dredging Project	1					
06/22/09	12:30	South	09-C0042		EPA/GE Dredging Project	1					
06/22/09	12:50	South	09-C0076		EPA/GE Dredging Project	1					
06/22/09	14:10	North	09-C0078		EPA/GE Dredging Project	1					
06/22/09	14:10	North	09-C0077		EPA/GE Dredging Project	1					
06/22/09	14:35	North	09-C0123		EPA/GE Dredging Project	1					
06/22/09	14:50	South	09-20607		Pleasure	1					
06/22/09	14:55	South	09-S0843		Pleasure	1					
06/22/09	15:15	North	09-10272		Pleasure	1	BLUE ARROW				
06/22/09	15:15	North	09-20607		Pleasure	1	MIKADO				
06/22/09	15:40	South	09-C0078		EPA/GE Dredging Project	1					
06/22/09	15:40	South	09-C0077		EPA/GE Dredging Project	1					
06/22/09	16:00	South	09-C0123		EPA/GE Dredging Project	1					
06/22/09	16:15	North	09-20947		Pleasure	1	VESTA				

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
06/22/09	16:55	North	09-C0042		EPA/GE Dredging Project	1					
06/22/09	16:55	North	09-C0124		EPA/GE Dredging Project	1					
06/22/09	18:25	South	09-C0124		EPA/GE Dredging Project	1					
06/22/09	18:25	South	09-C0042		EPA/GE Dredging Project	1					
06/23/09	0:50	North	09-C0078		EPA/GE Dredging Project	1					
06/23/09	0:50	North	09-C0077		EPA/GE Dredging Project	1					
06/23/09	3:10	South	09-C0077		EPA/GE Dredging Project	1					
06/23/09	3:10	South	09-C0078		EPA/GE Dredging Project	1					
06/23/09	4:30	North	09-C0077		EPA/GE Dredging Project	1					
06/23/09	4:30	North	09-C0078		EPA/GE Dredging Project	1					
06/23/09	5:40	South	09-C0077		EPA/GE Dredging Project	1					
06/23/09	5:40	South	09-C0078		EPA/GE Dredging Project	1					
06/23/09	7:20	North	09-C0124		EPA/GE Dredging Project	1					
06/23/09	7:20	North	09-C0042		EPA/GE Dredging Project	1					
06/23/09	9:35	South	09-C0042		EPA/GE Dredging Project	1					
06/23/09	9:35	South	09-C0124		EPA/GE Dredging Project	1					
06/23/09	11:15	North	09-20208	NY8414GD	Pleasure	1					
06/23/09	11:30	South	09-S0019	NY6916JZ	Pleasure	1					
06/23/09	12:25	North	09-C0123		EPA/GE Dredging Project	1					
06/23/09	12:55	South	09-20949		Pleasure	1	JAD- AU				
06/23/09	12:55	South	09-20940		Pleasure	1	LA ANGLE				
06/23/09	13:20	South	09-S0754		Pleasure	1	SUMMER SLOPES				
06/23/09	14:00	South	09-C0123		EPA/GE Dredging Project	1					
06/23/09	14:20	North	09-S0089		Pleasure	1	LEE'S JEWELL				
06/23/09	15:05	North	09-S0946		Pleasure	1	LADY IN RED				
06/23/09	16:00	South	09-C0061		Hire	1	FABIENNE SUZANNE				
06/23/09	16:30	North	09-C0077		EPA/GE Dredging Project	1					
06/23/09	16:30	North	09-C0124		EPA/GE Dredging Project	1					
06/23/09	16:55	North	09-S0762		Pleasure	1	CHANGES				
06/23/09	17:25	South	09-20951		Pleasure	1	KATHRYN				
06/23/09	18:20	South	09-C0077		EPA/GE Dredging Project	1					
06/23/09	18:20	South	09-C0124		EPA/GE Dredging Project	1					
06/24/09	1:35	North	09-C0077		EPA/GE Dredging Project	1					
06/24/09	1:35	North	09-C0078		EPA/GE Dredging Project	1					
06/24/09	3:35	South	09-C0077		EPA/GE Dredging Project	1					
06/24/09	3:35	South	09-C0078		EPA/GE Dredging Project	1					
06/24/09	6:10	North	09-C0078		EPA/GE Dredging Project	1					
06/24/09	6:10	North	09-C0077		EPA/GE Dredging Project	1					
06/24/09	8:50	South	09-C0078		EPA/GE Dredging Project	1					
06/24/09	8:50	South	09-C0077		EPA/GE Dredging Project	1					
06/24/09	9:30	North	09-C0124		EPA/GE Dredging Project	1					
06/24/09	9:30	North	09-C0122		EPA/GE Dredging Project	1					
06/24/09	11:30	South	09-C0122		EPA/GE Dredging Project	1					
06/24/09	11:30	South	09-C0124		EPA/GE Dredging Project	1					
06/24/09	11:55	North	09-S0782		Pleasure	1	SEAQUEL				
06/24/09	11:55	North	09-S0703		Pleasure	1	CLOVER				
06/24/09	13:15	North	09-C0124		EPA/GE Dredging Project	1					
06/24/09	13:15	North	09-C0122		EPA/GE Dredging Project	1					
06/24/09	13:40	North	09-20058		Pleasure	1	PAMELLA				
06/24/09	14:30	South	09-20953		Pleasure	1	LATITUDE 1				
06/24/09	15:00	South	09-C0124		EPA/GE Dredging Project	1					
06/24/09	15:00	South	09-C0077		EPA/GE Dredging Project	1					
06/24/09	15:30	North	09-C0123		EPA/GE Dredging Project	1					
06/24/09	16:55	South	09-C0123		EPA/GE Dredging Project	1					
06/24/09	18:25	North	09-C0124		EPA/GE Dredging Project	1					
06/24/09	18:25	North	09-C0077		EPA/GE Dredging Project	1					
06/24/09	19:55	South	09-C0124		EPA/GE Dredging Project	1					
06/24/09	19:55	South	09-C0077		EPA/GE Dredging Project	1					
06/24/09	22:30	North	09-C0077		EPA/GE Dredging Project	1					
06/24/09	22:30	North	09-C0124		EPA/GE Dredging Project	1					
06/25/09	1:45	South	09-C0077		EPA/GE Dredging Project	1					
06/25/09	1:45	South	09-C0124		EPA/GE Dredging Project	1					
06/25/09	3:30	North	09-C0124		EPA/GE Dredging Project	1					
06/25/09	3:30	North	09-C0078		EPA/GE Dredging Project	1					
06/25/09	5:35	South	09-C0124		EPA/GE Dredging Project	1					
06/25/09	5:35	South	09-C0078		EPA/GE Dredging Project	1					
06/25/09	7:40	North	09-C0077		EPA/GE Dredging Project	1					
06/25/09	8:55	North	09-C0122		EPA/GE Dredging Project	1					
06/25/09	8:55	North	09-C0078		EPA/GE Dredging Project	1					
06/25/09	10:00	South	09-C0123		EPA/GE Dredging Project	1					
06/25/09	10:25	South	09-C0122		EPA/GE Dredging Project	1					
06/25/09	10:25	South	09-C0078		EPA/GE Dredging Project	1					
06/25/09	11:50	North	UPT-15630	NY5443MG	Pleasure	1	PARSON'S PONTOON				
06/25/09	11:50	North	09-20608		Pleasure	1	LADY VEE				
06/25/09	12:10	South	09-20954	20D6788	Pleasure	1	AIME BAIE				
06/25/09	12:10	South	UPT-15630	NY5443MG	Pleasure	1	PARSON'S PONTOON				
06/25/09	12:10	South	09-10110	FL7087LM	Pleasure	1	WHISKER				
06/25/09	12:30	North	09-20609	QC858076	Pleasure	1	N/A				
06/25/09	13:35	North	09-C0042		EPA/GE Dredging Project	1					
06/25/09	13:35	North	09-C0124		EPA/GE Dredging Project	1					
06/25/09	14:25	South	09-S0762		Pleasure	1	CHANGES				
06/25/09	15:05	South	09-C0124		EPA/GE Dredging Project	1					
06/25/09	15:05	South	09-C0042		EPA/GE Dredging Project	1					
06/25/09	15:35	North	09-21351		Pleasure	1	SECOND STAR				
06/25/09	15:35	North	09-S1650		Pleasure	1	GALE FORCE				
06/25/09	15:50	South	09-S0089		Pleasure	1	LEE'S JEWELL				

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
06/25/09	17:15	North	09-10052		Pleasure	1	SOMEWERE				
06/25/09	19:05	North	09-C0042		EPA/GE Dredging Project	1					
06/25/09	19:05	North	09-C0124		EPA/GE Dredging Project	1					
06/25/09	20:40	South	09-C0124		EPA/GE Dredging Project	1					
06/25/09	20:40	South	09-C0042		EPA/GE Dredging Project	1					
06/26/09	3:35	North	09-C0042		EPA/GE Dredging Project	1					
06/26/09	3:35	North	09-C0124		EPA/GE Dredging Project	1					
06/26/09	5:45	South	09-C0042		EPA/GE Dredging Project	1					
06/26/09	5:45	South	09-C0124		EPA/GE Dredging Project	1					
06/26/09	8:15	North	09-C0078		EPA/GE Dredging Project	1					
06/26/09	8:15	North	09-C0042		EPA/GE Dredging Project	1					
06/26/09	10:25	South	09-C0042		EPA/GE Dredging Project	1					
06/26/09	10:25	South	09-C0078		EPA/GE Dredging Project	1					
06/26/09	10:40	North	UPT-15630	NY5443MG	Pleasure	1	GE/PARSON'S				
06/26/09	11:15	South	09-20955		Pleasure	1	BALLERINA				
06/26/09	11:30	North	09-20611		Pleasure	1					
06/26/09	11:30	North	09-20612		Pleasure	1					
06/26/09	11:45	South	UPT-15630	NY5443MG	Pleasure	1	PARSON'S/GE				
06/26/09	12:30	North	09-S0724		Pleasure	1	OTHER OFFICE				
06/26/09	12:30	North	09-20613		Pleasure	1					
06/26/09	14:15	North	09-S0754		Pleasure	1	SUMMER SLOPES				
06/26/09	14:40	North	09-C0076		EPA/GE Dredging Project	1					
06/26/09	15:55	North	09-C0077		EPA/GE Dredging Project	1					
06/26/09	15:55	North	09-C0046		EPA/GE Dredging Project	1					
06/26/09	16:10	South	09-C0076		EPA/GE Dredging Project	1					
06/26/09	16:25	North	09-20614		Pleasure	1	LAST FLING				
06/26/09	17:25	South	09-C0077		EPA/GE Dredging Project	1					
06/26/09	17:25	South	09-C0046		EPA/GE Dredging Project	1					
06/26/09	17:45	North	09-20616	NY5129JI	Pleasure	1					
06/26/09	17:45	North	09-20615	NY2012FK	Pleasure	1					
06/26/09	20:00	North	09-C0124		EPA/GE Dredging Project	1					
06/26/09	20:00	North	09-C0042		EPA/GE Dredging Project	1					
06/26/09	20:30	North	09-C0078		EPA/GE Dredging Project	1					
06/26/09	22:45	South	09-C0124		EPA/GE Dredging Project	1					
06/26/09	22:45	South	09-C0078		EPA/GE Dredging Project	1					
06/26/09	22:45	South	09-C0042		EPA/GE Dredging Project	1					
06/27/09	1:00	North	09-C0078		EPA/GE Dredging Project	1					
06/27/09	1:00	North	09-C0042		EPA/GE Dredging Project	1					
06/27/09	2:55	South	09-C0042		EPA/GE Dredging Project	1					
06/27/09	2:55	South	09-C0078		EPA/GE Dredging Project	1					
06/27/09	4:15	North	09-C0078		EPA/GE Dredging Project	1					
06/27/09	4:15	North	09-C0042		EPA/GE Dredging Project	1					
06/27/09	6:45	South	09-C0042		EPA/GE Dredging Project	1					
06/27/09	6:45	South	09-C0078		EPA/GE Dredging Project	1					
06/27/09	7:35	North	09-C0078		EPA/GE Dredging Project	1					
06/27/09	7:35	North	09-C0042		EPA/GE Dredging Project	1					
06/27/09	9:05	South	09-C0078		EPA/GE Dredging Project	1					
06/27/09	9:05	South	09-C0042		EPA/GE Dredging Project	1					
06/27/09	10:35	North	09-C0078		EPA/GE Dredging Project	1					
06/27/09	10:35	North	09-C0042		EPA/GE Dredging Project	1					
06/27/09	12:35	South	09-C0078		EPA/GE Dredging Project	1					
06/27/09	12:35	South	09-C0042		EPA/GE Dredging Project	1					
06/27/09	13:40	North	09-C0077		EPA/GE Dredging Project	1					
06/27/09	13:40	North	09-C0124		EPA/GE Dredging Project	1					
06/27/09	14:10	North	09-C0103		EPA/GE Dredging Project	1					
06/27/09	14:50	South	09-S0026		Pleasure	1	TUG 44				
06/27/09	15:20	South	09-C0124		EPA/GE Dredging Project	1					
06/27/09	15:20	South	09-C0077		EPA/GE Dredging Project	1					
06/27/09	16:10	South	09-C0103		EPA/GE Dredging Project	1					
06/27/09	16:45	North	09-C0042		EPA/GE Dredging Project	1					
06/27/09	16:45	North	09-C0123		EPA/GE Dredging Project	1					
06/27/09	17:00	South	09-20956		Pleasure	1	SMOOTH AS GLASS				
06/27/09	17:15	North	09-S0026		Pleasure	1	TUG 44				
06/27/09	17:30	South	09-20957		Pleasure	1					
06/27/09	18:00	South	09-S0838		Pleasure	1					
06/27/09	20:35	South	09-C0123		EPA/GE Dredging Project	1					
06/27/09	20:35	South	09-C0042		EPA/GE Dredging Project	1					
06/27/09	21:25	North	09-C0124		EPA/GE Dredging Project	1					
06/27/09	21:25	North	09-C0077		EPA/GE Dredging Project	1					
06/27/09	23:20	South	09-C0124		EPA/GE Dredging Project	1					
06/27/09	23:20	South	09-C0077		EPA/GE Dredging Project	1					
06/28/09	5:30	North	09-C0078		EPA/GE Dredging Project	1					
06/28/09	5:30	North	09-C0042		EPA/GE Dredging Project	1					
06/28/09	7:50	South	09-C0078		EPA/GE Dredging Project	1					
06/28/09	7:50	South	09-C0042		EPA/GE Dredging Project	1					
06/28/09	11:00	South	09-20951		Pleasure	1	LAM				
06/28/09	12:35	North	09-S0788		Pleasure	1	BALANCE				
06/29/09	0:50	North	09-C0042		EPA/GE Dredging Project	1					
06/29/09	0:50	North	09-C0078		EPA/GE Dredging Project	1					
06/29/09	1:40	North	09-C0105		EPA/GE Dredging Project	1					
06/29/09	3:50	South	09-C0105		EPA/GE Dredging Project	1					
06/29/09	4:55	South	09-C0078		EPA/GE Dredging Project	1					
06/29/09	4:55	South	09-C0042		EPA/GE Dredging Project	1					
06/29/09	5:55	North	09-C0078		EPA/GE Dredging Project	1					
06/29/09	5:55	North	09-C0042		EPA/GE Dredging Project	1					
06/29/09	7:40	North	09-C0076		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
06/29/09	8:20	South	09-C0042		EPA/GE Dredging Project	1					
06/29/09	8:20	South	09-C0078		EPA/GE Dredging Project	1					
06/29/09	9:00	South	09-C0076		EPA/GE Dredging Project	1					
06/29/09	11:10	North	09-C0042		EPA/GE Dredging Project	1					
06/29/09	11:10	North	09-C0124		EPA/GE Dredging Project	1					
06/29/09	12:05	South	09-S0848		Pleasure	1	GLORY B				
06/29/09	12:05	South	09-S0098		Pleasure	1	IRISH MIST				
06/29/09	12:25	North	09-20618		Pleasure	1	MOOR STUFF				
06/29/09	13:00	North	09-C0045		EPA/GE Dredging Project	1					
06/29/09	13:25	North	09-C0076		EPA/GE Dredging Project	1					
06/29/09	13:25	North	09-C0077		EPA/GE Dredging Project	1					
06/29/09	13:45	North	09-10537	NY8409FD	Pleasure	1					
06/29/09	14:10	South	09-C0124		EPA/GE Dredging Project	1					
06/29/09	14:10	South	09-C0042		EPA/GE Dredging Project	1					
06/29/09	14:35	South	09-C0045		EPA/GE Dredging Project	1					
06/29/09	14:45	North	09-20619	NY9791GD	Pleasure	1					
06/29/09	15:20	South	09-C0076		EPA/GE Dredging Project	1					
06/29/09	15:20	South	09-C0077		EPA/GE Dredging Project	1					
06/29/09	16:25	North	09-S0790		Pleasure	1	NAUGHTI AND NICE				
06/29/09	17:10	North	09-C0124		EPA/GE Dredging Project	1					
06/29/09	17:10	North	09-C0042		EPA/GE Dredging Project	1					
06/29/09	18:10	South	09-20959		Pleasure	1					
06/29/09	18:15	South	09-20960		Pleasure	1					
06/29/09	18:30	South	09-C0042		EPA/GE Dredging Project	1					
06/29/09	19:00	North	09-C0077		EPA/GE Dredging Project	1					
06/29/09	20:05	South	09-C0077		EPA/GE Dredging Project	1					
06/29/09	20:05	South	09-C0124		EPA/GE Dredging Project	1					
06/30/09	2:20	North	09-C0078		EPA/GE Dredging Project	1					
06/30/09	2:20	North	09-C0124		EPA/GE Dredging Project	1					
06/30/09	7:35	South	09-C0078		EPA/GE Dredging Project	1					
06/30/09	7:35	South	09-C0124		EPA/GE Dredging Project	1					
06/30/09	7:55	North	09-20623		Pleasure	1	ALARA				
06/30/09	8:05	South	09-10112		Pleasure	1	CATAWISSA				
06/30/09	8:20	North	09-20622		Pleasure	1	NAN SHAN				
06/30/09	8:20	North	09-C0104		EPA/GE Dredging Project	1					
06/30/09	9:00	South	09-10851		Pleasure	1					
06/30/09	9:00	South	09-10116		Pleasure	1					
06/30/09	9:00	South	09-10113		Pleasure	1					
06/30/09	9:00	South	09-10825		Pleasure	1					
06/30/09	9:00	South	09-10121		Pleasure	1					
06/30/09	9:00	South	09-10128		Pleasure	1					
06/30/09	9:00	South	09-10122	NH2707AH	Pleasure	1					
06/30/09	9:00	South	09-10111	CT9297AW	Pleasure	1					
06/30/09	9:00	South			Canal Corporation Vessel	1	TUG URGER				
06/30/09	9:00	South	09-10114		Pleasure	1					
06/30/09	9:00	South	09-S0841		Pleasure	1					
06/30/09	9:00	South	09-10115		Pleasure	1					
06/30/09	9:00	South	09-10824		Pleasure	1					
06/30/09	9:00	South	09-10120		Pleasure	1					
06/30/09	9:00	South	09-10126		Pleasure	1					
06/30/09	9:00	South	09-10118		Pleasure	1					
06/30/09	9:00	South	09-10123		Pleasure	1					
06/30/09	9:00	South	09-10119		Pleasure	1					
06/30/09	9:00	South	09-10117		Pleasure	1					
06/30/09	9:00	South	09-10124		Pleasure	1					
06/30/09	9:00	South	09-10127		Pleasure	1					
06/30/09	9:00	South	09-10852		Pleasure	1					
06/30/09	9:00	South	09-10125		Pleasure	1					
06/30/09	9:30	North	09-C0078		EPA/GE Dredging Project	1					
06/30/09	9:30	North	09-C0124		EPA/GE Dredging Project	1					
06/30/09	10:50	South	09-C0104		EPA/GE Dredging Project	1					
06/30/09	11:20	North	09-C0124		EPA/GE Dredging Project	1					
06/30/09	11:20	North	09-C0078		EPA/GE Dredging Project	1					
06/30/09	11:50	South	09-20962		Pleasure	1	LE LIVERNOIS				
06/30/09	11:50	South	09-20961		Pleasure	1	FIDDLE HEAD				
06/30/09	12:05	North	09-20262		Pleasure	1	PEARL				
06/30/09	13:20	North			Commercial	1		354	Marine Highway - Margot	CG276023	09-C0013
06/30/09	13:55	North	09-C0042		EPA/GE Dredging Project	1					
06/30/09	13:55	North	09-C0124		EPA/GE Dredging Project	1					
06/30/09	14:25	North	09-20624		Pleasure	1	INCOGNITO				
06/30/09	14:25	North	09-S0837		Pleasure	1	HAPPY DRAGON				
06/30/09	14:25	North	09-S0791		Pleasure	1	CALYPSO				
06/30/09	16:05	North	09-21360		Pleasure	1	HARMONY				
06/30/09	17:15	South	09-C0042		EPA/GE Dredging Project	1					
06/30/09	17:15	South	09-C0124		EPA/GE Dredging Project	1					
06/30/09	17:40	North	09-20626		Pleasure	1	VASANO				
06/30/09	19:10	North	09-C0124		EPA/GE Dredging Project	1					
06/30/09	19:10	North	09-C0042		EPA/GE Dredging Project	1					
06/30/09	20:55	South	09-C0042		EPA/GE Dredging Project	1					
06/30/09	20:55	South	09-C0124		EPA/GE Dredging Project	1					
06/30/09	22:00	North	09-C0042		EPA/GE Dredging Project	1					
06/30/09	22:00	North	09-C0124		EPA/GE Dredging Project	1					
07/01/09	1:00	South	09-C0042		EPA/GE Dredging Project	1					
07/01/09	1:00	South	09-C0124		EPA/GE Dredging Project	1					
07/01/09	7:45	North	09-C0104		EPA/GE Dredging Project	1					
07/01/09	9:05	North	09-20625		Pleasure	1	STERLING LADY				

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
07/01/09	9:25	South	09-C0104		EPA/GE Dredging Project	1					
07/01/09	10:00	North	09-20210		Pleasure	1	MONK VINEYARD				
07/01/09	12:25	North	09-10092	NJ7346GY	Pleasure	1					
07/01/09	13:00	North	09-C0077		EPA/GE Dredging Project	1					
07/01/09	13:00	North	09-C0076		EPA/GE Dredging Project	1					
07/01/09	13:30	South			Commercial	1		355	Marine Highway - Margot	CG276023	09-C0013
07/01/09	14:00	South	09-S0790		Pleasure	1	NAUGHTY OR NICE				
07/01/09	14:30	South	09-C0077		EPA/GE Dredging Project	1					
07/01/09	14:30	South	09-C0076		EPA/GE Dredging Project	1					
07/01/09	15:15	North	09-20627		Pleasure	1	TWO CAT				
07/01/09	16:55	North	09-C0077		EPA/GE Dredging Project	1					
07/01/09	16:55	North	09-C0076		EPA/GE Dredging Project	1					
07/01/09	18:25	South	09-C0077		EPA/GE Dredging Project	1					
07/01/09	18:25	South	09-C0076		EPA/GE Dredging Project	1					
07/01/09	19:25	North	09-C0124		EPA/GE Dredging Project	1					
07/01/09	19:25	North	09-C0077		EPA/GE Dredging Project	1					
07/01/09	21:00	South	09-C0077		EPA/GE Dredging Project	1					
07/01/09	21:00	South	09-C0124		EPA/GE Dredging Project	1					
07/02/09	0:40	South	09-C0124		EPA/GE Dredging Project	1					
07/02/09	0:40	South	09-C0042		EPA/GE Dredging Project	1					
07/02/09	1:00	North	09-C0104		EPA/GE Dredging Project	1					
07/02/09	2:00	North	09-C0078		EPA/GE Dredging Project	1					
07/02/09	2:00	North	09-C0042		EPA/GE Dredging Project	1					
07/02/09	3:25	South	09-C0104		EPA/GE Dredging Project	1					
07/02/09	6:00	South	09-C0078		EPA/GE Dredging Project	1					
07/02/09	6:00	South	09-C0042		EPA/GE Dredging Project	1					
07/02/09	6:50	North	09-C0078		EPA/GE Dredging Project	1					
07/02/09	6:50	North	09-C0042		EPA/GE Dredging Project	1					
07/02/09	9:05	South	09-C0045		EPA/GE Dredging Project	1					
07/02/09	9:05	South	09-C0078		EPA/GE Dredging Project	1					
07/02/09	9:30	North	09-C0045		EPA/GE Dredging Project	1					
07/02/09	9:30	North	09-C0076		EPA/GE Dredging Project	1					
07/02/09	10:00	South	09-20965		Pleasure	1	SOLSTICE				
07/02/09	10:10	North	09-20629		Pleasure	1					
07/02/09	10:10	North	09-20628		Pleasure	1					
07/02/09	10:10	North	09-20081		Pleasure	1					
07/02/09	10:10	North	09-20629		Pleasure	1					
07/02/09	10:10	North	09-S0792		Pleasure	1					
07/02/09	10:50	North	09-C0124		EPA/GE Dredging Project	1					
07/02/09	10:50	North	09-C0077		EPA/GE Dredging Project	1					
07/02/09	11:10	South	09-C0045		EPA/GE Dredging Project	1					
07/02/09	11:35	South	09-20964		Pleasure	1					
07/02/09	11:35	South	09-20966		Pleasure	1					
07/02/09	11:35	South	09-20965		Pleasure	1					
07/02/09	13:15	North	09-C0104		EPA/GE Dredging Project	1					
07/02/09	13:30	South	09-C0124		EPA/GE Dredging Project	1					
07/02/09	13:30	South	09-C0077		EPA/GE Dredging Project	1					
07/02/09	13:55	North	09-C0049		EPA/GE Dredging Project	1					
07/02/09	15:45	North	09-C0078		EPA/GE Dredging Project	1					
07/02/09	15:45	North	09-C0042		EPA/GE Dredging Project	1					
07/02/09	16:55	South	09-C0104		EPA/GE Dredging Project	1					
07/02/09	17:10	North	09-S0145		Pleasure	1	OFF THE WALL				
07/02/09	17:30	South	09-C0076		EPA/GE Dredging Project	1					
07/02/09	17:30	South	09-C0049		EPA/GE Dredging Project	1					
07/02/09	18:00	South	09-C0078		EPA/GE Dredging Project	1					
07/02/09	18:00	South	09-C0042		EPA/GE Dredging Project	1					
07/02/09	19:10	North	09-C0049		EPA/GE Dredging Project	1					
07/02/09	20:00	North	09-C0077		EPA/GE Dredging Project	1					
07/02/09	20:00	North	09-C0124		EPA/GE Dredging Project	1					
07/02/09	21:30	South	09-C0049		EPA/GE Dredging Project	1					
07/02/09	22:00	South	09-C0077		EPA/GE Dredging Project	1					
07/02/09	22:00	South	09-C0124		EPA/GE Dredging Project	1					
07/02/09	22:45	North	09-C0042		EPA/GE Dredging Project	1					
07/02/09	22:45	North	09-C0078		EPA/GE Dredging Project	1					
07/02/09	23:45	South	09-C0042		EPA/GE Dredging Project	1					
07/02/09	23:45	South	09-C0078		EPA/GE Dredging Project	1					
07/03/09	8:00	North	09-20633		Pleasure	1	WONDERFUL				
07/03/09	9:10	South	09-S0846		Pleasure	1	CLASSIC TRAVELER				
07/03/09	9:40	North	09-20631		Pleasure	1	REAL MAGIC				
07/03/09	9:40	North	09-20630		Pleasure	1	EASY LIVING				
07/03/09	9:40	North	09-20632		Pleasure	1	DOUBLE TROUBLE				
07/03/09	10:45	South	09-20969		Pleasure	1	CALIBRI II				
07/03/09	11:45	South	09-20967		Pleasure	1	REVE D'OCEAN				
07/03/09	11:45	South	09-20968		Pleasure	1	BLIND DATE				
07/03/09	12:00	North	09-S0886		Pleasure	1	MOOR MUSIC				
07/03/09	13:05	North	09-C0124		EPA/GE Dredging Project	1					
07/03/09	13:05	North	09-C0049		EPA/GE Dredging Project	1					
07/03/09	15:00	South	09-C0049		EPA/GE Dredging Project	1					
07/03/09	15:00	South	09-C0124		EPA/GE Dredging Project	1					
07/03/09	17:55	North	09-C0049		EPA/GE Dredging Project	1					
07/03/09	17:55	North	09-C0124		EPA/GE Dredging Project	1					
07/03/09	18:45	South	09-S0847		Pleasure	1	AB SEAS				
07/03/09	18:45	South	09-20970		Pleasure	1	LA TULIP'EAUSE				
07/03/09	19:35	South	09-C0049		EPA/GE Dredging Project	1					
07/03/09	19:35	South	09-C0104		EPA/GE Dredging Project	1					
07/03/09	21:15	North	09-C0124		EPA/GE Dredging Project	1					

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07/03/09	21:15	North	09-C0049		EPA/GE Dredging Project	1					
07/03/09	23:15	South	09-C0124		EPA/GE Dredging Project	1					
07/03/09	23:15	South	09-C0049		EPA/GE Dredging Project	1					
07/04/09	10:50	South	09-S0026		Pleasure	1	TUG 44				
07/04/09	12:55	North	09-S0618		Pleasure	1	WEED QUEEN				
07/04/09	13:40	North	09-C0124		EPA/GE Dredging Project	1					
07/04/09	13:40	North	09-C0123		EPA/GE Dredging Project	1					
07/04/09	14:05	North	09-S0726		Pleasure	1	RED DEVIL				
07/04/09	14:05	North	UPT-15631	NY1259UT	Pleasure	1					
07/04/09	14:25	North	09-20635		Pleasure	1	AIME BRIE				
07/04/09	14:50	North	09-C0102		EPA/GE Dredging Project	1					
07/04/09	15:15	South	09-C0124		EPA/GE Dredging Project	1					
07/04/09	15:15	South	09-C0123		EPA/GE Dredging Project	1					
07/04/09	16:15	North	09-C0124		EPA/GE Dredging Project	1					
07/04/09	16:15	North	09-C0123		EPA/GE Dredging Project	1					
07/04/09	16:35	South	09-C0102		EPA/GE Dredging Project	1					
07/04/09	17:45	South	09-C0124		EPA/GE Dredging Project	1					
07/04/09	17:45	South	09-C0123		EPA/GE Dredging Project	1					
07/04/09	18:05	South	UPT-15631	NY 1259 UT	Pleasure	1	PONTOON				
07/04/09	18:05	South	09-S0726		Pleasure	1	RED DEVIL				
07/04/09	18:40	South	09-S0788		Pleasure	1	BALANCE				
07/04/09	19:20	North	09-C0123		EPA/GE Dredging Project	1					
07/04/09	19:20	North	09-C0124		EPA/GE Dredging Project	1					
07/04/09	20:45	South	09-C0124		EPA/GE Dredging Project	1					
07/04/09	20:45	South	09-C0123		EPA/GE Dredging Project	1					
07/05/09	10:00	North	09-C0042		EPA/GE Dredging Project	1					
07/05/09	10:35	North	09-20433	NY8306FE	Pleasure	1					
07/05/09	10:50	South	09-C0042		EPA/GE Dredging Project	1					
07/05/09	11:50	South	09-20972		Pleasure	1	HELLELUJAH				
07/05/09	12:10	North	09-S0725	NY9391MA	Pleasure	1					
07/05/09	13:50	South	09-S0618		Pleasure	1	WEED QUEEN				
07/05/09	14:40	North	09-S0019		Pleasure	1					
07/05/09	15:10	South	09-S0019		Pleasure	1					
07/05/09	15:40	North	UPT-15685		Pleasure	1	CRAZY				
07/05/09	17:40	South	09-S0724		Pleasure	1	OTHER OFFICE LLL				
07/05/09	18:25	North	09-S0026		Pleasure	1	TUG 44				
07/05/09	20:25	South	09-S0725		Pleasure	1					
07/05/09	20:45	North	09-20283		Pleasure	1	MEREKEL				
07/06/09	5:45	North	09-C0049		EPA/GE Dredging Project	1					
07/06/09	7:10	North	09-C0077		EPA/GE Dredging Project	1					
07/06/09	7:10	North	09-C0124		EPA/GE Dredging Project	1					
07/06/09	7:40	North	09-C0076		EPA/GE Dredging Project	1					
07/06/09	7:55	South	09-C0049		EPA/GE Dredging Project	1					
07/06/09	8:50	South	09-C0124		EPA/GE Dredging Project	1					
07/06/09	8:50	South	09-C0077		EPA/GE Dredging Project	1					
07/06/09	9:20	South	09-C0076		EPA/GE Dredging Project	1					
07/06/09	10:05	South	09-S0849		Pleasure	1	JAMBO				
07/06/09	12:00	South	09-10854		Pleasure	1	NANCY ANN				
07/06/09	12:20	North	09-S0849		Pleasure	1	JAMBO				
07/06/09	14:25	North	09-C0123		EPA/GE Dredging Project	1					
07/06/09	14:25	North	09-C0124		EPA/GE Dredging Project	1					
07/06/09	14:55	North	09-10093		Pleasure	1					
07/06/09	15:20	North	09-C0103		EPA/GE Dredging Project	1					
07/06/09	15:50	South	09-C0123		EPA/GE Dredging Project	1					
07/06/09	15:50	South	09-C0124		EPA/GE Dredging Project	1					
07/06/09	16:15	South	09-S0943		Pleasure	1	CANDOR				
07/06/09	16:40	South	09-S0850		Pleasure	1					
07/06/09	17:05	North	09-C0123		EPA/GE Dredging Project	1					
07/06/09	17:05	North	09-C0124		EPA/GE Dredging Project	1					
07/06/09	17:35	South	09-C0103		EPA/GE Dredging Project	1					
07/06/09	18:55	South	09-C0124		EPA/GE Dredging Project	1					
07/06/09	18:55	South	09-C0123		EPA/GE Dredging Project	1					
07/06/09	19:10	North	09-20640		Pleasure	1					
07/06/09	22:10	North	09-C0042		EPA/GE Dredging Project	1					
07/06/09	22:10	North	09-C0078		EPA/GE Dredging Project	1					
07/06/09	22:35	North			Commercial	1		401	Brake - Gotham	CG1070376	09-C0036
07/06/09	23:45	South	09-C0042		EPA/GE Dredging Project	1					
07/06/09	23:45	South	09-C0078		EPA/GE Dredging Project	1					
07/07/09	2:05	North	09-C0078		EPA/GE Dredging Project	1					
07/07/09	2:05	North	09-C0042		EPA/GE Dredging Project	1					
07/07/09	3:50	North	09-C0103		EPA/GE Dredging Project	1					
07/07/09	4:30	South	09-C0042		EPA/GE Dredging Project	1					
07/07/09	4:30	South	09-C0078		EPA/GE Dredging Project	1					
07/07/09	6:05	North	09-C0042		EPA/GE Dredging Project	1					
07/07/09	6:05	North	09-C0078		EPA/GE Dredging Project	1					
07/07/09	7:20	South	09-C0103		EPA/GE Dredging Project	1					
07/07/09	7:45	South			Commercial	1		402	Brake - Gotham	CG1070376	09-C0036
07/07/09	8:25	North	09-C0046		EPA/GE Dredging Project	1					
07/07/09	8:25	North	09-C0077		EPA/GE Dredging Project	1					
07/07/09	8:50	South	09-C0078		EPA/GE Dredging Project	1					
07/07/09	8:50	South	09-C0042		EPA/GE Dredging Project	1					
07/07/09	10:45	South	09-C0077		EPA/GE Dredging Project	1					
07/07/09	10:45	South	09-C0046		EPA/GE Dredging Project	1					
07/07/09	11:35	South	09-20976		Pleasure	1	LAST FLING				
07/07/09	11:35	South	09-20974	QC514884	Pleasure	1					
07/07/09	12:30	North	09-C0077		EPA/GE Dredging Project	1					

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07/07/09	12:30	North	09-C0046		EPA/GE Dredging Project	1					
07/07/09	13:45	North	09-20639		Pleasure	1	SHABU				
07/07/09	14:20	South	09-C0046		EPA/GE Dredging Project	1					
07/07/09	14:20	South	09-C0077		EPA/GE Dredging Project	1					
07/07/09	15:15	North	09-C0046		EPA/GE Dredging Project	1					
07/07/09	15:15	North	09-C0077		EPA/GE Dredging Project	1					
07/07/09	15:35	South	09-20975		Pleasure	1	MINNIE				
07/07/09	15:50	North	09-20941		Pleasure	1	TIME PASSAGES				
07/07/09	16:50	South	09-C0046		EPA/GE Dredging Project	1					
07/07/09	16:50	South	09-C0077		EPA/GE Dredging Project	1					
07/07/09	18:50	North	09-C0046		EPA/GE Dredging Project	1					
07/07/09	18:50	North	09-C0077		EPA/GE Dredging Project	1					
07/07/09	19:45	North	09-C0104		EPA/GE Dredging Project	1					
07/07/09	20:25	South	09-C0046		EPA/GE Dredging Project	1					
07/07/09	20:25	South	09-C0077		EPA/GE Dredging Project	1					
07/07/09	21:30	South	09-C0104		EPA/GE Dredging Project	1					
07/07/09	22:25	North	09-C0042		EPA/GE Dredging Project	1					
07/07/09	22:25	North	09-C0123		EPA/GE Dredging Project	1					
07/08/09	1:00	South	09-C0042		EPA/GE Dredging Project	1					
07/08/09	1:00	South	09-C0123		EPA/GE Dredging Project	1					
07/08/09	1:45	North	09-C0046		EPA/GE Dredging Project	1					
07/08/09	1:45	North	09-C0077		EPA/GE Dredging Project	1					
07/08/09	7:20	South	09-C0077		EPA/GE Dredging Project	1					
07/08/09	7:20	South	09-C0046		EPA/GE Dredging Project	1					
07/08/09	8:30	North	09-C0077		EPA/GE Dredging Project	1					
07/08/09	8:30	North	09-C0046		EPA/GE Dredging Project	1					
07/08/09	9:05	South	09-20978	10D87574	Pleasure	1	AFFINITE				
07/08/09	9:05	South	09-20977		Pleasure	1	LA DIVA				
07/08/09	10:35	South	09-C0077		EPA/GE Dredging Project	1					
07/08/09	10:35	South	09-C0046		EPA/GE Dredging Project	1					
07/08/09	10:50	North	09-S0019		Pleasure	1	MARLENE				
07/08/09	11:20	North	09-C0077		EPA/GE Dredging Project	1					
07/08/09	11:20	North	09-C0046		EPA/GE Dredging Project	1					
07/08/09	13:25	South	09-C0046		EPA/GE Dredging Project	1					
07/08/09	13:25	South	09-C0077		EPA/GE Dredging Project	1					
07/08/09	13:40	North	09-20642	NY8222FE	Pleasure	1					
07/08/09	14:30	South	09-20979		Pleasure	1	L'OR BLEU				
07/08/09	15:00	North	09-20645		Pleasure	1					
07/08/09	15:00	North	09-20644		Pleasure	1					
07/08/09	15:00	North	09-20643		Pleasure	1					
07/08/09	15:35	North	09-C0077		EPA/GE Dredging Project	1					
07/08/09	15:35	North	09-C0046		EPA/GE Dredging Project	1					
07/08/09	16:55	North	09-C0047		EPA/GE Dredging Project	1					
07/08/09	17:20	South	09-C0077		EPA/GE Dredging Project	1					
07/08/09	17:20	South	09-C0046		EPA/GE Dredging Project	1					
07/08/09	19:20	North	09-C0077		EPA/GE Dredging Project	1					
07/08/09	19:20	North	09-C0046		EPA/GE Dredging Project	1					
07/08/09	19:50	South	09-S0145		Pleasure	1	OFF THE WALL				
07/08/09	19:50	South	09-S1060		Pleasure	1					
07/08/09	20:15	North	09-C0042		EPA/GE Dredging Project	1					
07/08/09	20:15	North	09-C0103		EPA/GE Dredging Project	1					
07/08/09	21:30	South	09-C0077		EPA/GE Dredging Project	1					
07/08/09	21:30	South	09-C0046		EPA/GE Dredging Project	1					
07/08/09	22:00	South	09-C0103		EPA/GE Dredging Project	1					
07/08/09	22:00	South	09-C0042		EPA/GE Dredging Project	1					
07/09/09	0:45	North	09-C0042		EPA/GE Dredging Project	1					
07/09/09	0:45	North	09-C0078		EPA/GE Dredging Project	1					
07/09/09	7:45	South	09-C0042		EPA/GE Dredging Project	1					
07/09/09	7:45	South	09-C0078		EPA/GE Dredging Project	1					
07/09/09	8:35	North	09-C0078		EPA/GE Dredging Project	1					
07/09/09	8:35	North	09-C0042		EPA/GE Dredging Project	1					
07/09/09	9:35	North	09-C0076		EPA/GE Dredging Project	1					
07/09/09	9:35	North	09-C0103		EPA/GE Dredging Project	1					
07/09/09	10:00	South	09-C0042		EPA/GE Dredging Project	1					
07/09/09	10:00	South	09-C0078		EPA/GE Dredging Project	1					
07/09/09	10:20	South	09-20980		Pleasure	1	ANNA				
07/09/09	10:20	South	09-20981		Pleasure	1	BOOMERANG				
07/09/09	10:40	North	09-C0078		EPA/GE Dredging Project	1					
07/09/09	10:40	North	09-C0042		EPA/GE Dredging Project	1					
07/09/09	11:20	South	09-C0103		EPA/GE Dredging Project	1					
07/09/09	11:20	South	09-C0076		EPA/GE Dredging Project	1					
07/09/09	11:35	North	09-20649		Pleasure	1	SASSY LADY				
07/09/09	11:45	South	09-20902	12D2924	Pleasure	1					
07/09/09	12:00	North	09-20649		Pleasure	1	GLADYS				
07/09/09	12:10	South	09-20984		Pleasure	1	TAKING STOCK				
07/09/09	12:10	South	09-20983		Pleasure	1	AFTER YOU				
07/09/09	13:15	South	09-C0042		EPA/GE Dredging Project	1					
07/09/09	13:15	South	09-C0078		EPA/GE Dredging Project	1					
07/09/09	14:00	North	09-C0103		EPA/GE Dredging Project	1					
07/09/09	14:00	North	09-C0046		EPA/GE Dredging Project	1					
07/09/09	15:35	South	09-C0103		EPA/GE Dredging Project	1					
07/09/09	15:35	South	09-C0046		EPA/GE Dredging Project	1					
07/09/09	16:25	North			Pleasure - No motor	1					
07/09/09	16:25	North	09-S0189		Pleasure	1	CHAMPION SHIP				
07/09/09	16:25	North	09-S0194		Pleasure	1	EVER READY				
07/09/09	16:25	North	09-20650	NY7231FR	Pleasure	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
07/09/09	16:50	South	09-20642	NY8222FE	Pleasure	1					
07/09/09	17:05	North	09-C0076		EPA/GE Dredging Project	1					
07/09/09	17:35	North	09-10094		Pleasure	1	BETTY L				
07/09/09	17:35	North	09-S0150		Pleasure	1	CINBOY				
07/09/09	17:35	North	09-C0042		EPA/GE Dredging Project	1					
07/09/09	18:45	South	09-C0076		EPA/GE Dredging Project	1					
07/09/09	19:35	North	09-C0078		EPA/GE Dredging Project	1					
07/09/09	19:35	North	09-C0042		EPA/GE Dredging Project	1					
07/09/09	20:10	North	09-C0077		EPA/GE Dredging Project	1					
07/09/09	20:10	North	09-C0124		EPA/GE Dredging Project	1					
07/09/09	21:10	South	09-C0042		EPA/GE Dredging Project	1					
07/09/09	21:10	South	09-C0078		EPA/GE Dredging Project	1					
07/09/09	22:20	North	09-C0078		EPA/GE Dredging Project	1					
07/09/09	22:20	North	09-C0042		EPA/GE Dredging Project	1					
07/09/09	22:45	South	09-C0124		EPA/GE Dredging Project	1					
07/09/09	22:45	South	09-C0077		EPA/GE Dredging Project	1					
07/10/09	0:20	South	09-C0042		EPA/GE Dredging Project	1					
07/10/09	0:20	South	09-C0078		EPA/GE Dredging Project	1					
07/10/09	1:05	North	09-C0124		EPA/GE Dredging Project	1					
07/10/09	1:05	North	09-C0077		EPA/GE Dredging Project	1					
07/10/09	7:50	South	09-C0124		EPA/GE Dredging Project	1					
07/10/09	7:50	South	09-C0077		EPA/GE Dredging Project	1					
07/10/09	8:10	North	09-C0078		EPA/GE Dredging Project	1					
07/10/09	8:10	North	09-C0042		EPA/GE Dredging Project	1					
07/10/09	8:20	South	09-20324	NJ4762GZ	Pleasure	1	SNUG TUG				
07/10/09	8:35	North	09-20651		Pleasure	1	ROUPILLON				
07/10/09	9:45	South	09-C0042		EPA/GE Dredging Project	1					
07/10/09	9:45	South	09-C0078		EPA/GE Dredging Project	1					
07/10/09	10:30	North	09-C0078		EPA/GE Dredging Project	1					
07/10/09	10:30	North	09-C0042		EPA/GE Dredging Project	1					
07/10/09	10:55	North	09-C0047		EPA/GE Dredging Project	1					
07/10/09	11:30	North	09-S0725		Pleasure	1	SMITTY				
07/10/09	11:30	North	09-S0725	DL8683V	Pleasure	1	N/A				
07/10/09	12:00	South	09-S0917		Pleasure	1	SEA SMOKE				
07/10/09	13:30	South	09-C0078		EPA/GE Dredging Project	1					
07/10/09	13:30	South	09-C0042		EPA/GE Dredging Project	1					
07/10/09	13:55	North	09-20652		Pleasure	1	LETULIP				
07/10/09	14:05	South	09-20985		Pleasure	1	BELOW ZERO				
07/10/09	14:05	South	09-C0047		EPA/GE Dredging Project	1					
07/10/09	14:35	North	09-C0042		EPA/GE Dredging Project	1					
07/10/09	14:35	North	09-C0078		EPA/GE Dredging Project	1					
07/10/09	14:35	North	09-C0047		EPA/GE Dredging Project	1					
07/10/09	15:00	South	09-20986		Pleasure	1	CONTESS				
07/10/09	15:45	South	09-C0047		EPA/GE Dredging Project	1					
07/10/09	16:20	South	09-C0078		EPA/GE Dredging Project	1					
07/10/09	16:20	South	09-C0042		EPA/GE Dredging Project	1					
07/10/09	16:40	South	09-20987		Pleasure	1					
07/10/09	18:15	North	09-C0042		EPA/GE Dredging Project	1					
07/10/09	18:15	North	09-C0078		EPA/GE Dredging Project	1					
07/10/09	18:50	South	09-S0725	NY9391MA	Pleasure	1					
07/10/09	19:35	South	09-C0078		EPA/GE Dredging Project	1					
07/10/09	19:35	South	09-C0042		EPA/GE Dredging Project	1					
07/10/09	20:15	North	09-C0077		EPA/GE Dredging Project	1					
07/10/09	20:15	North	09-C0124		EPA/GE Dredging Project	1					
07/10/09	20:40	North	09-S0646	NY8551EA	Pleasure	1					
07/10/09	21:45	South	09-C0077		EPA/GE Dredging Project	1					
07/10/09	21:45	South	09-C0124		EPA/GE Dredging Project	1					
07/11/09	5:25	North	09-C0047		EPA/GE Dredging Project	1					
07/11/09	7:05	North	09-C0124		EPA/GE Dredging Project	1					
07/11/09	7:05	North	09-C0077		EPA/GE Dredging Project	1					
07/11/09	7:35	South	09-C0047		EPA/GE Dredging Project	1					
07/11/09	7:50	North	09-C0078		EPA/GE Dredging Project	1					
07/11/09	7:50	North	09-C0076		EPA/GE Dredging Project	1					
07/11/09	8:50	South	09-20958		Pleasure	1	NAUTI DREAMS				
07/11/09	9:05	North	09-S0615		Tour Non-sleep aboard	1	SUZY Q				
07/11/09	9:05	North	09-S0616		Pleasure	1	RIVER DANCE				
07/11/09	9:30	South	09-C0124		EPA/GE Dredging Project	1					
07/11/09	9:30	South	09-C0077		EPA/GE Dredging Project	1					
07/11/09	10:00	South	09-C0046		EPA/GE Dredging Project	1					
07/11/09	10:00	South	09-C0078		EPA/GE Dredging Project	1					
07/11/09	10:30	South	09-S0852		Pleasure	1	ROWEN				
07/11/09	10:30	South	09-S0946		Pleasure	1	LADY IN RED				
07/11/09	11:30	South	09-S0886		Pleasure	1					
07/11/09	11:45	North	09-10008		Pleasure	1					
07/11/09	12:10	North	09-20215		Pleasure	1					
07/11/09	12:10	North	09-20987		Pleasure	1					
07/11/09	12:10	North	09-20218		Pleasure	1					
07/11/09	12:10	North	09-20216		Pleasure	1					
07/11/09	12:50	North	09-C0077		EPA/GE Dredging Project	1					
07/11/09	12:50	North	09-C0124		EPA/GE Dredging Project	1					
07/11/09	13:00	South	09-20989		Pleasure	1					
07/11/09	13:10	South	09-S0834		Pleasure	1					
07/11/09	13:10	South	09-S0835		Pleasure	1					
07/11/09	13:10	South	09-20085		Pleasure	1					
07/11/09	13:20	North	09-20085		Pleasure	1					
07/11/09	14:20	South	09-C0124		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
07/11/09	14:20	South	09-C0077		EPA/GE Dredging Project	1					
07/11/09	15:50	North	09-C0124		EPA/GE Dredging Project	1					
07/11/09	15:50	North	09-C0077		EPA/GE Dredging Project	1					
07/11/09	16:15	North	09-S0834		Pleasure	1					
07/11/09	16:15	North	09-S0835		Pleasure	1					
07/11/09	16:15	North	09-C0047		EPA/GE Dredging Project	1					
07/11/09	17:15	South	09-C0077		EPA/GE Dredging Project	1					
07/11/09	17:15	South	09-C0124		EPA/GE Dredging Project	1					
07/11/09	17:40	South	09-C0047		EPA/GE Dredging Project	1					
07/11/09	17:40	South	09-20990		Pleasure	1					
07/12/09	4:10	North	09-C0124		EPA/GE Dredging Project	1					
07/12/09	4:10	North	09-C0103		EPA/GE Dredging Project	1					
07/12/09	5:55	South	09-C0124		EPA/GE Dredging Project	1					
07/12/09	5:55	South	09-C0103		EPA/GE Dredging Project	1					
07/12/09	8:10	North	09-C0103		EPA/GE Dredging Project	1					
07/12/09	8:10	North	09-C0124		EPA/GE Dredging Project	1					
07/12/09	8:30	North	09-C0076		EPA/GE Dredging Project	1					
07/12/09	9:50	South	09-C0103		EPA/GE Dredging Project	1					
07/12/09	10:30	South	09-C0124		EPA/GE Dredging Project	1					
07/12/09	10:30	South	09-C0103		EPA/GE Dredging Project	1					
07/12/09	12:30	South	09-20991		Pleasure	1					
07/12/09	13:05	North	09-20656		Pleasure	1					
07/12/09	13:05	North	09-S0736		Pleasure	1					
07/12/09	14:30	North	09-20655		Pleasure	1					
07/12/09	14:40	North	09-20658		Pleasure	1					
07/12/09	15:30	North	09-20657		Pleasure	1					
07/12/09	15:30	North	09-20659		Pleasure	1	PEICE OF MIND				
07/12/09	15:45	South	09-S0736		Pleasure	1					
07/12/09	16:30	North	09-C0076		EPA/GE Dredging Project	1					
07/12/09	16:30	North	09-C0103		EPA/GE Dredging Project	1					
07/12/09	18:20	South	09-C0076		EPA/GE Dredging Project	1					
07/12/09	18:20	South	09-C0103		EPA/GE Dredging Project	1					
07/12/09	19:35	North	09-C0103		EPA/GE Dredging Project	1					
07/12/09	19:35	North	09-C0122		EPA/GE Dredging Project	1					
07/12/09	20:45	South	09-C0122		EPA/GE Dredging Project	1					
07/12/09	20:45	South	09-C0103		EPA/GE Dredging Project	1					
07/13/09	2:00	North	09-C0103		EPA/GE Dredging Project	1					
07/13/09	2:00	North	09-C0124		EPA/GE Dredging Project	1					
07/13/09	5:35	South	09-C0103		EPA/GE Dredging Project	1					
07/13/09	5:35	South	09-C0124		EPA/GE Dredging Project	1					
07/13/09	6:30	North	09-C0104		EPA/GE Dredging Project	1					
07/13/09	7:10	North	09-C0103		EPA/GE Dredging Project	1					
07/13/09	7:10	North	09-C0124		EPA/GE Dredging Project	1					
07/13/09	7:30	South	09-C0104		EPA/GE Dredging Project	1					
07/13/09	8:55	North	09-C0042		EPA/GE Dredging Project	1					
07/13/09	8:55	North	09-C0078		EPA/GE Dredging Project	1					
07/13/09	9:20	South	09-C0103		EPA/GE Dredging Project	1					
07/13/09	9:20	South	09-C0124		EPA/GE Dredging Project	1					
07/13/09	9:40	North	09-C0104		EPA/GE Dredging Project	1					
07/13/09	10:20	South	09-C0042		EPA/GE Dredging Project	1					
07/13/09	10:20	South	09-C0078		EPA/GE Dredging Project	1					
07/13/09	10:50	South	09-C0104		EPA/GE Dredging Project	1					
07/13/09	11:25	North	09-20661	12D2924	Pleasure	1	N/A				
07/13/09	12:30	North	09-C0042		EPA/GE Dredging Project	1					
07/13/09	12:30	North	09-C0078		EPA/GE Dredging Project	1					
07/13/09	12:50	South	09-20993	VT1675R	Pleasure	1	TOMELIA				
07/13/09	13:10	North	09-20993	VT1675R	Pleasure	1	TOMELIA				
07/13/09	14:00	South	09-C0042		EPA/GE Dredging Project	1					
07/13/09	14:00	South	09-C0078		EPA/GE Dredging Project	1					
07/13/09	14:50	South	09-20661	VT1675R	Pleasure	1	TOMELIA				
07/13/09	14:50	South	09-20995		Pleasure	1	ANVIL'S RING				
07/13/09	14:50	South	09-20217		Pleasure	1	JUST BECAUSE				
07/13/09	14:50	South	09-20219		Pleasure	1	KNOT HOME				
07/13/09	15:35	South	09-20994		Pleasure	1	CYRANO				
07/13/09	16:20	North	09-C0047		EPA/GE Dredging Project	1					
07/13/09	16:40	North	09-S0724		Pleasure	1	OTHER OFFICE				
07/13/09	17:20	South	09-S0724		Pleasure	1	OTHER OFFICE				
07/13/09	18:35	North	09-C0124		EPA/GE Dredging Project	1					
07/13/09	18:35	North	09-C0078		EPA/GE Dredging Project	1					
07/13/09	20:05	South	09-C0124		EPA/GE Dredging Project	1					
07/13/09	20:05	South	09-C0078		EPA/GE Dredging Project	1					
07/13/09	21:20	North	09-C0124		EPA/GE Dredging Project	1					
07/13/09	21:20	North	09-C0078		EPA/GE Dredging Project	1					
07/13/09	23:15	South	09-C0124		EPA/GE Dredging Project	1					
07/13/09	23:15	South	09-C0078		EPA/GE Dredging Project	1					
07/14/09	1:15	North	09-C0078		EPA/GE Dredging Project	1					
07/14/09	1:15	North	09-C0077		EPA/GE Dredging Project	1					
07/14/09	2:50	South	09-C0077		EPA/GE Dredging Project	1					
07/14/09	2:50	South	09-C0078		EPA/GE Dredging Project	1					
07/14/09	4:00	North	09-C0078		EPA/GE Dredging Project	1					
07/14/09	4:00	North	09-C0077		EPA/GE Dredging Project	1					
07/14/09	6:15	South	09-C0077		EPA/GE Dredging Project	1					
07/14/09	6:15	South	09-C0078		EPA/GE Dredging Project	1					
07/14/09	7:55	North	09-C0124		EPA/GE Dredging Project	1					
07/14/09	7:55	North	09-C0042		EPA/GE Dredging Project	1					
07/14/09	10:00	South	09-C0124		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
07/14/09	10:00	South	09-C0042		EPA/GE Dredging Project	1					
07/14/09	10:30	North	09-C0078		EPA/GE Dredging Project	1					
07/14/09	10:30	North	09-C0077		EPA/GE Dredging Project	1					
07/14/09	10:50	South	09-20996		Pleasure	1	ISBONE				
07/14/09	11:00	North	09-C0046		EPA/GE Dredging Project	1					
07/14/09	11:30	North	09-C0124		EPA/GE Dredging Project	1					
07/14/09	11:30	North	09-C0042		EPA/GE Dredging Project	1					
07/14/09	13:15	South	09-C0078		EPA/GE Dredging Project	1					
07/14/09	13:15	South	09-C0077		EPA/GE Dredging Project	1					
07/14/09	13:40	South	09-21000		Pleasure	1	EASY LIVING				
07/14/09	13:40	South	09-20999		Pleasure	1	DOUBLE TROUBLE				
07/14/09	13:40	South	09-20998		Pleasure	1	LE MATIN BLEU				
07/14/09	13:40	South	09-20997		Pleasure	1	MINORCA				
07/14/09	13:40	South	09-21001		Pleasure	1	REEL MAGIC				
07/14/09	14:05	South	09-C0046		EPA/GE Dredging Project	1					
07/14/09	14:05	South	09-C0042		EPA/GE Dredging Project	1					
07/14/09	14:05	South	09-C0124		EPA/GE Dredging Project	1					
07/14/09	15:05	South	09-21005		Pleasure	1					
07/14/09	15:05	South	09-21004		Pleasure	1					
07/14/09	16:30	South	09-C0077		EPA/GE Dredging Project	1					
07/14/09	16:30	South	09-C0078		EPA/GE Dredging Project	1					
07/14/09	18:00	North	09-C0078		EPA/GE Dredging Project	1					
07/14/09	18:00	North	09-C0077		EPA/GE Dredging Project	1					
07/14/09	19:30	South	09-C0077		EPA/GE Dredging Project	1					
07/14/09	19:30	South	09-C0078		EPA/GE Dredging Project	1					
07/14/09	21:15	North	09-C0124		EPA/GE Dredging Project	1					
07/14/09	21:15	North	09-C0042		EPA/GE Dredging Project	1					
07/14/09	23:05	South	09-C0042		EPA/GE Dredging Project	1					
07/14/09	23:05	South	09-C0124		EPA/GE Dredging Project	1					
07/15/09	1:20	North	09-C0123		EPA/GE Dredging Project	1					
07/15/09	1:20	North	09-C0042		EPA/GE Dredging Project	1					
07/15/09	3:20	South	09-C0123		EPA/GE Dredging Project	1					
07/15/09	3:20	South	09-C0042		EPA/GE Dredging Project	1					
07/15/09	3:40	North	09-C0047		EPA/GE Dredging Project	1					
07/15/09	4:20	North	09-C0123		EPA/GE Dredging Project	1					
07/15/09	4:20	North	09-C0042		EPA/GE Dredging Project	1					
07/15/09	7:05	South	09-C0123		EPA/GE Dredging Project	1					
07/15/09	7:05	South	09-C0042		EPA/GE Dredging Project	1					
07/15/09	8:15	North	09-C0124		EPA/GE Dredging Project	1					
07/15/09	8:15	North	09-C0077		EPA/GE Dredging Project	1					
07/15/09	8:35	South	09-C0047		EPA/GE Dredging Project	1					
07/15/09	8:55	North	09-C0123		EPA/GE Dredging Project	1					
07/15/09	8:55	North	09-C0042		EPA/GE Dredging Project	1					
07/15/09	10:00	North	09-20662		Pleasure	1	WATERCOLOR				
07/15/09	10:20	South	09-C0124		EPA/GE Dredging Project	1					
07/15/09	10:20	South	09-C0077		EPA/GE Dredging Project	1					
07/15/09	10:50	South	09-S0069	VT3320D	Pleasure	1	ADAGLO				
07/15/09	11:15	South	09-C0123		EPA/GE Dredging Project	1					
07/15/09	11:15	South	09-C0042		EPA/GE Dredging Project	1					
07/15/09	12:05	North	09-20663		Pleasure	1	NATACAR				
07/15/09	12:20	South	09-S1956		Pleasure	1	ROVER				
07/15/09	12:35	North	09-S0563		Pleasure	1	BEHR NECESSITY				
07/15/09	13:10	North	09-C0042		EPA/GE Dredging Project	1					
07/15/09	13:10	North	09-C0047		EPA/GE Dredging Project	1					
07/15/09	13:45	South	09-21008		Pleasure	1					
07/15/09	13:45	South	09-S0189		Pleasure	1					
07/15/09	15:40	South	09-C0042		EPA/GE Dredging Project	1					
07/15/09	15:40	South	09-C0047		EPA/GE Dredging Project	1					
07/15/09	16:30	North	09-C0077		EPA/GE Dredging Project	1					
07/15/09	16:30	North	09-C0124		EPA/GE Dredging Project	1					
07/15/09	18:10	South	09-C0124		EPA/GE Dredging Project	1					
07/15/09	18:10	South	09-C0077		EPA/GE Dredging Project	1					
07/15/09	18:45	North	09-C0042		EPA/GE Dredging Project	1					
07/15/09	18:45	North	09-C0049		EPA/GE Dredging Project	1					
07/15/09	22:00	North	09-C0124		EPA/GE Dredging Project	1					
07/15/09	22:00	North	09-C0077		EPA/GE Dredging Project	1					
07/16/09	0:35	South	09-C0042		EPA/GE Dredging Project	1					
07/16/09	0:35	South	09-C0049		EPA/GE Dredging Project	1					
07/16/09	3:30	North	09-C0047		EPA/GE Dredging Project	1					
07/16/09	4:40	South	09-C0077		EPA/GE Dredging Project	1					
07/16/09	4:40	South	09-C0124		EPA/GE Dredging Project	1					
07/16/09	6:00	North	09-C0042		EPA/GE Dredging Project	1					
07/16/09	6:00	North	09-C0049		EPA/GE Dredging Project	1					
07/16/09	6:40	South	09-C0047		EPA/GE Dredging Project	1					
07/16/09	7:15	South	09-C0049		EPA/GE Dredging Project	1					
07/16/09	7:15	South	09-C0072		EPA/GE Dredging Project	1					
07/16/09	7:45	North	09-C0124		EPA/GE Dredging Project	1					
07/16/09	7:45	North	09-C0077		EPA/GE Dredging Project	1					
07/16/09	8:10	South	09-S1687	AR2450AL	Pleasure	1	LOTTA LIGHT				
07/16/09	8:25	North	09-10095		Pleasure	1	KATHERINE				
07/16/09	8:35	South	09-S0150		Pleasure	1	CINBOY II				
07/16/09	9:05	South	09-10095		Pleasure	1	KATHARINE				
07/16/09	9:05	South	09-21009		Pleasure	1	SAPHIR BLEU				
07/16/09	10:15	South	09-21011		Pleasure	1	UIO				
07/16/09	11:45	South	09-21014	NY7418UZ	Pleasure	1	PIECE OF MIND				
07/16/09	11:45	South	09-21013	NY4293FT	Pleasure	1	STILL AROUND				

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
07/16/09	12:10	South	09-21012		Pleasure	1	VIDA DEL SOL				
07/16/09	13:15	South			Canal Corporation Vessel	1	SPS 51				
07/16/09	13:35	South	09-C0077		EPA/GE Dredging Project	1					
07/16/09	13:35	South	09-C0124		EPA/GE Dredging Project	1					
07/16/09	13:55	North	09-C0076		EPA/GE Dredging Project	1					
07/16/09	14:05	South	09-S0855		Pleasure	1	MARIE CLAIRE				
07/16/09	14:15	North	09-C0124		EPA/GE Dredging Project	1					
07/16/09	14:15	North	09-C0077		EPA/GE Dredging Project	1					
07/16/09	14:30	South	09-C0076		EPA/GE Dredging Project	1					
07/16/09	14:30	South	09-21010		Pleasure	1	LOTTE				
07/16/09	15:00	North	09-21010		Pleasure	1	LOTTE				
07/16/09	15:15	South	09-S0616		Pleasure	1	RIVER DANCE				
07/16/09	15:15	South	09-S0615		Pleasure	1	SUZY Q				
07/16/09	15:40	South	09-C0077		EPA/GE Dredging Project	1					
07/16/09	15:40	South	09-C0124		EPA/GE Dredging Project	1					
07/16/09	16:20	North	09-C0122		EPA/GE Dredging Project	1					
07/16/09	16:20	North	09-C0076		EPA/GE Dredging Project	1					
07/16/09	16:45	North	09-20087		Pleasure	1	SMOOTH AS GLASS				
07/16/09	17:05	North	09-20664		Pleasure	1	SAHARA				
07/16/09	17:35	North	09-10062		Pleasure	1	SLIPPERY SLOPE				
07/16/09	18:05	South	09-21015		Pleasure	1	CASH @ LOU II				
07/16/09	18:20	North	09-C0047		EPA/GE Dredging Project	1					
07/16/09	18:20	North	09-20665		Pleasure	1	ODYSSEY				
07/16/09	19:00	South	09-C0122		EPA/GE Dredging Project	1					
07/16/09	19:00	South	09-C0076		EPA/GE Dredging Project	1					
07/16/09	19:35	North	09-C0042		EPA/GE Dredging Project	1					
07/16/09	19:35	North	09-C0077		EPA/GE Dredging Project	1					
07/16/09	20:00	South	09-C0047		EPA/GE Dredging Project	1					
07/16/09	20:00	South	09-21016		Pleasure	1	ARCHIE				
07/16/09	23:05	South	09-C0077		EPA/GE Dredging Project	1					
07/16/09	23:05	South	09-C0042		EPA/GE Dredging Project	1					
07/17/09	1:10	North	09-C0049		EPA/GE Dredging Project	1					
07/17/09	1:10	North	09-C0124		EPA/GE Dredging Project	1					
07/17/09	3:25	South	09-C0049		EPA/GE Dredging Project	1					
07/17/09	3:25	South	09-C0124		EPA/GE Dredging Project	1					
07/17/09	8:45	North	09-C0042		EPA/GE Dredging Project	1					
07/17/09	8:45	North	09-C0077		EPA/GE Dredging Project	1					
07/17/09	9:10	North	09-C0049		EPA/GE Dredging Project	1					
07/17/09	9:10	North	09-C0124		EPA/GE Dredging Project	1					
07/17/09	9:35	North	09-10095		Pleasure	1	KATHARINE				
07/17/09	10:25	North	09-10061		Pleasure	1	OLIVIA ELISE				
07/17/09	10:40	South	09-C0042		EPA/GE Dredging Project	1					
07/17/09	10:40	South	09-C0077		EPA/GE Dredging Project	1					
07/17/09	11:25	North	09-21088		Pleasure	1	LE JADE				
07/17/09	12:00	South	09-S0646		Pleasure	1					
07/17/09	13:20	North	09-10096	CT7793BC	Pleasure	1					
07/17/09	13:20	North	09-S0318		Pleasure	1	JERSEY GIRL				
07/17/09	13:20	North	09-C0061		Hire	1	FABIENNE SUZANNE				
07/17/09	13:40	South	09-C0049		EPA/GE Dredging Project	1					
07/17/09	13:40	South	09-C0124		EPA/GE Dredging Project	1					
07/17/09	14:35	North	09-C0077		EPA/GE Dredging Project	1					
07/17/09	14:35	North	09-C0043		EPA/GE Dredging Project	1					
07/17/09	15:30	North	09-S0978		Pleasure	1	JOLIE BLONDE				
07/17/09	15:30	North	09-20666		Pleasure	1	SEA YA				
07/17/09	16:00	South	09-C0077		EPA/GE Dredging Project	1					
07/17/09	16:00	South	09-C0042		EPA/GE Dredging Project	1					
07/17/09	16:30	South	09-10854		Pleasure	1					
07/17/09	16:30	South	09-10855		Pleasure	1	L' EVASION V				
07/17/09	16:30	South	09-10856		Pleasure	1	JB PIER				
07/17/09	17:00	North	09-C0049		EPA/GE Dredging Project	1					
07/17/09	17:00	North	09-C0047		EPA/GE Dredging Project	1					
07/17/09	17:00	North	09-C0124		EPA/GE Dredging Project	1					
07/17/09	17:20	South	09-21018		Pleasure	1					
07/17/09	17:45	South	09-21019		Pleasure	1					
07/17/09	18:45	South	09-C0047		EPA/GE Dredging Project	1					
07/17/09	18:45	South	09-C0049		EPA/GE Dredging Project	1					
07/17/09	18:45	South	09-C0124		EPA/GE Dredging Project	1					
07/17/09	19:45	North	09-C0049		EPA/GE Dredging Project	1					
07/17/09	19:45	North	09-C0124		EPA/GE Dredging Project	1					
07/17/09	21:30	South	09-C0124		EPA/GE Dredging Project	1					
07/17/09	21:30	South	09-C0049		EPA/GE Dredging Project	1					
07/18/09	0:40	North	09-C0042		EPA/GE Dredging Project	1					
07/18/09	0:40	North	09-C0049		EPA/GE Dredging Project	1					
07/18/09	6:10	South	09-C0042		EPA/GE Dredging Project	1					
07/18/09	6:10	South	09-C0049		EPA/GE Dredging Project	1					
07/18/09	6:45	North	09-C0077		EPA/GE Dredging Project	1					
07/18/09	6:45	North	09-C0105		EPA/GE Dredging Project	1					
07/18/09	9:10	South	09-21020		Pleasure	1	SINOME				
07/18/09	9:30	South	09-C0105		EPA/GE Dredging Project	1					
07/18/09	9:30	South	09-C0077		EPA/GE Dredging Project	1					
07/18/09	10:30	South	09-21022		Pleasure	1	CHELMA				
07/18/09	10:30	South	09-21021		Pleasure	1					
07/18/09	10:30	South	09-10857		Pleasure	1	FRIEND SHIP				
07/18/09	10:30	South	09-10095		Pleasure	1	KATHARINE				
07/18/09	10:45	North	09-C0047		EPA/GE Dredging Project	1					
07/18/09	11:45	North	09-C0049		EPA/GE Dredging Project	1					

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07/18/09	11:45	North	09-C0124		EPA/GE Dredging Project	1					
07/18/09	12:20	South	09-21023		Pleasure	1	DOUBLE DREAM				
07/18/09	12:35	North			Pleasure - No motor	1					
07/18/09	12:35	North			Pleasure - No motor	1					
07/18/09	13:00	North	09-20668		Pleasure	1					
07/18/09	13:25	North	09-S0847		Pleasure	1	A B SEAS				
07/18/09	13:45	South	09-C0049		EPA/GE Dredging Project	1					
07/18/09	13:45	South	09-C0124		EPA/GE Dredging Project	1					
07/18/09	14:10	South	09-21026		Pleasure	1	HANG OVER				
07/18/09	14:10	South	09-21024		Pleasure	1	BREAUTHE EASY				
07/18/09	14:10	South	09-21025		Pleasure	1	LIQUOR BOX				
07/18/09	14:45	North	09-20088		EPA/GE Dredging Project	1					
07/18/09	14:45	North	09-20089		Pleasure	1					
07/18/09	15:10	North	09-S0611		Pleasure	1					
07/18/09	15:45	South	09-S0738		Pleasure	1	CRAZY				
07/18/09	16:00	South	09-21027		Pleasure	1					
07/18/09	16:00	South	09-C0061		Hire	1	FABIENNE SUZANNE				
07/18/09	16:00	South	09-C0047		EPA/GE Dredging Project	1					
07/18/09	16:20	South	09-S0611		Pleasure	1					
07/18/09	17:05	South	09-10859		Pleasure	1					
07/18/09	17:30	North	09-C0124		EPA/GE Dredging Project	1					
07/18/09	18:00	North	09-S0069		Pleasure	1					
07/18/09	18:35	South	09-10062		Pleasure	1					
07/18/09	19:05	South	09-C0124		EPA/GE Dredging Project	1					
07/18/09	19:05	South	09-C0077		EPA/GE Dredging Project	1					
07/18/09	19:30	South	09-10858		Pleasure	1					
07/18/09	20:25	North	09-C0123		EPA/GE Dredging Project	1					
07/18/09	20:25	North	09-C0076		EPA/GE Dredging Project	1					
07/18/09	22:40	South	09-C0123		EPA/GE Dredging Project	1					
07/18/09	22:40	South	09-C0076		EPA/GE Dredging Project	1					
07/19/09	2:10	North	09-C0077		EPA/GE Dredging Project	1					
07/19/09	2:10	North	09-C0042		EPA/GE Dredging Project	1					
07/19/09	4:10	South	09-C0077		EPA/GE Dredging Project	1					
07/19/09	4:10	South	09-C0042		EPA/GE Dredging Project	1					
07/19/09	5:10	North	09-C0077		EPA/GE Dredging Project	1					
07/19/09	5:10	North	09-C0042		EPA/GE Dredging Project	1					
07/19/09	6:50	South	09-C0077		EPA/GE Dredging Project	1					
07/19/09	6:50	South	09-C0042		EPA/GE Dredging Project	1					
07/19/09	7:25	North	09-C0045		EPA/GE Dredging Project	1					
07/19/09	8:25	South	09-S0856		Pleasure	1	MONTESINO				
07/19/09	10:10	South	09-21028		Pleasure	1	TOYS 4 US				
07/19/09	10:10	South	09-21029		Pleasure	1	APRES SKI				
07/19/09	10:35	South	09-21030		Pleasure	1	MARIN DEAY DOUCE				
07/19/09	11:15	North	09-C0049		EPA/GE Dredging Project	1					
07/19/09	11:15	North	09-C0077		EPA/GE Dredging Project	1					
07/19/09	12:05	South	09-21034		Pleasure	1					
07/19/09	12:05	South	09-21035		Pleasure	1					
07/19/09	12:05	South	09-21033		Pleasure	1					
07/19/09	12:05	South	09-21032		Pleasure	1					
07/19/09	12:05	South	09-21031		Pleasure	1					
07/19/09	12:05	South	09-10008		Pleasure	1					
07/19/09	12:45	South	09-C0045		EPA/GE Dredging Project	1					
07/19/09	13:15	South	09-10860		Pleasure	1					
07/19/09	13:25	North	09-10012		Pleasure	1	AVANTI				
07/19/09	13:30	North	UPT-15651		Pleasure	1					
07/19/09	13:50	South	09-C0049		EPA/GE Dredging Project	1					
07/19/09	13:50	South	09-C0077		EPA/GE Dredging Project	1					
07/19/09	14:30	South	09-S0026		Pleasure	1	TUG 44				
07/19/09	14:45	North	09-S1711		Pleasure	1	FLORANCE				
07/19/09	15:00	South	09-21036		Pleasure	1	ZABADO				
07/19/09	15:25	North	09-C0077		EPA/GE Dredging Project	1					
07/19/09	15:25	North	09-C0076		EPA/GE Dredging Project	1					
07/19/09	16:55	South	09-C0076		EPA/GE Dredging Project	1					
07/19/09	16:55	South	09-C0077		EPA/GE Dredging Project	1					
07/19/09	17:00	North	09-S0026		Pleasure	1	TUGG 44				
07/19/09	18:20	North	09-S2049		Pleasure	1	JALON				
07/19/09	19:50	North	09-C0076		EPA/GE Dredging Project	1					
07/19/09	20:40	South	09-C0076		EPA/GE Dredging Project	1					
07/20/09	1:30	North	09-C0077		Structural Inspection (non-DOT)	1					
07/20/09	1:30	North	09-C0047		EPA/GE Dredging Project	1					
07/20/09	3:45	South	09-C0047		EPA/GE Dredging Project	1					
07/20/09	3:45	South	09-C0077		EPA/GE Dredging Project	1					
07/20/09	9:20	North	09-C0042		EPA/GE Dredging Project	1					
07/20/09	11:30	North	09-20671		Pleasure	1	DA TIKI MON				
07/20/09	11:50	South	09-S0857		Pleasure	1	WHOOPEE				
07/20/09	11:50	South	09-C0042		EPA/GE Dredging Project	1					
07/20/09	11:50	South	09-S0194		Pleasure	1	EVER-READY				
07/20/09	12:40	South	09-21039		Pleasure	1					
07/20/09	12:40	South	09-21040		Pleasure	1					
07/20/09	12:40	South	09-21061		Pleasure	1					
07/20/09	13:40	South	09-21065		Pleasure	1					
07/20/09	13:40	South	09-21064		Pleasure	1					
07/20/09	13:40	South	09-21062		Pleasure	1					
07/20/09	13:40	South	09-21063		Pleasure	1					
07/20/09	14:15	South	09-10863		Pleasure	1	LE FOU				
07/20/09	14:15	South	09-10862		Pleasure	1	NUMBER 5				

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
07/20/09	14:40	North	09-C0042		EPA/GE Dredging Project	1					
07/20/09	14:40	North	09-C0077		EPA/GE Dredging Project	1					
07/20/09	15:20	North	09-20675		Pleasure	1	IMAGINE				
07/20/09	16:10	South	09-C0077		EPA/GE Dredging Project	1					
07/20/09	16:10	South	09-C0047		EPA/GE Dredging Project	1					
07/20/09	22:05	North	09-C0077		EPA/GE Dredging Project	1					
07/20/09	22:05	North	09-C0076		EPA/GE Dredging Project	1					
07/20/09	23:50	South	09-C0076		EPA/GE Dredging Project	1					
07/20/09	23:50	South	09-C0077		EPA/GE Dredging Project	1					
07/21/09	2:20	North	09-C0077		EPA/GE Dredging Project	1					
07/21/09	2:20	North	09-C0043		EPA/GE Dredging Project	1					
07/21/09	4:45	South	09-C0043		EPA/GE Dredging Project	1					
07/21/09	4:45	South	09-C0077		EPA/GE Dredging Project	1					
07/21/09	5:50	North	09-C0123		EPA/GE Dredging Project	1					
07/21/09	5:50	North	09-C0049		EPA/GE Dredging Project	1					
07/21/09	7:10	North	09-C0046		EPA/GE Dredging Project	1					
07/21/09	7:50	South	09-C0123		EPA/GE Dredging Project	1					
07/21/09	7:50	South	09-C0049		EPA/GE Dredging Project	1					
07/21/09	8:20	South	09-21073		Pleasure	1	MARMEGAL				
07/21/09	8:20	South	09-C0046		EPA/GE Dredging Project	1					
07/21/09	9:30	North	09-C0049		EPA/GE Dredging Project	1					
07/21/09	9:30	North	09-C0123		EPA/GE Dredging Project	1					
07/21/09	9:50	North	09-21035		Pleasure	1	PELICAN				
07/21/09	10:05	South	09-20170		Pleasure	1	MANIFRAN				
07/21/09	10:05	South	09-20169	10D5023	Pleasure	1	LE CENT NON				
07/21/09	10:05	South	09-20171	23D2295	Pleasure	1	FEUET				
07/21/09	10:20	North	09-20701		Pleasure	1					
07/21/09	10:20	North	09-20676		Pleasure	1					
07/21/09	10:20	North	09-20674		Pleasure	1					
07/21/09	10:45	South	09-C0123		EPA/GE Dredging Project	1					
07/21/09	10:45	South	09-C0049		EPA/GE Dredging Project	1					
07/21/09	11:05	North	09-20678		Pleasure	1	CRAZY TALK				
07/21/09	11:05	North	09-20221	ME15GCJ	Pleasure	1	LYDIA				
07/21/09	11:05	North	09-20677		Pleasure	1	HUDSON'S TREASURE				
07/21/09	11:35	North	09-C0049		EPA/GE Dredging Project	1					
07/21/09	11:35	North	09-C0123		EPA/GE Dredging Project	1					
07/21/09	12:00	South	09-S0845	VT1717P	Pleasure	1	DARE TO DREAM				
07/21/09	12:00	South	09-21072	20D5092	Pleasure	1					
07/21/09	12:00	South	09-S0019	NY6916JZ	Pleasure	1					
07/21/09	12:15	North	09-20679		Pleasure	1	LE BATEAU				
07/21/09	12:35	South	09-21076		Pleasure	1					
07/21/09	12:35	South	09-21077		Pleasure	1					
07/21/09	12:55	South	09-21037		Pleasure	1					
07/21/09	12:55	South	09-21075		Pleasure	1					
07/21/09	12:55	South	09-21074		Pleasure	1					
07/21/09	13:20	North	09-20680		Pleasure	1	MERRY WE				
07/21/09	13:35	South	09-21079		Pleasure	1	LOS BRISAS				
07/21/09	13:35	South	09-21078	QC1692715	Pleasure	1					
07/21/09	13:35	South	09-21066		Pleasure	1	HANGOVER				
07/21/09	13:35	South	09-21037		Pleasure	1	FRAN CARL				
07/21/09	14:00	North	09-21037		Pleasure	1	FRAN CARL				
07/21/09	15:00	North	09-C0105		EPA/GE Dredging Project	1					
07/21/09	16:25	North	09-S1873		Pleasure	1	BLACK TIE				
07/21/09	17:15	South	09-C0049		EPA/GE Dredging Project	1					
07/21/09	17:15	South	09-C0123		EPA/GE Dredging Project	1					
07/21/09	18:10	North	09-C0077		EPA/GE Dredging Project	1					
07/21/09	18:10	North	09-C0123		EPA/GE Dredging Project	1					
07/21/09	18:30	South	09-C0105		EPA/GE Dredging Project	1					
07/21/09	23:10	South	09-C0123		EPA/GE Dredging Project	1					
07/21/09	23:10	South	09-C0077		EPA/GE Dredging Project	1					
07/22/09	1:15	North	09-C0077		EPA/GE Dredging Project	1					
07/22/09	1:15	North	09-C0047		EPA/GE Dredging Project	1					
07/22/09	5:20	South	09-C0047		EPA/GE Dredging Project	1					
07/22/09	5:20	South	09-C0077		EPA/GE Dredging Project	1					
07/22/09	7:10	North	09-C0049		EPA/GE Dredging Project	1					
07/22/09	7:10	North	09-C0077		EPA/GE Dredging Project	1					
07/22/09	8:20	North	09-C0105		EPA/GE Dredging Project	1					
07/22/09	9:05	South	09-C0049		EPA/GE Dredging Project	1					
07/22/09	9:05	South	09-C0077		EPA/GE Dredging Project	1					
07/22/09	10:00	South	09-10864		Pleasure	1	ESPRESSOIII				
07/22/09	10:00	South	09-21068		Pleasure	1	LE DEVILLE				
07/22/09	10:00	South	09-21067		Pleasure	1	CONCORD				
07/22/09	10:55	North	09-C0123		EPA/GE Dredging Project	1					
07/22/09	10:55	North	09-C0077		EPA/GE Dredging Project	1					
07/22/09	11:10	South	09-C0105		EPA/GE Dredging Project	1					
07/22/09	11:25	North	UPT-15686		Pleasure	1	SEA SHACK				
07/22/09	13:00	South	09-10013	MS2008CG	Pleasure	1					
07/22/09	13:00	South	09-21042		Pleasure	1	L LOUDEMER				
07/22/09	13:15	North	09-S0988		Pleasure	1	WINSOME				
07/22/09	13:35	South	09-C0077		EPA/GE Dredging Project	1					
07/22/09	13:35	South	09-C0123		EPA/GE Dredging Project	1					
07/22/09	14:15	North	09-C0077		EPA/GE Dredging Project	1					
07/22/09	14:15	North	09-C0123		EPA/GE Dredging Project	1					
07/22/09	14:35	North	09-20703		Pleasure	1	ALEXANDRIA				
07/22/09	17:45	South	09-C0123		EPA/GE Dredging Project	1					
07/22/09	17:45	South	09-C0077		EPA/GE Dredging Project	1					

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07/22/09	18:05	South	09-21043		Pleasure	1					
07/22/09	19:00	North	09-S0101		Pleasure	1	BLUE BILL				
07/22/09	19:30	North	09-C0049		EPA/GE Dredging Project	1					
07/22/09	19:30	North	09-20704		Pleasure	1	PERE GRINE				
07/22/09	20:00	North	09-C0077		EPA/GE Dredging Project	1					
07/22/09	20:00	North	09-C0123		EPA/GE Dredging Project	1					
07/22/09	21:15	South	09-C0049		EPA/GE Dredging Project	1					
07/22/09	22:40	South	09-C0123		EPA/GE Dredging Project	1					
07/22/09	22:40	South	09-C0077		EPA/GE Dredging Project	1					
07/23/09	0:50	North	09-C0077		EPA/GE Dredging Project	1					
07/23/09	0:50	North	09-C0047		EPA/GE Dredging Project	1					
07/23/09	2:50	South	09-C0047		EPA/GE Dredging Project	1					
07/23/09	2:50	South	09-C0077		EPA/GE Dredging Project	1					
07/23/09	4:50	North	09-C0046		EPA/GE Dredging Project	1					
07/23/09	4:50	North	09-C0123		EPA/GE Dredging Project	1					
07/23/09	5:35	North	09-C0047		EPA/GE Dredging Project	1					
07/23/09	5:35	North	09-C0077		EPA/GE Dredging Project	1					
07/23/09	7:15	South	09-C0046		EPA/GE Dredging Project	1					
07/23/09	7:15	South	09-C0123		EPA/GE Dredging Project	1					
07/23/09	10:05	South	09-C0077		EPA/GE Dredging Project	1					
07/23/09	10:05	South	09-C0047		EPA/GE Dredging Project	1					
07/23/09	10:55	North	09-C0077		EPA/GE Dredging Project	1					
07/23/09	10:55	North	09-C0047		EPA/GE Dredging Project	1					
07/23/09	12:05	South	09-C0047		EPA/GE Dredging Project	1					
07/23/09	12:25	North	09-C0043		EPA/GE Dredging Project	1					
07/23/09	12:25	North	09-S0624		Pleasure	1	N/A				
07/23/09	12:35	South	09-21045	QC631846	Pleasure	1	N/A				
07/23/09	13:20	North	09-C0104		EPA/GE Dredging Project	1					
07/23/09	13:45	South	09-21046		Pleasure	1	MISS KIM II				
07/23/09	14:10	South	09-21047		Pleasure	1	ANTIQUITY				
07/23/09	14:25	North	09-20705	NY2641FX	Pleasure	1					
07/23/09	14:25	North	09-10013		Pleasure	1	YELLOWSAIL				
07/23/09	14:50	South	09-C0043		EPA/GE Dredging Project	1					
07/23/09	14:50	South	09-C0077		EPA/GE Dredging Project	1					
07/23/09	15:20	South	09-S0624		Pleasure	1					
07/23/09	15:20	South	09-21051		Pleasure	1					
07/23/09	15:20	South	09-21048		Pleasure	1					
07/23/09	15:20	South	09-21049		Pleasure	1					
07/23/09	15:50	North	09-C0043		EPA/GE Dredging Project	1					
07/23/09	15:50	North	09-C0077		EPA/GE Dredging Project	1					
07/23/09	16:00	South	09-21044		Pleasure	1					
07/23/09	16:20	South	09-10012		Pleasure	1	AVANTI				
07/23/09	16:30	North	09-20706		Pleasure	1					
07/23/09	16:30	North	09-C0103		EPA/GE Dredging Project	1					
07/23/09	17:05	South	09-C0104		EPA/GE Dredging Project	1					
07/23/09	17:05	South	09-21052		Pleasure	1	JUST MY SIZE				
07/23/09	17:20	North	09-10864		Pleasure	1					
07/23/09	17:40	South	09-C0103		EPA/GE Dredging Project	1					
07/23/09	17:50	North	09-20707		Pleasure	1	ALLEGRIA				
07/23/09	19:15	South	09-C0077		EPA/GE Dredging Project	1					
07/23/09	19:15	South	09-C0043		EPA/GE Dredging Project	1					
07/23/09	20:00	North	09-C0077		EPA/GE Dredging Project	1					
07/23/09	20:00	North	09-C0043		EPA/GE Dredging Project	1					
07/23/09	23:15	South	09-C0043		EPA/GE Dredging Project	1					
07/23/09	23:15	South	09-C0077		EPA/GE Dredging Project	1					
07/24/09	0:50	North	09-C0077		EPA/GE Dredging Project	1					
07/24/09	0:50	North	09-C0123		EPA/GE Dredging Project	1					
07/24/09	2:55	South	09-C0123		EPA/GE Dredging Project	1					
07/24/09	2:55	South	09-C0077		EPA/GE Dredging Project	1					
07/24/09	4:40	North	09-C0123		EPA/GE Dredging Project	1					
07/24/09	4:40	North	09-C0077		EPA/GE Dredging Project	1					
07/24/09	6:00	North	09-C0043		EPA/GE Dredging Project	1					
07/24/09	6:00	North	09-C0045		EPA/GE Dredging Project	1					
07/24/09	6:50	South	09-C0077		EPA/GE Dredging Project	1					
07/24/09	6:50	South	09-C0123		EPA/GE Dredging Project	1					
07/24/09	8:05	North	09-C0103		EPA/GE Dredging Project	1					
07/24/09	9:05	South	09-C0045		EPA/GE Dredging Project	1					
07/24/09	9:05	South	09-C0043		EPA/GE Dredging Project	1					
07/24/09	9:30	North	09-20222		Pleasure	1	MOON SHADOW				
07/24/09	9:50	North	09-C0049		EPA/GE Dredging Project	1					
07/24/09	9:50	North	09-C0077		EPA/GE Dredging Project	1					
07/24/09	10:10	South	09-21053	NY6846FM	Pleasure	1	GOOD TWO GO				
07/24/09	10:25	North	09-S0002	NH2157BN	Pleasure	1					
07/24/09	10:25	North	09-C0124		EPA/GE Dredging Project	1					
07/24/09	11:25	South	09-C0103		EPA/GE Dredging Project	1					
07/24/09	11:25	South	09-C0124		EPA/GE Dredging Project	1					
07/24/09	12:00	South	09-21054	ON844448	Pleasure	1					
07/24/09	12:00	South	09-21055		Pleasure	1	IMAGINE				
07/24/09	12:15	North	09-20708		Pleasure	1	HIGH LIFE				
07/24/09	12:35	South	09-C0049		EPA/GE Dredging Project	1					
07/24/09	12:35	South	09-C0077		EPA/GE Dredging Project	1					
07/24/09	12:55	North	09-C0043		EPA/GE Dredging Project	1					
07/24/09	12:55	North	09-C0042		EPA/GE Dredging Project	1					
07/24/09	13:15	South	09-S0260		Pleasure	1	FREEDOM				
07/24/09	13:15	South	09-10096		Pleasure	1	AMERICAN MADE				
07/24/09	13:50	South	09-21056		Pleasure	1	NIRVANA				

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07/24/09	14:10	North	09-S0407		EPA/GE Dredging Project	1					
07/24/09	14:10	North	09-S0405		Pleasure	1					
07/24/09	14:10	North	09-S0402		Pleasure	1					
07/24/09	14:10	North	09-S0780		Pleasure	1					
07/24/09	14:25	South	09-S0318		Pleasure	1					
07/24/09	15:00	South	09-S0858		Pleasure	1					
07/24/09	15:20	North	09-20710		Pleasure	1					
07/24/09	15:35	South	09-C0042		EPA/GE Dredging Project	1					
07/24/09	15:35	South	09-C0043		EPA/GE Dredging Project	1					
07/24/09	15:35	South	09-S0318		Pleasure	1	MISS EMILY				
07/24/09	15:55	North	09-S0976		Pleasure	1	OPHELIA				
07/24/09	16:30	North	09-20090		Pleasure	1					
07/24/09	17:00	North	09-C0077		EPA/GE Dredging Project	1					
07/24/09	17:00	North	09-C0049		EPA/GE Dredging Project	1					
07/24/09	17:25	South	09-21057		Pleasure	1	CAROLANA				
07/24/09	19:00	South	09-21059		Pleasure	1	LIFE IS NOW				
07/24/09	19:45	South	09-C0049		EPA/GE Dredging Project	1					
07/24/09	19:45	South	09-C0077		EPA/GE Dredging Project	1					
07/24/09	22:30	North	09-C0049		EPA/GE Dredging Project	1					
07/24/09	22:30	North	09-C0077		EPA/GE Dredging Project	1					
07/25/09	1:05	North	09-C0103		EPA/GE Dredging Project	1					
07/25/09	1:30	South	09-C0049		EPA/GE Dredging Project	1					
07/25/09	1:30	South	09-C0077		EPA/GE Dredging Project	1					
07/25/09	4:15	North	09-C0077		EPA/GE Dredging Project	1					
07/25/09	4:15	North	09-C0049		EPA/GE Dredging Project	1					
07/25/09	5:30	South	09-C0103		EPA/GE Dredging Project	1					
07/25/09	6:25	South	09-C0077		EPA/GE Dredging Project	1					
07/25/09	6:25	South	09-C0049		EPA/GE Dredging Project	1					
07/25/09	7:45	North	09-C0049		EPA/GE Dredging Project	1					
07/25/09	7:45	North	09-C0077		EPA/GE Dredging Project	1					
07/25/09	9:15	South	09-10866		Pleasure	1	RUBY				
07/25/09	11:00	North	09-S0617		Pleasure	1	SKIPPER 2				
07/25/09	11:20	South	09-C0049		EPA/GE Dredging Project	1					
07/25/09	11:20	South	09-C0077		EPA/GE Dredging Project	1					
07/25/09	11:45	North	09-S0722		Pleasure	1	GOOD COMPANY				
07/25/09	11:45	North	09-S0725		Pleasure	1					
07/25/09	11:45	North	09-S0721		Pleasure	1					
07/25/09	11:45	North	09-S0933		Pleasure	1	EASY DOES IT				
07/25/09	12:45	North	09-C0042		EPA/GE Dredging Project	1					
07/25/09	12:45	North	09-C0043		EPA/GE Dredging Project	1					
07/25/09	13:55	North	09-20713		Pleasure	1					
07/25/09	13:55	North	09-20714		Pleasure	1					
07/25/09	13:55	North	09-20712		Pleasure	1					
07/25/09	14:15	South	09-S0108		Pleasure	1					
07/25/09	14:15	South	09-21058		Pleasure	1					
07/25/09	14:40	North	09-C0077		EPA/GE Dredging Project	1					
07/25/09	14:40	North	09-C0049		EPA/GE Dredging Project	1					
07/25/09	15:00	South	09-C0042		EPA/GE Dredging Project	1					
07/25/09	15:00	South	09-C0043		EPA/GE Dredging Project	1					
07/25/09	15:50	North	09-C0043		EPA/GE Dredging Project	1					
07/25/09	15:50	North	09-C0042		EPA/GE Dredging Project	1					
07/25/09	16:05	South	09-21082		Pleasure	1					
07/25/09	16:20	North	09-S0157		Pleasure	1					
07/25/09	16:20	North	09-20183		Pleasure	1					
07/25/09	16:40	South	09-C0049		EPA/GE Dredging Project	1					
07/25/09	16:40	South	09-C0077		EPA/GE Dredging Project	1					
07/25/09	17:20	North	09-20719		Pleasure	1					
07/25/09	17:20	North	09-20718		Pleasure	1					
07/25/09	17:20	North	09-10863		Pleasure	1					
07/25/09	17:20	North	09-10862		Pleasure	1					
07/25/09	17:40	South	09-21086		Pleasure	1	LE SHARK				
07/25/09	17:50	South	09-S0002		Pleasure	1					
07/25/09	19:15	South	09-C0043		EPA/GE Dredging Project	1					
07/25/09	19:15	South	09-C0042		EPA/GE Dredging Project	1					
07/25/09	19:25	North	09-C0104		EPA/GE Dredging Project	1					
07/25/09	19:45	South	09-S0725		EPA/GE Dredging Project	1					
07/25/09	20:10	South	09-S0721		Pleasure	1					
07/25/09	21:05	South	09-C0104		EPA/GE Dredging Project	1					
07/26/09	1:25	North	09-C0104		EPA/GE Dredging Project	1					
07/26/09	1:25	North	09-C0042		EPA/GE Dredging Project	1					
07/26/09	3:40	South	09-C0042		EPA/GE Dredging Project	1					
07/26/09	3:40	South	09-C0104		EPA/GE Dredging Project	1					
07/26/09	4:30	North	09-C0104		EPA/GE Dredging Project	1					
07/26/09	4:30	North	09-C0042		EPA/GE Dredging Project	1					
07/26/09	8:20	South	09-C0104		EPA/GE Dredging Project	1					
07/26/09	8:20	South	09-C0042		EPA/GE Dredging Project	1					
07/26/09	8:45	North	09-20716		Pleasure	1	MOOSE				
07/26/09	9:25	North	09-20715		Pleasure	1	PATIENCE				
07/26/09	9:50	North	09-20722		Pleasure	1	MY GIRL				
07/26/09	10:15	North	09-C0104		EPA/GE Dredging Project	1					
07/26/09	10:15	North	09-C0122		EPA/GE Dredging Project	1					
07/26/09	11:35	South	09-21084		Pleasure	1	MY PEARL 1				
07/26/09	11:35	South	09-21083		Pleasure	1	VALET NOIV				
07/26/09	11:35	South	09-S1650		Pleasure	1	GALE FORCE				
07/26/09	11:35	South	09-C0122		EPA/GE Dredging Project	1					
07/26/09	11:35	South	09-C0104		EPA/GE Dredging Project	1					

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07/26/09	11:35	South	09-21085		Pleasure	1	MISTIC 13				
07/26/09	11:50	North	09-20720		Pleasure	1	IRISH MICK				
07/26/09	11:50	North	09-20721		Pleasure	1					
07/26/09	12:25	North	09-C0122		EPA/GE Dredging Project	1					
07/26/09	12:25	North	09-C0043		EPA/GE Dredging Project	1					
07/26/09	12:25	North	09-C0123		EPA/GE Dredging Project	1					
07/26/09	12:25	North	09-C0049		EPA/GE Dredging Project	1					
07/26/09	12:25	North	09-10855		Pleasure	1	LEVASION				
07/26/09	12:25	North	09-10956		Pleasure	1	JB PIER				
07/26/09	12:25	North	09-10854		Pleasure	1					
07/26/09	12:55	North	09-C0105		EPA/GE Dredging Project	1					
07/26/09	13:30	South	09-C0043		EPA/GE Dredging Project	1					
07/26/09	13:45	North	09-20725		Pleasure	1					
07/26/09	13:55	South	09-C0123		EPA/GE Dredging Project	1					
07/26/09	13:55	South	09-C0049		EPA/GE Dredging Project	1					
07/26/09	14:25	South	09-C0105		EPA/GE Dredging Project	1					
07/26/09	14:25	South	09-21087		Pleasure	1					
07/26/09	14:25	South	09-S0026		Pleasure	1	TUG 44				
07/26/09	14:40	North	09-20728		Pleasure	1	STORMY MONDAY				
07/26/09	15:15	North	09-C0049		EPA/GE Dredging Project	1					
07/26/09	15:15	North	09-C0123		EPA/GE Dredging Project	1					
07/26/09	15:40	North	09-S0858		Pleasure	1	VACILAR				
07/26/09	17:20	South	09-S0722		Pleasure	1	GOOD COMPANY				
07/26/09	17:35	North	09-20736		Pleasure	1	MANIFRAN				
07/26/09	17:35	North	09-20735		Pleasure	1	FEVER				
07/26/09	17:35	North	09-20737		Pleasure	1	LE CENT NON				
07/26/09	17:50	South	09-C0049		EPA/GE Dredging Project	1					
07/26/09	17:50	South	09-C0123		EPA/GE Dredging Project	1					
07/26/09	18:10	North	09-C0061		Hire	1	FABIENNE SUZANNE				
07/26/09	18:30	North	09-20738		Pleasure	1	SAGRESS				
07/26/09	18:30	North	09-S0026		Pleasure	1	TUGG 44				
07/26/09	19:25	North	09-20740		Pleasure	1	LAS BRIASAS				
07/26/09	19:25	North	09-20739	QC169275	Pleasure	1					
07/26/09	19:55	North	09-C0123		EPA/GE Dredging Project	1					
07/26/09	19:55	North	09-C0049		EPA/GE Dredging Project	1					
07/26/09	21:45	South	09-C0123		EPA/GE Dredging Project	1					
07/26/09	21:45	South	09-C0049		EPA/GE Dredging Project	1					
07/27/09	1:15	North	09-C0077		EPA/GE Dredging Project	1					
07/27/09	1:15	North	09-C0122		EPA/GE Dredging Project	1					
07/27/09	2:20	North	09-C0042		EPA/GE Dredging Project	1					
07/27/09	2:20	North	09-C0049		EPA/GE Dredging Project	1					
07/27/09	3:20	South	09-C0077		EPA/GE Dredging Project	1					
07/27/09	3:20	South	09-C0122		EPA/GE Dredging Project	1					
07/27/09	6:25	North	09-C0122		EPA/GE Dredging Project	1					
07/27/09	6:25	North	09-C0077		EPA/GE Dredging Project	1					
07/27/09	6:45	South	09-C0049		EPA/GE Dredging Project	1					
07/27/09	6:45	South	09-C0042		EPA/GE Dredging Project	1					
07/27/09	7:25	North	09-C0045		EPA/GE Dredging Project	1					
07/27/09	10:20	North	09-C0042		EPA/GE Dredging Project	1					
07/27/09	10:20	North	09-C0049		EPA/GE Dredging Project	1					
07/27/09	11:05	South	09-C0122		EPA/GE Dredging Project	1					
07/27/09	11:05	South	09-C0077		EPA/GE Dredging Project	1					
07/27/09	11:30	North	09-10803		Pleasure	1	SEA MENT SHOES				
07/27/09	12:20	South	09-C0045		EPA/GE Dredging Project	1					
07/27/09	12:50	South	09-21088		Pleasure	1	BLEUVET				
07/27/09	13:00	North	09-S1221		Pleasure	1	PLEIADES				
07/27/09	13:00	North	09-C0045		EPA/GE Dredging Project	1					
07/27/09	13:40	North	09-20741		Pleasure	1					
07/27/09	13:40	North	09-10861		Pleasure	1					
07/27/09	13:55	South	09-C0045		EPA/GE Dredging Project	1					
07/27/09	13:55	South	09-10867		Pleasure	1					
07/27/09	14:40	South	09-10868		Pleasure	1	TEMPUS FUJIT				
07/27/09	14:40	South	09-S0859		Pleasure	1	FILAMINGO				
07/27/09	14:55	North	09-20244		Pleasure	1	J P SHAW				
07/27/09	15:30	North	09-20742	QC1034749	Pleasure	1	MOJITO				
07/27/09	15:30	North	09-20746	10D87574	Pleasure	1	AFFINITE				
07/27/09	15:30	North	09-20743		Pleasure	1	OCEANE				
07/27/09	15:30	North	09-20744	59E30118	Pleasure	1					
07/27/09	15:30	North	09-20745	822390	Pleasure	1	LA DIVA II				
07/27/09	16:25	North	09-20747	20D5092	Pleasure	1					
07/27/09	16:45	South	09-C0042		EPA/GE Dredging Project	1					
07/27/09	16:45	South	09-C0049		EPA/GE Dredging Project	1					
07/27/09	17:35	North	09-20754		Pleasure	1	SIMONE				
07/27/09	17:35	North	09-20752	QC2009356	Pleasure	1					
07/27/09	17:35	North	09-20751	QC173439	Pleasure	1	LE' BEUREGARD				
07/27/09	17:35	North	09-20753	1204643	Pleasure	1	GRAND BANKS				
07/27/09	17:35	North	09-20755	13D25140	Pleasure	1	L'EDEN				
07/27/09	18:10	South	09-21089	NY 7652 EK	Pleasure	1					
07/27/09	19:30	North	09-C0049		EPA/GE Dredging Project	1					
07/27/09	19:30	North	09-C0042		EPA/GE Dredging Project	1					
07/27/09	23:20	South	09-C0042		EPA/GE Dredging Project	1					
07/27/09	23:20	South	09-C0049		EPA/GE Dredging Project	1					
07/28/09	0:35	North	09-C0045		EPA/GE Dredging Project	1					
07/28/09	1:40	North	09-C0049		EPA/GE Dredging Project	1					
07/28/09	1:40	North	09-C0103		EPA/GE Dredging Project	1					
07/28/09	5:55	South	09-C0045		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
07/28/09	8:25	South	09-C0049		EPA/GE Dredging Project	1					
07/28/09	8:25	South	09-C0103		EPA/GE Dredging Project	1					
07/28/09	9:00	North	09-C0122		EPA/GE Dredging Project	1					
07/28/09	9:00	North	09-C0042		EPA/GE Dredging Project	1					
07/28/09	10:10	South	UPT-15632	CT1715BA	Pleasure	1	SAGRES III				
07/28/09	10:10	South	09-10869		Pleasure	1	REALITE SHOW				
07/28/09	10:55	South	09-C0042		EPA/GE Dredging Project	1					
07/28/09	10:55	South	09-C0122		EPA/GE Dredging Project	1					
07/28/09	11:10	North	09-S0806	CT3887AZ	Pleasure	1					
07/28/09	11:35	North	09-20748		Pleasure	1					
07/28/09	11:35	North	09-20757		Pleasure	1					
07/28/09	11:35	North	09-20758		Pleasure	1					
07/28/09	12:10	North	09-20760		Pleasure	1					
07/28/09	12:25	North	09-C0122		EPA/GE Dredging Project	1					
07/28/09	12:25	North	09-C0042		EPA/GE Dredging Project	1					
07/28/09	12:50	South	09-21090		Pleasure	1	DA TIKI MON				
07/28/09	13:05	North	09-S0990		Pleasure	1	IMPULSE				
07/28/09	13:50	South	09-C0042		EPA/GE Dredging Project	1					
07/28/09	13:50	South	09-C0122		EPA/GE Dredging Project	1					
07/28/09	14:15	North	09-20761		Pleasure	1					
07/28/09	14:15	North	UPT-15730		Pleasure	1					
07/28/09	14:15	North	UPT-15729		Pleasure	1					
07/28/09	14:15	North	UPT-15731		Pleasure	1					
07/28/09	14:15	North	09-C0043		EPA/GE Dredging Project	1					
07/28/09	14:50	North	09-C0043		EPA/GE Dredging Project	1					
07/28/09	14:50	North	09-C0103		EPA/GE Dredging Project	1					
07/28/09	15:15	North	09-20763		Pleasure	1					
07/28/09	15:15	North	09-S0856		Pleasure	1					
07/28/09	15:15	North	UPT-15732		Pleasure	1					
07/28/09	15:15	North	UPT-15733		Pleasure	1					
07/28/09	15:15	North	09-20762		Pleasure	1	PEACE MONGER				
07/28/09	17:00	North	09-10100		Pleasure	1	JIBE-HO				
07/28/09	17:25	North	09-10911		Pleasure	1	JERSEY GIRL				
07/28/09	17:40	South	09-C0043		EPA/GE Dredging Project	1					
07/28/09	18:25	South	09-C0103		EPA/GE Dredging Project	1					
07/28/09	18:25	South	09-C0049		EPA/GE Dredging Project	1					
07/28/09	19:30	North	09-C0049		EPA/GE Dredging Project	1					
07/28/09	19:30	North	09-C0103		EPA/GE Dredging Project	1					
07/28/09	19:55	North	09-C0122		EPA/GE Dredging Project	1					
07/28/09	19:55	North	09-C0042		EPA/GE Dredging Project	1					
07/28/09	21:15	South	09-C0049		EPA/GE Dredging Project	1					
07/28/09	21:15	South	09-C0103		EPA/GE Dredging Project	1					
07/28/09	23:20	South	09-C0042		EPA/GE Dredging Project	1					
07/28/09	23:20	South	09-C0122		EPA/GE Dredging Project	1					
07/29/09	1:25	North	09-C0049		EPA/GE Dredging Project	1					
07/29/09	1:25	North	09-C0042		EPA/GE Dredging Project	1					
07/29/09	2:30	North	09-C0076		EPA/GE Dredging Project	1					
07/29/09	3:30	South	09-C0049		EPA/GE Dredging Project	1					
07/29/09	3:30	South	09-C0042		EPA/GE Dredging Project	1					
07/29/09	4:20	North	09-C0049		EPA/GE Dredging Project	1					
07/29/09	4:20	North	09-C0042		EPA/GE Dredging Project	1					
07/29/09	6:10	South	09-C0076		EPA/GE Dredging Project	1					
07/29/09	9:35	North	09-20765		Pleasure	1	VIO				
07/29/09	10:00	North	09-20767	MS8358HB	Pleasure	1	GATOR				
07/29/09	10:50	North	09-20766		Pleasure	1	FOLLOW ME				
07/29/09	11:00	South	09-C0049		EPA/GE Dredging Project	1					
07/29/09	11:10	North	09-C0124		EPA/GE Dredging Project	1					
07/29/09	11:40	North	09-20771		Pleasure	1	APRES SKI				
07/29/09	12:15	North	09-20768	NY5507MB	Pleasure	1	PEA PODS				
07/29/09	12:15	North	09-10913	NY8120UZ	Pleasure	1					
07/29/09	12:15	North	09-20764		Pleasure	1	VANUPIEDS				
07/29/09	12:45	South	09-21092		Pleasure	1					
07/29/09	12:45	South	09-21095		Pleasure	1					
07/29/09	12:45	South	09-21094		Pleasure	1					
07/29/09	13:05	North	09-C0103		EPA/GE Dredging Project	1					
07/29/09	13:05	North	09-C0046		EPA/GE Dredging Project	1					
07/29/09	13:35	North	09-10761	MIXED NUTS	Pleasure	1					
07/29/09	13:35	North	09-20770		Pleasure	1	COLIBRI				
07/29/09	13:35	North	09-20912	NY2060GQ	Pleasure	1					
07/29/09	14:10	South	09-21096		Pleasure	1	CAPITAINE HADDOCKS				
07/29/09	14:40	South	09-C0046		EPA/GE Dredging Project	1					
07/29/09	14:40	South	09-C0103		EPA/GE Dredging Project	1					
07/29/09	15:05	South	09-C0124		EPA/GE Dredging Project	1					
07/29/09	15:05	South	09-C0042		EPA/GE Dredging Project	1					
07/29/09	15:20	North	09-20773		Pleasure	1					
07/29/09	15:40	South	09-C0061		Hire	1	FABIEANNE SUZANNE				
07/29/09	17:00	North	09-C0042		EPA/GE Dredging Project	1					
07/29/09	17:00	North	09-C0124		EPA/GE Dredging Project	1					
07/29/09	18:40	South	09-C0042		EPA/GE Dredging Project	1					
07/29/09	18:40	South	09-C0124		EPA/GE Dredging Project	1					
07/29/09	18:55	North	09-C0043		EPA/GE Dredging Project	1					
07/29/09	21:10	South	09-C0043		EPA/GE Dredging Project	1					
07/29/09	22:00	North	09-C0122		EPA/GE Dredging Project	1					
07/29/09	22:00	North	09-C0042		EPA/GE Dredging Project	1					
07/29/09	23:25	South	09-C0122		EPA/GE Dredging Project	1					
07/29/09	23:25	South	09-C0042		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
07/30/09	1:00	North	09-C0105		EPA/GE Dredging Project	1					
07/30/09	1:00	North	09-C0103		EPA/GE Dredging Project	1					
07/30/09	4:10	South	09-C0103		EPA/GE Dredging Project	1					
07/30/09	4:10	South	09-C0105		EPA/GE Dredging Project	1					
07/30/09	6:30	North	09-C0105		EPA/GE Dredging Project	1					
07/30/09	6:30	North	09-C0103		EPA/GE Dredging Project	1					
07/30/09	8:50	South	09-C0103		EPA/GE Dredging Project	1					
07/30/09	8:50	South	09-C0105		EPA/GE Dredging Project	1					
07/30/09	9:40	South	09-20780	MS2007RW	Pleasure	1					
07/30/09	9:40	South	09-S0249		Pleasure	1	JALON				
07/30/09	9:40	South	09-S0405		Pleasure	1	SUN CATCHER III				
07/30/09	10:10	North	09-C0042		EPA/GE Dredging Project	1					
07/30/09	10:10	North	09-C0076		EPA/GE Dredging Project	1					
07/30/09	10:30	North	09-20775	NO1113656	Pleasure	1	ALREADY THERE				
07/30/09	11:20	South	09-20223		Pleasure	1	MOON SHADOW				
07/30/09	11:20	South	09-21097		Pleasure	1	LOVE BIRDS III				
07/30/09	12:00	North			Employee / Retiree	1	MICHAEL A. REILLY				
07/30/09	13:00	North	09-C0043		EPA/GE Dredging Project	1					
07/30/09	14:10	South	09-C0042		EPA/GE Dredging Project	1					
07/30/09	14:10	South	09-C0076		EPA/GE Dredging Project	1					
07/30/09	14:45	South	09-21098		Pleasure	1					
07/30/09	15:20	North	09-C0107		EPA/GE Dredging Project	1					
07/30/09	15:20	North	09-C0042		EPA/GE Dredging Project	1					
07/30/09	15:20	North	09-C0076		EPA/GE Dredging Project	1					
07/30/09	15:45	South	09-C0043		EPA/GE Dredging Project	1					
07/30/09	16:10	North	09-C0124		EPA/GE Dredging Project	1					
07/30/09	16:10	North	09-C0049		EPA/GE Dredging Project	1					
07/30/09	16:10	North			Commercial	1		753	Marine Highway - Ben Elliot	CG283659	09-C0014
07/30/09	16:40	North	09-20184		Pleasure	1	FINAL UPGRADE				
07/30/09	17:10	South			Commercial	1		751	Marine Highway - Ben Elliot	CG283659	09-C0014
07/30/09	18:15	North	09-20778		Pleasure	1					
07/30/09	18:15	North	09-20190		Pleasure	1					
07/30/09	18:15	North	09-20188		Pleasure	1					
07/30/09	18:15	North	09-20185		Pleasure	1					
07/30/09	18:15	North	09-20177		Pleasure	1					
07/30/09	18:30	South	09-C0107		EPA/GE Dredging Project	1					
07/30/09	19:10	South	09-C0049		EPA/GE Dredging Project	1					
07/30/09	20:15	South	09-C0042		EPA/GE Dredging Project	1					
07/30/09	20:15	South	09-C0076		EPA/GE Dredging Project	1					
07/30/09	20:15	South	09-C0124		EPA/GE Dredging Project	1					
07/30/09	20:40	North	09-20781		Pleasure	1					
07/30/09	20:40	North	09-20780		Pleasure	1					
07/30/09	20:40	North	09-20779		Pleasure	1					
07/30/09	20:40	North	09-20782		Pleasure	1					
07/30/09	21:15	North	09-C0049		EPA/GE Dredging Project	1					
07/30/09	21:15	North	09-C0103		EPA/GE Dredging Project	1					
07/30/09	23:30	South	09-C0103		EPA/GE Dredging Project	1					
07/30/09	23:30	South	09-C0049		EPA/GE Dredging Project	1					
07/30/09	23:40	South	09-C0077		EPA/GE Dredging Project	1					
07/30/09	23:40	South	09-C0049		EPA/GE Dredging Project	1					
07/31/09	0:45	North	09-C0042		EPA/GE Dredging Project	1					
07/31/09	0:45	North	09-C0103		EPA/GE Dredging Project	1					
07/31/09	1:15	North	09-C0049		EPA/GE Dredging Project	1					
07/31/09	5:40	South	09-C0103		EPA/GE Dredging Project	1					
07/31/09	5:40	South	09-C0042		EPA/GE Dredging Project	1					
07/31/09	6:20	South	09-C0049		EPA/GE Dredging Project	1					
07/31/09	7:00	North	09-C0103		EPA/GE Dredging Project	1					
07/31/09	7:00	North	09-C0123		EPA/GE Dredging Project	1					
07/31/09	7:45	North	09-C0042		EPA/GE Dredging Project	1					
07/31/09	8:40	North	09-20227		Pleasure	1	DOUBLE ROOM				
07/31/09	8:40	North	09-C0046		EPA/GE Dredging Project	1					
07/31/09	9:25	South	09-C0123		EPA/GE Dredging Project	1					
07/31/09	9:25	South	09-C0103		EPA/GE Dredging Project	1					
07/31/09	9:50	South	09-C0042		EPA/GE Dredging Project	1					
07/31/09	9:50	South	09-C0046		EPA/GE Dredging Project	1					
07/31/09	10:25	North	09-C0049		EPA/GE Dredging Project	1					
07/31/09	10:25	North	09-C0047		EPA/GE Dredging Project	1					
07/31/09	10:45	South			Canal Corporation Vessel	1	WORK BOAT WJ				
07/31/09	10:45	South	09-10803		Pleasure	1	SEAMENT SHOES				
07/31/09	11:05	North			Canal Corporation Vessel	1	WORK BOAT WJ				
07/31/09	11:05	North	09-20776		Pleasure	1	GERU				
07/31/09	12:25	South	09-C0047		EPA/GE Dredging Project	1					
07/31/09	12:45	North	09-C0055		EPA/GE Dredging Project	1					
07/31/09	12:45	North	09-C0123		EPA/GE Dredging Project	1					
07/31/09	12:45	North	09-C0043		EPA/GE Dredging Project	1					
07/31/09	12:45	North	09-C0076		EPA/GE Dredging Project	1					
07/31/09	14:10	South	09-C0076		EPA/GE Dredging Project	1					
07/31/09	14:10	South	09-C0049		EPA/GE Dredging Project	1					
07/31/09	14:35	South	09-S0861		Pleasure	1	NAUTICUS				
07/31/09	14:35	South	09-10100		Pleasure	1	JIBEHO				
07/31/09	14:35	South	09-10912		Pleasure	1					
07/31/09	14:50	North	09-20783		Pleasure	1	RISK FACTOR				
07/31/09	15:10	South	09-21102		Pleasure	1	MERRY ME				
07/31/09	15:10	South	09-21101		Pleasure	1	INTEGRITY				
07/31/09	15:10	South	09-21100		Pleasure	1	SLAINTE				
07/31/09	15:10	South	09-10870		Pleasure	1	LILYS PAD				

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07/31/09	15:25	North	09-C0042		EPA/GE Dredging Project	1					
07/31/09	16:10	South	09-C0055		EPA/GE Dredging Project	1					
07/31/09	17:10	South	09-C0043		EPA/GE Dredging Project	1					
07/31/09	17:10	South	09-C0123		EPA/GE Dredging Project	1					
07/31/09	17:35	South	09-C0042		EPA/GE Dredging Project	1					
07/31/09	18:05	North	09-C0076		EPA/GE Dredging Project	1					
07/31/09	18:05	North	09-C0103		EPA/GE Dredging Project	1					
07/31/09	19:10	South	09-C0076		EPA/GE Dredging Project	1					
07/31/09	19:10	South	09-C0103		EPA/GE Dredging Project	1					
07/31/09	20:40	North	09-C0122		EPA/GE Dredging Project	1					
07/31/09	20:40	North	09-C0076		EPA/GE Dredging Project	1					
08/01/09	6:45	North	09-C0077		EPA/GE Dredging Project	1					
08/01/09	7:00	South	09-C0076		EPA/GE Dredging Project	1					
08/01/09	8:05	South	09-C0077		EPA/GE Dredging Project	1					
08/01/09	8:05	South	09-C0122		EPA/GE Dredging Project	1					
08/01/09	9:00	South	09-S0993		Pleasure	1	EASY DOES IT				
08/01/09	9:20	North	09-C0047		EPA/GE Dredging Project	1					
08/01/09	9:20	North	09-C0042		EPA/GE Dredging Project	1					
08/01/09	9:45	North	09-S0825		Pleasure	1					
08/01/09	9:45	North	09-S0824		Pleasure	1	RED DEVIL				
08/01/09	9:45	North	09-20774		Pleasure	1	KNOTAGAIN				
08/01/09	10:15	North	09-C0122		EPA/GE Dredging Project	1					
08/01/09	10:15	North	09-C0077		EPA/GE Dredging Project	1					
08/01/09	11:00	South	09-C0047		EPA/GE Dredging Project	1					
08/01/09	11:00	South	09-C0042		EPA/GE Dredging Project	1					
08/01/09	12:00	South	09-21103		Pleasure	1					
08/01/09	12:15	North	09-S0725		Pleasure	1					
08/01/09	12:40	South	09-10913		Pleasure	1					
08/01/09	12:40	South	09-10871		Pleasure	1					
08/01/09	12:40	South	09-S1183		Pleasure	1					
08/01/09	12:40	South	09-21104		Pleasure	1					
08/01/09	12:40	South	09-20407		Pleasure	1					
08/01/09	13:00	North	09-20786		Pleasure	1					
08/01/09	13:00	North	09-S0623		Pleasure	1					
08/01/09	13:00	North	09-20785		Pleasure	1					
08/01/09	13:40	South	09-C0077		EPA/GE Dredging Project	1					
08/01/09	13:40	South	09-C0122		EPA/GE Dredging Project	1					
08/01/09	13:55	North	UPT-15688		Pleasure	1					
08/01/09	13:55	North	UPT-15687		Pleasure	1					
08/01/09	14:10	South	09-S1389		Pleasure	1	SARAH K				
08/01/09	14:30	North	09-C0042		EPA/GE Dredging Project	1					
08/01/09	14:30	North	09-C0076		EPA/GE Dredging Project	1					
08/01/09	15:05	North	09-20790		Pleasure	1					
08/01/09	15:05	North	09-10969		Pleasure	1					
08/01/09	15:05	North	09-10787		Pleasure	1					
08/01/09	15:05	North	09-20784		Pleasure	1					
08/01/09	15:05	North	09-20789		Pleasure	1					
08/01/09	15:05	North	09-20792		Pleasure	1					
08/01/09	15:05	North	09-20788		Pleasure	1					
08/01/09	15:45	North	09-20791		Pleasure	1	NIRVANA I				
08/01/09	16:05	South	09-C0042		EPA/GE Dredging Project	1					
08/01/09	16:05	South	09-C0076		EPA/GE Dredging Project	1					
08/01/09	16:40	North	09-C0124		EPA/GE Dredging Project	1					
08/01/09	16:40	North	09-C0122		EPA/GE Dredging Project	1					
08/01/09	18:50	South	09-21108	QC1014002	Pleasure	1	BAJA				
08/01/09	18:50	South	09-21107	18D1234	Pleasure	1					
08/01/09	19:25	North	09-C0076		EPA/GE Dredging Project	1					
08/01/09	20:05	North	09-C0043		EPA/GE Dredging Project	1					
08/01/09	20:20	South	09-C0076		EPA/GE Dredging Project	1					
08/01/09	20:45	South	09-S0725		Pleasure	1					
08/01/09	22:15	South	09-C0043		EPA/GE Dredging Project	1					
08/01/09	22:35	South	09-C0124		EPA/GE Dredging Project	1					
08/01/09	22:35	South	09-C0122		EPA/GE Dredging Project	1					
08/02/09	4:50	North	09-C0049		EPA/GE Dredging Project	1					
08/02/09	4:50	North	09-C0077		EPA/GE Dredging Project	1					
08/02/09	6:50	South	09-C0077		EPA/GE Dredging Project	1					
08/02/09	6:50	South	09-C0049		EPA/GE Dredging Project	1					
08/02/09	9:00	North	09-C0047		EPA/GE Dredging Project	1					
08/02/09	9:00	North	09-C0042		EPA/GE Dredging Project	1					
08/02/09	10:20	North	09-20793		Pleasure	1					
08/02/09	10:20	North	09-20794		Pleasure	1					
08/02/09	10:20	North	09-20794		Pleasure	1					
08/02/09	10:35	South	09-10872		Pleasure	1	BONNE CHANCE				
08/02/09	11:05	North	UPT-15689		Pleasure	1	ZIP.A.DOE.DO.DAH				
08/02/09	11:20	South	09-C0042		EPA/GE Dredging Project	1					
08/02/09	11:20	South	09-C0047		EPA/GE Dredging Project	1					
08/02/09	11:45	South	09-S0617		Pleasure	1	SKIPPER 2				
08/02/09	12:30	North	09-C0077		EPA/GE Dredging Project	1					
08/02/09	12:30	North	09-C0046		EPA/GE Dredging Project	1					
08/02/09	12:30	North	09-20796		Pleasure	1					
08/02/09	12:30	North	09-10914		Pleasure	1					
08/02/09	13:15	North	09-S0108		Pleasure	1	MARYKA				
08/02/09	13:15	North	09-20797		Pleasure	1					
08/02/09	13:45	South	09-C0046		EPA/GE Dredging Project	1					
08/02/09	13:45	South	09-C0077		EPA/GE Dredging Project	1					
08/02/09	14:10	North	09-10809		Pleasure	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
08/02/09	14:10	North	09-10808		Pleasure	1					
08/02/09	14:10	North	09-20798		Pleasure	1					
08/02/09	14:10	North	09-20799		Pleasure	1					
08/02/09	14:10	North	09-11346		Pleasure	1					
08/02/09	14:45	North	09-C0076		EPA/GE Dredging Project	1					
08/02/09	14:45	North	09-C0077		EPA/GE Dredging Project	1					
08/02/09	15:20	North	09-10867		Pleasure	1					
08/02/09	15:20	North	09-20800		Pleasure	1	BREATHE EASY				
08/02/09	17:05	South	09-C0077		EPA/GE Dredging Project	1					
08/02/09	17:05	South	09-C0076		EPA/GE Dredging Project	1					
08/02/09	18:05	North	09-20228		Pleasure	1	LE SHARK				
08/02/09	23:20	South	09-C0077		EPA/GE Dredging Project	1					
08/02/09	23:20	South	09-C0076		EPA/GE Dredging Project	1					
08/03/09	8:40	North	09-C0043		EPA/GE Dredging Project	1					
08/03/09	8:40	North	09-C0122		EPA/GE Dredging Project	1					
08/03/09	8:40	North	09-C0077		EPA/GE Dredging Project	1					
08/03/09	10:00	North	09-S0843		Pleasure	1					
08/03/09	10:30	South	09-C0043		EPA/GE Dredging Project	1					
08/03/09	10:50	South	09-C0077		EPA/GE Dredging Project	1					
08/03/09	10:50	South	09-C0122		EPA/GE Dredging Project	1					
08/03/09	11:10	North	09-S0843	NY7281FC	Pleasure	1					
08/03/09	11:25	South	09-21110		Pleasure	1	LE' DOC II				
08/03/09	11:25	South	09-21111		Pleasure	1					
08/03/09	11:25	South	09-21112		Pleasure	1	MAXIMUS				
08/03/09	11:25	South	09-21116		Pleasure	1					
08/03/09	11:25	South	09-21117		Pleasure	1	LARGO II				
08/03/09	11:25	South	09-21118		Pleasure	1	SASSY LADY				
08/03/09	11:25	South	09-21109		Pleasure	1	LE' G' EAU II				
08/03/09	12:15	North	09-C0042		EPA/GE Dredging Project	1					
08/03/09	12:15	North	09-C0049		EPA/GE Dredging Project	1					
08/03/09	13:00	South	09-21119		Pleasure	1	ZARPAS				
08/03/09	13:15	North	UPT-15652		Pleasure	1					
08/03/09	13:35	North	09-C0043		EPA/GE Dredging Project	1					
08/03/09	13:35	North	09-C0046		EPA/GE Dredging Project	1					
08/03/09	14:00	South	09-21120		Pleasure	1					
08/03/09	14:15	North	09-S0857		Pleasure	1	WHOOPEE				
08/03/09	14:35	South	09-C0046		EPA/GE Dredging Project	1					
08/03/09	14:35	South	09-21121		Pleasure	1	PEACEMONGER				
08/03/09	15:05	North	09-20802		Pleasure	1					
08/03/09	15:20	South	09-10873		Pleasure	1					
08/03/09	15:20	South	09-S0862		Pleasure	1					
08/03/09	15:55	South	09-S0825		Pleasure	1					
08/03/09	15:55	South	09-S0824		Pleasure	1					
08/03/09	16:25	North	09-S0603		Pleasure	1					
08/03/09	16:35	South	09-C0043		EPA/GE Dredging Project	1					
08/03/09	16:55	North	09-20189		Pleasure	1					
08/03/09	16:55	North	09-20804		Pleasure	1					
08/03/09	17:15	South	09-C0049		EPA/GE Dredging Project	1					
08/03/09	17:15	South	09-C0042		EPA/GE Dredging Project	1					
08/03/09	17:35	North	09-20801		Pleasure	1					
08/03/09	17:35	North	09-20805		Pleasure	1					
08/03/09	18:00	South	09-S0603		Pleasure	1					
08/03/09	18:20	North	09-C0077		EPA/GE Dredging Project	1					
08/03/09	18:20	North	09-C0122		EPA/GE Dredging Project	1					
08/03/09	22:00	South	09-C0122		EPA/GE Dredging Project	1					
08/03/09	22:00	South	09-C0077		EPA/GE Dredging Project	1					
08/03/09	22:55	North	09-C0122		EPA/GE Dredging Project	1					
08/03/09	22:55	North	09-C0042		EPA/GE Dredging Project	1					
08/04/09	2:50	South	09-C0122		EPA/GE Dredging Project	1					
08/04/09	2:50	South	09-C0042		EPA/GE Dredging Project	1					
08/04/09	4:05	North	09-C0042		EPA/GE Dredging Project	1					
08/04/09	4:05	North	09-C0122		EPA/GE Dredging Project	1					
08/04/09	4:55	North	09-C0043		EPA/GE Dredging Project	1					
08/04/09	8:15	North	09-C0049		EPA/GE Dredging Project	1					
08/04/09	8:15	North	09-C0124		EPA/GE Dredging Project	1					
08/04/09	9:00	North	09-20803		Pleasure	1	C VENTURE				
08/04/09	9:25	South	09-C0077		EPA/GE Dredging Project	1					
08/04/09	9:25	South	09-C0122		EPA/GE Dredging Project	1					
08/04/09	10:35	South	09-C0043		EPA/GE Dredging Project	1					
08/04/09	11:10	South	09-C0124		EPA/GE Dredging Project	1					
08/04/09	11:10	South	09-C0049		EPA/GE Dredging Project	1					
08/04/09	12:30	North	09-S0799		Pleasure	1	LADY ANNE				
08/04/09	12:55	South	09-10876		Pleasure	1					
08/04/09	12:55	South	09-10875		Pleasure	1					
08/04/09	12:55	South	09-10874		Pleasure	1					
08/04/09	13:10	North	09-C0077		EPA/GE Dredging Project	1					
08/04/09	13:10	North	09-C0049		EPA/GE Dredging Project	1					
08/04/09	13:30	North	09-20807		Pleasure	1					
08/04/09	13:30	North	09-20808		Pleasure	1					
08/04/09	13:50	South	09-21124		Pleasure	1					
08/04/09	13:50	South	09-21123		Pleasure	1					
08/04/09	14:00	North	09-C0076		EPA/GE Dredging Project	1					
08/04/09	14:45	South	09-C0049		EPA/GE Dredging Project	1					
08/04/09	14:45	South	09-C0077		EPA/GE Dredging Project	1					
08/04/09	15:05	South	09-21125		Pleasure	1					
08/04/09	15:05	South	09-10877		Pleasure	1					

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08/04/09	15:05	South	09-S0101		Pleasure	1					
08/04/09	15:45	North	09-C0105		EPA/GE Dredging Project	1					
08/04/09	15:45	North	09-20810		Pleasure	1					
08/04/09	16:40	North	09-C0077		EPA/GE Dredging Project	1					
08/04/09	16:40	North	09-C0049		EPA/GE Dredging Project	1					
08/04/09	17:20	South	09-21127		Pleasure	1	NATA CAR				
08/04/09	17:20	South	09-21126		Pleasure	1	DODBBLE 6				
08/04/09	17:35	North	09-S0884		Pleasure	1	MAHALO				
08/04/09	18:10	South	09-C0105		EPA/GE Dredging Project	1					
08/04/09	19:00	North	09-20818		Pleasure	1	LIFE IS NOW				
08/04/09	19:50	South	09-C0077		EPA/GE Dredging Project	1					
08/04/09	19:50	South	09-C0049		EPA/GE Dredging Project	1					
08/04/09	20:25	North	09-C0043		EPA/GE Dredging Project	1					
08/04/09	20:50	North	09-C0049		EPA/GE Dredging Project	1					
08/04/09	20:50	North	09-C0077		EPA/GE Dredging Project	1					
08/04/09	22:35	South	09-C0077		EPA/GE Dredging Project	1					
08/04/09	22:35	South	09-C0049		EPA/GE Dredging Project	1					
08/04/09	22:50	South	09-C0043		EPA/GE Dredging Project	1					
08/04/09	23:20	North	09-C0049		EPA/GE Dredging Project	1					
08/04/09	23:20	North	09-C0077		EPA/GE Dredging Project	1					
08/05/09	2:40	South	09-C0077		EPA/GE Dredging Project	1					
08/05/09	2:40	South	09-C0049		EPA/GE Dredging Project	1					
08/05/09	3:25	North	09-C0122		EPA/GE Dredging Project	1					
08/05/09	3:25	North	09-C0042		EPA/GE Dredging Project	1					
08/05/09	6:35	South	09-C0122		EPA/GE Dredging Project	1					
08/05/09	6:35	South	09-C0042		EPA/GE Dredging Project	1					
08/05/09	6:55	North	09-C0078		EPA/GE Dredging Project	1					
08/05/09	9:45	North	09-C0042		EPA/GE Dredging Project	1					
08/05/09	9:45	North	09-C0077		EPA/GE Dredging Project	1					
08/05/09	10:25	South			Canal Corporation Vessel	1	WORK BOAT WJ				
08/05/09	10:25	South	09-C0078		EPA/GE Dredging Project	1					
08/05/09	13:10	South	09-C0077		EPA/GE Dredging Project	1					
08/05/09	13:10	South	09-C0042		EPA/GE Dredging Project	1					
08/05/09	13:30	North	09-20821		Pleasure	1					
08/05/09	13:30	North	09-C0061		Hire	1	FABIENNE SUZANNE				
08/05/09	13:30	North	09-20819		Pleasure	1					
08/05/09	13:45	South	09-21128		Pleasure	1					
08/05/09	13:45	South	09-21130		Pleasure	1					
08/05/09	13:45	South	09-21131		Pleasure	1					
08/05/09	13:55	North	09-20820		Pleasure	1					
08/05/09	14:05	South	09-20769		Pleasure	1					
08/05/09	14:05	South	09-21133		Pleasure	1					
08/05/09	14:30	North	09-C0042		EPA/GE Dredging Project	1					
08/05/09	14:30	North			Canal Corporation Vessel	1	WORK BOAT WJ				
08/05/09	14:30	North	09-C0077		EPA/GE Dredging Project	1					
08/05/09	15:20	North	09-C0124		EPA/GE Dredging Project	1					
08/05/09	15:40	South	09-21132		Pleasure	1	MARKANIE				
08/05/09	16:10	South	09-C0042		EPA/GE Dredging Project	1					
08/05/09	16:10	South	09-C0077		EPA/GE Dredging Project	1					
08/05/09	16:30	South	09-C0124		EPA/GE Dredging Project	1					
08/05/09	21:00	North	09-C0042		EPA/GE Dredging Project	1					
08/05/09	21:00	North	09-C0049		EPA/GE Dredging Project	1					
08/05/09	22:40	South	09-C0042		EPA/GE Dredging Project	1					
08/05/09	22:40	South	09-C0049		EPA/GE Dredging Project	1					
08/06/09	1:15	North	09-C0043		EPA/GE Dredging Project	1					
08/06/09	1:15	North	09-C0042		EPA/GE Dredging Project	1					
08/06/09	1:15	North	09-C0049		EPA/GE Dredging Project	1					
08/06/09	2:55	South	09-C0049		EPA/GE Dredging Project	1					
08/06/09	2:55	South	09-C0042		EPA/GE Dredging Project	1					
08/06/09	3:25	North	09-C0124		EPA/GE Dredging Project	1					
08/06/09	3:25	North	09-C0077		EPA/GE Dredging Project	1					
08/06/09	3:45	South	09-C0043		EPA/GE Dredging Project	1					
08/06/09	6:00	South	09-C0124		EPA/GE Dredging Project	1					
08/06/09	6:00	South	09-C0077		EPA/GE Dredging Project	1					
08/06/09	8:20	North	09-C0042		EPA/GE Dredging Project	1					
08/06/09	8:20	North	09-C0105		EPA/GE Dredging Project	1					
08/06/09	8:35	South	09-21134		Pleasure	1	OASIS LM				
08/06/09	8:35	South	09-21135		Pleasure	1	MARICATH				
08/06/09	9:40	North	09-20825	WN8012NY	Pleasure	1	BOATING LIFE				
08/06/09	10:10	South	09-C0042		EPA/GE Dredging Project	1					
08/06/09	10:10	South	09-C0105		EPA/GE Dredging Project	1					
08/06/09	10:40	North			Canal Corporation Vessel	1	TUG URGER				
08/06/09	10:50	South	09-21136		Pleasure	1	REENIE ROO				
08/06/09	11:20	South	09-21138		Pleasure	1	PATIENCE				
08/06/09	11:50	South	09-21139		Pleasure	1	SLIP AWAY				
08/06/09	12:15	North	09-20826		Pleasure	1	NELLIE JO				
08/06/09	12:15	North	09-20824		Pleasure	1	SEA BELLE				
08/06/09	12:15	North	09-C0122		EPA/GE Dredging Project	1					
08/06/09	12:15	North	09-C0042		EPA/GE Dredging Project	1					
08/06/09	12:30	South	09-10911		Pleasure	1	N/N				
08/06/09	13:20	North	09-20828		Pleasure	1	QC1014002				
08/06/09	13:20	North	09-20827	18D1234	Pleasure	1					
08/06/09	13:35	South	09-C0122		EPA/GE Dredging Project	1					
08/06/09	13:35	South	09-C0042		EPA/GE Dredging Project	1					
08/06/09	13:50	North	09-S0040		Pleasure	1					
08/06/09	13:50	North	09-20822		Pleasure	1					

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08/06/09	13:50	North	09-20823		Pleasure	1					
08/06/09	14:05	South	09-20225		Pleasure	1	J.P SHAW				
08/06/09	14:05	South	09-21140		Pleasure	1					
08/06/09	14:25	South	09-21141		Pleasure	1					
08/06/09	14:40	North	09-20830		Pleasure	1					
08/06/09	14:40	North	09-S1739		Pleasure	1					
08/06/09	15:15	North	09-10916		Pleasure	1					
08/06/09	15:40	South	09-21137		Pleasure	1					
08/06/09	15:40	South	09-S0884		Pleasure	1					
08/06/09	16:05	North	09-C0122		EPA/GE Dredging Project	1					
08/06/09	16:05	North	09-C0042		EPA/GE Dredging Project	1					
08/06/09	16:25	South	09-10914		Pleasure	1					
08/06/09	17:25	South			Employee / Retiree	1	MIKE REILLY				
08/06/09	18:50	North	09-20831		Pleasure	1					
08/06/09	18:50	North			Commercial	1		4	Marine Highway - 8th Sea	CG1057948	09-C0016
08/06/09	18:50	North			Employee / Retiree	1	MIKE REILLY				
08/06/09	19:15	North			Other Government	1	DAY PEKINPAUGH				
08/06/09	19:50	North	09-C0077		EPA/GE Dredging Project	1					
08/06/09	19:50	North	09-C0049		EPA/GE Dredging Project	1					
08/06/09	20:15	North	09-21133		Pleasure	1					
08/06/09	21:05	South	09-C0042		EPA/GE Dredging Project	1					
08/06/09	21:05	South	09-C0122		EPA/GE Dredging Project	1					
08/06/09	21:05	South	09-C0049		EPA/GE Dredging Project	1					
08/06/09	21:30	South	09-C0077		EPA/GE Dredging Project	1					
08/06/09	22:30	North	09-C0124		EPA/GE Dredging Project	1					
08/06/09	22:30	North	09-C0076		EPA/GE Dredging Project	1					
08/06/09	23:45	South	09-C0076		EPA/GE Dredging Project	1					
08/06/09	23:45	South	09-C0124		EPA/GE Dredging Project	1					
08/07/09	0:30	North	09-C0122		EPA/GE Dredging Project	1					
08/07/09	0:30	North	09-C0042		EPA/GE Dredging Project	1					
08/07/09	1:50	South	09-C0122		EPA/GE Dredging Project	1					
08/07/09	1:50	South	09-C0042		EPA/GE Dredging Project	1					
08/07/09	2:55	North	09-C0124		EPA/GE Dredging Project	1					
08/07/09	2:55	North	09-C0077		EPA/GE Dredging Project	1					
08/07/09	7:40	South	09-C0124		EPA/GE Dredging Project	1					
08/07/09	7:40	South	09-C0077		EPA/GE Dredging Project	1					
08/07/09	8:30	North	09-20832		Pleasure	1	LATTITUDE				
08/07/09	8:50	North	09-C0077		EPA/GE Dredging Project	1					
08/07/09	8:50	North	09-C0124		EPA/GE Dredging Project	1					
08/07/09	9:15	North	09-20833		Pleasure	1	PRESQUILE				
08/07/09	11:30	South	09-C0061		Hire	1	FABIENNE SUZANNE				
08/07/09	11:55	North	09-20835		Pleasure	1					
08/07/09	11:55	North	09-20836		Pleasure	1					
08/07/09	11:55	North	09-20834		Pleasure	1					
08/07/09	12:25	South	09-21146		Pleasure	1	RHUMB RUNNER				
08/07/09	13:40	South	09-C0124		EPA/GE Dredging Project	1					
08/07/09	13:40	South	09-C0077		EPA/GE Dredging Project	1					
08/07/09	14:00	North	09-C0076		EPA/GE Dredging Project	1					
08/07/09	14:00	North	09-C0122		EPA/GE Dredging Project	1					
08/07/09	14:20	South	09-21145		Pleasure	1	SNOW GOOSE				
08/07/09	14:20	South	09-21142		Pleasure	1					
08/07/09	14:20	South	09-21144		Pleasure	1					
08/07/09	14:30	North	09-S1969		Pleasure	1	TRILOGY				
08/07/09	14:55	South	09-21149		Pleasure	1					
08/07/09	14:55	South	09-21148		Pleasure	1					
08/07/09	14:55	South	09-21147		Pleasure	1	TWILIGHT ZONE				
08/07/09	15:25	North	09-20837		Pleasure	1	ADVENTURE				
08/07/09	15:25	North	09-10578		Pleasure	1	MIGHTY QUINN				
08/07/09	15:40	South	09-21150		Pleasure	1	SCUBA DOO				
08/07/09	15:40	South	09-S0844		Pleasure	1	TRANQUILITY				
08/07/09	16:20	North	09-10573		Pleasure	1	DAZE AWAY				
08/07/09	16:55	South	09-C0076		EPA/GE Dredging Project	1					
08/07/09	16:55	South	09-C0122		EPA/GE Dredging Project	1					
08/07/09	17:10	North	09-C0043		EPA/GE Dredging Project	1					
08/07/09	17:20	South	09-S0838	NY2324UJ	Pleasure	1					
08/07/09	18:15	North	09-C0077		EPA/GE Dredging Project	1					
08/07/09	18:15	North	09-C0124		EPA/GE Dredging Project	1					
08/07/09	19:00	North	09-C0042		EPA/GE Dredging Project	1					
08/07/09	19:25	North	09-20839		Pleasure	1	SAPHIR BLEU				
08/07/09	19:45	South	09-C0043		EPA/GE Dredging Project	1					
08/07/09	19:45	South	09-C0042		EPA/GE Dredging Project	1					
08/07/09	22:20	North	09-C0122		EPA/GE Dredging Project	1					
08/07/09	22:20	North	09-C0076		EPA/GE Dredging Project	1					
08/08/09	0:50	South	09-C0124		EPA/GE Dredging Project	1					
08/08/09	0:50	South	09-C0076		EPA/GE Dredging Project	1					
08/08/09	0:50	South	09-C0122		EPA/GE Dredging Project	1					
08/08/09	0:50	South	09-C0077		EPA/GE Dredging Project	1					
08/08/09	1:35	North	09-C0077		EPA/GE Dredging Project	1					
08/08/09	1:35	North	09-C0124		EPA/GE Dredging Project	1					
08/08/09	8:15	South	09-C0077		EPA/GE Dredging Project	1					
08/08/09	8:15	South	09-C0124		EPA/GE Dredging Project	1					
08/08/09	8:40	South	09-21152	QC610645	Pleasure	1					
08/08/09	8:40	South	09-21151	QC120700	Pleasure	1					
08/08/09	9:00	North	09-21129		Pleasure	1	NIRVANA				
08/08/09	9:30	North	09-C0077		EPA/GE Dredging Project	1					
08/08/09	9:30	North	09-C0124		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
08/08/09	10:40	North	09-20840		Pleasure	1	ONWARD				
08/08/09	11:20	South	09-C0124		EPA/GE Dredging Project	1					
08/08/09	11:20	South	09-C0077		EPA/GE Dredging Project	1					
08/08/09	11:40	South	09-S0157		Pleasure	1					
08/08/09	12:00	North	09-S0131		Pleasure	1					
08/08/09	12:00	North	09-20841		Pleasure	1	GOOD TO GO				
08/08/09	12:00	North	09-S0130		Pleasure	1					
08/08/09	12:30	North	09-C0042		EPA/GE Dredging Project	1					
08/08/09	12:30	North	09-C0124		EPA/GE Dredging Project	1					
08/08/09	12:30	North	09-20842		Pleasure	1	DOUBLE DJ				
08/08/09	12:30	North	09-10030		Pleasure	1	TOMALEA				
08/08/09	13:25	South	09-21154		Pleasure	1					
08/08/09	13:25	South	09-S0040		Pleasure	1	HUNNY BUNNY 3				
08/08/09	14:30	South	09-21153		Pleasure	1	RISK FACTOR				
08/08/09	14:50	North	09-S0844		Pleasure	1	TRANQUILITY				
08/08/09	14:50	North	09-S0801		Pleasure	1	REST IN PEACE				
08/08/09	14:50	North	09-C0076		EPA/GE Dredging Project	1					
08/08/09	15:20	North	09-C0123		EPA/GE Dredging Project	1					
08/08/09	16:05	North	09-20846		Pleasure	1	KITTY O				
08/08/09	16:05	North	09-20844		Pleasure	1	CATHY'S CLOWN				
08/08/09	16:05	North	09-20843		Pleasure	1	M PULSE				
08/08/09	16:20	South	09-C0123		EPA/GE Dredging Project	1					
08/08/09	16:20	South	09-10879		Pleasure	1					
08/08/09	16:20	South	09-10878		Pleasure	1					
08/08/09	16:20	South	09-21155		Pleasure	1					
08/08/09	16:40	North	09-20847		Pleasure	1	LADY LYNA				
08/08/09	17:00	South	09-C0042		EPA/GE Dredging Project	1					
08/08/09	17:00	South	09-C0124		EPA/GE Dredging Project	1					
08/08/09	17:25	South	09-C0076		EPA/GE Dredging Project	1					
08/08/09	17:55	North	09-C0042		EPA/GE Dredging Project	1					
08/08/09	17:55	North	09-C0124		EPA/GE Dredging Project	1					
08/08/09	19:05	South	09-21163		Pleasure	1					
08/08/09	19:05	South	09-21161		Pleasure	1					
08/08/09	19:05	South	09-21159		Pleasure	1					
08/08/09	19:05	South	09-21162		Pleasure	1					
08/08/09	22:10	South	09-C0124		EPA/GE Dredging Project	1					
08/08/09	22:10	South	09-C0042		EPA/GE Dredging Project	1					
08/09/09	0:20	North	09-C0078		EPA/GE Dredging Project	1					
08/09/09	0:20	North	09-C0042		EPA/GE Dredging Project	1					
08/09/09	6:15	South	09-C0042		EPA/GE Dredging Project	1					
08/09/09	6:15	South	09-C0078		EPA/GE Dredging Project	1					
08/09/09	7:05	North	09-C0078		EPA/GE Dredging Project	1					
08/09/09	7:05	North	09-C0042		EPA/GE Dredging Project	1					
08/09/09	8:05	South	09-C0048		EPA/GE Dredging Project	1					
08/09/09	8:50	South	09-C0042		EPA/GE Dredging Project	1					
08/09/09	8:50	South	09-C0078		EPA/GE Dredging Project	1					
08/09/09	9:20	North	UPT-15633		Pleasure	1					
08/09/09	9:20	North	UPT-15634		Pleasure	1					
08/09/09	9:35	South	09-S0792		Pleasure	1	SCHIFFLE				
08/09/09	9:50	North	09-C0078		EPA/GE Dredging Project	1					
08/09/09	9:50	North	09-C0042		EPA/GE Dredging Project	1					
08/09/09	10:30	North	09-C0048		EPA/GE Dredging Project	1					
08/09/09	10:30	North	09-20849		Pleasure	1					
08/09/09	10:50	South	09-21160		Pleasure	1					
08/09/09	10:50	South	09-21164		Pleasure	1					
08/09/09	11:05	North	09-10918		Pleasure	1					
08/09/09	11:20	South	09-C0078		EPA/GE Dredging Project	1					
08/09/09	11:20	South	09-C0042		EPA/GE Dredging Project	1					
08/09/09	12:00	South	09-S0863		Pleasure	1					
08/09/09	12:50	North	UPT-15279		Pleasure	1					
08/09/09	13:15	North	09-C0055		EPA/GE Dredging Project	1					
08/09/09	14:25	South	09-10808		Pleasure	1					
08/09/09	14:25	South	09-11346		Pleasure	1					
08/09/09	14:25	South	09-21167		Pleasure	1					
08/09/09	14:25	South	09-21166		Pleasure	1					
08/09/09	14:25	South	09-10809		Pleasure	1					
08/09/09	14:40	North	09-23981		Pleasure	1					
08/09/09	14:55	South	09-S0130		Pleasure	1					
08/09/09	14:55	South	09-S0131		Pleasure	1					
08/09/09	16:15	South	09-C0055		EPA/GE Dredging Project	1					
08/09/09	17:20	North	09-10915		Pleasure	1	SEA TURTLE NEST				
08/09/09	17:35	South	09-10915		Pleasure	1	SEA TURTLE NEST				
08/09/09	18:45	North	09-20853		Pleasure	1	VIKING MAID				
08/09/09	19:55	North	09-20854		Pleasure	1					
08/09/09	19:55	North	09-20855		Pleasure	1	PHANTOM				
08/09/09	20:25	North	09-C0049		EPA/GE Dredging Project	1					
08/09/09	20:25	North	09-C0076		EPA/GE Dredging Project	1					
08/09/09	21:35	South	09-C0076		EPA/GE Dredging Project	1					
08/09/09	21:35	South	09-C0049		EPA/GE Dredging Project	1					
08/09/09	22:20	North	09-C0078		EPA/GE Dredging Project	1					
08/09/09	22:20	North	09-C0124		EPA/GE Dredging Project	1					
08/09/09	23:25	South	09-C0078		EPA/GE Dredging Project	1					
08/09/09	23:25	South	09-C0123		EPA/GE Dredging Project	1					
08/10/09	0:30	North	09-C0042		EPA/GE Dredging Project	1					
08/10/09	0:30	North	09-C0123		EPA/GE Dredging Project	1					
08/10/09	6:55	South	09-C0123		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
08/10/09	6:55	South	09-C0042		EPA/GE Dredging Project	1					
08/10/09	8:20	South			Pleasure - No motor	1	1 MAN CANOE				
08/10/09	8:40	North	09-C0046		EPA/GE Dredging Project	1					
08/10/09	8:40	North	09-C0042		EPA/GE Dredging Project	1					
08/10/09	9:05	North	09-10915	VT2933P	Pleasure	1	SEA TURTLE NEST				
08/10/09	9:05	North	09-20857		Pleasure	1	BALLERINA				
08/10/09	9:30	North	09-C0124		EPA/GE Dredging Project	1					
08/10/09	10:10	North	09-20856	NY4303UX	Pleasure	1					
08/10/09	10:25	South			Pleasure - No motor	1	WE-NO-AH CANOE,1 PERSON				
08/10/09	10:40	North	09-20852		Pleasure	1	HOILDAY				
08/10/09	10:55	South	09-C0124		EPA/GE Dredging Project	1					
08/10/09	11:25	South	09-C0046		EPA/GE Dredging Project	1					
08/10/09	12:15	North	09-C0077		EPA/GE Dredging Project	1					
08/10/09	12:50	North	09-20859		Pleasure	1	OCEANIDE				
08/10/09	13:15	South	09-C0042		EPA/GE Dredging Project	1					
08/10/09	13:15	South	09-C0077		EPA/GE Dredging Project	1					
08/10/09	13:45	North	09-C0062		Hire	1	RICHARD WILLIAM				
08/10/09	13:45	North	09-C0060		Hire	1	NICOLE CLAUDINE				
08/10/09	14:05	South	09-S0027		Pleasure	1					
08/10/09	14:05	South	09-21169		Pleasure	1					
08/10/09	14:05	South	09-21168		Pleasure	1					
08/10/09	14:25	North	09-C0042		EPA/GE Dredging Project	1					
08/10/09	14:25	North	09-C0077		EPA/GE Dredging Project	1					
08/10/09	15:20	South	09-21170		Pleasure	1	UNICORN				
08/10/09	15:50	South	09-C0077		EPA/GE Dredging Project	1					
08/10/09	15:50	South	09-C0042		EPA/GE Dredging Project	1					
08/10/09	16:00	North	09-S0838		Pleasure	1					
08/10/09	16:00	North	09-10874		Pleasure	1					
08/10/09	16:00	North	09-10875		Pleasure	1					
08/10/09	16:00	North	09-10876		Pleasure	1					
08/10/09	16:15	South	09-21171		Pleasure	1					
08/10/09	16:30	North	09-20860		Pleasure	1					
08/10/09	17:05	North	09-C0077		EPA/GE Dredging Project	1					
08/10/09	17:05	North	09-C0042		EPA/GE Dredging Project	1					
08/10/09	17:45	North	09-S0902		Pleasure	1	SALTY LADY				
08/10/09	18:55	South	09-C0077		EPA/GE Dredging Project	1					
08/10/09	18:55	South	09-C0042		EPA/GE Dredging Project	1					
08/10/09	20:25	North	09-C0077		EPA/GE Dredging Project	1					
08/10/09	20:25	North	09-C0042		EPA/GE Dredging Project	1					
08/10/09	21:25	South	09-C0042		EPA/GE Dredging Project	1					
08/10/09	21:25	South	09-C0077		EPA/GE Dredging Project	1					
08/10/09	22:10	North	09-C0077		EPA/GE Dredging Project	1					
08/10/09	22:10	North	09-C0124		EPA/GE Dredging Project	1					
08/10/09	23:30	South	09-C0124		EPA/GE Dredging Project	1					
08/10/09	23:30	South	09-C0077		EPA/GE Dredging Project	1					
08/11/09	5:35	North	09-C0122		EPA/GE Dredging Project	1					
08/11/09	5:35	North	09-C0049		EPA/GE Dredging Project	1					
08/11/09	7:20	South	09-C0049		EPA/GE Dredging Project	1					
08/11/09	7:20	South	09-C0122		EPA/GE Dredging Project	1					
08/11/09	7:50	North	09-C0049		EPA/GE Dredging Project	1					
08/11/09	7:50	North	09-C0122		EPA/GE Dredging Project	1					
08/11/09	10:00	North	09-S1232		Pleasure	1	MORNING GLORY				
08/11/09	10:15	South	09-21174		Pleasure	1	COOT				
08/11/09	10:35	North	09-20861		Pleasure	1					
08/11/09	11:00	North		C0028	Other Government	1	PONTOON				
08/11/09	11:00	North			Employee / Retiree	1	DAN CULLIGAN				
08/11/09	11:15	South	09-C0049		EPA/GE Dredging Project	1					
08/11/09	11:15	South	09-C0122		EPA/GE Dredging Project	1					
08/11/09	11:45	South	09-21173		Pleasure	1	FOLLOW ME				
08/11/09	12:00	North	09-20863		Pleasure	1					
08/11/09	12:05	North			Employee / Retiree	1	DAN CULLIGAN				
08/11/09	12:05	North	09-20861		Pleasure	1					
08/11/09	12:15	South	09-S0806	CT3887AZ	Pleasure	1					
08/11/09	12:40	North	09-20863	NJ7688FB	Pleasure	1					
08/11/09	13:10	North	09-C0124		EPA/GE Dredging Project	1					
08/11/09	13:10	North	09-C0077		EPA/GE Dredging Project	1					
08/11/09	13:25	South	09-10916		Pleasure	1	MAGIC ESCAPE				
08/11/09	13:45	South	09-10918		Pleasure	1					
08/11/09	14:10	South			Employee / Retiree	1	DAN CULLIGAN				
08/11/09	14:30	South	09-C0077		EPA/GE Dredging Project	1					
08/11/09	14:30	South	09-C0124		EPA/GE Dredging Project	1					
08/11/09	15:15	North	09-C0124		EPA/GE Dredging Project	1					
08/11/09	15:15	North	09-20862		Pleasure	1	ANTIQUTI				
08/11/09	15:15	North	09-C0077		EPA/GE Dredging Project	1					
08/11/09	16:10	South	09-S0864		Pleasure	1	GREAT SCOT 1				
08/11/09	17:05	South	09-C0104		EPA/GE Dredging Project	1					
08/11/09	17:05	South	09-S0629		Pleasure	1	LOKI LANI				
08/11/09	17:25	North	09-20865		Pleasure	1	SWEET PETE				
08/11/09	17:55	South	09-C0043		EPA/GE Dredging Project	1					
08/11/09	19:05	South	09-C0124		EPA/GE Dredging Project	1					
08/11/09	19:05	South	09-C0077		EPA/GE Dredging Project	1					
08/12/09	9:00	North	09-C0124		EPA/GE Dredging Project	1					
08/12/09	9:00	North	09-C0077		EPA/GE Dredging Project	1					
08/12/09	10:05	South	09-S2089	NY0794FS	Pleasure	1	BLUE SKYE				
08/12/09	10:45	South	09-S1739		Pleasure	1					
08/12/09	10:45	South	09-10880		Pleasure	1					

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08/12/09	10:45	South			Employee / Retiree	1	MIKE REILLY				
08/12/09	11:15	South	09-21177		Pleasure	1	STILL THE ONE				
08/12/09	11:15	South	09-C0077		EPA/GE Dredging Project	1					
08/12/09	11:15	South	09-C0124		EPA/GE Dredging Project	1					
08/12/09	11:35	North	09-20867		Pleasure	1	ANNA SIMONE				
08/12/09	11:35	North	09-20866		Pleasure	1					
08/12/09	12:15	North	09-C0077		EPA/GE Dredging Project	1					
08/12/09	12:15	North	09-C0124		EPA/GE Dredging Project	1					
08/12/09	13:20	South	09-21176		Pleasure	1					
08/12/09	13:20	South	09-21178		Pleasure	1					
08/12/09	13:20	South	09-21179		Pleasure	1					
08/12/09	14:05	North	09-20297	NH8458BN	Pleasure	1					
08/12/09	14:05	North	09-C0061		Hire	1	FABIENNE SUZANNE				
08/12/09	14:20	South	09-C0060		Hire	1	NICOLE CLAUDINE				
08/12/09	14:20	South	09-C0062		Hire	1	RICHARD WILLIAM				
08/12/09	14:45	South	09-21184		Pleasure	1					
08/12/09	14:45	South	09-21182		Pleasure	1					
08/12/09	14:45	South	09-21180		Pleasure	1					
08/12/09	15:00	North	09-20869		Pleasure	1					
08/12/09	15:50	North	09-20873		Pleasure	1					
08/12/09	15:50	North	09-C0043		EPA/GE Dredging Project	1					
08/12/09	17:25	North	09-20872		Pleasure	1	MINRCA				
08/12/09	17:25	North	09-20875		Pleasure	1					
08/12/09	17:25	North	09-20876		Pleasure	1	LAZY BONES				
08/12/09	17:25	North	09-20874		Pleasure	1	SHASTA				
08/12/09	17:25	North	09-20871		Pleasure	1	LE MATIN BLEU				
08/12/09	18:10	South	09-21187		Pleasure	1					
08/12/09	18:55	North	09-20880		Pleasure	1					
08/12/09	18:55	North	09-20882		Pleasure	1	MAXIMUS				
08/12/09	18:55	North	09-20881		Pleasure	1					
08/12/09	18:55	North	09-20879		Pleasure	1	LE DOC 11				
08/12/09	19:45	North	09-20883		Pleasure	1	BEACH HOUSE				
08/12/09	20:50	South	09-C0043		EPA/GE Dredging Project	1					
08/12/09	21:25	South	09-C0077		EPA/GE Dredging Project	1					
08/12/09	21:25	South	09-C0124		EPA/GE Dredging Project	1					
08/13/09	0:40	North	09-C0042		EPA/GE Dredging Project	1					
08/13/09	0:40	North	09-C0124		EPA/GE Dredging Project	1					
08/13/09	4:30	North	09-C0049		EPA/GE Dredging Project	1					
08/13/09	4:55	South	09-C0042		EPA/GE Dredging Project	1					
08/13/09	4:55	South	09-C0124		EPA/GE Dredging Project	1					
08/13/09	6:00	North	09-C0042		EPA/GE Dredging Project	1					
08/13/09	6:00	North	09-C0124		EPA/GE Dredging Project	1					
08/13/09	8:00	South	09-C0049		EPA/GE Dredging Project	1					
08/13/09	9:50	North	09-20229		Pleasure	1	NASDAQ				
08/13/09	10:05	South	09-10030		Pleasure	1					
08/13/09	10:50	North	09-S1140		Pleasure	1	MORGAN R				
08/13/09	11:05	South	09-C0042		EPA/GE Dredging Project	1					
08/13/09	11:05	South	09-C0124		EPA/GE Dredging Project	1					
08/13/09	11:40	North	09-21172		Pleasure	1					
08/13/09	12:35	North	09-S0277		Pleasure	1	LOOKING GLASS				
08/13/09	13:10	South	09-10881		Pleasure	1					
08/13/09	13:10	South	09-21186		Pleasure	1					
08/13/09	13:25	North	09-10581		Pleasure	1	MAUDE				
08/13/09	13:40	South	09-21188		Pleasure	1					
08/13/09	15:20	North	09-20885		Pleasure	1					
08/13/09	15:45	North	09-20887		Pleasure	1					
08/13/09	16:05	North	09-C0124		EPA/GE Dredging Project	1					
08/13/09	16:05	North	09-C0042		EPA/GE Dredging Project	1					
08/13/09	16:40	North	09-20886		Pleasure	1					
08/13/09	19:10	North	09-S2005		Pleasure	1	TIDAL WAVE				
08/13/09	19:50	South	09-C0042		EPA/GE Dredging Project	1					
08/13/09	19:50	South	09-C0124		EPA/GE Dredging Project	1					
08/13/09	20:30	North	09-C0122		EPA/GE Dredging Project	1					
08/13/09	20:30	North	09-C0049		EPA/GE Dredging Project	1					
08/13/09	22:15	North	09-C0042		EPA/GE Dredging Project	1					
08/13/09	22:15	North	09-C0124		EPA/GE Dredging Project	1					
08/13/09	22:40	South	09-C0049		EPA/GE Dredging Project	1					
08/13/09	22:40	South	09-C0122		EPA/GE Dredging Project	1					
08/14/09	3:00	North	09-C0049		EPA/GE Dredging Project	1					
08/14/09	7:05	North	09-C0122		EPA/GE Dredging Project	1					
08/14/09	7:05	North	09-C0077		EPA/GE Dredging Project	1					
08/14/09	7:45	South	09-C0042		EPA/GE Dredging Project	1					
08/14/09	7:45	South	09-C0124		EPA/GE Dredging Project	1					
08/14/09	8:40	South	09-C0049		EPA/GE Dredging Project	1					
08/14/09	9:10	North	09-C0124		EPA/GE Dredging Project	1					
08/14/09	9:10	North	09-C0042		EPA/GE Dredging Project	1					
08/14/09	9:35	South	09-C0077		EPA/GE Dredging Project	1					
08/14/09	9:35	South	09-C0122		EPA/GE Dredging Project	1					
08/14/09	9:55	North	09-C0049		EPA/GE Dredging Project	1					
08/14/09	10:30	South	09-21189	NY3943HB	Pleasure	1					
08/14/09	10:30	South	09-21190	NY9867JZ	Pleasure	1					
08/14/09	11:05	South	09-C0124		EPA/GE Dredging Project	1					
08/14/09	11:05	South	09-C0042		EPA/GE Dredging Project	1					
08/14/09	11:25	North	09-20890	QC1176328	Pleasure	1					
08/14/09	12:20	North	09-C0124		EPA/GE Dredging Project	1					
08/14/09	12:20	North	09-C0042		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
08/14/09	12:40	North	09-10355		Pleasure	1					
08/14/09	12:40	North	09-10586		Pleasure	1	AQUAVIT				
08/14/09	12:55	South	09-S0977		Pleasure	1					
08/14/09	13:15	North	09-C0077		EPA/GE Dredging Project	1					
08/14/09	13:15	North	09-C0122		EPA/GE Dredging Project	1					
08/14/09	13:25	South	09-C0049		EPA/GE Dredging Project	1					
08/14/09	13:40	North	09-20891		Pleasure	1					
08/14/09	13:40	North			Other Government	1	NYSDEC NY7818EB				
08/14/09	13:40	North	09-20892		Pleasure	1					
08/14/09	14:35	South		NY7818EB	Other Government	1	NYSDEC PONTOON BOAT				
08/14/09	14:35	South	09-21193		Pleasure	1					
08/14/09	14:50	North	09-20893		Pleasure	1					
08/14/09	14:50	North	09-10919	NJ3552FN	Pleasure	1					
08/14/09	15:10	North	09-C0124		EPA/GE Dredging Project	1					
08/14/09	15:10	North	09-C0042		EPA/GE Dredging Project	1					
08/14/09	16:30	South	09-21194		Pleasure	1					
08/14/09	16:30	South	09-S0801		Pleasure	1					
08/14/09	16:30	South	09-21195		Pleasure	1					
08/14/09	17:35	South	09-C0122		EPA/GE Dredging Project	1					
08/14/09	17:35	South	09-C0077		EPA/GE Dredging Project	1					
08/14/09	19:00	North	09-C0122		EPA/GE Dredging Project	1					
08/14/09	19:00	North	09-C0077		EPA/GE Dredging Project	1					
08/14/09	20:15	North	09-C0043		EPA/GE Dredging Project	1					
08/14/09	21:35	North	09-C0124		EPA/GE Dredging Project	1					
08/14/09	21:35	North	09-C0047		EPA/GE Dredging Project	1					
08/14/09	22:50	South	09-C0043		EPA/GE Dredging Project	1					
08/14/09	23:15	South	09-C0124		EPA/GE Dredging Project	1					
08/15/09	0:30	South	09-C0042		EPA/GE Dredging Project	1					
08/15/09	0:30	South	09-C0122		EPA/GE Dredging Project	1					
08/15/09	0:30	South	09-C0077		EPA/GE Dredging Project	1					
08/15/09	1:35	North	09-C0077		EPA/GE Dredging Project	1					
08/15/09	1:35	North	09-C0042		EPA/GE Dredging Project	1					
08/15/09	6:40	North	09-C0124		EPA/GE Dredging Project	1					
08/15/09	6:40	North	09-C0122		EPA/GE Dredging Project	1					
08/15/09	7:05	South	09-C0042		EPA/GE Dredging Project	1					
08/15/09	7:05	South	09-C0077		EPA/GE Dredging Project	1					
08/15/09	8:10	North	09-C0077		EPA/GE Dredging Project	1					
08/15/09	8:10	North	09-C0042		EPA/GE Dredging Project	1					
08/15/09	8:30	South	09-21192		Pleasure	1	C VENTURE				
08/15/09	9:25	South	09-C0122		EPA/GE Dredging Project	1					
08/15/09	9:25	South	09-C0124		EPA/GE Dredging Project	1					
08/15/09	10:15	North	09-S0721		Pleasure	1					
08/15/09	11:00	South	09-C0077		EPA/GE Dredging Project	1					
08/15/09	11:05	South	09-C0042		EPA/GE Dredging Project	1					
08/15/09	11:05	South	09-C0077		EPA/GE Dredging Project	1					
08/15/09	11:35	North	09-C0034		Tour - Sleep Aboard	1	CALDWELL BELLE				
08/15/09	12:10	South	09-C0061		Hire	1	FABIENNE SUZANNE				
08/15/09	12:10	South	09-21197		Pleasure	1	ADVENTURE				
08/15/09	12:25	North	UPT-15608		Pleasure	1					
08/15/09	12:25	North	09-S0736		Pleasure	1					
08/15/09	12:55	North	09-C0122		EPA/GE Dredging Project	1					
08/15/09	12:55	North	09-C0124		EPA/GE Dredging Project	1					
08/15/09	13:15	South	09-S0970		Pleasure	1	LYRA				
08/15/09	13:15	South	09-21196		Pleasure	1	KMA				
08/15/09	13:45	North	09-20889		Pleasure	1	L AN GE				
08/15/09	13:45	North	09-S1885		Pleasure	1	POETIC JUSTICE				
08/15/09	13:45	North	09-20888		Pleasure	1	JAD AU				
08/15/09	14:15	North	09-C0077		EPA/GE Dredging Project	1					
08/15/09	14:15	North	09-C0042		EPA/GE Dredging Project	1					
08/15/09	14:35	South	09-C0124		EPA/GE Dredging Project	1					
08/15/09	14:35	South	09-C0122		EPA/GE Dredging Project	1					
08/15/09	14:50	North	09-10032		Pleasure	1	DREAM COME TRUE				
08/15/09	14:50	North	09-21194		Pleasure	1	SKYY BLUE				
08/15/09	14:50	North	09-20895		Pleasure	1					
08/15/09	15:15	South	09-21198		Pleasure	1	ON WARD				
08/15/09	15:40	South	09-C0077		EPA/GE Dredging Project	1					
08/15/09	15:40	South	09-C0042		EPA/GE Dredging Project	1					
08/15/09	17:25	North	09-10878		Pleasure	1					
08/15/09	17:25	North	09-10879		Pleasure	1					
08/15/09	18:50	South	09-S0721		Pleasure	1					
08/15/09	19:30	South	09-S0736		Pleasure	1					
08/15/09	20:10	North	09-C0043		EPA/GE Dredging Project	1					
08/15/09	21:05	North	09-C0042		EPA/GE Dredging Project	1					
08/15/09	21:05	North	09-C0077		EPA/GE Dredging Project	1					
08/15/09	22:15	South	09-C0043		EPA/GE Dredging Project	1					
08/15/09	22:40	South	09-C0077		EPA/GE Dredging Project	1					
08/15/09	22:40	South	09-C0042		EPA/GE Dredging Project	1					
08/16/09	1:10	North	09-C0042		EPA/GE Dredging Project	1					
08/16/09	1:10	North	09-C0124		EPA/GE Dredging Project	1					
08/16/09	6:55	South	09-C0124		EPA/GE Dredging Project	1					
08/16/09	6:55	South	09-C0042		EPA/GE Dredging Project	1					
08/16/09	7:30	North	09-C0042		EPA/GE Dredging Project	1					
08/16/09	7:30	North	09-C0124		EPA/GE Dredging Project	1					
08/16/09	8:45	South	09-C0042		EPA/GE Dredging Project	1					
08/16/09	8:45	South	09-C0124		EPA/GE Dredging Project	1					
08/16/09	9:40	North	09-20896		Pleasure	1	NORTH STAR				

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
08/16/09	10:30	North	09-20897		Pleasure	1	SNOW GOOSE				
08/16/09	11:15	North	09-20898		Pleasure	1					
08/16/09	12:45	North	09-C0124		EPA/GE Dredging Project	1					
08/16/09	12:45	North	09-C0077		EPA/GE Dredging Project	1					
08/16/09	13:00	South	09-21200		Pleasure	1	HIGH LIFE				
08/16/09	13:50	South	09-C0034		Tour Non-sleep aboard	1	CALDWELL BELLE				
08/16/09	14:25	South	09-C0124		EPA/GE Dredging Project	1					
08/16/09	14:25	South	09-C0077		EPA/GE Dredging Project	1					
08/16/09	14:45	South	09-21202		Pleasure	1					
08/16/09	17:55	North	09-20901	NY1241MC	Pleasure	1					
08/16/09	18:40	North	09-C0060		Hire	1	NICOLE CLAUDINE				
08/16/09	20:10	North	09-C0077		EPA/GE Dredging Project	1					
08/16/09	20:10	North	09-C0124		EPA/GE Dredging Project	1					
08/16/09	21:30	South	09-C0124		EPA/GE Dredging Project	1					
08/16/09	21:30	South	09-C0077		EPA/GE Dredging Project	1					
08/17/09	0:55	North	09-C0042		EPA/GE Dredging Project	1					
08/17/09	0:55	North	09-C0122		EPA/GE Dredging Project	1					
08/17/09	1:25	North	09-C0103		EPA/GE Dredging Project	1					
08/17/09	9:20	South	09-C0042		EPA/GE Dredging Project	1					
08/17/09	9:20	South	09-C0122		EPA/GE Dredging Project	1					
08/17/09	9:20	South	09-C0103		EPA/GE Dredging Project	1					
08/17/09	9:50	South	09-C0060		Hire	1					
08/17/09	10:20	South	09-S0277		Pleasure	1	LOOKING GLASS				
08/17/09	10:20	South	09-21206		Pleasure	1					
08/17/09	10:20	South	09-10882		Pleasure	1					
08/17/09	10:45	North	09-C0122		EPA/GE Dredging Project	1					
08/17/09	10:45	North	09-C0042		EPA/GE Dredging Project	1					
08/17/09	11:05	North	09-C0124		Pleasure	1					
08/17/09	11:05	North	09-C0077		EPA/GE Dredging Project	1					
08/17/09	11:40	South	09-21207		Pleasure	1	STO LAT				
08/17/09	11:40	South	09-21228		Pleasure	1					
08/17/09	11:55	North	09-20900		Pleasure	1	COMPANERA				
08/17/09	12:10	South	09-10919		Pleasure	1					
08/17/09	12:40	South	09-C0077		EPA/GE Dredging Project	1					
08/17/09	12:40	South	09-C0124		EPA/GE Dredging Project	1					
08/17/09	12:45	South	09-21209	NH8458BN	Pleasure	1					
08/17/09	13:10	South	09-C0122		EPA/GE Dredging Project	1					
08/17/09	13:10	South	09-C0042		EPA/GE Dredging Project	1					
08/17/09	13:35	South	09-C0077		EPA/GE Dredging Project	1					
08/17/09	13:35	South	09-C0124		EPA/GE Dredging Project	1					
08/17/09	13:50	North	09-20903		Pleasure	1	RON'S BUCKET				
08/17/09	14:05	South	09-S0278		Pleasure	1	YIPPEE I OWE				
08/17/09	14:30	North	09-C0077		EPA/GE Dredging Project	1					
08/17/09	14:30	North	09-C0124		EPA/GE Dredging Project	1					
08/17/09	16:10	South	09-C0077		EPA/GE Dredging Project	1					
08/17/09	16:10	South	09-C0124		EPA/GE Dredging Project	1					
08/17/09	16:40	North	09-C0077		EPA/GE Dredging Project	1					
08/17/09	16:40	North	09-C0124		EPA/GE Dredging Project	1					
08/17/09	17:40	South	09-C0077		EPA/GE Dredging Project	1					
08/17/09	17:40	South	09-C0124		EPA/GE Dredging Project	1					
08/17/09	19:20	North	09-C0077		EPA/GE Dredging Project	1					
08/17/09	19:20	North	09-C0124		EPA/GE Dredging Project	1					
08/17/09	19:55	North	09-C0043		EPA/GE Dredging Project	1					
08/17/09	20:40	South	09-C0124		EPA/GE Dredging Project	1					
08/17/09	20:40	South	09-C0077		EPA/GE Dredging Project	1					
08/17/09	21:05	South	09-C0043		EPA/GE Dredging Project	1					
08/17/09	21:35	North	09-C0124		EPA/GE Dredging Project	1					
08/17/09	21:35	North	09-C0077		EPA/GE Dredging Project	1					
08/17/09	22:55	South	09-C0077		EPA/GE Dredging Project	1					
08/17/09	22:55	South	09-C0124		EPA/GE Dredging Project	1					
08/17/09	23:25	North	09-C0077		EPA/GE Dredging Project	1					
08/17/09	23:25	North	09-C0124		EPA/GE Dredging Project	1					
08/18/09	2:30	South	09-C0124		EPA/GE Dredging Project	1					
08/18/09	2:30	South	09-C0077		EPA/GE Dredging Project	1					
08/18/09	4:10	North	09-C0077		EPA/GE Dredging Project	1					
08/18/09	4:10	North	09-C0124		EPA/GE Dredging Project	1					
08/18/09	7:30	South	09-C0124		EPA/GE Dredging Project	1					
08/18/09	7:30	South	09-C0077		EPA/GE Dredging Project	1					
08/18/09	8:35	North	09-C0124		EPA/GE Dredging Project	1					
08/18/09	8:35	North	09-C0077		EPA/GE Dredging Project	1					
08/18/09	10:00	South	09-10355		Pleasure	1	SWEET N LOW				
08/18/09	10:35	South	09-C0077		EPA/GE Dredging Project	1					
08/18/09	10:35	South	09-C0124		EPA/GE Dredging Project	1					
08/18/09	11:00	North	09-20063		Pleasure	1	BABY GRAND				
08/18/09	11:15	South	09-10883	VT7157N	Pleasure	1	SEA GRAND				
08/18/09	11:55	North	09-20905		Pleasure	1					
08/18/09	12:20	South	09-20184		Pleasure	1	FINAL UPGRADE				
08/18/09	12:55	North	09-C0124		EPA/GE Dredging Project	1					
08/18/09	12:55	North	09-C0077		EPA/GE Dredging Project	1					
08/18/09	13:35	South	09-S0978		Pleasure	1					
08/18/09	13:35	South	09-21211		Pleasure	1					
08/18/09	13:35	South	09-21212		Pleasure	1					
08/18/09	13:45	North	09-20904		Pleasure	1					
08/18/09	14:25	South	09-C0122		EPA/GE Dredging Project	1					
08/18/09	14:25	South	09-C0124		EPA/GE Dredging Project	1					
08/18/09	14:45	North	09-C0042		EPA/GE Dredging Project	1					

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08/18/09	14:45	North	09-C0077		EPA/GE Dredging Project	1					
08/18/09	14:45	North	09-20907		Pleasure	1					
08/18/09	14:45	North	09-23506		Pleasure	1					
08/18/09	15:00	South	09-S2005		Pleasure	1	TITLE WAVE				
08/18/09	15:00	South	09-21213		Pleasure	1	BERLINER BAR				
08/18/09	15:30	North	09-10921		Pleasure	1					
08/18/09	15:30	North	09-10922		Pleasure	1					
08/18/09	15:30	North	09-20213		Pleasure	1					
08/18/09	16:00	South	09-21214		Pleasure	1					
08/18/09	16:20	North	09-C0076		EPA/GE Dredging Project	1					
08/18/09	17:40	South	09-C0042		EPA/GE Dredging Project	1					
08/18/09	17:40	South	09-C0077		EPA/GE Dredging Project	1					
08/18/09	18:10	North	09-C0122		EPA/GE Dredging Project	1					
08/18/09	18:10	North	09-C0124		EPA/GE Dredging Project	1					
08/18/09	18:25	South	09-10884		Pleasure	1	SKIPPING SCHOOL				
08/18/09	18:25	South	09-C0076		EPA/GE Dredging Project	1					
08/19/09	2:20	North	09-C0042		EPA/GE Dredging Project	1					
08/19/09	2:20	North	09-C0077		EPA/GE Dredging Project	1					
08/19/09	3:55	South	09-C0122		EPA/GE Dredging Project	1					
08/19/09	3:55	South	09-C0124		EPA/GE Dredging Project	1					
08/19/09	6:00	North	09-C0124		EPA/GE Dredging Project	1					
08/19/09	6:00	North	09-C0122		EPA/GE Dredging Project	1					
08/19/09	6:55	South	09-C0077		EPA/GE Dredging Project	1					
08/19/09	6:55	South	09-C0042		EPA/GE Dredging Project	1					
08/19/09	8:15	North			Canal Corporation Vessel	1	TUG GRAND ERIE				
08/19/09	9:20	South	09-C0122		EPA/GE Dredging Project	1					
08/19/09	9:20	South	09-C0124		EPA/GE Dredging Project	1					
08/19/09	9:55	North	09-C0077		EPA/GE Dredging Project	1					
08/19/09	9:55	North	09-C0042		EPA/GE Dredging Project	1					
08/19/09	10:45	North	09-20908		Pleasure	1					
08/19/09	11:05	North	UPT-11347		Pleasure	1					
08/19/09	11:20	South	09-C0042		EPA/GE Dredging Project	1					
08/19/09	11:20	South	09-C0077		EPA/GE Dredging Project	1					
08/19/09	11:20	South	09-10032		Pleasure	1					
08/19/09	12:40	North	09-C0124		EPA/GE Dredging Project	1					
08/19/09	12:40	North	09-C0122		EPA/GE Dredging Project	1					
08/19/09	12:55	South	09-S1157		Pleasure	1					
08/19/09	13:40	South	09-C0124		EPA/GE Dredging Project	1					
08/19/09	13:40	South	09-C0122		EPA/GE Dredging Project	1					
08/19/09	14:30	North	09-C0077		EPA/GE Dredging Project	1					
08/19/09	14:30	North	09-C0042		EPA/GE Dredging Project	1					
08/19/09	14:55	South	09-S0193		Pleasure	1	PATHFINDER				
08/19/09	15:35	North	09-S0098		Pleasure	1	IRISH MIST				
08/19/09	16:45	South	09-20536		Pleasure	1	MARY				
08/19/09	17:10	South	09-C0042		EPA/GE Dredging Project	1					
08/19/09	17:10	South	09-C0077		EPA/GE Dredging Project	1					
08/19/09	18:30	North	09-C0077		EPA/GE Dredging Project	1					
08/19/09	18:30	North	09-C0042		EPA/GE Dredging Project	1					
08/19/09	21:25	North	09-C0124		EPA/GE Dredging Project	1					
08/19/09	21:25	North	09-C0122		EPA/GE Dredging Project	1					
08/19/09	22:45	South	09-C0122		EPA/GE Dredging Project	1					
08/19/09	22:45	South	09-C0124		EPA/GE Dredging Project	1					
08/20/09	1:25	South	09-C0077		EPA/GE Dredging Project	1					
08/20/09	1:25	South	09-C0042		EPA/GE Dredging Project	1					
08/20/09	2:10	North	09-C0122		EPA/GE Dredging Project	1					
08/20/09	2:10	North	09-C0124		EPA/GE Dredging Project	1					
08/20/09	8:05	South	09-C0124		EPA/GE Dredging Project	1					
08/20/09	8:05	South	09-C0122		EPA/GE Dredging Project	1					
08/20/09	9:35	North	09-C0122		EPA/GE Dredging Project	1					
08/20/09	9:35	North	09-C0124		EPA/GE Dredging Project	1					
08/20/09	12:20	South	09-C0122		EPA/GE Dredging Project	1					
08/20/09	12:20	South	09-C0124		EPA/GE Dredging Project	1					
08/20/09	12:40	North	09-C0042		EPA/GE Dredging Project	1					
08/20/09	12:40	North	09-C0077		EPA/GE Dredging Project	1					
08/20/09	12:55	South			Canal Corporation Vessel	1	TUG GRAND ERIE				
08/20/09	12:55	South			Employee / Retiree	1	MIKE REILLY				
08/20/09	13:20	South	09-S0799		Pleasure	1					
08/20/09	13:20	South	09-21216		Pleasure	1					
08/20/09	13:20	South	09-21215		Pleasure	1					
08/20/09	13:20	South	09-S0866		Pleasure	1					
08/20/09	13:40	South	09-C0077		EPA/GE Dredging Project	1					
08/20/09	13:40	South	09-C0042		EPA/GE Dredging Project	1					
08/20/09	14:10	North	09-C0124		EPA/GE Dredging Project	1					
08/20/09	14:10	North	09-C0122		EPA/GE Dredging Project	1					
08/20/09	14:30	South	09-21217		Pleasure	1					
08/20/09	14:30	South	09-S1221		Pleasure	1					
08/20/09	14:30	South	09-20906		Pleasure	1					
08/20/09	14:40	North			Employee / Retiree	1	MIKE REILLY				
08/20/09	17:05	North	09-C0043		EPA/GE Dredging Project	1					
08/20/09	17:30	South	09-C0124		EPA/GE Dredging Project	1					
08/20/09	17:30	South	09-C0122		EPA/GE Dredging Project	1					
08/20/09	18:40	North	09-C0077		EPA/GE Dredging Project	1					
08/20/09	18:40	North	09-C0042		EPA/GE Dredging Project	1					
08/20/09	19:05	South			Employee / Retiree	1	MIKE REILLY				
08/20/09	20:10	North	09-C0076		EPA/GE Dredging Project	1					
08/20/09	20:10	North	09-C0124		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
08/20/09	20:30	South	09-C0077		EPA/GE Dredging Project	1					
08/20/09	20:30	South	09-C0042		EPA/GE Dredging Project	1					
08/20/09	20:45	North			Employee / Retiree	1	MIKE REILLY				
08/20/09	21:30	South	09-C0043		EPA/GE Dredging Project	1					
08/20/09	21:50	North	09-C0042		EPA/GE Dredging Project	1					
08/20/09	21:50	North	09-C0077		EPA/GE Dredging Project	1					
08/20/09	22:10	South	09-C0124		EPA/GE Dredging Project	1					
08/20/09	22:10	South	09-C0076		EPA/GE Dredging Project	1					
08/21/09	0:55	North	09-C0122		EPA/GE Dredging Project	1					
08/21/09	0:55	North	09-C0124		EPA/GE Dredging Project	1					
08/21/09	1:30	South	09-C0042		EPA/GE Dredging Project	1					
08/21/09	1:30	South	09-C0077		EPA/GE Dredging Project	1					
08/21/09	6:30	North	09-C0103		EPA/GE Dredging Project	1					
08/21/09	7:05	South	09-C0122		EPA/GE Dredging Project	1					
08/21/09	7:05	South	09-C0124		EPA/GE Dredging Project	1					
08/21/09	7:30	North	09-C0045		EPA/GE Dredging Project	1					
08/21/09	7:30	North	09-C0049		EPA/GE Dredging Project	1					
08/21/09	8:25	South	09-C0103		EPA/GE Dredging Project	1					
08/21/09	8:25	South	09-21218		Pleasure	1					
08/21/09	9:05	North	09-10883		Pleasure	1	SEA GULL				
08/21/09	9:15	North	09-10883		Pleasure	1	SEA GULL				
08/21/09	9:15	North	09-10882		Pleasure	1					
08/21/09	10:35	North	09-C0042		EPA/GE Dredging Project	1					
08/21/09	10:35	North	09-C0077		EPA/GE Dredging Project	1					
08/21/09	10:50	South	09-21219		Pleasure	1	RONS BUCKET				
08/21/09	11:20	South	09-C0049		EPA/GE Dredging Project	1					
08/21/09	11:20	South	09-C0045		EPA/GE Dredging Project	1					
08/21/09	12:40	North	09-S1745		Pleasure	1					
08/21/09	13:25	North	09-20910		Pleasure	1	ZABADO				
08/21/09	14:55	South	09-C0077		EPA/GE Dredging Project	1					
08/21/09	14:55	South	09-C0042		EPA/GE Dredging Project	1					
08/21/09	15:30	South	09-10922		Pleasure	1					
08/21/09	15:30	South	09-10921		Pleasure	1					
08/21/09	15:30	South	09-11347		Pleasure	1					
08/21/09	16:05	North	09-C0042		EPA/GE Dredging Project	1					
08/21/09	16:05	North	09-C0077		EPA/GE Dredging Project	1					
08/21/09	17:40	North	09-20064		Pleasure	1					
08/21/09	19:30	North	09-C0124		EPA/GE Dredging Project	1					
08/21/09	19:30	North	09-C0122		EPA/GE Dredging Project	1					
08/21/09	19:45	South	09-C0077		EPA/GE Dredging Project	1					
08/21/09	19:45	South	09-C0042		EPA/GE Dredging Project	1					
08/21/09	21:30	North	09-C0077		EPA/GE Dredging Project	1					
08/21/09	21:30	North	09-C0042		EPA/GE Dredging Project	1					
08/21/09	23:20	South	09-C0122		EPA/GE Dredging Project	1					
08/21/09	23:20	South	09-C0124		EPA/GE Dredging Project	1					
08/21/09	23:20	South	09-C0077		EPA/GE Dredging Project	1					
08/21/09	23:20	South	09-C0042		EPA/GE Dredging Project	1					
08/22/09	1:50	North	09-C0077		EPA/GE Dredging Project	1					
08/22/09	1:50	North	09-C0042		EPA/GE Dredging Project	1					
08/22/09	3:45	South	09-C0077		EPA/GE Dredging Project	1					
08/22/09	3:45	South	09-C0042		EPA/GE Dredging Project	1					
08/22/09	5:35	North	09-C0122		EPA/GE Dredging Project	1					
08/22/09	5:35	North	09-C0077		EPA/GE Dredging Project	1					
08/22/09	7:50	South	09-C0077		EPA/GE Dredging Project	1					
08/22/09	7:50	South	09-C0122		EPA/GE Dredging Project	1					
08/22/09	7:50	South	09-C0077		EPA/GE Dredging Project	1					
08/22/09	8:05	North	09-C0042		EPA/GE Dredging Project	1					
08/22/09	8:05	North	09-C0045		EPA/GE Dredging Project	1					
08/22/09	9:00	South	09-10886		Pleasure	1	REVERIE				
08/22/09	9:00	South	09-10885		Pleasure	1	SEA DRIVE				
08/22/09	9:25	South	09-C0042		EPA/GE Dredging Project	1					
08/22/09	9:25	South	09-C0045		EPA/GE Dredging Project	1					
08/22/09	9:55	North	09-C0049		EPA/GE Dredging Project	1					
08/22/09	9:55	North	09-C0124		EPA/GE Dredging Project	1					
08/22/09	11:45	North	09-21912		Pleasure	1	CONFUSION 2				
08/22/09	12:30	South	09-C0049		EPA/GE Dredging Project	1					
08/22/09	12:30	South	09-C0124		EPA/GE Dredging Project	1					
08/22/09	13:00	North	09-C0077		EPA/GE Dredging Project	1					
08/22/09	13:00	North	09-C0042		EPA/GE Dredging Project	1					
08/22/09	13:15	South	09-S0096		Pleasure	1	TUG 44				
08/22/09	15:10	South	09-C0042		EPA/GE Dredging Project	1					
08/22/09	15:10	South	09-C0077		EPA/GE Dredging Project	1					
08/22/09	15:35	North	09-C0124		EPA/GE Dredging Project	1					
08/22/09	15:35	North	09-C0122		EPA/GE Dredging Project	1					
08/22/09	15:55	South	09-21220		Pleasure	1					
08/22/09	16:25	North	09-S0026		Pleasure	1	TUG 44				
08/22/09	17:05	North	09-20913		Pleasure	1	LE MER LENA				
08/22/09	17:25	South	09-C0122		EPA/GE Dredging Project	1					
08/22/09	17:25	South	09-C0124		EPA/GE Dredging Project	1					
08/22/09	18:25	North	09-C0103		EPA/GE Dredging Project	1					
08/22/09	18:25	North	09-C0077		EPA/GE Dredging Project	1					
08/22/09	18:35	South	09-10887		Pleasure	1					
08/22/09	21:15	South	09-C0103		EPA/GE Dredging Project	1					
08/22/09	21:15	South	09-C0077		EPA/GE Dredging Project	1					
08/22/09	22:00	North	09-C0124		EPA/GE Dredging Project	1					
08/22/09	22:00	North	09-C0122		EPA/GE Dredging Project	1					

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08/22/09	23:15	South	09-C0124		EPA/GE Dredging Project	1					
08/22/09	23:15	South	09-C0043		EPA/GE Dredging Project	1					
08/23/09	1:25	North	09-C0077		EPA/GE Dredging Project	1					
08/23/09	1:25	North	09-C0122		EPA/GE Dredging Project	1					
08/23/09	3:30	South	09-C0077		EPA/GE Dredging Project	1					
08/23/09	3:30	South	09-C0122		EPA/GE Dredging Project	1					
08/23/09	5:25	North	09-C0122		EPA/GE Dredging Project	1					
08/23/09	5:25	North	09-C0077		EPA/GE Dredging Project	1					
08/23/09	7:35	South	09-C0122		EPA/GE Dredging Project	1					
08/23/09	7:35	South	09-C0077		EPA/GE Dredging Project	1					
08/23/09	8:15	North	09-C0122		EPA/GE Dredging Project	1					
08/23/09	8:15	North	09-C0077		EPA/GE Dredging Project	1					
08/23/09	9:40	South	09-C0077		EPA/GE Dredging Project	1					
08/23/09	9:40	South	09-C0122		EPA/GE Dredging Project	1					
08/23/09	10:10	South	09-20186		Pleasure	1					
08/23/09	12:20	North	09-C0122		EPA/GE Dredging Project	1					
08/23/09	12:20	North	09-C0124		EPA/GE Dredging Project	1					
08/23/09	13:45	South	09-21221		Pleasure	1					
08/23/09	14:10	North	09-20916		Pleasure	1					
08/23/09	14:40	North	09-C0122		EPA/GE Dredging Project	1					
08/23/09	14:40	North	09-C0124		EPA/GE Dredging Project	1					
08/23/09	16:05	South	09-C0124		EPA/GE Dredging Project	1					
08/23/09	16:10	South	09-C0124		EPA/GE Dredging Project	1					
08/23/09	16:10	South	09-C0122		EPA/GE Dredging Project	1					
08/23/09	16:40	North	09-C0124		EPA/GE Dredging Project	1					
08/23/09	16:40	North	09-C0122		EPA/GE Dredging Project	1					
08/23/09	17:40	South	09-C0122		EPA/GE Dredging Project	1					
08/23/09	17:40	South	09-C0124		EPA/GE Dredging Project	1					
08/23/09	18:00	South	09-S1745		Pleasure	1					
08/24/09	0:55	North	09-C0124		EPA/GE Dredging Project	1					
08/24/09	0:55	North	09-C0077		EPA/GE Dredging Project	1					
08/24/09	0:55	North	09-C0049		EPA/GE Dredging Project	1					
08/24/09	4:10	South	09-C0077		EPA/GE Dredging Project	1					
08/24/09	4:10	South	09-C0124		EPA/GE Dredging Project	1					
08/24/09	4:35	South	09-C0049		EPA/GE Dredging Project	1					
08/24/09	5:45	North	09-C0049		EPA/GE Dredging Project	1					
08/24/09	8:00	North	09-C0122		EPA/GE Dredging Project	1					
08/24/09	8:00	North	09-C0124		EPA/GE Dredging Project	1					
08/24/09	8:25	South	09-21222		Pleasure	1	WINTERS DREAMS				
08/24/09	9:00	South	09-C0049		EPA/GE Dredging Project	1					
08/24/09	9:45	South	09-C0124		EPA/GE Dredging Project	1					
08/24/09	9:45	South	09-C0122		EPA/GE Dredging Project	1					
08/24/09	10:20	North	09-C0124		EPA/GE Dredging Project	1					
08/24/09	10:20	North	09-C0122		EPA/GE Dredging Project	1					
08/24/09	11:25	South	09-C0122		EPA/GE Dredging Project	1					
08/24/09	11:25	South	09-C0124		EPA/GE Dredging Project	1					
08/24/09	11:25	South	09-S2023		Pleasure	1					
08/24/09	11:40	North	09-10982	NY5870UF	Pleasure	1					
08/24/09	12:20	North			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
08/24/09	12:50	North	09-C0042		EPA/GE Dredging Project	1					
08/24/09	12:50	North	09-C0049		EPA/GE Dredging Project	1					
08/24/09	13:50	South	09-C0049		EPA/GE Dredging Project	1					
08/24/09	13:50	South	09-C0042		EPA/GE Dredging Project	1					
08/24/09	14:10	North	09-C0043		EPA/GE Dredging Project	1					
08/24/09	14:40	North	09-C0122		EPA/GE Dredging Project	1					
08/24/09	14:40	North	09-C0124		EPA/GE Dredging Project	1					
08/24/09	17:05	South	09-C0122		EPA/GE Dredging Project	1					
08/24/09	17:05	South	09-C0124		EPA/GE Dredging Project	1					
08/24/09	17:35	North	09-C0077		EPA/GE Dredging Project	1					
08/24/09	17:35	North	09-C0042		EPA/GE Dredging Project	1					
08/24/09	19:10	South	09-C0077		EPA/GE Dredging Project	1					
08/24/09	19:10	South	09-C0042		EPA/GE Dredging Project	1					
08/24/09	19:10	South	09-C0043		EPA/GE Dredging Project	1					
08/24/09	19:50	North	09-C0042		EPA/GE Dredging Project	1					
08/24/09	19:50	North	09-C0077		EPA/GE Dredging Project	1					
08/24/09	21:10	South	09-C0042		EPA/GE Dredging Project	1					
08/24/09	21:10	South	09-C0077		EPA/GE Dredging Project	1					
08/24/09	22:35	North	09-C0042		EPA/GE Dredging Project	1					
08/24/09	22:35	North	09-C0077		EPA/GE Dredging Project	1					
08/25/09	0:35	South	09-C0042		EPA/GE Dredging Project	1					
08/25/09	0:35	South	09-C0077		EPA/GE Dredging Project	1					
08/25/09	1:20	North	09-C0042		EPA/GE Dredging Project	1					
08/25/09	1:20	North	09-C0077		EPA/GE Dredging Project	1					
08/25/09	5:20	North	09-C0124		EPA/GE Dredging Project	1					
08/25/09	5:20	North	09-C0122		EPA/GE Dredging Project	1					
08/25/09	9:20	South	09-C0042		EPA/GE Dredging Project	1					
08/25/09	9:20	South			Pleasure - No motor	1					
08/25/09	9:20	South			Pleasure - No motor	1					
08/25/09	9:20	South	09-C0077		EPA/GE Dredging Project	1					
08/25/09	10:15	North	09-20917		Pleasure	1	AUTUMN STAR				
08/25/09	10:45	South	09-C0042		EPA/GE Dredging Project	1					
08/25/09	10:45	South	09-C0077		EPA/GE Dredging Project	1					
08/25/09	11:40	North	09-C0122		EPA/GE Dredging Project	1					
08/25/09	11:40	North	09-C0124		EPA/GE Dredging Project	1					
08/25/09	12:10	North	09-S0314		Pleasure	1					
08/25/09	12:10	North	09-10035		Pleasure	1					

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08/25/09	13:45	South	09-C0122		EPA/GE Dredging Project	1					
08/25/09	13:45	South	09-C0124		EPA/GE Dredging Project	1					
08/25/09	14:25	North	09-C0124		EPA/GE Dredging Project	1					
08/25/09	14:25	North	09-C0122		EPA/GE Dredging Project	1					
08/25/09	14:50	South	09-S0902		Pleasure	1	LEE ANN				
08/25/09	15:40	North	09-C0043		EPA/GE Dredging Project	1					
08/25/09	16:00	South	09-C0124		EPA/GE Dredging Project	1					
08/25/09	16:00	South	09-C0122		EPA/GE Dredging Project	1					
08/25/09	16:30	North	09-C0077		EPA/GE Dredging Project	1					
08/25/09	16:30	North	09-C0042		EPA/GE Dredging Project	1					
08/25/09	17:55	South	09-C0043		EPA/GE Dredging Project	1					
08/25/09	19:20	South	09-C0077		EPA/GE Dredging Project	1					
08/25/09	19:20	South	09-C0042		EPA/GE Dredging Project	1					
08/25/09	20:15	North	09-C0124		EPA/GE Dredging Project	1					
08/25/09	20:15	North	09-C0122		EPA/GE Dredging Project	1					
08/25/09	22:10	North	09-C0077		EPA/GE Dredging Project	1					
08/25/09	22:10	North	09-C0042		EPA/GE Dredging Project	1					
08/26/09	0:30	South	09-C0124		EPA/GE Dredging Project	1					
08/26/09	0:30	South	09-C0122		EPA/GE Dredging Project	1					
08/26/09	1:50	North	09-C0124		EPA/GE Dredging Project	1					
08/26/09	1:50	North	09-C0122		EPA/GE Dredging Project	1					
08/26/09	3:25	South	09-C0042		EPA/GE Dredging Project	1					
08/26/09	3:25	South	09-C0077		EPA/GE Dredging Project	1					
08/26/09	6:05	South	09-C0124		EPA/GE Dredging Project	1					
08/26/09	6:05	South	09-C0122		EPA/GE Dredging Project	1					
08/26/09	6:45	North	09-C0076		EPA/GE Dredging Project	1					
08/26/09	6:45	North	09-C0077		EPA/GE Dredging Project	1					
08/26/09	9:50	South	09-21224		Pleasure	1					
08/26/09	10:20	South	09-C0076		EPA/GE Dredging Project	1					
08/26/09	10:20	South	09-C0077		EPA/GE Dredging Project	1					
08/26/09	10:50	North	09-10598		Pleasure	1					
08/26/09	11:15	North	09-C0042		EPA/GE Dredging Project	1					
08/26/09	11:15	North	09-C0077		EPA/GE Dredging Project	1					
08/26/09	11:55	North	09-S0113		Pleasure	1					
08/26/09	12:15	South			Canal Corporation Vessel	1	TUG URGER				
08/26/09	12:35	North	09-C0122		EPA/GE Dredging Project	1					
08/26/09	12:35	North	09-C0124		EPA/GE Dredging Project	1					
08/26/09	13:05	South	09-C0077		EPA/GE Dredging Project	1					
08/26/09	13:05	South	09-C0042		EPA/GE Dredging Project	1					
08/26/09	14:30	North	09-S0406		Pleasure	1					
08/26/09	14:30	North	09-S1648		Pleasure	1					
08/26/09	14:30	North	09-C0043		EPA/GE Dredging Project	1					
08/26/09	14:50	South	09-S0314		Pleasure	1					
08/26/09	15:20	South	09-C0122		EPA/GE Dredging Project	1					
08/26/09	15:20	South	09-C0124		EPA/GE Dredging Project	1					
08/26/09	15:45	North	09-C0077		EPA/GE Dredging Project	1					
08/26/09	15:45	North	09-C0042		EPA/GE Dredging Project	1					
08/26/09	16:00	South	09-21223		Pleasure	1	LADY GRACE				
08/26/09	17:10	South	09-C0042		EPA/GE Dredging Project	1					
08/26/09	17:10	South	09-C0077		EPA/GE Dredging Project	1					
08/26/09	17:50	North	09-C0124		EPA/GE Dredging Project	1					
08/26/09	17:50	North	09-C0122		EPA/GE Dredging Project	1					
08/26/09	18:45	North	09-20485		Pleasure	1					
08/26/09	19:00	North	09-C0043		EPA/GE Dredging Project	1					
08/26/09	19:10	South	09-C0043		EPA/GE Dredging Project	1					
08/26/09	19:30	South	09-20485		Pleasure	1					
08/26/09	19:55	South	09-C0122		EPA/GE Dredging Project	1					
08/26/09	19:55	South	09-C0124		EPA/GE Dredging Project	1					
08/26/09	21:00	North	09-C0124		EPA/GE Dredging Project	1					
08/26/09	21:00	North	09-C0122		EPA/GE Dredging Project	1					
08/27/09	1:50	South	09-C0124		EPA/GE Dredging Project	1					
08/27/09	1:50	South	09-C0122		EPA/GE Dredging Project	1					
08/27/09	4:00	North	09-C0077		EPA/GE Dredging Project	1					
08/27/09	4:00	North	09-C0042		EPA/GE Dredging Project	1					
08/27/09	8:10	South			Commercial	1		51	Marine Highway - 8th Sea	CG1057948	09-C0016
08/27/09	8:40	North	09-C0122		EPA/GE Dredging Project	1					
08/27/09	8:40	North	09-C0124		EPA/GE Dredging Project	1					
08/27/09	10:10	South	09-C0042		EPA/GE Dredging Project	1					
08/27/09	10:10	South	09-C0077		EPA/GE Dredging Project	1					
08/27/09	11:05	South	09-C0124		EPA/GE Dredging Project	1					
08/27/09	11:05	South	09-C0122		EPA/GE Dredging Project	1					
08/27/09	13:40	North	09-20919		Pleasure	1	ELESIVE				
08/27/09	13:40	North	09-S0905		Pleasure	1	INDIAN SUMMER				
08/27/09	14:05	South	09-S0868		Pleasure	1					
08/27/09	14:05	South			Pleasure - No motor	1	LOIS MCCLURE				
08/27/09	14:35	North	09-C0077		EPA/GE Dredging Project	1					
08/27/09	14:35	North	09-C0122		EPA/GE Dredging Project	1					
08/27/09	15:15	North	09-20920		Pleasure	1	STO LAT				
08/27/09	15:15	North	09-S1759		Pleasure	1	MOON DANCER				
08/27/09	15:15	North	09-S0018		Pleasure	1	JENNY LIND				
08/27/09	16:10	South	09-C0122		EPA/GE Dredging Project	1					
08/27/09	16:10	South	09-C0077		EPA/GE Dredging Project	1					
08/27/09	16:45	North	09-C0049		EPA/GE Dredging Project	1					
08/27/09	16:45	North	09-C0124		EPA/GE Dredging Project	1					
08/27/09	17:10	North	09-22502		Pleasure	1					
08/27/09	18:35	South	09-C0049		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
08/27/09	18:35	South	09-C0124		EPA/GE Dredging Project	1					
08/27/09	19:00	North	09-C0122		EPA/GE Dredging Project	1					
08/27/09	19:00	North	09-C0077		EPA/GE Dredging Project	1					
08/27/09	19:15	North	09-22503		Pleasure	1	KODA				
08/27/09	19:40	South	09-S1648		Pleasure	1					
08/27/09	20:00	South	09-C0077		EPA/GE Dredging Project	1					
08/27/09	20:00	South	09-C0122		EPA/GE Dredging Project	1					
08/27/09	20:45	North	09-C0077		EPA/GE Dredging Project	1					
08/27/09	20:45	North	09-C0122		EPA/GE Dredging Project	1					
08/27/09	22:25	North	09-C0049		EPA/GE Dredging Project	1					
08/27/09	22:25	North	09-C0124		EPA/GE Dredging Project	1					
08/28/09	0:40	South	09-C0049		EPA/GE Dredging Project	1					
08/28/09	0:40	South	09-C0077		EPA/GE Dredging Project	1					
08/28/09	0:40	South	09-C0122		EPA/GE Dredging Project	1					
08/28/09	0:55	North	09-C0042		EPA/GE Dredging Project	1					
08/28/09	3:10	South	09-C0042		EPA/GE Dredging Project	1					
08/28/09	3:10	South	09-C0124		EPA/GE Dredging Project	1					
08/28/09	3:45	North	09-C0122		EPA/GE Dredging Project	1					
08/28/09	3:45	North	09-C0077		EPA/GE Dredging Project	1					
08/28/09	6:30	South	09-C0122		EPA/GE Dredging Project	1					
08/28/09	6:30	South	09-C0077		EPA/GE Dredging Project	1					
08/28/09	7:00	North	09-C0124		EPA/GE Dredging Project	1					
08/28/09	7:00	North	09-C0042		EPA/GE Dredging Project	1					
08/28/09	7:20	South	09-S0018		Pleasure	1	JENNY LIND				
08/28/09	8:10	South			Other Government	1	DAY PECKINPAUGH				
08/28/09	10:40	South	09-21226		Pleasure	1	FIRE FLY				
08/28/09	12:00	South	09-S0869		Pleasure	1	SUNNY				
08/28/09	12:00	South	09-S0912		Pleasure	1	CLADGAGH				
08/28/09	12:00	South	09-S0113		Pleasure	1	KASHEER				
08/28/09	12:35	North	09-C0045		EPA/GE Dredging Project	1					
08/28/09	12:50	South			Pleasure - No motor	1					
08/28/09	13:15	South	09-C0042		EPA/GE Dredging Project	1					
08/28/09	13:15	South	09-C0124		EPA/GE Dredging Project	1					
08/28/09	13:30	North	09-22505		Pleasure	1	AQUAHOLIC 2				
08/28/09	13:45	South	09-C0045		EPA/GE Dredging Project	1					
08/28/09	14:10	North	09-C0124		EPA/GE Dredging Project	1					
08/28/09	14:10	North	09-C0122		EPA/GE Dredging Project	1					
08/28/09	15:50	South	09-21227		Pleasure	1					
08/28/09	16:20	South	09-C0124		EPA/GE Dredging Project	1					
08/28/09	16:20	South	09-C0122		EPA/GE Dredging Project	1					
08/28/09	16:40	North	09-C0104		EPA/GE Dredging Project	1					
08/28/09	16:40	North	09-C0042		EPA/GE Dredging Project	1					
08/28/09	16:40	North	09-C0077		EPA/GE Dredging Project	1					
08/28/09	17:15	South	09-S0406		Pleasure	1	GRACE				
08/28/09	19:20	South	09-C0104		EPA/GE Dredging Project	1					
08/28/09	20:10	South	09-C0077		EPA/GE Dredging Project	1					
08/28/09	20:10	South	09-C0042		EPA/GE Dredging Project	1					
08/28/09	20:45	North	09-C0122		EPA/GE Dredging Project	1					
08/28/09	20:45	North	09-C0124		EPA/GE Dredging Project	1					
08/29/09	1:35	North	09-C0042		EPA/GE Dredging Project	1					
08/29/09	1:35	North	09-C0077		EPA/GE Dredging Project	1					
08/29/09	2:00	South	09-C0124		EPA/GE Dredging Project	1					
08/29/09	2:00	South	09-C0122		EPA/GE Dredging Project	1					
08/29/09	7:10	South	09-10888		Pleasure	1	GUSTO DEL MAR				
08/29/09	8:05	North	09-C0104		EPA/GE Dredging Project	1					
08/29/09	8:20	South	09-C0042		EPA/GE Dredging Project	1					
08/29/09	8:20	South	09-C0077		EPA/GE Dredging Project	1					
08/29/09	9:10	North	09-C0122		EPA/GE Dredging Project	1					
08/29/09	9:10	North	09-C0124		EPA/GE Dredging Project	1					
08/29/09	10:00	South	09-C0104		EPA/GE Dredging Project	1					
08/29/09	12:15	South	09-10982		Pleasure	1					
08/29/09	13:00	South	09-C0048		EPA/GE Dredging Project	1					
08/29/09	15:55	North	09-22506		Pleasure	1					
08/29/09	15:55	North	09-C0048		EPA/GE Dredging Project	1					
08/29/09	16:50	North	09-C0077		EPA/GE Dredging Project	1					
08/29/09	16:50	North	09-C0076		EPA/GE Dredging Project	1					
08/29/09	17:40	South	09-C0124		EPA/GE Dredging Project	1					
08/29/09	17:40	South	09-C0122		EPA/GE Dredging Project	1					
08/29/09	18:25	South	09-C0077		EPA/GE Dredging Project	1					
08/29/09	18:25	South	09-C0076		EPA/GE Dredging Project	1					
08/29/09	18:55	North	09-C0076		EPA/GE Dredging Project	1					
08/29/09	18:55	North	09-C0077		EPA/GE Dredging Project	1					
08/29/09	22:50	South	09-C0076		EPA/GE Dredging Project	1					
08/29/09	22:50	South	09-C0077		EPA/GE Dredging Project	1					
08/30/09	0:20	North	09-C0078		EPA/GE Dredging Project	1					
08/30/09	0:20	North	09-C0042		EPA/GE Dredging Project	1					
08/30/09	1:35	South	09-C0078		EPA/GE Dredging Project	1					
08/30/09	1:35	South	09-C0042		EPA/GE Dredging Project	1					
08/30/09	2:55	North	09-C0042		EPA/GE Dredging Project	1					
08/30/09	2:55	North	09-C0078		EPA/GE Dredging Project	1					
08/30/09	8:00	South	09-C0078		EPA/GE Dredging Project	1					
08/30/09	8:00	South	09-C0042		EPA/GE Dredging Project	1					
08/30/09	9:00	North	09-C0042		EPA/GE Dredging Project	1					
08/30/09	9:00	North	09-C0078		EPA/GE Dredging Project	1					
08/30/09	10:25	South	09-C0078		EPA/GE Dredging Project	1					
08/30/09	10:25	South	09-21228		Pleasure	1	ALLEGRIA				

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
08/30/09	10:25	South	09-C0042		EPA/GE Dredging Project	1					
08/30/09	10:25	South	09-21229		Pleasure	1	TRANSITION				
08/30/09	11:10	South	09-21230		Pleasure	1	MISTY HORIZON				
08/30/09	11:30	North	09-S0866		Pleasure	1	TEMUS FUGIT				
08/30/09	12:00	South	09-S1360		Pleasure	1	OCEANUS				
08/30/09	13:10	South	09-10889		Pleasure	1	SIDE BY SIDE				
08/30/09	13:10	South	09-S0920		Pleasure	1	TARWATHIE				
08/30/09	13:50	South	09-S0929		Pleasure	1	NEPHELE				
08/30/09	14:15	South	09-21231		Pleasure	1	ARRESTED DEDELOPMENT				
08/30/09	14:45	North	09-C0056		EPA/GE Dredging Project	1					
08/30/09	16:00	South	09-C0056		EPA/GE Dredging Project	1					
08/30/09	16:50	South	09-10035		Pleasure	1					
08/30/09	17:05	North	09-C0056		EPA/GE Dredging Project	1					
08/30/09	17:35	North	09-C0124		EPA/GE Dredging Project	1					
08/30/09	17:35	North	09-C0076		EPA/GE Dredging Project	1					
08/30/09	17:45	South	09-C0056		EPA/GE Dredging Project	1					
08/30/09	17:55	North	09-C0061		Hire	1	FABIENNE SUZANNE				
08/30/09	18:35	South	09-C0124		EPA/GE Dredging Project	1					
08/30/09	18:35	South	09-C0076		EPA/GE Dredging Project	1					
08/30/09	19:20	North	09-C0043		EPA/GE Dredging Project	1					
08/30/09	20:30	South	09-C0043		EPA/GE Dredging Project	1					
08/30/09	22:25	North	09-C0077		EPA/GE Dredging Project	1					
08/30/09	22:25	North	09-C0049		EPA/GE Dredging Project	1					
08/31/09	1:10	North	09-C0043		EPA/GE Dredging Project	1					
08/31/09	3:05	South	09-C0043		EPA/GE Dredging Project	1					
08/31/09	4:05	North	09-C0077		EPA/GE Dredging Project	1					
08/31/09	4:05	North	09-C0042		EPA/GE Dredging Project	1					
08/31/09	5:55	South	09-C0077		EPA/GE Dredging Project	1					
08/31/09	5:55	South	09-C0042		EPA/GE Dredging Project	1					
08/31/09	6:40	North	09-C0122		EPA/GE Dredging Project	1					
08/31/09	6:40	North	09-C0124		EPA/GE Dredging Project	1					
08/31/09	11:35	South	09-10941		Pleasure	1	LARENA				
08/31/09	11:35	South	09-C0060		Hire	1	FABIENNE SUZANNE				
08/31/09	12:25	North	09-S0868		Pleasure	1					
08/31/09	12:25	North			Pleasure - No motor	1	LOIS MCLURE				
08/31/09	12:25	North	09-S0867		Pleasure	1	CL CHURCHILL				
08/31/09	12:40	South	09-21232		Pleasure	1	JANBAREE 3				
08/31/09	13:00	North	09-C0042		EPA/GE Dredging Project	1					
08/31/09	13:00	North	09-C0076		EPA/GE Dredging Project	1					
08/31/09	13:35	South	09-S0969		Pleasure	1	FINALLY FUN				
08/31/09	14:05	South	09-C0122		EPA/GE Dredging Project	1					
08/31/09	14:05	South	09-C0124		EPA/GE Dredging Project	1					
08/31/09	14:25	South	09-S1232		Pleasure	1	MORNING GLORY II				
08/31/09	16:40	North	09-S0790		Pleasure	1	NAUTI & NICE				
08/31/09	18:35	South	09-C0076		EPA/GE Dredging Project	1					
08/31/09	18:35	South	09-C0042		EPA/GE Dredging Project	1					
08/31/09	19:40	North	09-C0124		EPA/GE Dredging Project	1					
08/31/09	19:40	North	09-C0049		EPA/GE Dredging Project	1					
08/31/09	19:40	North	09-C0122		EPA/GE Dredging Project	1					
08/31/09	20:45	South	09-C0049		EPA/GE Dredging Project	1					
09/01/09	2:00	South	09-C0124		EPA/GE Dredging Project	1					
09/01/09	2:00	South	09-C0122		EPA/GE Dredging Project	1					
09/01/09	2:30	North	09-C0042		EPA/GE Dredging Project	1					
09/01/09	2:30	North	09-C0077		EPA/GE Dredging Project	1					
09/01/09	3:00	North	09-C0104		EPA/GE Dredging Project	1					
09/01/09	7:10	South	09-C0104		EPA/GE Dredging Project	1					
09/01/09	8:50	North	09-C0104		EPA/GE Dredging Project	1					
09/01/09	9:55	South	09-C0042		EPA/GE Dredging Project	1					
09/01/09	9:55	South	09-C0077		EPA/GE Dredging Project	1					
09/01/09	10:10	North	09-C0124		EPA/GE Dredging Project	1					
09/01/09	10:10	North	09-C0121		EPA/GE Dredging Project	1					
09/01/09	15:20	South	09-C0124		EPA/GE Dredging Project	1					
09/01/09	15:20	South	09-C0122		EPA/GE Dredging Project	1					
09/01/09	15:35	North	09-C0076		EPA/GE Dredging Project	1					
09/01/09	16:20	North	09-C0042		EPA/GE Dredging Project	1					
09/01/09	16:20	North	09-C0077		EPA/GE Dredging Project	1					
09/01/09	17:15	South	09-C0076		EPA/GE Dredging Project	1					
09/01/09	17:50	South	09-C0104		EPA/GE Dredging Project	1					
09/01/09	18:50	North	09-10037		Pleasure	1	JAZZY				
09/01/09	20:50	South	09-C0042		EPA/GE Dredging Project	1					
09/01/09	20:50	South	09-C0077		EPA/GE Dredging Project	1					
09/01/09	21:40	North	09-C0124		EPA/GE Dredging Project	1					
09/01/09	21:40	North	09-C0122		EPA/GE Dredging Project	1					
09/02/09	8:25	South	09-C0124		EPA/GE Dredging Project	1					
09/02/09	8:25	South	09-C0122		EPA/GE Dredging Project	1					
09/02/09	9:00	North	09-C0077		EPA/GE Dredging Project	1					
09/02/09	9:00	North	09-C0043		EPA/GE Dredging Project	1					
09/02/09	9:00	North	09-C0042		EPA/GE Dredging Project	1					
09/02/09	10:55	South	09-C0043		EPA/GE Dredging Project	1					
09/02/09	10:55	South	09-C0042		EPA/GE Dredging Project	1					
09/02/09	10:55	South	09-C0077		EPA/GE Dredging Project	1					
09/02/09	11:20	North	09-S0724		Pleasure	1	OTHER OFFICE				
09/02/09	12:20	North	09-C0124		EPA/GE Dredging Project	1					
09/02/09	12:20	North	09-C0122		EPA/GE Dredging Project	1					
09/02/09	12:50	North	09-C0077		EPA/GE Dredging Project	1					
09/02/09	12:50	North	09-C0042		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
09/02/09	15:40	South	09-C0077		EPA/GE Dredging Project	1					
09/02/09	15:40	South	09-C0042		EPA/GE Dredging Project	1					
09/02/09	16:10	South	09-C0047		EPA/GE Dredging Project	1					
09/02/09	18:15	North	09-C0122		EPA/GE Dredging Project	1					
09/02/09	18:15	North	09-C0124		EPA/GE Dredging Project	1					
09/02/09	23:35	South	09-C0122		EPA/GE Dredging Project	1					
09/02/09	23:35	South	09-C0124		EPA/GE Dredging Project	1					
09/03/09	1:10	North	09-C0077		EPA/GE Dredging Project	1					
09/03/09	1:10	North	09-C0042		EPA/GE Dredging Project	1					
09/03/09	8:50	North	09-C0045		EPA/GE Dredging Project	1					
09/03/09	9:50	South	09-C0042		EPA/GE Dredging Project	1					
09/03/09	9:50	South	09-C0077		EPA/GE Dredging Project	1					
09/03/09	10:30	South	09-C0045		EPA/GE Dredging Project	1					
09/03/09	10:30	South			Pleasure - No motor	1	LOIS MCCLURE				
09/03/09	10:30	South	09-S0868		Pleasure	1					
09/03/09	10:30	South	09-S0867		Pleasure	1					
09/03/09	11:00	North	09-C0124		EPA/GE Dredging Project	1					
09/03/09	11:00	North	09-C0122		EPA/GE Dredging Project	1					
09/03/09	12:35	North	09-10924		Pleasure	1	NELL				
09/03/09	13:45	South	09-C0124		EPA/GE Dredging Project	1					
09/03/09	13:45	South	09-C0122		EPA/GE Dredging Project	1					
09/03/09	15:45	North	09-C0042		EPA/GE Dredging Project	1					
09/03/09	15:45	North	09-C0077		EPA/GE Dredging Project	1					
09/03/09	16:10	North	09-C0076		EPA/GE Dredging Project	1					
09/03/09	16:10	North	09-10828		Pleasure	1					
09/03/09	16:30	North	09-22508		Pleasure	1					
09/03/09	17:15	South	09-C0042		EPA/GE Dredging Project	1					
09/03/09	17:15	South	09-C0076		EPA/GE Dredging Project	1					
09/03/09	17:15	South	09-C0077		EPA/GE Dredging Project	1					
09/03/09	18:40	North	09-C0124		EPA/GE Dredging Project	1					
09/03/09	18:40	North	09-C0076		EPA/GE Dredging Project	1					
09/03/09	20:10	South	09-C0124		EPA/GE Dredging Project	1					
09/03/09	20:10	South	09-C0076		EPA/GE Dredging Project	1					
09/03/09	20:45	North	09-C0122		EPA/GE Dredging Project	1					
09/03/09	20:45	North	09-C0042		EPA/GE Dredging Project	1					
09/04/09	9:05	South	09-10037		Pleasure	1	JAZZY				
09/04/09	9:40	North	09-C0124		EPA/GE Dredging Project	1					
09/04/09	9:40	North	09-C0077		EPA/GE Dredging Project	1					
09/04/09	10:55	South	09-C0122		EPA/GE Dredging Project	1					
09/04/09	10:55	South	09-C0042		EPA/GE Dredging Project	1					
09/04/09	11:30	South	09-C0124		EPA/GE Dredging Project	1					
09/04/09	11:30	South	09-C0077		EPA/GE Dredging Project	1					
09/04/09	12:45	North	09-C0042		EPA/GE Dredging Project	1					
09/04/09	12:45	North	09-C0122		EPA/GE Dredging Project	1					
09/04/09	12:45	North	09-C0077		EPA/GE Dredging Project	1					
09/04/09	13:40	North	09-C0076		EPA/GE Dredging Project	1					
09/04/09	13:40	North	09-C0124		EPA/GE Dredging Project	1					
09/04/09	14:00	South	09-C0122		EPA/GE Dredging Project	1					
09/04/09	14:00	South	09-C0042		EPA/GE Dredging Project	1					
09/04/09	14:20	South	09-C0077		EPA/GE Dredging Project	1					
09/04/09	14:20	South			Employee / Retiree	1	MIKE				
09/04/09	14:40	North	09-C0104		EPA/GE Dredging Project	1					
09/04/09	15:20	South	09-C0124		EPA/GE Dredging Project	1					
09/04/09	15:20	South	09-C0076		EPA/GE Dredging Project	1					
09/04/09	15:55	North	09-C0122		EPA/GE Dredging Project	1					
09/04/09	15:55	North	09-C0042		EPA/GE Dredging Project	1					
09/04/09	16:20	South	09-21233		Pleasure	1	AU GRE DES VENTS				
09/04/09	16:20	South	09-21235	NY2709UM	Pleasure - No motor	1	CANOE				
09/04/09	16:20	South	09-21234		Pleasure	1	CRAZY TALK				
09/04/09	16:45	North			Pleasure - No motor	1	CANOE				
09/04/09	16:45	North	09-10925		Pleasure	1	CAPTAIN SEAWEED III				
09/04/09	16:45	North	09-S0935		Pleasure	1					
09/04/09	17:30	South	09-C0122		EPA/GE Dredging Project	1					
09/04/09	17:30	South	09-C0104		EPA/GE Dredging Project	1					
09/04/09	17:30	South	09-C0042		EPA/GE Dredging Project	1					
09/04/09	18:00	North	09-C0076		EPA/GE Dredging Project	1					
09/04/09	18:00	North	09-C0124		EPA/GE Dredging Project	1					
09/04/09	19:20	North	09-C0122		EPA/GE Dredging Project	1					
09/04/09	19:20	North	09-C0077		EPA/GE Dredging Project	1					
09/04/09	19:40	South	09-C0124		EPA/GE Dredging Project	1					
09/04/09	19:40	South	09-C0076		EPA/GE Dredging Project	1					
09/04/09	20:50	South	09-C0122		EPA/GE Dredging Project	1					
09/04/09	20:50	South	09-C0077		EPA/GE Dredging Project	1					
09/04/09	22:40	North	09-C0076		EPA/GE Dredging Project	1					
09/04/09	22:40	North	09-C0122		EPA/GE Dredging Project	1					
09/05/09	0:00	South	09-C0122		EPA/GE Dredging Project	1					
09/05/09	0:00	South	09-C0076		EPA/GE Dredging Project	1					
09/05/09	8:55	South	09-C0042		EPA/GE Dredging Project	1					
09/05/09	8:55	South	09-C0077		EPA/GE Dredging Project	1					
09/05/09	9:35	North	09-C0077		EPA/GE Dredging Project	1					
09/05/09	9:35	North	09-C0042		EPA/GE Dredging Project	1					
09/05/09	10:10	South	09-S0790		Pleasure	1	NAUTI NICE				
09/05/09	10:25	North	09-C0045		EPA/GE Dredging Project	1					
09/05/09	10:25	North	09-C0122		EPA/GE Dredging Project	1					
09/05/09	11:00	South	09-C0042		EPA/GE Dredging Project	1					
09/05/09	11:00	South	09-C0077		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
09/05/09	11:25	South	09-10924		Pleasure	1	NELL				
09/05/09	11:45	North	09-S0725		Pleasure	1					
09/05/09	11:45	North			Employee / Retiree	1	MIKE				
09/05/09	11:45	North	09-22509		Pleasure	1					
09/05/09	13:15	South	09-C0122		EPA/GE Dredging Project	1					
09/05/09	13:15	South	09-C0045		EPA/GE Dredging Project	1					
09/05/09	13:40	South	09-21236		Pleasure	1	RED HEAD				
09/05/09	14:35	South	09-21238		Pleasure	1	GATORS REVENGE				
09/05/09	15:10	North	09-C0077		EPA/GE Dredging Project	1					
09/05/09	15:10	North	09-C0124		EPA/GE Dredging Project	1					
09/05/09	15:35	North	09-S0852		Pleasure	1					
09/05/09	15:45	South	09-21237		Pleasure	1					
09/05/09	16:00	North	UPT-15635		Pleasure	1					
09/05/09	16:45	South	09-C0124		EPA/GE Dredging Project	1					
09/05/09	16:45	South	09-C0077		EPA/GE Dredging Project	1					
09/05/09	17:05	North	09-C0124		EPA/GE Dredging Project	1					
09/05/09	17:05	North	09-C0077		EPA/GE Dredging Project	1					
09/05/09	18:25	South	09-C0077		EPA/GE Dredging Project	1					
09/05/09	18:25	South	09-C0124		EPA/GE Dredging Project	1					
09/05/09	18:45	South	09-S0725		Pleasure	1					
09/05/09	18:45	South	UPT-15635		Pleasure	1					
09/05/09	19:00	North			Pleasure - No motor	1					
09/06/09	13:10	North	09-C0124		EPA/GE Dredging Project	1					
09/06/09	13:10	North	09-C0077		EPA/GE Dredging Project	1					
09/06/09	13:35	North	09-S0736		Pleasure	1					
09/06/09	13:35	North	09-S1129		Pleasure	1	BROWN EYE GIRL				
09/06/09	14:15	South	09-21239		Pleasure	1					
09/06/09	14:30	North	09-20026		Pleasure	1					
09/06/09	14:50	South	09-C0077		EPA/GE Dredging Project	1					
09/06/09	14:50	South	09-C0124		EPA/GE Dredging Project	1					
09/06/09	15:15	South	09-10942		Pleasure	1	KADENA				
09/06/09	15:40	South	09-10828		Pleasure	1					
09/06/09	15:40	South	09-S0736		Pleasure	1					
09/06/09	16:00	South	09-S0026		Pleasure	1					
09/06/09	16:15	North	09-C0060		Hire	1	FABIENN SUZANNE				
09/06/09	16:30	South	09-20066		Pleasure	1					
09/06/09	17:00	North	09-C0124		EPA/GE Dredging Project	1					
09/06/09	17:00	North	09-C0077		EPA/GE Dredging Project	1					
09/06/09	17:20	South	09-S0935		Pleasure	1					
09/06/09	17:50	North	09-21239		Pleasure	1					
09/06/09	18:20	South	09-C0077		EPA/GE Dredging Project	1					
09/06/09	18:20	South	09-C0124		EPA/GE Dredging Project	1					
09/06/09	18:40	North	09-S0026		Pleasure	1					
09/06/09	19:30	South	09-C0060		Hire	1	FABIENNE SUZANN				
09/07/09	9:00	South	09-21240	QC1033143	Pleasure	1					
09/07/09	10:05	South	09-10925		Pleasure	1	CAPTAIN SEAWEED III				
09/07/09	10:25	South	09-S0026		Pleasure	1	TUG 44				
09/07/09	12:30	South	09-S0865		Pleasure	1	YIPPEE I OWE				
09/07/09	15:10	South	09-S0971		Pleasure	1					
09/07/09	15:10	South	09-10943		Pleasure	1					
09/07/09	16:25	South	09-S0724		Pleasure	1					
09/07/09	17:55	North	09-22514		Pleasure	1	BOATWISER				
09/08/09	8:45	North	09-C0077		EPA/GE Dredging Project	1					
09/08/09	9:15	South	09-21247		Pleasure	1					
09/08/09	10:05	South	09-21244		Pleasure	1					
09/08/09	10:45	North	09-C0122		EPA/GE Dredging Project	1					
09/08/09	10:45	North	09-C0124		EPA/GE Dredging Project	1					
09/08/09	11:00	South	09-C0077		EPA/GE Dredging Project	1					
09/08/09	11:30	South	09-21246		Pleasure	1					
09/08/09	11:30	South	09-21245		Pleasure	1					
09/08/09	11:45	North	09-22516		Pleasure	1					
09/08/09	11:45	North	09-22515		Pleasure	1					
09/08/09	12:45	South	09-21248		Pleasure	1					
09/08/09	13:10	South	09-C0122		EPA/GE Dredging Project	1					
09/08/09	13:10	South	09-C0124		EPA/GE Dredging Project	1					
09/08/09	13:50	South	09-S1969		Pleasure	1	TRILOGY				
09/08/09	14:10	North	09-C0045		Pleasure	1					
09/08/09	14:10	North	09-C0077		EPA/GE Dredging Project	1					
09/08/09	14:20	South	09-21242		Pleasure	1					
09/08/09	14:20	South	09-21241		Pleasure	1					
09/08/09	15:20	South	09-21243		Pleasure	1	LE JON				
09/08/09	15:40	North	09-C0077		EPA/GE Dredging Project	1					
09/08/09	15:40	North	09-C0042		EPA/GE Dredging Project	1					
09/08/09	16:25	North	09-C0043		EPA/GE Dredging Project	1					
09/08/09	17:10	South	09-C0042		EPA/GE Dredging Project	1					
09/08/09	17:10	South	09-C0077		EPA/GE Dredging Project	1					
09/08/09	17:45	North	09-C0076		EPA/GE Dredging Project	1					
09/08/09	17:45	North	09-C0122		EPA/GE Dredging Project	1					
09/08/09	18:00	South	09-C0043		EPA/GE Dredging Project	1					
09/08/09	19:15	South	09-C0122		EPA/GE Dredging Project	1					
09/08/09	19:15	South	09-C0076		EPA/GE Dredging Project	1					
09/08/09	19:35	North	09-C0042		EPA/GE Dredging Project	1					
09/08/09	19:35	North	09-C0077		EPA/GE Dredging Project	1					
09/08/09	20:10	North	09-C0043		EPA/GE Dredging Project	1					
09/08/09	20:40	South	09-C0077		EPA/GE Dredging Project	1					
09/08/09	20:40	South	09-C0042		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
09/08/09	21:45	North	09-C0077		EPA/GE Dredging Project	1					
09/08/09	21:45	North	09-C0042		EPA/GE Dredging Project	1					
09/08/09	22:50	South	09-C0043		EPA/GE Dredging Project	1					
09/09/09	1:10	South	09-C0042		EPA/GE Dredging Project	1					
09/09/09	1:10	South	09-C0077		EPA/GE Dredging Project	1					
09/09/09	2:15	North	09-C0077		EPA/GE Dredging Project	1					
09/09/09	2:15	North	09-C0042		EPA/GE Dredging Project	1					
09/09/09	4:15	South	09-C0077		EPA/GE Dredging Project	1					
09/09/09	4:15	South	09-C0042		EPA/GE Dredging Project	1					
09/09/09	4:55	North	09-C0124		EPA/GE Dredging Project	1					
09/09/09	4:55	North	09-C0122		EPA/GE Dredging Project	1					
09/09/09	7:05	North	09-C0049		EPA/GE Dredging Project	1					
09/09/09	7:45	South	09-C0124		EPA/GE Dredging Project	1					
09/09/09	7:45	South	09-C0122		EPA/GE Dredging Project	1					
09/09/09	8:15	North	09-C0047		EPA/GE Dredging Project	1					
09/09/09	8:15	North	09-C0077		EPA/GE Dredging Project	1					
09/09/09	9:00	North	09-S0862		Pleasure	1	ALWAYS SATURDAY				
09/09/09	9:30	South	09-C0049		EPA/GE Dredging Project	1					
09/09/09	10:30	South	09-C0077		EPA/GE Dredging Project	1					
09/09/09	10:30	South	09-C0042		EPA/GE Dredging Project	1					
09/09/09	12:40	South	09-S1129		Pleasure	1					
09/09/09	12:40	South	09-S0965		Pleasure	1					
09/09/09	13:00	North	09-C0077		EPA/GE Dredging Project	1					
09/09/09	13:00	North	09-C0042		EPA/GE Dredging Project	1					
09/09/09	14:10	North	09-C0076		EPA/GE Dredging Project	1					
09/09/09	14:10	North	09-C0124		EPA/GE Dredging Project	1					
09/09/09	14:35	South	09-C0077		EPA/GE Dredging Project	1					
09/09/09	14:35	South	09-C0042		EPA/GE Dredging Project	1					
09/09/09	14:45	North	09-23985		Pleasure	1					
09/09/09	15:25	North	09-C0077		EPA/GE Dredging Project	1					
09/09/09	15:25	North	09-C0042		EPA/GE Dredging Project	1					
09/09/09	15:50	South	09-C0124		EPA/GE Dredging Project	1					
09/09/09	15:50	South	09-C0076		EPA/GE Dredging Project	1					
09/09/09	16:10	South	09-S0858		Pleasure	1	VACILAR				
09/09/09	17:10	South	09-C0042		EPA/GE Dredging Project	1					
09/09/09	17:10	South	09-C0077		EPA/GE Dredging Project	1					
09/09/09	17:20	South	UPT-15636	NY 8327 MB	Pleasure	1	BOATWISER				
09/09/09	18:40	North	09-C0042		EPA/GE Dredging Project	1					
09/09/09	18:40	North	09-C0124		EPA/GE Dredging Project	1					
09/09/09	20:20	South	09-C0124		EPA/GE Dredging Project	1					
09/09/09	20:20	South	09-C0076		EPA/GE Dredging Project	1					
09/09/09	21:25	North	09-C0042		EPA/GE Dredging Project	1					
09/09/09	21:25	North	09-C0077		EPA/GE Dredging Project	1					
09/09/09	22:50	South	09-C0077		EPA/GE Dredging Project	1					
09/09/09	22:50	South	09-C0042		EPA/GE Dredging Project	1					
09/10/09	1:20	North	09-C0122		EPA/GE Dredging Project	1					
09/10/09	1:20	North	09-C0124		EPA/GE Dredging Project	1					
09/10/09	2:10	North	09-C0103		EPA/GE Dredging Project	1					
09/10/09	8:35	South	09-C0124		EPA/GE Dredging Project	1					
09/10/09	8:35	South	09-C0122		EPA/GE Dredging Project	1					
09/10/09	8:45	North			Other Government	1	EPA-OCEAN SURVEY ECHO,CT611AE				
09/10/09	9:05	South	09-C0103		EPA/GE Dredging Project	1					
09/10/09	9:25	North	09-C0042		EPA/GE Dredging Project	1					
09/10/09	9:25	North	09-C0077		EPA/GE Dredging Project	1					
09/10/09	9:45	South	09-S0953		Pleasure	1	MOON BEAM				
09/10/09	10:10	South	09-S0905	DO1185597	Pleasure	1	INDIAN SUMMER				
09/10/09	11:20	South	09-C0077		EPA/GE Dredging Project	1					
09/10/09	11:20	South	09-C0042		EPA/GE Dredging Project	1					
09/10/09	12:30	South	09-21253		Pleasure	1	HOLIDAY				
09/10/09	12:40	North	09-20239		Pleasure	1	MOON SHADOW				
09/10/09	13:10	South	09-21254		Pleasure	1	BLUE SKIES				
09/10/09	13:25	North	09-22519	NY2709UM	Pleasure	1					
09/10/09	13:50	North	09-C0122		EPA/GE Dredging Project	1					
09/10/09	13:50	North	09-C0076		EPA/GE Dredging Project	1					
09/10/09	14:20	North	09-C0077		EPA/GE Dredging Project	1					
09/10/09	14:20	North	09-C0124		EPA/GE Dredging Project	1					
09/10/09	14:40	South	09-22151		Pleasure	1					
09/10/09	14:40	South	09-22152		Pleasure	1					
09/10/09	14:40	South	09-10944		Pleasure	1					
09/10/09	14:40	South	09-22150		Pleasure	1					
09/10/09	15:00	North	09-S0865		Pleasure	1	YIPPEE I OWE				
09/10/09	15:10	South	09-21252		Pleasure	1	CONFUSION 2				
09/10/09	15:35	South	09-C0122		EPA/GE Dredging Project	1					
09/10/09	15:35	South	09-C0076		EPA/GE Dredging Project	1					
09/10/09	16:05	South	09-C0124		EPA/GE Dredging Project	1					
09/10/09	16:05	South	09-C0077		EPA/GE Dredging Project	1					
09/10/09	16:05	South			Other Government	1	OCEAN SURVEY ECHO				
09/10/09	17:15	South	09-21255		Pleasure	1	CABO				
09/10/09	17:35	North	09-C0076		EPA/GE Dredging Project	1					
09/10/09	17:35	North	09-C0122		EPA/GE Dredging Project	1					
09/10/09	19:20	South	09-C0076		EPA/GE Dredging Project	1					
09/10/09	19:20	South	09-C0122		EPA/GE Dredging Project	1					
09/10/09	19:35	North	09-C0043		EPA/GE Dredging Project	1					
09/10/09	19:35	North	09-C0042		EPA/GE Dredging Project	1					
09/10/09	20:15	North	09-C0077		EPA/GE Dredging Project	1					
09/10/09	20:15	North	09-C0124		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
09/10/09	20:55	South	09-C0042		EPA/GE Dredging Project	1					
09/10/09	20:55	South	09-C0077		EPA/GE Dredging Project	1					
09/10/09	20:55	South	09-C0124		EPA/GE Dredging Project	1					
09/10/09	22:25	North	09-C0122		EPA/GE Dredging Project	1					
09/10/09	22:25	North	09-C0076		EPA/GE Dredging Project	1					
09/10/09	22:45	South	09-C0043		EPA/GE Dredging Project	1					
09/10/09	23:40	South	09-C0122		EPA/GE Dredging Project	1					
09/10/09	23:40	South	09-C0076		EPA/GE Dredging Project	1					
09/11/09	1:00	North	09-C0077		EPA/GE Dredging Project	1					
09/11/09	1:00	North	09-C0042		EPA/GE Dredging Project	1					
09/11/09	8:05	South	09-C0077		EPA/GE Dredging Project	1					
09/11/09	8:05	South	09-C0042		EPA/GE Dredging Project	1					
09/11/09	8:20	North	09-C0124		EPA/GE Dredging Project	1					
09/11/09	8:20	North	09-C0122		EPA/GE Dredging Project	1					
09/11/09	8:20	North	09-C0103		EPA/GE Dredging Project	1					
09/11/09	9:40	South	09-C0124		EPA/GE Dredging Project	1					
09/11/09	9:40	South	09-C0122		EPA/GE Dredging Project	1					
09/11/09	10:00	North	09-10890		Pleasure	1	GYPSY ROSE				
09/11/09	10:50	South	09-C0103		EPA/GE Dredging Project	1					
09/11/09	11:35	South	09-10945		Pleasure	1	LITTLE BIT				
09/11/09	11:35	South	09-10946		Pleasure	1	VOLENDAM				
09/11/09	11:35	South	09-21258		Pleasure	1	OUTER LIMIT				
09/11/09	12:25	South	09-21256		Pleasure	1	OUR QUARTERS				
09/11/09	12:25	South	09-21257		Pleasure	1					
09/11/09	13:15	South	09-C0124		EPA/GE Dredging Project	1					
09/11/09	13:15	South	09-C0122		EPA/GE Dredging Project	1					
09/11/09	14:00	North	09-C0122		EPA/GE Dredging Project	1					
09/11/09	14:00	North	09-C0124		EPA/GE Dredging Project	1					
09/11/09	15:30	South	09-C0124		EPA/GE Dredging Project	1					
09/11/09	15:30	South	09-C0122		EPA/GE Dredging Project	1					
09/11/09	16:05	North	09-10943		Pleasure	1	RED CASTLES				
09/11/09	16:35	North	09-C0049		EPA/GE Dredging Project	1					
09/11/09	16:35	North	09-C0077		EPA/GE Dredging Project	1					
09/11/09	18:10	South	09-C0077		EPA/GE Dredging Project	1					
09/11/09	18:10	South	09-C0049		EPA/GE Dredging Project	1					
09/11/09	19:15	North	09-C0124		EPA/GE Dredging Project	1					
09/11/09	19:15	North	09-C0122		EPA/GE Dredging Project	1					
09/11/09	19:15	North	09-C0076		EPA/GE Dredging Project	1					
09/11/09	19:50	North	09-C0043		EPA/GE Dredging Project	1					
09/11/09	20:10	South	09-C0076		EPA/GE Dredging Project	1					
09/11/09	22:00	South	09-C0043		EPA/GE Dredging Project	1					
09/11/09	22:00	South	09-C0124		EPA/GE Dredging Project	1					
09/11/09	22:00	South	09-C0122		EPA/GE Dredging Project	1					
09/11/09	22:30	North	09-C0049		EPA/GE Dredging Project	1					
09/11/09	22:30	North	09-C0077		EPA/GE Dredging Project	1					
09/11/09	23:40	South	09-C0049		EPA/GE Dredging Project	1					
09/11/09	23:40	South	09-C0077		EPA/GE Dredging Project	1					
09/12/09	1:35	North	09-C0124		EPA/GE Dredging Project	1					
09/12/09	1:35	North	09-C0122		EPA/GE Dredging Project	1					
09/12/09	3:50	South	09-C0124		EPA/GE Dredging Project	1					
09/12/09	3:50	South	09-C0122		EPA/GE Dredging Project	1					
09/12/09	5:35	North	09-C0124		EPA/GE Dredging Project	1					
09/12/09	5:35	North	09-C0122		EPA/GE Dredging Project	1					
09/12/09	7:00	South	09-C0122		EPA/GE Dredging Project	1					
09/12/09	7:00	South	09-C0124		EPA/GE Dredging Project	1					
09/12/09	8:00	North	09-C0077		EPA/GE Dredging Project	1					
09/12/09	8:00	North	09-C0042		EPA/GE Dredging Project	1					
09/12/09	9:50	South	09-C0042		EPA/GE Dredging Project	1					
09/12/09	9:50	South	09-C0077		EPA/GE Dredging Project	1					
09/12/09	10:45	North	09-C0124		EPA/GE Dredging Project	1					
09/12/09	10:45	North	09-C0122		EPA/GE Dredging Project	1					
09/12/09	11:10	South	09-21260		Pleasure	1	ABIGAIL				
09/12/09	11:25	North	09-S0736		Pleasure	1					
09/12/09	13:30	South	09-C0124		EPA/GE Dredging Project	1					
09/12/09	13:30	South	09-C0122		EPA/GE Dredging Project	1					
09/12/09	14:35	North	09-C0124		EPA/GE Dredging Project	1					
09/12/09	14:35	North	09-C0122		EPA/GE Dredging Project	1					
09/12/09	15:05	South	09-20486		Pleasure	1	COMPANERA				
09/12/09	15:30	North	09-C0105		EPA/GE Dredging Project	1					
09/12/09	15:30	North	09-C0043		EPA/GE Dredging Project	1					
09/12/09	16:40	South	09-C0043		EPA/GE Dredging Project	1					
09/12/09	16:40	South	09-S0736		Pleasure	1					
09/12/09	17:05	North	09-22521		Pleasure	1					
09/12/09	17:45	South	09-C0105		EPA/GE Dredging Project	1					
09/12/09	19:00	South	09-C0124		EPA/GE Dredging Project	1					
09/12/09	19:00	South	09-C0122		EPA/GE Dredging Project	1					
09/12/09	19:30	North	09-C0077		EPA/GE Dredging Project	1					
09/12/09	19:30	North	09-C0042		EPA/GE Dredging Project	1					
09/12/09	22:20	South	09-C0077		EPA/GE Dredging Project	1					
09/12/09	22:20	South	09-C0042		EPA/GE Dredging Project	1					
09/13/09	6:45	South	09-20489		Pleasure	1					
09/13/09	7:20	North	09-C0046		EPA/GE Dredging Project	1					
09/13/09	7:20	North	09-C0078		EPA/GE Dredging Project	1					
09/13/09	7:45	South	09-21259		Pleasure	1	D.M. DOLPHIN 1				
09/13/09	8:00	North	09-C0104		EPA/GE Dredging Project	1					
09/13/09	8:15	South	09-22521	NY1635OG	Pleasure	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
09/13/09	9:25	North	09-C0045		EPA/GE Dredging Project	1					
09/13/09	9:25	North	09-C0042		EPA/GE Dredging Project	1					
09/13/09	10:10	South	09-C0046		EPA/GE Dredging Project	1					
09/13/09	10:10	South	09-C0078		EPA/GE Dredging Project	1					
09/13/09	10:40	South	09-20487		Pleasure	1	LANIKAI				
09/13/09	10:40	South	09-C0104		EPA/GE Dredging Project	1					
09/13/09	11:25	South	09-C0042		EPA/GE Dredging Project	1					
09/13/09	11:25	South	09-C0045		EPA/GE Dredging Project	1					
09/13/09	11:50	South	09-S0862		Pleasure	1	ALWAYS SATURDAY				
09/13/09	11:50	South	09-20488		Pleasure	1	UNICORN				
09/13/09	12:05	North	09-S0824		Pleasure	1	RED DEVIL				
09/13/09	12:05	North	09-S0825		Pleasure	1					
09/13/09	13:05	North	09-C0104		EPA/GE Dredging Project	1					
09/13/09	13:05	North	09-C0076		EPA/GE Dredging Project	1					
09/13/09	14:35	South	09-C0076		EPA/GE Dredging Project	1					
09/13/09	14:35	South	09-C0104		EPA/GE Dredging Project	1					
09/13/09	15:25	North	09-C0124		EPA/GE Dredging Project	1					
09/13/09	15:25	North	09-C0122		EPA/GE Dredging Project	1					
09/13/09	15:45	South	09-S0824		Pleasure	1	RED DEVIL				
09/13/09	15:45	South	09-S0825		Pleasure	1	TERMITES DELIGHT				
09/13/09	16:50	South	09-20490		Pleasure	1	GREAT WHITE				
09/13/09	17:15	South	09-C0124		EPA/GE Dredging Project	1					
09/13/09	17:15	South	09-C0122		EPA/GE Dredging Project	1					
09/13/09	18:15	North	09-C0076		EPA/GE Dredging Project	1					
09/13/09	18:15	North	09-C0104		EPA/GE Dredging Project	1					
09/13/09	19:45	South	09-C0042		EPA/GE Dredging Project	1					
09/13/09	19:45	South	09-C0104		EPA/GE Dredging Project	1					
09/13/09	20:35	North	09-C0042		EPA/GE Dredging Project	1					
09/13/09	20:35	North	09-C0104		EPA/GE Dredging Project	1					
09/13/09	21:50	South	09-C0076		EPA/GE Dredging Project	1					
09/13/09	21:50	South	09-C0104		EPA/GE Dredging Project	1					
09/14/09	3:00	North	09-C0124		EPA/GE Dredging Project	1					
09/14/09	3:00	North	09-C0122		EPA/GE Dredging Project	1					
09/14/09	6:30	South	09-C0122		EPA/GE Dredging Project	1					
09/14/09	6:30	South	09-C0124		EPA/GE Dredging Project	1					
09/14/09	7:05	North	09-C0077		EPA/GE Dredging Project	1					
09/14/09	7:05	North	09-C0049		EPA/GE Dredging Project	1					
09/14/09	7:35	North	09-C0104		EPA/GE Dredging Project	1					
09/14/09	8:50	South	09-C0049		EPA/GE Dredging Project	1					
09/14/09	8:50	South	09-C0077		EPA/GE Dredging Project	1					
09/14/09	9:10	North	09-22522		Pleasure	1					
09/14/09	9:35	South	09-C0104		EPA/GE Dredging Project	1					
09/14/09	10:00	North	09-C0049		EPA/GE Dredging Project	1					
09/14/09	10:00	North	09-C0077		EPA/GE Dredging Project	1					
09/14/09	10:45	South	09-20238		Pleasure	1	MOON SHADOW				
09/14/09	11:35	South	09-C0077		EPA/GE Dredging Project	1					
09/14/09	11:35	South	09-C0049		EPA/GE Dredging Project	1					
09/14/09	12:00	South	09-24101		Pleasure	1	OCEANE II				
09/14/09	12:45	North	09-C0077		EPA/GE Dredging Project	1					
09/14/09	12:45	North	09-C0122		EPA/GE Dredging Project	1					
09/14/09	12:55	South	09-24102		Pleasure	1	GRAND ADVENTURE				
09/14/09	13:15	North	09-C0104		EPA/GE Dredging Project	1					
09/14/09	14:05	South	09-C0122		EPA/GE Dredging Project	1					
09/14/09	14:05	South	09-C0077		EPA/GE Dredging Project	1					
09/14/09	14:20	North	09-10946		Pleasure	1	LITTLE BITT				
09/14/09	14:20	North	09-10949		Pleasure	1	VOLENDAM				
09/14/09	14:35	South	09-C0104		EPA/GE Dredging Project	1					
09/14/09	14:55	North	09-C0077		EPA/GE Dredging Project	1					
09/14/09	14:55	North	09-C0122		EPA/GE Dredging Project	1					
09/14/09	17:25	South	09-C0122		EPA/GE Dredging Project	1					
09/14/09	17:25	South	09-C0077		EPA/GE Dredging Project	1					
09/14/09	19:25	North	09-C0077		EPA/GE Dredging Project	1					
09/14/09	19:25	North	09-C0042		EPA/GE Dredging Project	1					
09/14/09	19:45	North	09-C0043		EPA/GE Dredging Project	1					
09/14/09	20:55	North	09-C0042		EPA/GE Dredging Project	1					
09/14/09	20:55	North	09-C0077		EPA/GE Dredging Project	1					
09/14/09	21:30	North	09-C0049		EPA/GE Dredging Project	1					
09/14/09	21:45	South	09-C0043		EPA/GE Dredging Project	1					
09/14/09	22:30	South	09-C0049		EPA/GE Dredging Project	1					
09/15/09	1:10	North	09-C0042		EPA/GE Dredging Project	1					
09/15/09	1:10	North	09-C0124		EPA/GE Dredging Project	1					
09/15/09	1:50	North	09-C0077		EPA/GE Dredging Project	1					
09/15/09	1:50	North	09-C0122		EPA/GE Dredging Project	1					
09/15/09	3:35	South	09-C0124		EPA/GE Dredging Project	1					
09/15/09	3:35	South	09-C0042		EPA/GE Dredging Project	1					
09/15/09	4:20	South	09-C0077		EPA/GE Dredging Project	1					
09/15/09	4:20	South	09-C0122		EPA/GE Dredging Project	1					
09/15/09	5:10	North	09-C0077		EPA/GE Dredging Project	1					
09/15/09	5:10	North	09-C0122		EPA/GE Dredging Project	1					
09/15/09	7:15	South	09-C0077		EPA/GE Dredging Project	1					
09/15/09	7:15	South	09-C0122		EPA/GE Dredging Project	1					
09/15/09	7:50	North	09-C0124		EPA/GE Dredging Project	1					
09/15/09	7:50	North	09-C0042		EPA/GE Dredging Project	1					
09/15/09	9:05	South	09-C0124		EPA/GE Dredging Project	1					
09/15/09	9:05	South	09-C0042		EPA/GE Dredging Project	1					
09/15/09	9:55	North	09-C0124		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
09/15/09	9:55	North	09-C0042		EPA/GE Dredging Project	1					
09/15/09	10:10	South	09-24104	818413	Pleasure	1	ATTITUDE				
09/15/09	11:00	South	09-C0124		EPA/GE Dredging Project	1					
09/15/09	11:00	South	09-C0042		EPA/GE Dredging Project	1					
09/15/09	11:10	North	09-S0868		Pleasure	1	DINGHY				
09/15/09	11:10	North			Pleasure - No motor	1	CANAL SCHOONER LOIS MCLURE				
09/15/09	11:10	North	09-S0867		Pleasure	1	TUG CHURCHILL				
09/15/09	12:30	South	09-C0124		EPA/GE Dredging Project	1					
09/15/09	12:30	South	09-C0042		EPA/GE Dredging Project	1					
09/15/09	13:10	North	09-C0042		EPA/GE Dredging Project	1					
09/15/09	13:10	North	09-C0124		EPA/GE Dredging Project	1					
09/15/09	13:40	North	09-C0077		EPA/GE Dredging Project	1					
09/15/09	13:40	North	09-C0043		EPA/GE Dredging Project	1					
09/15/09	14:55	North	09-C0012		EPA/GE Dredging Project	1					
09/15/09	15:10	South	09-C0077		EPA/GE Dredging Project	1					
09/15/09	15:10	South	09-24105	VT7880H	Pleasure	1	SALLY JEANE				
09/15/09	15:30	North	09-C0042		EPA/GE Dredging Project	1					
09/15/09	15:30	North	09-C0124		EPA/GE Dredging Project	1					
09/15/09	15:45	South	09-S0988		Pleasure	1	WINSOME				
09/15/09	16:55	South	09-C0042		EPA/GE Dredging Project	1					
09/15/09	16:55	South	09-C0124		EPA/GE Dredging Project	1					
09/15/09	17:00	South	09-C0043		EPA/GE Dredging Project	1					
09/15/09	17:15	North	09-11254		Pleasure	1	SKIMMER				
09/15/09	17:25	South	09-C0122		EPA/GE Dredging Project	1					
09/15/09	18:00	South	09-24108		Pleasure	1					
09/15/09	18:20	North	09-C0042		EPA/GE Dredging Project	1					
09/15/09	18:20	North	09-C0124		EPA/GE Dredging Project	1					
09/15/09	21:30	North	09-C0124		EPA/GE Dredging Project	1					
09/15/09	21:30	North	09-C0042		EPA/GE Dredging Project	1					
09/16/09	0:55	North	09-C0122		EPA/GE Dredging Project	1					
09/16/09	0:55	North	09-C0124		EPA/GE Dredging Project	1					
09/16/09	3:10	South	09-C0124		EPA/GE Dredging Project	1					
09/16/09	3:10	South	09-C0122		EPA/GE Dredging Project	1					
09/16/09	4:55	North	09-C0077		EPA/GE Dredging Project	1					
09/16/09	6:00	North	09-C0124		EPA/GE Dredging Project	1					
09/16/09	6:00	North	09-C0122		EPA/GE Dredging Project	1					
09/16/09	6:20	South	09-C0077		EPA/GE Dredging Project	1					
09/16/09	9:40	North	09-C0124		EPA/GE Dredging Project	1					
09/16/09	9:40	North	09-C0122		EPA/GE Dredging Project	1					
09/16/09	9:55	South	09-24106		Pleasure	1	KIMAEL				
09/16/09	11:20	South	09-C0122		EPA/GE Dredging Project	1					
09/16/09	11:20	South	09-C0124		EPA/GE Dredging Project	1					
09/16/09	12:15	North	09-S0605		Pleasure	1					
09/16/09	12:40	North	09-C0122		EPA/GE Dredging Project	1					
09/16/09	12:40	North	09-C0124		EPA/GE Dredging Project	1					
09/16/09	16:10	South	09-C0122		EPA/GE Dredging Project	1					
09/16/09	16:10	South	09-C0124		EPA/GE Dredging Project	1					
09/16/09	17:05	North	09-C0122		EPA/GE Dredging Project	1					
09/16/09	17:05	North	09-C0124		EPA/GE Dredging Project	1					
09/16/09	18:50	South	09-C0122		EPA/GE Dredging Project	1					
09/16/09	18:50	South	09-C0124		EPA/GE Dredging Project	1					
09/16/09	19:20	North	09-C0122		EPA/GE Dredging Project	1					
09/16/09	19:20	North	09-C0124		EPA/GE Dredging Project	1					
09/16/09	20:35	South	09-C0124		EPA/GE Dredging Project	1					
09/16/09	20:35	South	09-C0122		EPA/GE Dredging Project	1					
09/16/09	21:00	North	09-C0043		EPA/GE Dredging Project	1					
09/17/09	1:50	North	09-C0122		EPA/GE Dredging Project	1					
09/17/09	1:50	North	09-C0124		EPA/GE Dredging Project	1					
09/17/09	6:25	North	09-C0077		EPA/GE Dredging Project	1					
09/17/09	6:25	North	09-C0042		EPA/GE Dredging Project	1					
09/17/09	7:30	South	09-C0124		EPA/GE Dredging Project	1					
09/17/09	7:30	South	09-C0122		EPA/GE Dredging Project	1					
09/17/09	8:05	South	09-C0077		EPA/GE Dredging Project	1					
09/17/09	8:05	South	09-C0042		EPA/GE Dredging Project	1					
09/17/09	9:50	North	09-C0042		EPA/GE Dredging Project	1					
09/17/09	9:50	North	09-C0077		EPA/GE Dredging Project	1					
09/17/09	11:15	South	09-24109		Pleasure	1					
09/17/09	11:30	North			Other Government	1	OVER SITE II				
09/17/09	12:15	South			Other Government	1	OVERSITE II				
09/17/09	13:40	North	09-C0124		EPA/GE Dredging Project	1					
09/17/09	13:55	South	09-C0077		EPA/GE Dredging Project	1					
09/17/09	13:55	South	09-C0042		EPA/GE Dredging Project	1					
09/17/09	14:15	South			Employee / Retiree	1	MIKE REILLY				
09/17/09	14:45	North	09-C0042		EPA/GE Dredging Project	1					
09/17/09	14:45	North	09-C0077		EPA/GE Dredging Project	1					
09/17/09	15:15	North	09-S0804		Pleasure	1	EVENING STAR				
09/17/09	15:15	North	09-C0049		EPA/GE Dredging Project	1					
09/17/09	16:05	South	09-C0124		EPA/GE Dredging Project	1					
09/17/09	16:05	South	09-C0077		EPA/GE Dredging Project	1					
09/17/09	16:05	South	09-C0042		EPA/GE Dredging Project	1					
09/17/09	16:25	North			Employee / Retiree	1	MIKE REILLY				
09/17/09	16:35	South	09-C0049		EPA/GE Dredging Project	1					
09/17/09	17:20	North	09-C0043		EPA/GE Dredging Project	1					
09/17/09	19:15	South	09-C0043		EPA/GE Dredging Project	1					
09/17/09	20:00	North	09-C0077		EPA/GE Dredging Project	1					
09/17/09	20:00	North	09-C0042		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
09/17/09	21:35	South	09-C0042		EPA/GE Dredging Project	1					
09/17/09	21:35	South	09-C0077		EPA/GE Dredging Project	1					
09/18/09	3:50	North	09-C0124		EPA/GE Dredging Project	1					
09/18/09	3:50	North	09-C0122		EPA/GE Dredging Project	1					
09/18/09	4:45	North	09-C0043		EPA/GE Dredging Project	1					
09/18/09	5:50	South	09-C0122		EPA/GE Dredging Project	1					
09/18/09	5:50	South	09-C0124		EPA/GE Dredging Project	1					
09/18/09	8:00	South	09-24111		Pleasure	1	SPLENDOUR				
09/18/09	8:35	South	09-C0043		EPA/GE Dredging Project	1					
09/18/09	9:35	North	09-C0049		EPA/GE Dredging Project	1					
09/18/09	10:05	North			Other Government	1	ENCON				
09/18/09	10:30	South	09-C0049		EPA/GE Dredging Project	1					
09/18/09	13:25	South	09-24106		Pleasure	1	JOLIE JULIE				
09/18/09	13:45	North	09-10926		Pleasure	1	LADY H				
09/18/09	14:40	South	09-24112		Pleasure	1					
09/18/09	17:45	North	09-C0124		EPA/GE Dredging Project	1					
09/18/09	17:45	North	09-C0042		EPA/GE Dredging Project	1					
09/18/09	17:45	North	09-C0043		EPA/GE Dredging Project	1					
09/18/09	18:50	South	09-C0124		EPA/GE Dredging Project	1					
09/18/09	18:50	South	09-C0042		EPA/GE Dredging Project	1					
09/18/09	19:55	South	09-C0043		EPA/GE Dredging Project	1					
09/18/09	21:15	North	09-C0042		EPA/GE Dredging Project	1					
09/18/09	21:15	North	09-C0124		EPA/GE Dredging Project	1					
09/18/09	22:20	South	09-C0124		EPA/GE Dredging Project	1					
09/18/09	22:20	South	09-C0042		EPA/GE Dredging Project	1					
09/19/09	1:25	North	09-C0122		EPA/GE Dredging Project	1					
09/19/09	1:25	North	09-C0124		EPA/GE Dredging Project	1					
09/19/09	3:30	South	09-C0124		EPA/GE Dredging Project	1					
09/19/09	3:30	South	09-C0122		EPA/GE Dredging Project	1					
09/19/09	6:20	North	09-C0077		EPA/GE Dredging Project	1					
09/19/09	6:20	North	09-C0042		EPA/GE Dredging Project	1					
09/19/09	7:30	South	09-C0042		EPA/GE Dredging Project	1					
09/19/09	7:30	South	09-C0077		EPA/GE Dredging Project	1					
09/19/09	10:40	North	09-C0077		EPA/GE Dredging Project	1					
09/19/09	10:40	North	09-C0042		EPA/GE Dredging Project	1					
09/19/09	11:45	North	09-C0034		Tour Non-sleep aboard	1					
09/19/09	12:55	North	UPT-15403		Pleasure	1	NOAH GENDA				
09/19/09	12:55	North	UPT-15404		Pleasure	1	SEA DUCTION				
09/19/09	12:55	North	UPT-15405		Pleasure	1	LUCKY WINN				
09/19/09	13:05	South	09-C0077		EPA/GE Dredging Project	1					
09/19/09	13:05	South	09-C0042		EPA/GE Dredging Project	1					
09/19/09	13:50	North	09-C0077		EPA/GE Dredging Project	1					
09/19/09	13:50	North	09-C0042		EPA/GE Dredging Project	1					
09/19/09	14:10	North	09-S0619		Pleasure	1	SEMPER FI				
09/19/09	15:40	South	09-C0077		EPA/GE Dredging Project	1					
09/19/09	15:40	South	09-C0042		EPA/GE Dredging Project	1					
09/19/09	16:00	South	09-24115		Pleasure	1	DOUBLE J.D.				
09/19/09	18:10	North	09-C0042		EPA/GE Dredging Project	1					
09/19/09	18:10	North	09-C0077		EPA/GE Dredging Project	1					
09/19/09	19:05	South	09-C0077		EPA/GE Dredging Project	1					
09/19/09	19:05	South	09-C0042		EPA/GE Dredging Project	1					
09/20/09	10:30	North	09-C0046		EPA/GE Dredging Project	1					
09/20/09	10:30	North	09-C0123		EPA/GE Dredging Project	1					
09/20/09	11:20	South	09-S0026		Pleasure	1	TUG 44				
09/20/09	12:40	South	09-C0046		EPA/GE Dredging Project	1					
09/20/09	12:40	South	09-C0123		EPA/GE Dredging Project	1					
09/20/09	12:55	North	09-S0726		Pleasure	1					
09/20/09	12:55	North	09-S0825		Pleasure	1					
09/20/09	13:05	South			Other Government	1	DEC 282				
09/20/09	13:45	South	09-24114		Pleasure	1					
09/20/09	13:45	South	09-24113		Pleasure	1					
09/20/09	13:45	South	09-24116		Pleasure	1					
09/20/09	14:00	North	09-22523		Pleasure	1	BORKA				
09/20/09	14:25	South	09-C0034		Tour Non-sleep aboard	1	CALDWELL BELLE				
09/20/09	14:25	South	09-S0909		Pleasure	1					
09/20/09	14:25	South	UPT-15404		Pleasure	1	SEA DUCTION				
09/20/09	14:25	South	UPT-15403		Pleasure	1	NOAH GENDA				
09/20/09	14:25	South	UPT-15405		Pleasure	1	LUCKY WINN				
09/20/09	14:35	North	09-S0026		Pleasure	1	TUG 44				
09/20/09	15:20	North	09-C0046		EPA/GE Dredging Project	1					
09/20/09	16:25	South	09-C0046		EPA/GE Dredging Project	1					
09/20/09	16:45	South	09-S0825		Pleasure	1	TERMITES DELIGHT				
09/20/09	16:45	South	09-S0726		Pleasure	1	RED DEVIL				
09/20/09	17:10	North	09-C0046		EPA/GE Dredging Project	1					
09/20/09	17:55	North	09-C0122		EPA/GE Dredging Project	1					
09/20/09	17:55	North	09-C0042		EPA/GE Dredging Project	1					
09/20/09	19:05	South	09-C0122		EPA/GE Dredging Project	1					
09/20/09	19:05	South	09-C0042		EPA/GE Dredging Project	1					
09/20/09	19:05	South	09-C0046		EPA/GE Dredging Project	1					
09/21/09	1:00	North	09-C0124		EPA/GE Dredging Project	1					
09/21/09	1:00	North	09-C0122		EPA/GE Dredging Project	1					
09/21/09	9:30	South	09-C0124		EPA/GE Dredging Project	1					
09/21/09	9:30	South	09-C0122		EPA/GE Dredging Project	1					
09/21/09	10:05	North	09-C0042		EPA/GE Dredging Project	1					
09/21/09	10:05	North	09-C0077		EPA/GE Dredging Project	1					
09/21/09	10:20	South	09-24118		Pleasure	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
09/21/09	10:35	North	09-C0124		EPA/GE Dredging Project	1					
09/21/09	10:35	North	09-C0122		EPA/GE Dredging Project	1					
09/21/09	10:55	South	09-10947		Pleasure	1					
09/21/09	11:15	South	09-23986		Pleasure	1					
09/21/09	11:45	South	09-11254		Pleasure	1	SKIMMER				
09/21/09	12:00	North	09-S0807		Pleasure	1					
09/21/09	12:55	South	09-C0042		EPA/GE Dredging Project	1					
09/21/09	12:55	South	09-C0077		EPA/GE Dredging Project	1					
09/21/09	13:15	South	09-24117		Pleasure	1	SUNRISE				
09/21/09	13:40	North	09-C0042		EPA/GE Dredging Project	1					
09/21/09	13:40	North	09-C0043		EPA/GE Dredging Project	1					
09/21/09	13:40	North	09-C0077		EPA/GE Dredging Project	1					
09/21/09	15:05	South	09-C0042		EPA/GE Dredging Project	1					
09/21/09	15:05	South	09-C0077		EPA/GE Dredging Project	1					
09/21/09	15:25	North	09-22525		Pleasure	1					
09/21/09	15:55	North	09-C0122		EPA/GE Dredging Project	1					
09/21/09	15:55	North	09-C0124		EPA/GE Dredging Project	1					
09/21/09	16:10	South	09-C0043		EPA/GE Dredging Project	1					
09/21/09	17:20	South	09-C0122		EPA/GE Dredging Project	1					
09/21/09	17:20	South	09-C0124		EPA/GE Dredging Project	1					
09/21/09	18:15	North	09-C0042		EPA/GE Dredging Project	1					
09/21/09	18:15	North	09-C0077		EPA/GE Dredging Project	1					
09/21/09	18:55	North	09-C0122		EPA/GE Dredging Project	1					
09/21/09	18:55	North	09-C0122		EPA/GE Dredging Project	1					
09/21/09	19:35	South	09-C0077		EPA/GE Dredging Project	1					
09/21/09	19:35	South	09-C0042		EPA/GE Dredging Project	1					
09/21/09	20:55	South	09-C0124		EPA/GE Dredging Project	1					
09/21/09	20:55	South	09-C0122		EPA/GE Dredging Project	1					
09/21/09	22:20	North	09-C0124		EPA/GE Dredging Project	1					
09/21/09	22:20	North	09-C0122		EPA/GE Dredging Project	1					
09/21/09	23:25	South	09-C0122		EPA/GE Dredging Project	1					
09/21/09	23:25	South	09-C0124		EPA/GE Dredging Project	1					
09/22/09	1:10	North	09-C0124		EPA/GE Dredging Project	1					
09/22/09	1:10	North	09-C0122		EPA/GE Dredging Project	1					
09/22/09	2:35	South	09-C0124		EPA/GE Dredging Project	1					
09/22/09	2:35	South	09-C0122		EPA/GE Dredging Project	1					
09/22/09	5:00	North	09-C0049		EPA/GE Dredging Project	1					
09/22/09	6:00	South	09-C0049		EPA/GE Dredging Project	1					
09/22/09	6:40	North	09-C0124		EPA/GE Dredging Project	1					
09/22/09	6:40	North	09-C0122		EPA/GE Dredging Project	1					
09/22/09	8:55	South	09-C0124		EPA/GE Dredging Project	1					
09/22/09	8:55	South	09-C0122		EPA/GE Dredging Project	1					
09/22/09	9:15	North	09-22527		Pleasure	1	BIJOU				
09/22/09	9:30	North	09-C0043		EPA/GE Dredging Project	1					
09/22/09	10:30	North	09-C0124		EPA/GE Dredging Project	1					
09/22/09	10:30	North	09-C0122		EPA/GE Dredging Project	1					
09/22/09	12:00	North	09-22526		Pleasure	1	NOMAD				
09/22/09	12:15	South	09-S0619		Pleasure	1	SEMPER FI				
09/22/09	13:05	South	09-C0012		EPA/GE Dredging Project	1					
09/22/09	13:05	South	09-C0122		EPA/GE Dredging Project	1					
09/22/09	13:20	North	09-22528		Pleasure	1					
09/22/09	13:50	North	09-C0046		EPA/GE Dredging Project	1					
09/22/09	14:10	South	09-C0046		EPA/GE Dredging Project	1					
09/22/09	14:10	South	09-C0043		EPA/GE Dredging Project	1					
09/22/09	15:00	North	09-C0045		EPA/GE Dredging Project	1					
09/22/09	16:55	North	09-C0077		EPA/GE Dredging Project	1					
09/22/09	16:55	North	09-C0042		EPA/GE Dredging Project	1					
09/22/09	18:00	South	09-C0045		EPA/GE Dredging Project	1					
09/22/09	18:00	South	09-C0042		EPA/GE Dredging Project	1					
09/22/09	18:00	South	09-C0077		EPA/GE Dredging Project	1					
09/23/09	1:20	North	09-C0122		EPA/GE Dredging Project	1					
09/23/09	1:20	North	09-C0124		EPA/GE Dredging Project	1					
09/23/09	3:25	South	09-C0122		EPA/GE Dredging Project	1					
09/23/09	3:25	South	09-C0124		EPA/GE Dredging Project	1					
09/23/09	5:40	North	09-C0122		EPA/GE Dredging Project	1					
09/23/09	5:40	North	09-C0124		EPA/GE Dredging Project	1					
09/23/09	7:25	South	09-C0124		EPA/GE Dredging Project	1					
09/23/09	7:25	South	09-C0122		EPA/GE Dredging Project	1					
09/23/09	8:10	North	09-C0043		EPA/GE Dredging Project	1					
09/23/09	9:50	South	09-24119		Pleasure	1					
09/23/09	9:50	South	09-24120		Pleasure	1					
09/23/09	10:25	South	09-C0043		EPA/GE Dredging Project	1					
09/23/09	12:30	North	09-C0077		EPA/GE Dredging Project	1					
09/23/09	12:30	North	09-C0124		EPA/GE Dredging Project	1					
09/23/09	13:25	North			Other Government	1	OVERSITE LL				
09/23/09	13:45	South	09-24124		Pleasure	1					
09/23/09	13:45	South	09-24123		Pleasure	1					
09/23/09	13:45	South	09-24122		Pleasure	1					
09/23/09	14:15	South	09-C0077		EPA/GE Dredging Project	1					
09/23/09	14:15	South	09-C0124		EPA/GE Dredging Project	1					
09/23/09	14:30	South			Other Government	1	OVERSITE LL				
09/23/09	15:00	North	09-C0124		EPA/GE Dredging Project	1					
09/23/09	15:00	North	09-C0077		EPA/GE Dredging Project	1					
09/23/09	16:30	South	09-C0124		EPA/GE Dredging Project	1					
09/23/09	16:30	South	09-C0077		EPA/GE Dredging Project	1					
09/23/09	17:25	North	09-C0077		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
09/23/09	17:25	North	09-C0124		EPA/GE Dredging Project	1					
09/23/09	18:45	South	09-C0077		EPA/GE Dredging Project	1					
09/23/09	18:45	South	09-C0124		EPA/GE Dredging Project	1					
09/23/09	21:10	North	09-C0122		EPA/GE Dredging Project	1					
09/23/09	22:30	South	09-C0122		EPA/GE Dredging Project	1					
09/23/09	22:30	South	09-C0124		EPA/GE Dredging Project	1					
09/24/09	1:00	North	09-C0122		EPA/GE Dredging Project	1					
09/24/09	1:00	North	09-C0124		EPA/GE Dredging Project	1					
09/24/09	3:30	South	09-C0122		EPA/GE Dredging Project	1					
09/24/09	3:30	South	09-C0124		EPA/GE Dredging Project	1					
09/24/09	4:30	North	09-C0124		EPA/GE Dredging Project	1					
09/24/09	4:30	North	09-C0122		EPA/GE Dredging Project	1					
09/24/09	7:20	South	09-C0122		EPA/GE Dredging Project	1					
09/24/09	7:20	South	09-C0124		EPA/GE Dredging Project	1					
09/24/09	8:10	North	09-C0124		EPA/GE Dredging Project	1					
09/24/09	8:10	North	09-C0122		EPA/GE Dredging Project	1					
09/24/09	8:55	North	09-22530		Pleasure	1					
09/24/09	8:55	North	09-22529		Pleasure	1					
09/24/09	10:10	South	09-C0124		EPA/GE Dredging Project	1					
09/24/09	10:10	South	09-C0122		EPA/GE Dredging Project	1					
09/24/09	12:10	South	09-24125		Pleasure	1					
09/24/09	12:10	South	09-24124		Pleasure	1					
09/24/09	12:25	North	09-C0124		EPA/GE Dredging Project	1					
09/24/09	12:25	North	09-C0122		EPA/GE Dredging Project	1					
09/24/09	12:50	North	09-C0043		EPA/GE Dredging Project	1					
09/24/09	14:10	North	09-22531		Pleasure	1					
09/24/09	14:50	North	09-C0104		EPA/GE Dredging Project	1					
09/24/09	15:45	South	09-C0104		EPA/GE Dredging Project	1					
09/24/09	15:45	South	09-C0124		EPA/GE Dredging Project	1					
09/24/09	15:45	South	09-C0122		EPA/GE Dredging Project	1					
09/24/09	16:30	South	09-24126		Pleasure	1	PAMERO				
09/24/09	16:30	South	09-S2125		Pleasure	1	KNIGHT HAWK				
09/24/09	16:30	South	09-C0043		EPA/GE Dredging Project	1					
09/24/09	16:50	North	09-C0122		EPA/GE Dredging Project	1					
09/24/09	16:50	North	09-C0124		EPA/GE Dredging Project	1					
09/24/09	17:25	North	09-22532		Pleasure	1					
09/24/09	21:55	South	09-C0124		EPA/GE Dredging Project	1					
09/24/09	21:55	South	09-C0122		EPA/GE Dredging Project	1					
09/25/09	0:50	North	09-C0122		EPA/GE Dredging Project	1					
09/25/09	0:50	North	09-C0049		EPA/GE Dredging Project	1					
09/25/09	2:50	South	09-C0122		EPA/GE Dredging Project	1					
09/25/09	2:50	South	09-C0049		EPA/GE Dredging Project	1					
09/25/09	4:10	North	09-C0049		EPA/GE Dredging Project	1					
09/25/09	4:10	North	09-C0122		EPA/GE Dredging Project	1					
09/25/09	6:15	South	09-C0122		EPA/GE Dredging Project	1					
09/25/09	6:15	South	09-C0049		EPA/GE Dredging Project	1					
09/25/09	8:00	North	09-C0049		EPA/GE Dredging Project	1					
09/25/09	8:00	North	09-C0122		EPA/GE Dredging Project	1					
09/25/09	9:20	North	09-C0104		EPA/GE Dredging Project	1					
09/25/09	9:45	South	09-C0122		EPA/GE Dredging Project	1					
09/25/09	9:45	South	09-C0049		EPA/GE Dredging Project	1					
09/25/09	11:40	North			Other Government	1	NYSDEC BOAT 1				
09/25/09	11:40	North	09-22533		Pleasure	1	PARTRICIA K				
09/25/09	12:45	North	09-C0077		EPA/GE Dredging Project	1					
09/25/09	12:45	North	09-C0042		EPA/GE Dredging Project	1					
09/25/09	13:05	South			Other Government	1	NYSDEC BOAT1				
09/25/09	13:55	South	09-24128		Pleasure	1					
09/25/09	13:55	South	09-24129		Pleasure	1					
09/25/09	13:55	South	09-24127		Pleasure	1					
09/25/09	14:20	South	09-C0042		EPA/GE Dredging Project	1					
09/25/09	14:20	South	09-C0077		EPA/GE Dredging Project	1					
09/25/09	14:50	South	09-24130		Pleasure	1					
09/25/09	14:50	South	09-C0104		EPA/GE Dredging Project	1					
09/25/09	15:15	South	09-10926		Pleasure	1	LADY H				
09/25/09	15:15	South	09-24131		Pleasure	1	FIL EAN III				
09/25/09	15:50	North	09-C0077		EPA/GE Dredging Project	1					
09/25/09	15:50	North	09-C0042		EPA/GE Dredging Project	1					
09/25/09	16:40	North	09-C0043		EPA/GE Dredging Project	1					
09/25/09	17:15	South	09-C0077		EPA/GE Dredging Project	1					
09/25/09	17:15	South	09-C0042		EPA/GE Dredging Project	1					
09/25/09	18:50	South	09-C0043		EPA/GE Dredging Project	1					
09/25/09	19:40	North	09-C0077		EPA/GE Dredging Project	1					
09/25/09	19:40	North	09-C0042		EPA/GE Dredging Project	1					
09/25/09	22:40	South	09-C0042		EPA/GE Dredging Project	1					
09/25/09	22:40	South	09-C0077		EPA/GE Dredging Project	1					
09/26/09	0:50	North	09-C0049		EPA/GE Dredging Project	1					
09/26/09	0:50	North	09-C0077		EPA/GE Dredging Project	1					
09/26/09	10:30	South	09-C0049		EPA/GE Dredging Project	1					
09/26/09	10:30	South	09-C0077		EPA/GE Dredging Project	1					
09/26/09	11:25	North	09-C0042		EPA/GE Dredging Project	1					
09/26/09	11:25	North	09-C0077		EPA/GE Dredging Project	1					
09/26/09	12:55	South	09-C0077		EPA/GE Dredging Project	1					
09/26/09	12:55	South	09-C0042		EPA/GE Dredging Project	1					
09/26/09	14:00	South	09-24133		Pleasure	1	DESS				
09/26/09	14:15	North	09-10947	VT6963K	Pleasure	1					
09/26/09	15:20	North	09-C0043		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
09/26/09	15:50	North	09-S0901		Pleasure	1					
09/26/09	16:05	South	09-24134		Pleasure	1	LA FLANEUSE				
09/26/09	16:25	North	09-C0122		EPA/GE Dredging Project	1					
09/26/09	17:45	South	09-C0043		EPA/GE Dredging Project	1					
09/26/09	17:45	South	09-C0122		EPA/GE Dredging Project	1					
09/26/09	18:10	North	09-C0042		EPA/GE Dredging Project	1					
09/26/09	18:10	North	09-C0077		EPA/GE Dredging Project	1					
09/26/09	19:35	South	09-C0042		EPA/GE Dredging Project	1					
09/26/09	19:35	South	09-C0077		EPA/GE Dredging Project	1					
09/26/09	20:25	North	09-C0122		EPA/GE Dredging Project	1					
09/26/09	21:10	South	09-C0122		EPA/GE Dredging Project	1					
09/27/09	2:30	North	09-C0042		EPA/GE Dredging Project	1					
09/27/09	2:30	North	09-C0122		EPA/GE Dredging Project	1					
09/27/09	4:55	South	09-C0042		EPA/GE Dredging Project	1					
09/27/09	4:55	South	09-C0122		EPA/GE Dredging Project	1					
09/27/09	7:40	North	09-C0122		EPA/GE Dredging Project	1					
09/27/09	7:40	North	09-C0103		EPA/GE Dredging Project	1					
09/27/09	10:05	South	09-C0122		EPA/GE Dredging Project	1					
09/27/09	10:05	South	09-C0103		EPA/GE Dredging Project	1					
09/27/09	10:30	South	09-24132		Pleasure	1					
09/27/09	11:00	North	09-C0103		EPA/GE Dredging Project	1					
09/27/09	11:00	North	09-C0122		EPA/GE Dredging Project	1					
09/27/09	11:40	South	09-24136		Pleasure	1	1 ERE ESCAPADE				
09/27/09	12:15	North	09-C0042		EPA/GE Dredging Project	1					
09/27/09	13:00	South	09-24135		Pleasure	1	MIGRATION				
09/27/09	13:25	South	09-C0122		EPA/GE Dredging Project	1					
09/27/09	13:25	South	09-C0103		EPA/GE Dredging Project	1					
09/27/09	14:00	North	09-C0103		EPA/GE Dredging Project	1					
09/27/09	14:00	North	09-C0122		EPA/GE Dredging Project	1					
09/27/09	14:15	South	09-C0042		EPA/GE Dredging Project	1					
09/27/09	15:20	South	09-C0122		EPA/GE Dredging Project	1					
09/27/09	15:20	South	09-C0103		EPA/GE Dredging Project	1					
09/27/09	18:05	North	09-C0049		EPA/GE Dredging Project	1					
09/27/09	18:20	South	09-C0049		EPA/GE Dredging Project	1					
09/28/09	0:45	North	09-C0124		EPA/GE Dredging Project	1					
09/28/09	0:45	North	09-C0122		EPA/GE Dredging Project	1					
09/28/09	3:05	South	09-C0124		EPA/GE Dredging Project	1					
09/28/09	3:05	South	09-C0122		EPA/GE Dredging Project	1					
09/28/09	7:40	North	09-C0043		EPA/GE Dredging Project	1					
09/28/09	9:40	North			Canal Corporation Vessel	1	TUG WATERFORD				
09/28/09	10:00	South	09-S0807		Pleasure	1	KAREN MARIE				
09/28/09	10:00	South	09-C0043		EPA/GE Dredging Project	1					
09/28/09	11:35	North	09-C0124		EPA/GE Dredging Project	1					
09/28/09	11:35	North	09-C0122		EPA/GE Dredging Project	1					
09/28/09	11:50	South	09-S0822		Pleasure	1	ISLAND GYPSY				
09/28/09	12:25	North	09-C0042		EPA/GE Dredging Project	1					
09/28/09	12:35	South	09-24138		Pleasure	1	MODERATION III				
09/28/09	13:10	South	09-C0042		EPA/GE Dredging Project	1					
09/28/09	13:35	South	09-C0124		EPA/GE Dredging Project	1					
09/28/09	13:35	South	09-C0122		EPA/GE Dredging Project	1					
09/28/09	14:50	South	09-24139		Pleasure	1	DOUCE EVASION				
09/28/09	16:10	North	09-C0122		EPA/GE Dredging Project	1					
09/28/09	16:10	North	09-C0124		EPA/GE Dredging Project	1					
09/28/09	17:35	South	09-C0122		EPA/GE Dredging Project	1					
09/28/09	17:35	South	09-C0124		EPA/GE Dredging Project	1					
09/28/09	20:00	North	09-C0043		EPA/GE Dredging Project	1					
09/28/09	22:20	South	09-C0043		EPA/GE Dredging Project	1					
09/29/09	3:00	North	09-C0042		EPA/GE Dredging Project	1					
09/29/09	3:00	North	09-C0077		EPA/GE Dredging Project	1					
09/29/09	7:15	South	09-24141		Pleasure	1	AZIMUT				
09/29/09	8:00	South	09-C0077		EPA/GE Dredging Project	1					
09/29/09	8:00	South	09-C0042		EPA/GE Dredging Project	1					
09/29/09	8:15	North			Other Government	1	ECHO				
09/29/09	8:30	South	09-S0901		Pleasure	1	CATABOUT				
09/29/09	9:35	South	09-24140		Pleasure	1					
09/29/09	10:00	South			Canal Corporation Vessel	1	TUG WATERFORD				
09/29/09	10:20	South	09-24145		Pleasure	1					
09/29/09	10:20	South	09-24144		Pleasure	1					
09/29/09	10:55	South	09-C0077		EPA/GE Dredging Project	1					
09/29/09	10:55	South	09-C0042		EPA/GE Dredging Project	1					
09/29/09	11:50	South	09-24143		Pleasure	1					
09/29/09	12:25	South	09-24142		Pleasure	1					
09/29/09	12:50	North	09-C0077		EPA/GE Dredging Project	1					
09/29/09	12:50	North	09-C0042		EPA/GE Dredging Project	1					
09/29/09	14:20	South	09-C0042		EPA/GE Dredging Project	1					
09/29/09	14:20	South	09-C0077		EPA/GE Dredging Project	1					
09/29/09	15:00	South	09-C0046		EPA/GE Dredging Project	1					
09/29/09	16:10	North	09-C0077		EPA/GE Dredging Project	1					
09/29/09	16:10	North	09-C0042		EPA/GE Dredging Project	1					
09/29/09	16:25	South			Other Government	1	ECHO-EPA				
09/29/09	17:10	South	09-C0046		EPA/GE Dredging Project	1					
09/29/09	17:35	South	09-C0077		EPA/GE Dredging Project	1					
09/29/09	17:35	South	09-C0042		EPA/GE Dredging Project	1					
09/29/09	18:00	South	09-24146	CAN. VD1882	Pleasure	1	BASILEA				
09/29/09	19:25	North	09-C0043		EPA/GE Dredging Project	1					
09/29/09	21:25	North	09-C0078		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
09/29/09	21:50	South	09-C0043		EPA/GE Dredging Project	1					
09/29/09	22:15	South	09-C0078		EPA/GE Dredging Project	1					
09/30/09	2:05	North	09-C0042		EPA/GE Dredging Project	1					
09/30/09	2:05	North	09-C0077		EPA/GE Dredging Project	1					
09/30/09	3:55	South	09-C0042		EPA/GE Dredging Project	1					
09/30/09	3:55	South	09-C0077		EPA/GE Dredging Project	1					
09/30/09	9:40	North			Canal Corporation Vessel	1	TUG WATERFORD				
09/30/09	11:40	South	09-24137		Pleasure	1	XANAX				
09/30/09	12:30	North	09-C0122		EPA/GE Dredging Project	1					
09/30/09	12:30	North	09-C0124		EPA/GE Dredging Project	1					
09/30/09	13:45	South	09-C0124		EPA/GE Dredging Project	1					
09/30/09	13:45	South	09-C0122		EPA/GE Dredging Project	1					
09/30/09	14:25	North	09-22537		Pleasure	1	RIGA				
09/30/09	15:20	South	09-S0945		Pleasure	1	ADRIA				
09/30/09	15:50	North	09-C0043		EPA/GE Dredging Project	1					
09/30/09	16:10	South	09-24147		Pleasure	1					
09/30/09	16:10	South	09-24148		Pleasure	1					
09/30/09	17:05	North	09-C0122		EPA/GE Dredging Project	1					
09/30/09	17:50	North	09-C0042		EPA/GE Dredging Project	1					
09/30/09	18:25	South	09-C0043		EPA/GE Dredging Project	1					
09/30/09	19:50	South	09-C0042		EPA/GE Dredging Project	1					
09/30/09	19:50	South	09-C0122		EPA/GE Dredging Project	1					
09/30/09	21:30	North	09-C0042		EPA/GE Dredging Project	1					
09/30/09	21:55	North	09-C0124		EPA/GE Dredging Project	1					
09/30/09	21:55	North	09-C0122		EPA/GE Dredging Project	1					
09/30/09	22:25	South	09-C0042		EPA/GE Dredging Project	1					
09/30/09	23:00	South	09-C0124		EPA/GE Dredging Project	1					
09/30/09	23:00	South	09-C0122		EPA/GE Dredging Project	1					
10/01/09	2:25	North	09-C0049		EPA/GE Dredging Project	1					
10/01/09	2:25	North	09-C0077		EPA/GE Dredging Project	1					
10/01/09	2:25	North	09-C0122		EPA/GE Dredging Project	1					
10/01/09	2:25	North	09-C0042		EPA/GE Dredging Project	1					
10/01/09	3:45	South	09-C0042		EPA/GE Dredging Project	1					
10/01/09	3:45	South	09-C0122		EPA/GE Dredging Project	1					
10/01/09	4:15	South	09-C0049		EPA/GE Dredging Project	1					
10/01/09	4:15	South	09-C0077		EPA/GE Dredging Project	1					
10/01/09	5:50	North	09-C0077		EPA/GE Dredging Project	1					
10/01/09	5:50	North	09-C0042		EPA/GE Dredging Project	1					
10/01/09	7:15	South	09-24149		Pleasure	1	LADY JANE				
10/01/09	7:55	South	09-C0042		EPA/GE Dredging Project	1					
10/01/09	7:55	South	09-C0077		EPA/GE Dredging Project	1					
10/01/09	10:10	North	09-C0077		EPA/GE Dredging Project	1					
10/01/09	10:50	North	09-C0122		EPA/GE Dredging Project	1					
10/01/09	10:50	North	09-C0042		EPA/GE Dredging Project	1					
10/01/09	10:50	North	09-C0057		EPA/GE Dredging Project	1					
10/01/09	11:30	South	09-C0057		EPA/GE Dredging Project	1					
10/01/09	12:35	North	09-C0081		Tour - Sleep Aboard	1	NIAGRA PRINCE				
10/01/09	12:55	South	09-24150		Pleasure	1					
10/01/09	13:10	North		NY7818 BE	Other Government	1	PONTOON				
10/01/09	13:25	South	09-C0122		EPA/GE Dredging Project	1					
10/01/09	13:25	South	09-C0042		EPA/GE Dredging Project	1					
10/01/09	13:40	North	09-C0105		EPA/GE Dredging Project	1					
10/01/09	14:35	North	09-C0042		EPA/GE Dredging Project	1					
10/01/09	14:35	North	09-C0122		EPA/GE Dredging Project	1					
10/01/09	14:50	South	09-C0105		EPA/GE Dredging Project	1					
10/01/09	14:50	South			Other Government	1	DEC PONTOON				
10/01/09	15:50	South			Other Government	1	RIV ECHO				
10/01/09	16:10	South	09-C0042		EPA/GE Dredging Project	1					
10/01/09	16:10	South	09-C0122		EPA/GE Dredging Project	1					
10/01/09	17:25	North	09-C0045		EPA/GE Dredging Project	1					
10/01/09	17:25	North	09-C0124		EPA/GE Dredging Project	1					
10/01/09	18:20	South	09-C0077		EPA/GE Dredging Project	1					
10/01/09	18:50	South	09-C0124		EPA/GE Dredging Project	1					
10/01/09	18:50	South	09-C0045		EPA/GE Dredging Project	1					
10/01/09	19:30	North	09-C0042		EPA/GE Dredging Project	1					
10/01/09	19:30	North	09-C0077		EPA/GE Dredging Project	1					
10/01/09	21:00	North	09-C0043		EPA/GE Dredging Project	1					
10/01/09	21:45	South	09-C0042		EPA/GE Dredging Project	1					
10/01/09	21:45	South	09-C0077		EPA/GE Dredging Project	1					
10/01/09	22:25	North	09-C0077		EPA/GE Dredging Project	1					
10/01/09	22:25	North	09-C0042		EPA/GE Dredging Project	1					
10/01/09	23:25	South	09-C0043		EPA/GE Dredging Project	1					
10/01/09	23:25	South	09-C0077		EPA/GE Dredging Project	1					
10/01/09	23:25	South	09-C0042		EPA/GE Dredging Project	1					
10/02/09	2:40	North	09-C0077		EPA/GE Dredging Project	1					
10/02/09	4:20	North	09-C0124		EPA/GE Dredging Project	1					
10/02/09	4:20	North	09-C0044		EPA/GE Dredging Project	1					
10/02/09	4:35	South	09-C0077		EPA/GE Dredging Project	1					
10/02/09	5:45	North	09-C0042		EPA/GE Dredging Project	1					
10/02/09	5:45	North	09-C0077		EPA/GE Dredging Project	1					
10/02/09	7:10	South	09-C0124		EPA/GE Dredging Project	1					
10/02/09	7:10	South	09-C0044		EPA/GE Dredging Project	1					
10/02/09	8:10	North	09-C0043		EPA/GE Dredging Project	1					
10/02/09	9:15	South	09-C0077		EPA/GE Dredging Project	1					
10/02/09	9:15	South	09-C0042		EPA/GE Dredging Project	1					
10/02/09	10:00	South	09-C0043		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
10/02/09	11:35	South	09-24151		Pleasure	1	OSPREY				
10/02/09	11:35	South	09-24152		Pleasure	1	DESTINY				
10/02/09	12:10	South	09-S0163		Pleasure	1	BEAR NECESSITY				
10/02/09	14:55	North	09-C0043		EPA/GE Dredging Project	1					
10/02/09	14:55	North	09-C0042		EPA/GE Dredging Project	1					
10/02/09	14:55	North	09-C0077		EPA/GE Dredging Project	1					
10/02/09	16:15	South	09-C0077		EPA/GE Dredging Project	1					
10/02/09	16:15	South	09-C0124		EPA/GE Dredging Project	1					
10/02/09	19:45	North	09-C0122		EPA/GE Dredging Project	1					
10/02/09	19:45	North	09-C0124		EPA/GE Dredging Project	1					
10/02/09	20:20	South	09-C0124		EPA/GE Dredging Project	1					
10/02/09	20:20	South	09-C0122		EPA/GE Dredging Project	1					
10/02/09	22:35	South	09-C0043		EPA/GE Dredging Project	1					
10/02/09	23:10	North	09-C0077		EPA/GE Dredging Project	1					
10/02/09	23:10	North	09-C0042		EPA/GE Dredging Project	1					
10/03/09	2:50	North	09-C0077		EPA/GE Dredging Project	1					
10/03/09	2:50	North	09-C0042		EPA/GE Dredging Project	1					
10/03/09	4:45	North	09-C0077		EPA/GE Dredging Project	1					
10/03/09	4:45	North	09-C0042		EPA/GE Dredging Project	1					
10/03/09	7:10	South	09-C0042		EPA/GE Dredging Project	1					
10/03/09	7:10	South	09-C0077		EPA/GE Dredging Project	1					
10/03/09	8:20	North	09-C0077		EPA/GE Dredging Project	1					
10/03/09	8:20	North	09-C0042		EPA/GE Dredging Project	1					
10/03/09	9:30	South	09-24153	VT1263P	Pleasure	1					
10/03/09	10:25	South	09-C0077		EPA/GE Dredging Project	1					
10/03/09	10:25	South	09-C0042		EPA/GE Dredging Project	1					
10/03/09	10:50	North	09-C0078		EPA/GE Dredging Project	1					
10/03/09	12:30	North	09-C0077		EPA/GE Dredging Project	1					
10/03/09	12:30	North	09-C0042		EPA/GE Dredging Project	1					
10/03/09	13:10	South	09-24154		Pleasure	1	SO FINE				
10/03/09	15:00	North	09-C0042		EPA/GE Dredging Project	1					
10/03/09	15:00	North	09-C0077		EPA/GE Dredging Project	1					
10/03/09	16:25	South	09-C0077		EPA/GE Dredging Project	1					
10/03/09	16:25	South	09-C0042		EPA/GE Dredging Project	1					
10/03/09	19:05	North	09-C0077		EPA/GE Dredging Project	1					
10/03/09	19:05	North	09-C0042		EPA/GE Dredging Project	1					
10/03/09	21:40	South	09-C0124		EPA/GE Dredging Project	1					
10/03/09	21:40	South	09-C0077		EPA/GE Dredging Project	1					
10/04/09	7:30	North	09-C0122		EPA/GE Dredging Project	1					
10/04/09	7:30	North	09-C0045		EPA/GE Dredging Project	1					
10/04/09	8:40	South	09-24155		Pleasure	1	BLUE DIVEL				
10/04/09	9:05	South	09-C0045		EPA/GE Dredging Project	1					
10/04/09	9:05	South	09-C0122		EPA/GE Dredging Project	1					
10/04/09	10:55	North	09-C0078		EPA/GE Dredging Project	1					
10/04/09	10:55	North	09-C0042		EPA/GE Dredging Project	1					
10/04/09	11:10	South	09-10949		Pleasure	1	F'EALE				
10/04/09	11:50	South	09-C0078		EPA/GE Dredging Project	1					
10/04/09	11:50	South	09-C0042		EPA/GE Dredging Project	1					
10/04/09	13:35	North	09-C0103		EPA/GE Dredging Project	1					
10/04/09	13:35	North	09-C0124		EPA/GE Dredging Project	1					
10/04/09	14:40	South	09-C0103		EPA/GE Dredging Project	1					
10/04/09	14:40	South	09-C0124		EPA/GE Dredging Project	1					
10/04/09	15:30	North	09-22538		Pleasure	1	KERI ANN				
10/04/09	15:55	South	09-24156		Pleasure	1	KATMANDU				
10/04/09	23:15	North	09-C0124		EPA/GE Dredging Project	1					
10/04/09	23:15	North	09-C0045		EPA/GE Dredging Project	1					
10/05/09	2:15	South	09-C0045		EPA/GE Dredging Project	1					
10/05/09	2:15	South	09-C0124		EPA/GE Dredging Project	1					
10/05/09	3:05	North	09-C0124		EPA/GE Dredging Project	1					
10/05/09	3:05	North	09-C0045		EPA/GE Dredging Project	1					
10/05/09	5:40	North	09-C0078		EPA/GE Dredging Project	1					
10/05/09	6:05	South	09-C0124		EPA/GE Dredging Project	1					
10/05/09	6:05	South	09-C0045		EPA/GE Dredging Project	1					
10/05/09	8:00	South			Canal Corporation Vessel	1	TUG WATERFORD				
10/05/09	8:25	South	09-24157		Pleasure	1	RI DON				
10/05/09	10:20	South	09-24158		Pleasure	1	BARBARA ANN				
10/05/09	10:40	South	09-C0078		EPA/GE Dredging Project	1					
10/05/09	13:20	North	09-C0045		EPA/GE Dredging Project	1					
10/05/09	13:20	North	09-C0124		EPA/GE Dredging Project	1					
10/05/09	13:35	South	09-24159		Pleasure	1	CASA MOTU				
10/05/09	14:05	South	09-10948		Pleasure	1	DYAD				
10/05/09	14:15	North	09-22539		Pleasure	1	BOAT OF US				
10/05/09	14:35	South	09-24160		Pleasure	1	ESPACE 2				
10/05/09	16:00	South	09-C0124		EPA/GE Dredging Project	1					
10/05/09	16:00	South	09-C0045		EPA/GE Dredging Project	1					
10/05/09	16:30	North	09-C0042		EPA/GE Dredging Project	1					
10/05/09	16:30	North	09-C0077		EPA/GE Dredging Project	1					
10/05/09	17:50	South	09-C0077		EPA/GE Dredging Project	1					
10/05/09	17:50	South	09-C0042		EPA/GE Dredging Project	1					
10/05/09	17:50	South	09-C0077		EPA/GE Dredging Project	1					
10/05/09	18:35	North	09-C0042		EPA/GE Dredging Project	1					
10/05/09	18:35	North	09-C0077		EPA/GE Dredging Project	1					
10/05/09	20:10	South	09-C0042		EPA/GE Dredging Project	1					
10/05/09	20:10	South	09-C0077		EPA/GE Dredging Project	1					
10/05/09	22:10	North	09-C0045		EPA/GE Dredging Project	1					
10/05/09	22:10	North	09-C0077		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
10/05/09	23:30	South	09-C0077		EPA/GE Dredging Project	1					
10/05/09	23:30	South	09-C0045		EPA/GE Dredging Project	1					
10/06/09	4:45	North	09-C0044		EPA/GE Dredging Project	1					
10/06/09	4:45	North	09-C0124		EPA/GE Dredging Project	1					
10/06/09	6:40	South	09-C0124		EPA/GE Dredging Project	1					
10/06/09	6:40	South	09-C0044		EPA/GE Dredging Project	1					
10/06/09	10:50	North			Canal Corporation Vessel	1	TUG WATERFORD				
10/06/09	11:55	North			Canal Corporation Vessel	1	SPS 51				
10/06/09	12:50	North	09-C0042		EPA/GE Dredging Project	1					
10/06/09	12:50	North	09-C0124		EPA/GE Dredging Project	1					
10/06/09	13:10	North	09-23988		Pleasure	1	WIND WALKER				
10/06/09	14:10	South	09-C0042		EPA/GE Dredging Project	1					
10/06/09	14:10	South	09-C0124		EPA/GE Dredging Project	1					
10/06/09	15:50	North	09-C0124		EPA/GE Dredging Project	1					
10/06/09	15:50	North	09-C0042		EPA/GE Dredging Project	1					
10/06/09	16:25	North	09-C0043		EPA/GE Dredging Project	1					
10/06/09	17:05	South	09-C0042		EPA/GE Dredging Project	1					
10/06/09	17:05	South	09-C0124		EPA/GE Dredging Project	1					
10/06/09	17:35	North	09-C0077		EPA/GE Dredging Project	1					
10/06/09	17:35	North	09-C0044		EPA/GE Dredging Project	1					
10/06/09	17:50	South	09-C0043		EPA/GE Dredging Project	1					
10/06/09	18:10	South	09-24161		Pleasure	1	GIGI 1				
10/06/09	19:10	South	09-C0044		EPA/GE Dredging Project	1					
10/06/09	19:10	South	09-C0077		EPA/GE Dredging Project	1					
10/07/09	3:50	North	09-C0124		EPA/GE Dredging Project	1					
10/07/09	3:50	North	09-C0043		EPA/GE Dredging Project	1					
10/07/09	6:00	South	09-C0124		EPA/GE Dredging Project	1					
10/07/09	6:00	South	09-C0043		EPA/GE Dredging Project	1					
10/07/09	9:20	South			Canal Corporation Vessel	1	TUG WATERFORD				
10/07/09	9:45	North			Canal Corporation Vessel	1	TUG GOVERNOR CLEVELAND				
10/07/09	10:30	South	09-C0124		EPA/GE Dredging Project	1					
10/07/09	10:30	South	09-C0043		EPA/GE Dredging Project	1					
10/07/09	10:50	North	09-S0040		Pleasure	1	HUNNY BUNNY				
10/07/09	11:50	South	UPT-15354		Pleasure	1	BOAT OF US				
10/07/09	12:55	South	09-24162		Pleasure	1	CHARLOTTE				
10/07/09	13:20	South	09-C0124		EPA/GE Dredging Project	1					
10/07/09	13:20	South	09-C0043		EPA/GE Dredging Project	1					
10/07/09	13:45	North	09-C0077		EPA/GE Dredging Project	1					
10/07/09	13:45	North	09-C0042		EPA/GE Dredging Project	1					
10/07/09	14:00	South			Canal Corporation Vessel	1	TUG GOVERNOR CLEVELAND				
10/07/09	14:20	South	09-C0081		Tour - Sleep Aboard	1	NIAGARA PRINCE				
10/07/09	14:30	North	09-C0028		EPA/GE Dredging Project	1					
10/07/09	15:35	South	09-C0077		EPA/GE Dredging Project	1					
10/07/09	15:35	South	09-C0042		EPA/GE Dredging Project	1					
10/07/09	15:45	South	09-S2121		Pleasure	1					
10/07/09	15:55	South	09-C0028		EPA/GE Dredging Project	1					
10/07/09	16:05	North			Canal Corporation Vessel	1	TUG WATERFORD				
10/07/09	16:50	North	09-C0077		EPA/GE Dredging Project	1					
10/07/09	16:50	North	09-C0042		EPA/GE Dredging Project	1					
10/07/09	18:05	South	09-C0077		EPA/GE Dredging Project	1					
10/07/09	18:05	South	09-C0042		EPA/GE Dredging Project	1					
10/07/09	22:05	North	09-C0077		EPA/GE Dredging Project	1					
10/07/09	22:05	North	09-C0042		EPA/GE Dredging Project	1					
10/07/09	23:30	South	09-C0042		EPA/GE Dredging Project	1					
10/07/09	23:30	South	09-C0077		EPA/GE Dredging Project	1					
10/08/09	2:55	North	09-C0124		EPA/GE Dredging Project	1					
10/08/09	2:55	North	09-C0122		EPA/GE Dredging Project	1					
10/08/09	5:20	South	09-C0124		EPA/GE Dredging Project	1					
10/08/09	5:20	South	09-C0122		EPA/GE Dredging Project	1					
10/08/09	8:35	South	09-24163		Pleasure	1	OLIVER PLUNKETTE				
10/08/09	9:10	North	09-C0049		EPA/GE Dredging Project	1					
10/08/09	10:20	South	09-24164		Pleasure	1	SEPTEMBRE				
10/08/09	10:20	South	09-C0049		EPA/GE Dredging Project	1					
10/08/09	11:05	North	09-C0122		EPA/GE Dredging Project	1					
10/08/09	11:50	South	09-C0122		EPA/GE Dredging Project	1					
10/08/09	12:20	South			Canal Corporation Vessel	1	TUG WATERFORD				
10/08/09	12:50	North	09-C0122		EPA/GE Dredging Project	1					
10/08/09	12:50	North	09-C0124		EPA/GE Dredging Project	1					
10/08/09	13:20	North	09-C0077		EPA/GE Dredging Project	1					
10/08/09	14:00	South	09-24165		Pleasure	1	MAMZEL				
10/08/09	14:25	South	09-C0122		EPA/GE Dredging Project	1					
10/08/09	14:25	South	09-C0124		EPA/GE Dredging Project	1					
10/08/09	15:05	North	09-C0042		EPA/GE Dredging Project	1					
10/08/09	16:00	North			Canal Corporation Vessel	1	TUG WATERFORD				
10/08/09	16:25	South	09-C0077		EPA/GE Dredging Project	1					
10/08/09	17:45	North	09-C0124		EPA/GE Dredging Project	1					
10/08/09	17:45	North	09-C0122		EPA/GE Dredging Project	1					
10/08/09	19:15	South	09-C0124		EPA/GE Dredging Project	1					
10/08/09	19:15	South	09-C0122		EPA/GE Dredging Project	1					
10/08/09	20:45	South	09-C0042		EPA/GE Dredging Project	1					
10/08/09	22:10	North	09-C0124		EPA/GE Dredging Project	1					
10/08/09	22:10	North	09-C0122		EPA/GE Dredging Project	1					
10/08/09	23:35	South	09-C0122		EPA/GE Dredging Project	1					
10/09/09	3:40	North	09-C0042		EPA/GE Dredging Project	1					
10/09/09	3:40	North	09-C0077		EPA/GE Dredging Project	1					
10/09/09	6:00	South	09-C0077		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
10/09/09	6:00	South	09-C0042		EPA/GE Dredging Project	1					
10/09/09	6:20	North	09-C0049		EPA/GE Dredging Project	1					
10/09/09	7:10	North	09-C0042		EPA/GE Dredging Project	1					
10/09/09	7:10	North	09-C0077		EPA/GE Dredging Project	1					
10/09/09	8:25	South	09-C0049		EPA/GE Dredging Project	1					
10/09/09	8:40	North	09-C0122		EPA/GE Dredging Project	1					
10/09/09	9:00	South	09-C0042		EPA/GE Dredging Project	1					
10/09/09	9:00	South	09-C0077		EPA/GE Dredging Project	1					
10/09/09	9:30	South			Canal Corporation Vessel	1	SPS 51				
10/09/09	10:00	North	09-C0042		EPA/GE Dredging Project	1					
10/09/09	10:00	North	09-C0077		EPA/GE Dredging Project	1					
10/09/09	10:15	South	09-24166		Pleasure	1	STAN SHA 1				
10/09/09	11:50	South	09-C0042		EPA/GE Dredging Project	1					
10/09/09	11:50	South	09-C0077		EPA/GE Dredging Project	1					
10/09/09	12:15	South	09-24168		Pleasure	1	I NIDA WIND II				
10/09/09	12:15	South	09-24167		Pleasure	1	RELEASE				
10/09/09	17:55	South	09-C0122		EPA/GE Dredging Project	1					
10/09/09	18:30	North	09-C0046		EPA/GE Dredging Project	1					
10/09/09	18:30	North	09-C0124		EPA/GE Dredging Project	1					
10/09/09	18:50	North	09-C0042		EPA/GE Dredging Project	1					
10/09/09	20:05	South	09-C0124		EPA/GE Dredging Project	1					
10/09/09	20:05	South	09-C0046		EPA/GE Dredging Project	1					
10/09/09	20:05	South	09-C0042		EPA/GE Dredging Project	1					
10/09/09	21:00	North	09-C0042		EPA/GE Dredging Project	1					
10/09/09	21:00	North	09-C0122		EPA/GE Dredging Project	1					
10/09/09	22:40	South	09-C0042		EPA/GE Dredging Project	1					
10/09/09	22:40	South	09-C0122		EPA/GE Dredging Project	1					
10/10/09	2:20	North	09-C0122		EPA/GE Dredging Project	1					
10/10/09	2:20	North	09-C0124		EPA/GE Dredging Project	1					
10/10/09	4:10	South	09-C0122		EPA/GE Dredging Project	1					
10/10/09	4:10	South	09-C0124		EPA/GE Dredging Project	1					
10/10/09	8:45	South	09-24169		Pleasure	1	MAIRE CLAIRE				
10/10/09	9:55	North	09-C0122		EPA/GE Dredging Project	1					
10/10/09	9:55	North	09-C0049		EPA/GE Dredging Project	1					
10/10/09	10:40	South	09-24170		Pleasure	1	FREE TO B				
10/10/09	11:15	South	09-C0049		EPA/GE Dredging Project	1					
10/10/09	11:15	South	09-24171		Pleasure	1	ANTARES				
10/10/09	11:15	South	09-C0122		EPA/GE Dredging Project	1					
10/10/09	12:30	North	09-C0077		EPA/GE Dredging Project	1					
10/10/09	12:30	North	09-C0124		EPA/GE Dredging Project	1					
10/10/09	12:40	South	09-S0754		Pleasure	1	SUMMER SLOPES				
10/10/09	13:55	South	09-C0124		EPA/GE Dredging Project	1					
10/10/09	13:55	South	09-C0077		EPA/GE Dredging Project	1					
10/10/09	14:35	North	09-S0736		Pleasure	1					
10/10/09	15:05	North	09-C0077		EPA/GE Dredging Project	1					
10/10/09	15:05	North	09-C0124		EPA/GE Dredging Project	1					
10/10/09	15:35	South	09-24172		Pleasure	1	K2				
10/10/09	16:20	South	09-S0736		Pleasure	1					
10/10/09	16:50	South	09-C0124		EPA/GE Dredging Project	1					
10/10/09	16:50	South	09-C0077		EPA/GE Dredging Project	1					
10/10/09	17:15	North	09-22540		Pleasure	1	JJ II				
10/10/09	17:50	North	09-C0077		EPA/GE Dredging Project	1					
10/10/09	17:50	North	09-C0124		EPA/GE Dredging Project	1					
10/10/09	19:05	South	09-C0077		EPA/GE Dredging Project	1					
10/10/09	19:05	South	09-C0124		EPA/GE Dredging Project	1					
10/11/09	6:00	North	09-C0124		EPA/GE Dredging Project	1					
10/11/09	6:00	North	09-C0122		EPA/GE Dredging Project	1					
10/11/09	7:40	South	09-C0122		EPA/GE Dredging Project	1					
10/11/09	7:40	South	09-C0124		EPA/GE Dredging Project	1					
10/11/09	8:15	South	09-24173		Pleasure	1	STEELING AWAY				
10/11/09	9:20	North	09-C0122		EPA/GE Dredging Project	1					
10/11/09	9:20	North	09-C0124		EPA/GE Dredging Project	1					
10/11/09	9:55	South	09-24174		Pleasure	1	EMERALD				
10/11/09	10:30	South	09-S0026		Pleasure	1	TUG 44				
10/11/09	10:55	South	09-C0122		EPA/GE Dredging Project	1					
10/11/09	10:55	South	09-C0124		EPA/GE Dredging Project	1					
10/11/09	11:15	South	09-24178		Pleasure	1	DREAM CHASER				
10/11/09	11:40	South	09-24177		Pleasure	1	CALICO JACK				
10/11/09	15:40	North	09-C0103		EPA/GE Dredging Project	1					
10/11/09	15:40	North	09-C0122		EPA/GE Dredging Project	1					
10/11/09	17:05	South	09-C0103		EPA/GE Dredging Project	1					
10/11/09	17:05	South	09-C0122		EPA/GE Dredging Project	1					
10/11/09	17:25	South	09-S0323		Pleasure	1	SWEET PEA				
10/11/09	17:55	North	09-C0042		EPA/GE Dredging Project	1					
10/11/09	17:55	North	09-C0077		EPA/GE Dredging Project	1					
10/11/09	19:25	South	09-C0042		EPA/GE Dredging Project	1					
10/11/09	19:25	South	09-C0077		EPA/GE Dredging Project	1					
10/12/09	4:25	North	09-C0124		EPA/GE Dredging Project	1					
10/12/09	4:25	North	09-C0077		EPA/GE Dredging Project	1					
10/12/09	6:00	North	09-C0049		EPA/GE Dredging Project	1					
10/12/09	6:40	South	09-C0077		EPA/GE Dredging Project	1					
10/12/09	6:40	South	09-C0124		EPA/GE Dredging Project	1					
10/12/09	10:20	South	09-C0049		EPA/GE Dredging Project	1					
10/12/09	11:15	North	09-C0077		EPA/GE Dredging Project	1					
10/12/09	11:15	North	09-C0124		EPA/GE Dredging Project	1					
10/12/09	11:40	South			Canal Corporation Vessel	1	TUG WATERFORD				

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
10/12/09	12:40	North	09-C0042		EPA/GE Dredging Project	1					
10/12/09	12:50	South	09-C0124		EPA/GE Dredging Project	1					
10/12/09	13:40	South	09-C0077		EPA/GE Dredging Project	1					
10/12/09	13:40	South	09-C0042		EPA/GE Dredging Project	1					
10/12/09	13:55	North	09-C0123		EPA/GE Dredging Project	1					
10/12/09	13:55	North	09-C0122		EPA/GE Dredging Project	1					
10/12/09	14:55	South	09-C0122		EPA/GE Dredging Project	1					
10/12/09	14:55	South	09-C0123		EPA/GE Dredging Project	1					
10/12/09	15:10	North			Canal Corporation Vessel	1	TUG WATERFORD				
10/12/09	16:10	North	09-C0042		EPA/GE Dredging Project	1					
10/12/09	16:10	North	09-C0122		EPA/GE Dredging Project	1					
10/12/09	17:20	South	09-C0042		EPA/GE Dredging Project	1					
10/12/09	17:20	South	09-C0122		EPA/GE Dredging Project	1					
10/12/09	19:40	North	09-C0042		EPA/GE Dredging Project	1					
10/12/09	19:40	North	09-C0122		EPA/GE Dredging Project	1					
10/12/09	21:20	South	09-C0122		EPA/GE Dredging Project	1					
10/12/09	21:20	South	09-C0042		EPA/GE Dredging Project	1					
10/13/09	1:55	North	09-C0124		EPA/GE Dredging Project	1					
10/13/09	1:55	North	09-C0122		EPA/GE Dredging Project	1					
10/13/09	4:00	South	09-C0122		EPA/GE Dredging Project	1					
10/13/09	4:00	South	09-C0124		EPA/GE Dredging Project	1					
10/13/09	7:45	North	09-C0077		EPA/GE Dredging Project	1					
10/13/09	7:45	North	09-C0124		EPA/GE Dredging Project	1					
10/13/09	7:45	North	09-C0122		EPA/GE Dredging Project	1					
10/13/09	8:40	South	09-24179		Pleasure	1	ZARYA				
10/13/09	9:30	South	09-C0122		EPA/GE Dredging Project	1					
10/13/09	9:30	South	09-C0124		EPA/GE Dredging Project	1					
10/13/09	9:55	South	09-C0077		EPA/GE Dredging Project	1					
10/13/09	10:00	North	09-C0122		EPA/GE Dredging Project	1					
10/13/09	11:00	North	09-C0124		EPA/GE Dredging Project	1					
10/13/09	11:00	North	09-C0122		EPA/GE Dredging Project	1					
10/13/09	11:30	North	09-C0077		EPA/GE Dredging Project	1					
10/13/09	11:30	North	09-C0123		EPA/GE Dredging Project	1					
10/13/09	12:15	South			Canal Corporation Vessel	1	TUG WATERFORD				
10/13/09	12:35	South	09-C0122		EPA/GE Dredging Project	1					
10/13/09	12:35	South	09-C0124		EPA/GE Dredging Project	1					
10/13/09	12:50	North			Other Government	1	EPA-OVERSIGHT 11				
10/13/09	13:35	South	09-C0123		EPA/GE Dredging Project	1					
10/13/09	13:35	South	09-C0077		EPA/GE Dredging Project	1					
10/13/09	13:55	North	09-22542		Pleasure	1	FOGGY DEW				
10/13/09	14:05	South			Other Government	1	EPA_OVERSIGHT 2				
10/13/09	14:50	North	09-C0077		EPA/GE Dredging Project	1					
10/13/09	14:50	North	09-C0042		EPA/GE Dredging Project	1					
10/13/09	15:05	North	09-C0049		EPA/GE Dredging Project	1					
10/13/09	18:10	South	09-C0049		EPA/GE Dredging Project	1					
10/13/09	20:25	South	09-C0042		EPA/GE Dredging Project	1					
10/13/09	20:25	South	09-C0077		EPA/GE Dredging Project	1					
10/13/09	20:25	South	09-C0077		EPA/GE Dredging Project	1					
10/14/09	1:55	North	09-C0124		EPA/GE Dredging Project	1					
10/14/09	1:55	North	09-C0077		EPA/GE Dredging Project	1					
10/14/09	6:35	South	09-C0077		EPA/GE Dredging Project	1					
10/14/09	6:35	South	09-C0124		EPA/GE Dredging Project	1					
10/14/09	7:40	North	09-C0124		EPA/GE Dredging Project	1					
10/14/09	7:40	North	09-C0077		EPA/GE Dredging Project	1					
10/14/09	8:15	North	09-C0049		EPA/GE Dredging Project	1					
10/14/09	8:15	North	09-C0122		EPA/GE Dredging Project	1					
10/14/09	9:15	South			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
10/14/09	9:45	South	09-C0124		EPA/GE Dredging Project	1					
10/14/09	9:45	South	09-C0077		EPA/GE Dredging Project	1					
10/14/09	10:05	South	09-24182		Pleasure	1	PELAGUIA				
10/14/09	10:45	North	09-C0077		EPA/GE Dredging Project	1					
10/14/09	10:45	North	09-C0124		EPA/GE Dredging Project	1					
10/14/09	11:05	South	09-C0122		EPA/GE Dredging Project	1					
10/14/09	11:05	South	09-C0049		EPA/GE Dredging Project	1					
10/14/09	11:40	South	09-C0124		EPA/GE Dredging Project	1					
10/14/09	11:40	South	09-C0077		EPA/GE Dredging Project	1					
10/14/09	12:10	South	09-24180		Pleasure	1	SCOTTISH LADY				
10/14/09	12:40	North	09-C0122		EPA/GE Dredging Project	1					
10/14/09	12:40	North	09-C0124		EPA/GE Dredging Project	1					
10/14/09	13:45	North	09-C0077		EPA/GE Dredging Project	1					
10/14/09	13:45	North	09-C0042		EPA/GE Dredging Project	1					
10/14/09	14:35	South	09-24181		Pleasure	1	COINSIDENCE				
10/14/09	15:00	South	09-C0122		EPA/GE Dredging Project	1					
10/14/09	15:00	South	09-C0124		EPA/GE Dredging Project	1					
10/14/09	15:25	South	09-C0042		EPA/GE Dredging Project	1					
10/14/09	15:25	South	09-C0077		EPA/GE Dredging Project	1					
10/14/09	19:35	North	09-C0124		EPA/GE Dredging Project	1					
10/14/09	19:35	North	09-C0077		EPA/GE Dredging Project	1					
10/14/09	20:55	South	09-C0077		EPA/GE Dredging Project	1					
10/14/09	20:55	South	09-C0124		EPA/GE Dredging Project	1					
10/14/09	21:45	North	09-C0124		EPA/GE Dredging Project	1					
10/14/09	21:45	North	09-C0077		EPA/GE Dredging Project	1					
10/14/09	22:40	South	09-C0049		EPA/GE Dredging Project	1					
10/14/09	23:15	South	09-C0077		EPA/GE Dredging Project	1					
10/14/09	23:15	South	09-C0124		EPA/GE Dredging Project	1					
10/15/09	1:15	North	09-C0077		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
10/15/09	1:15	North	09-C0124		EPA/GE Dredging Project	1					
10/15/09	5:40	South	09-C0124		EPA/GE Dredging Project	1					
10/15/09	5:40	South	09-C0077		EPA/GE Dredging Project	1					
10/15/09	6:50	North	09-C0122		EPA/GE Dredging Project	1					
10/15/09	6:50	North	09-C0049		EPA/GE Dredging Project	1					
10/15/09	8:05	South	09-C0122		EPA/GE Dredging Project	1					
10/15/09	8:05	South	09-C0049		EPA/GE Dredging Project	1					
10/15/09	9:45	North	09-C0124		EPA/GE Dredging Project	1					
10/15/09	9:45	North	09-C0077		EPA/GE Dredging Project	1					
10/15/09	11:20	South	09-C0077		EPA/GE Dredging Project	1					
10/15/09	11:20	South	09-C0124		EPA/GE Dredging Project	1					
10/15/09	12:20	North			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
10/15/09	14:05	North			Canal Corporation Vessel	1	TUG WATERFORD				
10/15/09	15:20	North			Commercial	1		6			
10/15/09	18:10	North	09-C0042		EPA/GE Dredging Project	1					
10/15/09	18:10	North	09-C0124		EPA/GE Dredging Project	1					
10/15/09	19:45	South	09-C0042		EPA/GE Dredging Project	1					
10/15/09	19:45	South	09-C0124		EPA/GE Dredging Project	1					
10/15/09	22:30	North	09-C0122		EPA/GE Dredging Project	1					
10/15/09	22:30	North	09-C0124		EPA/GE Dredging Project	1					
10/16/09	1:50	South	09-C0124		EPA/GE Dredging Project	1					
10/16/09	1:50	South	09-C0122		EPA/GE Dredging Project	1					
10/16/09	2:50	North	09-C0124		EPA/GE Dredging Project	1					
10/16/09	2:50	North	09-C0122		EPA/GE Dredging Project	1					
10/16/09	4:00	North	09-C0042		EPA/GE Dredging Project	1					
10/16/09	4:00	North	09-C0077		EPA/GE Dredging Project	1					
10/16/09	4:35	South	09-C0124		EPA/GE Dredging Project	1					
10/16/09	4:35	South	09-C0122		EPA/GE Dredging Project	1					
10/16/09	5:55	South	09-C0042		EPA/GE Dredging Project	1					
10/16/09	5:55	South	09-C0077		EPA/GE Dredging Project	1					
10/16/09	6:15	North	09-C0044		EPA/GE Dredging Project	1					
10/16/09	8:25	North	09-C0124		EPA/GE Dredging Project	1					
10/16/09	8:25	North	09-C0122		EPA/GE Dredging Project	1					
10/16/09	10:00	South	09-C0124		EPA/GE Dredging Project	1					
10/16/09	10:00	South	09-C0122		EPA/GE Dredging Project	1					
10/16/09	10:25	South	09-C0044		EPA/GE Dredging Project	1					
10/16/09	13:25	South	09-24183		Pleasure	1	X TASE I				
10/16/09	14:30	North	09-C0124		EPA/GE Dredging Project	1					
10/16/09	14:30	North	09-C0122		EPA/GE Dredging Project	1					
10/16/09	16:00	South	09-C0122		EPA/GE Dredging Project	1					
10/16/09	16:00	South	09-C0124		EPA/GE Dredging Project	1					
10/16/09	17:45	North	09-C0122		EPA/GE Dredging Project	1					
10/16/09	17:45	North	09-C0124		EPA/GE Dredging Project	1					
10/16/09	19:00	South	09-C0124		EPA/GE Dredging Project	1					
10/16/09	19:00	South	09-C0122		EPA/GE Dredging Project	1					
10/16/09	19:50	North	09-C0124		EPA/GE Dredging Project	1					
10/16/09	19:50	North	09-C0122		EPA/GE Dredging Project	1					
10/16/09	21:50	South	09-C0122		EPA/GE Dredging Project	1					
10/16/09	21:50	South	09-C0124		EPA/GE Dredging Project	1					
10/17/09	2:05	North	09-C0124		EPA/GE Dredging Project	1					
10/17/09	2:05	North	09-C0122		EPA/GE Dredging Project	1					
10/17/09	3:50	South	09-C0122		EPA/GE Dredging Project	1					
10/17/09	3:50	South	09-C0124		EPA/GE Dredging Project	1					
10/17/09	4:50	North	09-C0122		EPA/GE Dredging Project	1					
10/17/09	4:50	North	09-C0124		EPA/GE Dredging Project	1					
10/17/09	7:55	South	09-C0122		EPA/GE Dredging Project	1					
10/17/09	7:55	South	09-C0124		EPA/GE Dredging Project	1					
10/17/09	8:20	South	09-24184		Pleasure	1					
10/17/09	8:20	South	09-24185		Pleasure	1					
10/17/09	10:15	North	09-C0122		EPA/GE Dredging Project	1					
10/17/09	10:15	North	09-C0124		EPA/GE Dredging Project	1					
10/17/09	12:45	South	09-C0122		EPA/GE Dredging Project	1					
10/17/09	12:45	South	09-C0124		EPA/GE Dredging Project	1					
10/17/09	19:10	North	09-C0122		EPA/GE Dredging Project	1					
10/17/09	19:10	North	09-C0124		EPA/GE Dredging Project	1					
10/17/09	20:40	South	09-C0124		EPA/GE Dredging Project	1					
10/17/09	20:40	South	09-C0122		EPA/GE Dredging Project	1					
10/17/09	21:30	North	09-C0122		EPA/GE Dredging Project	1					
10/17/09	21:30	North	09-C0124		EPA/GE Dredging Project	1					
10/17/09	22:30	South	09-C0122		EPA/GE Dredging Project	1					
10/17/09	22:30	South	09-C0124		EPA/GE Dredging Project	1					
10/18/09	3:15	North	09-C0123		EPA/GE Dredging Project	1					
10/18/09	3:15	North	09-C0077		EPA/GE Dredging Project	1					
10/18/09	6:15	South	09-C0077		EPA/GE Dredging Project	1					
10/18/09	6:15	South	09-C0123		EPA/GE Dredging Project	1					
10/18/09	13:20	North	09-C0046		EPA/GE Dredging Project	1					
10/18/09	13:20	North	09-C0123		EPA/GE Dredging Project	1					
10/18/09	14:40	North	09-10672		Pleasure	1	WRIGHT TIME				
10/18/09	15:30	South	09-C0123		EPA/GE Dredging Project	1					
10/18/09	15:30	South	09-C0046		EPA/GE Dredging Project	1					
10/18/09	17:45	North	09-C0104		EPA/GE Dredging Project	1					
10/18/09	17:45	North	09-C0046		EPA/GE Dredging Project	1					
10/18/09	19:35	South	09-C0103		EPA/GE Dredging Project	1					
10/18/09	19:35	South	09-C0046		EPA/GE Dredging Project	1					
10/18/09	20:25	North	09-C0076		EPA/GE Dredging Project	1					
10/18/09	22:40	South	09-C0076		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
10/18/09	23:35	North	09-C0124		EPA/GE Dredging Project	1					
10/18/09	23:35	North	09-C0122		EPA/GE Dredging Project	1					
10/19/09	0:40	North	09-C0124		EPA/GE Dredging Project	1					
10/19/09	7:50	South	09-C0122		EPA/GE Dredging Project	1					
10/19/09	7:50	South	09-C0124		EPA/GE Dredging Project	1					
10/19/09	8:25	North	09-C0124		EPA/GE Dredging Project	1					
10/19/09	8:25	North	09-C0122		EPA/GE Dredging Project	1					
10/19/09	9:00	South			Commercial	1		7	Brake - Gotham	CG1070376	09-C0036
10/19/09	9:00	South	09-24186		Pleasure	1	VICTORIA V				
10/19/09	9:55	South	09-C0124		EPA/GE Dredging Project	1					
10/19/09	9:55	South	09-C0122		EPA/GE Dredging Project	1					
10/19/09	10:55	North	09-C0077		EPA/GE Dredging Project	1					
10/19/09	10:55	North	09-C0049		EPA/GE Dredging Project	1					
10/19/09	11:40	South			Canal Corporation Vessel	1	TUG WATERFORD				
10/19/09	12:00	South	09-C0077		EPA/GE Dredging Project	1					
10/19/09	12:00	South	09-C0049		EPA/GE Dredging Project	1					
10/19/09	12:25	North	09-C0042		EPA/GE Dredging Project	1					
10/19/09	12:25	North	09-C0077		EPA/GE Dredging Project	1					
10/19/09	13:40	North	09-C0077		EPA/GE Dredging Project	1					
10/19/09	13:40	North	09-C0042		EPA/GE Dredging Project	1					
10/19/09	13:40	North	09-C0045		EPA/GE Dredging Project	1					
10/19/09	14:10	South	09-24194		Pleasure	1	LADY LYNA 1V				
10/19/09	14:10	South	09-24189		Pleasure	1	GRAND MARINIEL				
10/19/09	14:10	South	09-24188		Pleasure	1	LE NOMAD				
10/19/09	14:10	South	09-24187		Pleasure	1	FARENHEIGHT				
10/19/09	14:10	South	09-24193		Pleasure	1	CONGO				
10/19/09	14:10	South	09-24192		Pleasure	1	TOBAGO				
10/19/09	14:10	South	09-24191		Pleasure	1	RIO				
10/19/09	14:10	South	09-24190		Pleasure	1	MAEVA				
10/19/09	14:35	South	09-C0042		EPA/GE Dredging Project	1					
10/19/09	14:35	South	09-C0077		EPA/GE Dredging Project	1					
10/19/09	15:00	North	09-C0077		EPA/GE Dredging Project	1					
10/19/09	15:00	North	09-C0042		EPA/GE Dredging Project	1					
10/19/09	15:20	North			Canal Corporation Vessel	1	TUG WATERFORD				
10/19/09	15:55	South	09-C0042		EPA/GE Dredging Project	1					
10/19/09	15:55	South	09-C0077		EPA/GE Dredging Project	1					
10/19/09	16:40	South	09-C0045		EPA/GE Dredging Project	1					
10/19/09	18:30	North	09-C0077		EPA/GE Dredging Project	1					
10/19/09	18:30	North	09-C0042		EPA/GE Dredging Project	1					
10/19/09	19:55	South	09-C0042		EPA/GE Dredging Project	1					
10/19/09	19:55	South	09-C0077		EPA/GE Dredging Project	1					
10/19/09	20:50	North	09-C0077		EPA/GE Dredging Project	1					
10/19/09	20:50	North	09-C0042		EPA/GE Dredging Project	1					
10/19/09	22:05	South	09-C0077		EPA/GE Dredging Project	1					
10/19/09	22:05	South	09-C0042		EPA/GE Dredging Project	1					
10/20/09	1:00	North	09-C0122		EPA/GE Dredging Project	1					
10/20/09	1:00	North	09-C0045		EPA/GE Dredging Project	1					
10/20/09	3:20	South	09-C0045		EPA/GE Dredging Project	1					
10/20/09	3:20	South	09-C0122		EPA/GE Dredging Project	1					
10/20/09	4:35	North	09-C0045		EPA/GE Dredging Project	1					
10/20/09	4:35	North	09-C0122		EPA/GE Dredging Project	1					
10/20/09	6:10	South	09-C0045		EPA/GE Dredging Project	1					
10/20/09	6:10	South	09-C0122		EPA/GE Dredging Project	1					
10/20/09	6:50	North	09-C0045		EPA/GE Dredging Project	1					
10/20/09	6:50	North	09-C0122		EPA/GE Dredging Project	1					
10/20/09	7:30	South	09-24197		Pleasure	1	SERENIA I				
10/20/09	7:30	South	09-24196		Pleasure	1	ODIN I				
10/20/09	8:05	South	09-24195		Pleasure	1					
10/20/09	9:05	South	09-C0045		EPA/GE Dredging Project	1					
10/20/09	9:05	South	09-C0122		EPA/GE Dredging Project	1					
10/20/09	11:45	South	09-24198		Pleasure	1	SOLEIADO				
10/20/09	13:30	South	09-24199		Pleasure	1	QUASAR				
10/20/09	13:45	North	09-C0077		EPA/GE Dredging Project	1					
10/20/09	14:55	South	09-C0077		EPA/GE Dredging Project	1					
10/20/09	15:20	South	09-24200	665984	Pleasure	1	O'DEGE				
10/20/09	15:40	North	09-C0045		EPA/GE Dredging Project	1					
10/20/09	16:10	North	09-C0077		EPA/GE Dredging Project	1					
10/20/09	16:10	North	09-C0042		EPA/GE Dredging Project	1					
10/20/09	16:55	South	09-C0045		EPA/GE Dredging Project	1					
10/20/09	17:30	South	09-C0077		EPA/GE Dredging Project	1					
10/20/09	17:30	South	09-C0042		EPA/GE Dredging Project	1					
10/20/09	18:40	North	09-C0042		EPA/GE Dredging Project	1					
10/20/09	18:40	North	09-C0077		EPA/GE Dredging Project	1					
10/20/09	20:00	North	09-C0103		EPA/GE Dredging Project	1					
10/20/09	20:55	South	09-C0077		EPA/GE Dredging Project	1					
10/20/09	20:55	South	09-C0042		EPA/GE Dredging Project	1					
10/20/09	21:15	South	09-C0103		EPA/GE Dredging Project	1					
10/20/09	22:00	North	09-C0042		EPA/GE Dredging Project	1					
10/20/09	22:00	North	09-C0077		EPA/GE Dredging Project	1					
10/20/09	23:10	South	09-C0042		EPA/GE Dredging Project	1					
10/20/09	23:15	South	09-C0077		EPA/GE Dredging Project	1					
10/21/09	1:30	North	09-C0042		EPA/GE Dredging Project	1					
10/21/09	1:30	North	09-C0077		EPA/GE Dredging Project	1					
10/21/09	3:20	South	09-C0042		EPA/GE Dredging Project	1					
10/21/09	3:25	South	09-C0077		EPA/GE Dredging Project	1					
10/21/09	4:40	North	09-C0077		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
10/21/09	4:40	North	09-C0042		EPA/GE Dredging Project	1					
10/21/09	6:20	South	09-C0077		EPA/GE Dredging Project	1					
10/21/09	6:20	South	09-C0042		EPA/GE Dredging Project	1					
10/21/09	7:55	North	09-C0042		EPA/GE Dredging Project	1					
10/21/09	7:55	North	09-C0077		EPA/GE Dredging Project	1					
10/21/09	9:25	South	09-C0077		EPA/GE Dredging Project	1					
10/21/09	9:25	South	09-C0042		EPA/GE Dredging Project	1					
10/21/09	9:50	North			Commercial	1		8	Brake - Gotham	CG1070376	09-C0036
10/21/09	10:10	North	09-C0042		EPA/GE Dredging Project	1					
10/21/09	10:10	North	09-C0077		EPA/GE Dredging Project	1					
10/21/09	11:20	South	09-C0077		EPA/GE Dredging Project	1					
10/21/09	11:20	South	09-C0042		EPA/GE Dredging Project	1					
10/21/09	11:45	South	09-24084		Pleasure	1	GALAXIA 2				
10/21/09	11:45	South	09-24085		Pleasure	1	FIGHTING IRISH				
10/21/09	12:50	South	09-24086		Pleasure	1	BEAUCASTEL				
10/21/09	14:15	North	09-C0124		EPA/GE Dredging Project	1					
10/21/09	14:15	North	09-C0077		EPA/GE Dredging Project	1					
10/21/09	15:55	North	09-C0043		EPA/GE Dredging Project	1					
10/21/09	15:55	North			Canal Corporation Vessel	1	TUG GOVERNOR CLEVELAND				
10/21/09	16:40	North	09-C0077		EPA/GE Dredging Project	1					
10/21/09	16:40	North	09-C0124		EPA/GE Dredging Project	1					
10/21/09	18:15	South	09-C0124		EPA/GE Dredging Project	1					
10/21/09	18:15	South	09-C0077		EPA/GE Dredging Project	1					
10/21/09	20:25	South	09-C0043		EPA/GE Dredging Project	1					
10/21/09	21:30	North	09-C0077		EPA/GE Dredging Project	1					
10/21/09	21:30	North	09-C0042		EPA/GE Dredging Project	1					
10/21/09	22:50	South	09-C0042		EPA/GE Dredging Project	1					
10/21/09	22:50	South	09-C0077		EPA/GE Dredging Project	1					
10/22/09	1:00	North	09-C0042		EPA/GE Dredging Project	1					
10/22/09	1:00	North	09-C0077		EPA/GE Dredging Project	1					
10/22/09	2:55	South	09-C0042		EPA/GE Dredging Project	1					
10/22/09	2:55	South	09-C0077		EPA/GE Dredging Project	1					
10/22/09	5:00	North	09-C0077		EPA/GE Dredging Project	1					
10/22/09	5:00	North	09-C0042		EPA/GE Dredging Project	1					
10/22/09	6:45	South	09-C0077		EPA/GE Dredging Project	1					
10/22/09	6:45	South	09-C0042		EPA/GE Dredging Project	1					
10/22/09	7:50	South	09-24087		Pleasure	1	OCEALYS				
10/22/09	8:15	South			Canal Corporation Vessel	1	TUG WATERFORD				
10/22/09	8:40	North	09-C0077		EPA/GE Dredging Project	1					
10/22/09	8:55	South	09-24088		Pleasure	1	MICHALKA				
10/22/09	10:15	South			Canal Corporation Vessel	1	TUG GOVERNOR CLEVELAND				
10/22/09	11:30	South	09-C0077		EPA/GE Dredging Project	1					
10/22/09	11:55	North			Canal Corporation Vessel	1	TUG WATERFORD				
10/22/09	12:35	North	09-C0124		EPA/GE Dredging Project	1					
10/22/09	12:35	North	09-C0077		EPA/GE Dredging Project	1					
10/22/09	13:20	South			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
10/22/09	13:55	South	09-C0077		EPA/GE Dredging Project	1					
10/22/09	13:55	South	09-C0124		EPA/GE Dredging Project	1					
10/22/09	14:10	North			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
10/22/09	17:00	North	09-C0124		EPA/GE Dredging Project	1					
10/22/09	17:00	North	09-C0077		EPA/GE Dredging Project	1					
10/22/09	18:25	South	09-C0077		EPA/GE Dredging Project	1					
10/22/09	18:25	South	09-C0124		EPA/GE Dredging Project	1					
10/22/09	22:20	North	09-C0122		EPA/GE Dredging Project	1					
10/22/09	22:20	North	09-C0077		EPA/GE Dredging Project	1					
10/23/09	1:30	South	09-C0122		EPA/GE Dredging Project	1					
10/23/09	1:30	South	09-C0077		EPA/GE Dredging Project	1					
10/23/09	2:25	North	09-C0077		EPA/GE Dredging Project	1					
10/23/09	2:25	North	09-C0122		EPA/GE Dredging Project	1					
10/23/09	4:45	South	09-C0122		EPA/GE Dredging Project	1					
10/23/09	4:45	South	09-C0077		EPA/GE Dredging Project	1					
10/23/09	5:15	North	09-C0042		EPA/GE Dredging Project	1					
10/23/09	5:15	North	09-C0049		EPA/GE Dredging Project	1					
10/23/09	7:15	South	09-C0042		EPA/GE Dredging Project	1					
10/23/09	7:15	South	09-C0049		EPA/GE Dredging Project	1					
10/23/09	7:35	North	09-C0124		EPA/GE Dredging Project	1					
10/23/09	8:00	South	09-24089		Pleasure	1	EXPLORER II				
10/23/09	8:25	North	09-C0049		EPA/GE Dredging Project	1					
10/23/09	8:25	North	09-C0042		EPA/GE Dredging Project	1					
10/23/09	8:40	South	09-C0124		EPA/GE Dredging Project	1					
10/23/09	10:40	South	09-C0042		EPA/GE Dredging Project	1					
10/23/09	10:40	South	09-C0049		EPA/GE Dredging Project	1					
10/23/09	12:45	North	09-C0042		EPA/GE Dredging Project	1					
10/23/09	12:45	North	09-C0122		EPA/GE Dredging Project	1					
10/23/09	13:45	North	09-22544		Pleasure	1	CELTIC MOON				
10/23/09	14:20	South	09-C0042		EPA/GE Dredging Project	1					
10/23/09	14:20	South	09-C0122		EPA/GE Dredging Project	1					
10/23/09	15:25	North	09-C0122		EPA/GE Dredging Project	1					
10/23/09	15:25	North	09-C0042		EPA/GE Dredging Project	1					
10/23/09	16:45	South	09-C0122		EPA/GE Dredging Project	1					
10/23/09	16:45	South	09-C0042		EPA/GE Dredging Project	1					
10/23/09	18:15	North	09-C0077		EPA/GE Dredging Project	1					
10/23/09	18:15	North	09-C0046		EPA/GE Dredging Project	1					
10/23/09	19:50	South	09-C0077		EPA/GE Dredging Project	1					
10/23/09	19:50	South	09-C0046		EPA/GE Dredging Project	1					
10/24/09	1:35	North	09-C0049		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
10/24/09	1:35	North	09-C0122		EPA/GE Dredging Project	1					
10/24/09	3:10	South	09-C0049		EPA/GE Dredging Project	1					
10/24/09	3:15	South	09-C0122		EPA/GE Dredging Project	1					
10/24/09	5:00	North	09-C0077		EPA/GE Dredging Project	1					
10/24/09	8:00	South	09-C0077		EPA/GE Dredging Project	1					
10/24/09	8:00	South	09-C0042		EPA/GE Dredging Project	1					
10/24/09	8:50	South	09-24090		Pleasure	1	LAUREAT 1				
10/24/09	9:35	North	09-C0078		EPA/GE Dredging Project	1					
10/24/09	9:35	North	09-C0122		EPA/GE Dredging Project	1					
10/24/09	11:00	South	09-C0122		EPA/GE Dredging Project	1					
10/24/09	11:00	South	09-C0078		EPA/GE Dredging Project	1					
10/24/09	12:55	North	09-C0122		EPA/GE Dredging Project	1					
10/24/09	12:55	North	09-C0049		EPA/GE Dredging Project	1					
10/24/09	14:10	South	09-C0049		EPA/GE Dredging Project	1					
10/24/09	14:10	South	09-C0122		EPA/GE Dredging Project	1					
10/24/09	14:55	North	09-C0049		EPA/GE Dredging Project	1					
10/24/09	14:55	North	09-C0122		EPA/GE Dredging Project	1					
10/24/09	15:50	South	09-24091		Pleasure	1	GIGI				
10/24/09	16:45	South	09-C0122		EPA/GE Dredging Project	1					
10/24/09	16:45	South	09-C0049		EPA/GE Dredging Project	1					
10/24/09	19:30	North	09-C0049		EPA/GE Dredging Project	1					
10/24/09	19:30	North	09-C0122		EPA/GE Dredging Project	1					
10/24/09	21:25	South	09-C0122		EPA/GE Dredging Project	1					
10/24/09	21:25	South	09-C0049		EPA/GE Dredging Project	1					
10/26/09	10:30	North	09-C0045		EPA/GE Dredging Project	1					
10/26/09	10:30	North	09-C0122		EPA/GE Dredging Project	1					
10/26/09	10:30	North	09-C0042		EPA/GE Dredging Project	1					
10/26/09	10:30	North	09-C0078		EPA/GE Dredging Project	1					
10/26/09	11:40	South	09-C0045		EPA/GE Dredging Project	1					
10/26/09	11:40	South	09-C0078		EPA/GE Dredging Project	1					
10/26/09	12:40	South	09-C0122		EPA/GE Dredging Project	1					
10/26/09	12:40	South	09-C0042		EPA/GE Dredging Project	1					
10/26/09	13:05	South	09-24093		Pleasure	1	" D LAS C " I				
10/26/09	13:05	South	09-24092		Pleasure	1	VIE DEAU				
10/26/09	13:40	North	09-C0077		EPA/GE Dredging Project	1					
10/26/09	13:40	North	09-C0124		EPA/GE Dredging Project	1					
10/26/09	14:00	North	09-C0043		EPA/GE Dredging Project	1					
10/26/09	14:55	South	09-C0123		EPA/GE Dredging Project	1					
10/26/09	14:55	South	09-C0077		EPA/GE Dredging Project	1					
10/26/09	15:35	North	09-C0077		EPA/GE Dredging Project	1					
10/26/09	15:35	North	09-C0124		EPA/GE Dredging Project	1					
10/26/09	16:55	South	09-C0077		EPA/GE Dredging Project	1					
10/26/09	17:15	South	09-C0124		EPA/GE Dredging Project	1					
10/26/09	18:10	South	09-C0043		EPA/GE Dredging Project	1					
10/27/09	1:10	North	09-C0049		EPA/GE Dredging Project	1					
10/27/09	1:10	North	09-C0122		EPA/GE Dredging Project	1					
10/27/09	3:05	South	09-C0049		EPA/GE Dredging Project	1					
10/27/09	3:05	South	09-C0122		EPA/GE Dredging Project	1					
10/27/09	5:50	North	09-C0122		EPA/GE Dredging Project	1					
10/27/09	5:50	North	09-C0049		EPA/GE Dredging Project	1					
10/27/09	7:35	South			Canal Corporation Vessel	1	TUG WATERFORD				
10/27/09	7:55	South	09-C0122		EPA/GE Dredging Project	1					
10/27/09	7:55	South	09-C0049		EPA/GE Dredging Project	1					
10/27/09	9:55	North	09-C0124		EPA/GE Dredging Project	1					
10/27/09	9:55	North	09-C0122		EPA/GE Dredging Project	1					
10/27/09	10:20	North			Canal Corporation Vessel	1	TUG WATERFORD				
10/27/09	11:30	South	09-C0124		EPA/GE Dredging Project	1					
10/27/09	11:30	South	09-C0122		EPA/GE Dredging Project	1					
10/27/09	12:40	South	09-24095		Pleasure	1	GRACE				
10/27/09	13:00	North	09-C0124		EPA/GE Dredging Project	1					
10/27/09	13:00	North	09-C0122		EPA/GE Dredging Project	1					
10/27/09	13:15	South	09-24094		Pleasure	1	CHARLEAU				
10/27/09	14:05	North			Canal Corporation Vessel	1	TUG GOVERNOR CLEVELAND				
10/27/09	14:25	South	09-C0122		EPA/GE Dredging Project	1					
10/27/09	14:25	South	09-C0124		EPA/GE Dredging Project	1					
10/27/09	15:05	North	09-C0043		EPA/GE Dredging Project	1					
10/27/09	16:05	North	09-C0122		EPA/GE Dredging Project	1					
10/27/09	16:05	North	09-C0124		EPA/GE Dredging Project	1					
10/27/09	17:00	South	09-C0043		EPA/GE Dredging Project	1					
10/27/09	17:30	South	09-C0122		EPA/GE Dredging Project	1					
10/27/09	17:30	South	09-C0124		EPA/GE Dredging Project	1					
10/27/09	18:00	North	09-C0049		EPA/GE Dredging Project	1					
10/27/09	18:00	North	09-C0042		EPA/GE Dredging Project	1					
10/27/09	19:10	South	09-C0042		EPA/GE Dredging Project	1					
10/27/09	19:10	South	09-C0049		EPA/GE Dredging Project	1					
10/28/09	1:25	North	09-C0122		EPA/GE Dredging Project	1					
10/28/09	1:25	North	09-C0042		EPA/GE Dredging Project	1					
10/28/09	2:45	South	09-C0042		EPA/GE Dredging Project	1					
10/28/09	2:45	South	09-C0122		EPA/GE Dredging Project	1					
10/28/09	4:00	North	09-C0042		EPA/GE Dredging Project	1					
10/28/09	4:00	North	09-C0122		EPA/GE Dredging Project	1					
10/28/09	6:45	South	09-C0042		EPA/GE Dredging Project	1					
10/28/09	6:45	South	09-C0122		EPA/GE Dredging Project	1					
10/28/09	8:00	South			Canal Corporation Vessel	1	TUG GOVERNOR CLEVELAND				
10/28/09	8:20	South			Canal Corporation Vessel	1	TUG WATERFORD				
10/28/09	8:55	North	09-C0042		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
10/28/09	8:55	North	09-C0122		EPA/GE Dredging Project	1					
10/28/09	9:10	South			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
10/28/09	10:30	South	09-C0122		EPA/GE Dredging Project	1					
10/28/09	10:30	South	09-C0042		EPA/GE Dredging Project	1					
10/28/09	10:50	South	09-24099	NY 8999 FX	Pleasure	1					
10/28/09	11:25	North			Canal Corporation Vessel	1	TUG WATERFORD				
10/28/09	13:15	North	09-C0042		EPA/GE Dredging Project	1					
10/28/09	13:15	North	09-C0077		EPA/GE Dredging Project	1					
10/28/09	14:25	South	09-C0042		EPA/GE Dredging Project	1					
10/28/09	14:25	South	09-C0077		EPA/GE Dredging Project	1					
10/28/09	14:35	North			Canal Corporation Vessel	1	SPS 51				
10/28/09	15:15	South	09-24097		Pleasure	1	UKULA				
10/28/09	15:50	North	09-C0077		EPA/GE Dredging Project	1					
10/28/09	15:50	North	09-C0042		EPA/GE Dredging Project	1					
10/28/09	17:15	South	09-C0077		EPA/GE Dredging Project	1					
10/28/09	17:15	South	09-C0042		EPA/GE Dredging Project	1					
10/28/09	18:55	North	09-C0077		EPA/GE Dredging Project	1					
10/28/09	18:55	North	09-C0042		EPA/GE Dredging Project	1					
10/28/09	20:35	South	09-C0042		EPA/GE Dredging Project	1					
10/28/09	20:35	South	09-C0077		EPA/GE Dredging Project	1					
10/29/09	1:40	North	09-C0122		EPA/GE Dredging Project	1					
10/29/09	1:40	North	09-C0042		EPA/GE Dredging Project	1					
10/29/09	3:55	South	09-C0042		EPA/GE Dredging Project	1					
10/29/09	3:55	South	09-C0122		EPA/GE Dredging Project	1					
10/29/09	5:25	North	09-C0042		EPA/GE Dredging Project	1					
10/29/09	5:25	North	09-C0122		EPA/GE Dredging Project	1					
10/29/09	7:50	South	09-C0042		EPA/GE Dredging Project	1					
10/29/09	7:50	South	09-C0122		EPA/GE Dredging Project	1					
10/29/09	8:10	South	09-24100		Pleasure	1	WISPER				
10/29/09	13:40	North	09-C0042		EPA/GE Dredging Project	1					
10/29/09	13:40	North	09-C0124		EPA/GE Dredging Project	1					
10/29/09	15:35	South	09-C0042		EPA/GE Dredging Project	1					
10/29/09	15:35	South	09-C0124		EPA/GE Dredging Project	1					
10/29/09	16:55	North	09-C0124		EPA/GE Dredging Project	1					
10/29/09	16:55	North	09-C0042		EPA/GE Dredging Project	1					
10/29/09	20:25	South	09-C0124		EPA/GE Dredging Project	1					
10/29/09	20:25	South	09-C0042		EPA/GE Dredging Project	1					
10/29/09	22:10	North	09-C0124		EPA/GE Dredging Project	1					
10/29/09	22:10	North	09-C0042		EPA/GE Dredging Project	1					
10/29/09	23:40	South	09-C0042		EPA/GE Dredging Project	1					
10/29/09	23:40	South	09-C0124		EPA/GE Dredging Project	1					
10/30/09	1:10	North	09-C0077		EPA/GE Dredging Project	1					
10/30/09	1:10	North	09-C0042		EPA/GE Dredging Project	1					
10/30/09	2:30	South	09-C0077		EPA/GE Dredging Project	1					
10/30/09	2:30	South	09-C0042		EPA/GE Dredging Project	1					
10/30/09	3:50	North	09-C0103		EPA/GE Dredging Project	1					
10/30/09	4:45	South	09-C0103		EPA/GE Dredging Project	1					
10/30/09	7:45	South			Canal Corporation Vessel	1	WORK BOAT (FORT EDWARD)				
10/30/09	8:15	North	09-C0077		EPA/GE Dredging Project	1					
10/30/09	8:15	North	09-C0042		EPA/GE Dredging Project	1					
10/30/09	10:30	South	09-C0042		EPA/GE Dredging Project	1					
10/30/09	10:30	South	09-C0077		EPA/GE Dredging Project	1					
10/30/09	12:15	North	09-C0077		EPA/GE Dredging Project	1					
10/30/09	12:15	North	09-C0059		EPA/GE Dredging Project	1					
10/30/09	13:15	South	09-C0077		EPA/GE Dredging Project	1					
10/30/09	13:15	South	09-C0059		EPA/GE Dredging Project	1					
10/30/09	15:30	North	09-C0042		EPA/GE Dredging Project	1					
10/30/09	15:30	North	09-C0077		EPA/GE Dredging Project	1					
10/30/09	16:25	South	09-C0077		EPA/GE Dredging Project	1					
10/30/09	16:25	South	09-C0042		EPA/GE Dredging Project	1					
10/30/09	18:50	North	09-C0078		EPA/GE Dredging Project	1					
10/31/09	8:10	South	09-24361		Pleasure	1	IT'S TIME				
10/31/09	9:30	North	09-C0045		EPA/GE Dredging Project	1					
10/31/09	9:30	North	09-C0042		EPA/GE Dredging Project	1					
10/31/09	10:55	South	09-C0042		EPA/GE Dredging Project	1					
10/31/09	10:55	South	09-C0045		EPA/GE Dredging Project	1					
10/31/09	11:30	South	09-C0078		EPA/GE Dredging Project	1					
10/31/09	11:55	North	09-C0055		EPA/GE Dredging Project	1					
10/31/09	14:10	North		CT 6111 AE	Other Government	1	ECHO				
10/31/09	14:25	South	09-C0055		EPA/GE Dredging Project	1					
10/31/09	16:15	South			Other Government	1	ECHO				
11/02/09	3:40	North	09-C0045		EPA/GE Dredging Project	1					
11/02/09	4:30	South	09-C0045		EPA/GE Dredging Project	1					
11/02/09	7:30	North	09-C0042		EPA/GE Dredging Project	1					
11/02/09	7:30	North	09-C0122		EPA/GE Dredging Project	1					
11/02/09	9:10	South	09-C0042		EPA/GE Dredging Project	1					
11/02/09	9:10	South	09-C0122		EPA/GE Dredging Project	1					
11/02/09	12:30	North	09-C0042		EPA/GE Dredging Project	1					
11/02/09	12:30	North	09-C0077		EPA/GE Dredging Project	1					
11/02/09	13:30	South	09-C0042		EPA/GE Dredging Project	1					
11/02/09	13:30	South	09-C0077		EPA/GE Dredging Project	1					
11/02/09	14:10	North	09-C0077		EPA/GE Dredging Project	1					
11/02/09	14:10	North	09-C0042		EPA/GE Dredging Project	1					
11/02/09	15:10	South	09-C0042		EPA/GE Dredging Project	1					
11/02/09	15:10	South	09-C0077		EPA/GE Dredging Project	1					
11/02/09	18:20	North	09-C0078		EPA/GE Dredging Project	1					

DATE	TIME	DIRECTION	PERMITNUMBER	REGISTRATIONNUMBER	VESSELTYPE	VESSELCOUNT	VESSELNAME	COMMERCIALTRIPNUMBER	COMMERCIALVESSELNAME	COMMERCIALREGISTRATIONNUMBER	COMMERCIALPERMITNUMBER
11/02/09	18:55	South	09-C0078		EPA/GE Dredging Project	1					
11/03/09	9:45	South	09-24362		Pleasure	1	GLADYS				
11/03/09	14:15	South	09-24363		Pleasure	1	TREE HOUSE				
11/03/09	14:40	North	09-C0078		EPA/GE Dredging Project	1					
11/03/09	17:20	South	09-C0078		EPA/GE Dredging Project	1					

Common Appendix

Correspondence Between GE and EPA 2009

From:"Blaha, Scott R (GE, Corporate)" scott.blaha@ge.com
To: Benny Conetta/R2/USEPA/US@EPA
Sent: 09/05/2008 12:04 PM
cc
Subject: Re: Accepted: Phase 1 Resuspension Controls and Loads

No. Just more of the 650 kg would be applied to Phase 1, based on the ratio of PCB mass between Phase 1 and Phase 2.

Scott Blaha

Sent using BlackBerry

----- Original Message -----
From: Conetta.Benny@epamail.epa.gov <Conetta.Benny@epamail.epa.gov>
To: Blaha, Scott R (GE, Corporate)
Sent: Fri Sep 05 10:10:52 2008
Subject: RE: Accepted: Phase 1 Resuspension Controls and Loads

Hi Scott.

Just wanted some clarification on the load adjustment. Is GE also proposing to increase the project load from 650 kg as well?

Thanks.

From: Benny Conetta/R2/USEPA/US@EPA
Sent: 01/30/2009 04:57 PM
To: "Blaha, Scott R (GE, Corporate)" scott.blaha@ge.com
cc Doug Garbarini/R2/USEPA/US@EPA,
Douglas Fischer/R2/USEPA/US@EPA
Subject: Re: Contingent Controls(Document link: Benny Conetta

Hi Scott.

Attached is our letter on the Contingent controls revisions.

Thanks.

(See attached file: 2009-01-30 Contingent Controls letter.pdf)

January 30, ~~2008~~ 2009

Via Electronic Mail and
First Class Mail

John Haggard
General Electric Company
319 Great Oaks Blvd
Albany, New York 12203

Re: Hudson River PCBs Superfund Site – Consent Decree (Civil Action No. 1:05-CV-1270) Design Revision for Contingent Resuspension Controls

Dear John:

GE's proposal to utilize silt curtains in lieu of steel sheet piling for contingent resuspension controls for the CU's identified and as outlined in the Company's letter of September 22, 2008, is acceptable to USEPA on a trial basis for Phase 1 only subject to certain conditions indentified below. This change in the Phase 1 design for contingent resuspension controls adds an additional element of risk in terms of potential losses of resuspended PCBs to downstream areas. EPA recognizes that avoiding the potential impacts on the dredging schedule due to the extensive time needed to install the sheeting and eliminating the noise associated with driving sheet piling are such that it makes sense to try this approach during the initial phase of the dredging.

Accordingly, EPA is willing to accept this proposed change with the understanding that, should silt curtains fail to control the loss of excessive amounts of suspended solids to downstream areas in compliance with the Resuspension Standard, GE will take additional controls to reduce these losses to an acceptable level. These additional controls should include reducing bucket cycle time below that typically used when working in a sheeted enclosure, installing silt curtains that are anchored at their bottom along the river bed as opposed to more traditional silt curtains which employ a chain ballast suspended approximately a foot above the river bed, and using a combination of silt curtains installed parallel to the flow lines in the river with sheet pile walls at right angles to the flow line where necessary to divert high flows around the containment area. These controls may need to be evaluated in combination with each other depending on river flow rates and release rates.

In the event that these additional controls are still not effective, EPA reserves the right to require GE to install the sheet pile containment structures originally approved as contingent resuspension controls for Phase 1.

If at the start of the season it is apparent that sheet piles are indeed needed based on resuspension loses, EPA may require that sheet piles be installed. If this is the case, it is suggested that GE re-evaluate the design to determine whether shorter sheet piles would be acceptable.

Please feel free to call me, or have your staff call Ben Conetta at 212-637-3030.

Sincerely yours,

Doug Garbarini, Chief
New York Remediation Branch

cc: William Daigle, NYSDEC
David King, EPA

HUDSON RIVER PROJECT - PHASE 1

381 Broadway. Building 40-2. Fort Edward, NY 12828. 518-746-5311. Fax: 518-746-5703

TRANSMITTAL
Transmittal No. 00006

TASK: 163A - Shipping of Dredge Materials

7/1/2009

From: Susan Dane
Parsons
Bldg 40-2
Ft. Edward, NY 12828
Phone: 518-746-6071

ATTN: David King
Environmental Protection Agency
421 Lower Main Street
Hudson Falls, NY 12839

REF: Unit Tain 2
Manifest 000922801GBF

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
☐ Shop Drawings	☐ Approval	☐ Approved as Submitted
☐ Letter	☑ Your Use	☐ Approved as Noted
☐ Prints	☐ As Requested	☐ Returned After Loan
☐ Change Order	☐ Review and Comment	☐ Resubmit
☐ Plans		☐ Submit
☐ Samples	**SENT VIA:**	☐ Returned
☐ Specifications	☑ Attached	☐ Returned for Corrections
☑ Other: Manifest	☐ Separate Cover Via:	☐ Due Date:

ITEM NO.	COPIES	DATE	ITEM	NUMBER	REV. NO.	DESCRIPTION	STATUS
001	1	06/30/09				Manifest 000922801GBF	NEW
002	1	06/30/09				Manifest Attachment	NEW

RECEIVED
JUL 02 2009

CC: Karen Diel

Signed: Susan Dane
Susan Dane

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number NYD980763841	2. Page 1 of 2	3. Emergency Response Phone 518-705-3158	4. Manifest Tracking Number 000922801 GBF

GENERATOR

5. Generator's Name and Mailing Address
General Electric - Hudson River Project
381 Broadway Bldg 40-2, Fort Edward, NY 12828
Generator's Phone: 518-746-6701

Generator's Site Address (if different than mailing address)
General Electric - Hudson River Project
446 Lock 8 Way
Hudson Falls, NY 12839

6. Transporter 1 Company Name: Canadian Pacific Railway — U.S. EPA ID Number: NYD986068139

7. Transporter 2 Company Name: CSX Transportation — U.S. EPA ID Number: FLD006921340

8. Designated Facility Name and Site Address: Waste Control Specialists, LLC
9998 W. Hwy 176
Andrews, TX 79714
Facility's Phone: 888-789-2783 — U.S. EPA ID Number: TXD988088464

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. RQ, Waste, Polychlorinated Biphenyls, Solid, mixture, 9, UN 3432, III	81	BA ~~HG~~	7589 599 ~~8[illegible]~~	K	B007 OUTS	3941	L
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
Quanity information (#11 above) is for unit train.
Weight of PCB waste (in pounds) unit train 16,732,200 lbs
PCB date to storage for disposal 5-19-09
(Cont. on Page 2)

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: AS AGENT FOR GENERAL ELECTRIC COMPANY MARK MURPHY — Signature: Mark Murphy — Month 06 Day 30 Year 09

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: William L. Follett — Signature: [signature] — Month 06 Day 30 Year 09
Transporter 2 Printed/Typed Name: — Signature: — Month Day Year

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number: NYD980763841

22. Page: 2 of 2

23. Manifest Tracking Number: 000922801 GBF

24. Generator's Name: General Electric - Hudson River Project

25. Transporter 3 Company Name: Union Pacific Railroad — U.S. EPA ID Number: NED001792910

26. Transporter 4 Company Name: Texas New Mexico Railroad — U.S. EPA ID Number: TXW0000057133

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information
WCS Waste profile No: WP-019597
Average density of waste: 1.5 tons/cubic yard
Emergency Response Guide #171.
See manifest Attachment for additional Information

33. Transporter ____ Acknowledgment of Receipt of Materials
Printed/Typed Name: ~~William L. Follett~~ W 6-31-09 Signature: ~~[signature]~~ Month Day Year: ~~06 30 09~~

34. Transporter ____ Acknowledgment of Receipt of Materials
Printed/Typed Name | Signature | Month Day Year

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

GENERATOR / TRANSPORTER / DESIGNATED FACILITY

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

MANIFEST ATTACHMENT - Unit Train -2

Manifest Tracking Number: 000922801 GBF **Unit Train Ship Date:___6-30-09___ Unit Train No.:___2**

	Railcar ID #'s (in Unit Train order)		Gross Wt. (lbs.)	Tare Wt. (lbs.)	Net Wt. (lbs.)	Net Wt. (kgs.)	Notes
	Engine						
1	FURX	322343	269400	62700	206,700	93757.55	Filter cake on bottom
2	FURX	322341	266400	62600	203,800	92442.13	
3	FURX	322340	268300	62600	205,700	93303.96	
4	FURX	322330	268200	62700	205,500	93213.24	
5	FURX	322353	269600	62700	206,900	93848.27	
6	FURX	322355	266800	62800	204,000	92532.85	
7	FURX	322354	269400	62900	206,500	93666.83	
8	FURX	322448	268000	62800	205,200	93077.16	
9	FURX	322458	268700	62700	206,000	93440.03	
10	FURX	322457	267500	62600	204,900	92941.08	
11	FURX	322452	268400	62700	205,700	93303.96	
12	FURX	322461	264800	62700	202,100	91671.02	
13	FURX	322464	267700	62800	204,900	92941.08	
14	FURX	322376	273500	62700	210,800	95617.28	
15	FURX	322388	272200	62900	209,300	94936.89	
16	FURX	322466	270500	62700	207,800	94256.50	
17	FURX	322463	263800	62600	201,200	91262.79	
18	FURX	322404	268100	62600	205,500	93213.24	
19	FURX	322408	264600	62700	201,900	91580.31	
20	FURX	322413	269000	62900	206,100	93485.39	
21	FURX	322312	267600	62800	204,800	92895.72	
22	FURX	322304	268900	62700	206,200	93530.75	
23	FURX	322308	268100	62400	205,700	93303.96	
24	FURX	322300	271000	62800	208,200	94437.94	Filter cake on bottom
25	FURX	322307	267800	62500	205,300	93122.52	
26	FURX	322403	272800	62700	210,100	95299.76	All Filter cake
27	FURX	322402	273600	62600	211,000	95708.00	Filter cake on bottom
28	FURX	322401	270900	62600	208,300	94483.30	Filter cake on bottom
29	FURX	322483	269200	62700	206,500	93666.83	Filter cake on bottom
30	FURX	322482	269500	62900	206,600	93712.19	Filter cake on bottom
31	FURX	322453	268700	62700	206,000	93440.03	Filter cake on bottom
32	FURX	322481	268600	62700	205,900	93394.68	Filter cake on bottom
33	FURX	322396	271200	62600	208,600	94619.37	
34	FURX	322391	267100	62700	204,400	92714.29	
35	FURX	322350	267400	62500	204,900	92941.08	
36	FURX	322347	267400	62800	204,600	92805.01	
37	FURX	322331	268500	62400	206,100	93485.39	
38	FURX	322301	266800	62500	204,300	92668.93	
39	FURX	322334	270800	62800	208,000	94347.22	
40	FURX	322326	271600	62800	208,800	94710.09	
41	FURX	322316	271000	62800	208,200	94437.94	
42	FURX	322318	268700	62800	205,900	93394.68	
43	FURX	322449	268300	62700	205,600	93258.60	
44	FURX	322447	271400	62700	208,700	94664.73	
45	FURX	322443	271000	62700	208,300	94483.30	
46	FURX	322450	267200	62700	204,500	92759.65	
47	FURX	322323	270100	62700	207,400	94075.06	

Manifest Tracking Number: 000922801 GBF   Unit Train Ship Date:___6-30-09___ Unit Train No.:___2

	Railcar ID #'s (in Unit Train order)		Gross Wt. (lbs.)	Tare Wt. (lbs.)	Net Wt. (lbs.)	Net Wt. (kgs.)	Notes
48	FURX	322328	270200	62400	207,800	94256.50	
49	FURX	322473	269100	62600	206,500	93666.83	
50	FURX	322493	267100	62700	204,400	92714.29	
51	FURX	322492	268200	62700	205,500	93213.24	
52	FURX	322477	267800	62600	205,200	93077.16	
53	FURX	322319	269700	62900	206,800	93802.91	
54	FURX	322317	270100	62800	207,300	94029.70	
55	FURX	322385	269200	62500	206,700	93757.55	
56	FURX	322407	270000	62700	207,300	94029.70	
57	FURX	322406	270600	62900	207,700	94211.14	
58	FURX	322384	269600	62700	206,900	93848.27	
59	FURX	322400	269200	62600	206,600	93712.19	
60	FURX	322390	267600	62700	204,900	92941.08	
61	FURX	322394	272800	62500	210,300	95390.48	
62	FURX	322393	269400	62700	206,700	93757.55	
63	FURX	322395	269700	62500	207,200	93984.35	
64	FURX	322451	269200	62700	206,500	93666.83	
65	FURX	322321	269300	62800	206,500	93666.83	
66	FURX	322324	269600	62800	206,800	93802.91	
67	FURX	322322	269300	62800	206,500	93666.83	
68	FURX	322325	270000	62700	207,300	94029.70	
69	FURX	322320	271100	62800	208,300	94483.30	
70	FURX	322472	270200	62600	207,600	94165.78	
71	FURX	322479	265300	62700	202,600	91897.82	
72	FURX	322478	271300	62600	208,700	94664.73	
73	FURX	322485	269100	62800	206,300	93576.11	
74	FURX	322484	271300	62800	208,500	94574.02	
75	FURX	322488	271700	62700	209,000	94800.81	
76	FURX	322487	269100	62700	206,400	93621.47	
77	FURX	322480	271400	62700	208,700	94664.73	
78	FURX	322491	271200	62600	208,600	94619.37	
79	FURX	322474	272900	62800	210,100	95299.76	
80	FURX	322495	269100	62800	206,300	93576.11	
81	FURX	322494	268900	62600	206,300	93576.11	

UNIT TRAIN TOTALS:

16,732,200	lbs.
8,366	TONS
7589598.755	kgs.

HUDSON RIVER PROJECT - PHASE 1

381 Broadway. Building 40-2. Fort Edward, NY 12828. 518-746-5311. Fax: 518-746-5703

TRANSMITTAL
Transmittal No. 00013

TASK: 000 - Programmatic

7/2/2009

From: Timothy Kruppenbacher
General Electric
Building 40-2
Fort Edward, NY 12828
Phone: (518) 746-5247

ATTN: David King
Environmental Protection Agency
421 Lower Main Street
Hudson Falls, NY 12839

REF: 000B - Exceedance Reports

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
☐ Shop Drawings	☐ Approval	☐ Approved as Submitted
☐ Letter	☐ Your Use	☐ Approved as Noted
☐ Prints	☐ As Requested	☐ Returned After Loan
☐ Change Order	☐ Review and Comment	☐ Resubmit
☐ Plans		☐ Submit
☐ Samples	**SENT VIA:**	☐ Returned
☐ Specifications	☑ Attached	☐ Returned for Corrections
☑ Other: CD	☐ Separate Cover Via:	☐ Due Date:

ITEM NO.	COPIES	DATE	ITEM	NUMBER	REV. NO.	DESCRIPTION	STATUS
001	1	07/02/09				CD containing Exceedance Reports Provided to the EPA through 6/27/09.	FIO

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JUL 02 2009

CC:

Signed:
Timothy Kruppenbacher

RECEIVED
JUL 0 6 2009

Timothy A. Kruppenbacher P.E.
Operations Manager

GE-CEP
Hudson River Project Office
Building 40-2
381 Broadway
Fort Edward, NY 12828

T 518 746 5247
F 518 746 5701

timothy.kruppenbacher@ge.com

July 2, 2009

David H. King, P.E.
Director and Project Coordinator, Hudson River Field Office
United States Environmental Protection Agency, Region 2
421 Lower Main Street
Hudson Falls, NY 12839

Re: Hudson River PCBs Superfund Site – Consent Decree (Civil Action No. 1:05-CV-1270): Phase 1 Design Revision to Contract 4 Specification 13801 – Inventory Dredging

Dear Mr. King:

This letter requests a revision to the "concurrent CU inventory dredging" provision in the Contract 4 Specification Section 13801 3.01 A. As discussed during the weekly meeting on Wednesday July 1, 2009, that provision currently limits inventory dredging to occurring concurrently in a maximum of two contiguous CUs from the following CU groups: West CUs 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16; and East CUs 1, 2, 3 and 4.

The proposed revision would allow inventory dredging to begin in a third contiguous CU when the bulk inventory dredging, i.e., the dredging designed by the contractor to remove the targeted inventory, has been completed in the first CU of the contiguous three-CU group and only cleanup inventory dredging, i.e., additional dredging necessary to meet the required elevations, remains in that first CU. This revision, if approved, would enhance the efficiency and productivity of the in-river operations. In addition, since the bulk inventory dredging in the first (upstream) CU would be completed before starting work in the third (downstream) CU, this approach would not be expected to cause any significant re-contamination of the downstream CU, and any minimal amounts of sediment that might be transported to the downstream CU would be captured by the additional inventory dredging in that CU prior to the residual sampling.

Please let us know of EPA's approval of this proposed revision. In the meantime, please call me with any questions.

Sincerely,

Timothy A. Kruppenbacher

Timothy A. Kruppenbacher, P.E.
Operations Manager

cc:

Doug Garbarini
Team Leader, Hudson River Team
Emergency and Remedial Response Division
United States Environmental Protection Agency, Region 2
290 Broadway, 19th Floor
New York, NY 10007-1866

Chief, New York/Caribbean Superfund Branch
Office of Regional Counsel
United States Environmental Protection Agency, Region 2
290 Broadway, 17th Floor
New York, NY 10007-1866
Attn: Hudson River PCBs Superfund Site Attorney

Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, DC 20044-7611
Re: DJ #90-11-2-529 (letter only)

Director, Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, NY 12233-7011
Attn: Hudson River PCBs Superfund Site

Lisa Rosman
Coastal Resource Coordinator
NOAA
290 Broadway, 18th Floor
New York, NY 10007-1866

Robert Foley
Hudson River Case Manager
U.S. Fish and Wildlife Service
U.S. Department of the Interior
300 Westgate Center Drive
Hadley, MA 01035

Director, Bureau of Environmental Exposure Investigation
New York State Department of Health
547 River Street
Troy, NY 12180
Attn: Hudson River PCBs Superfund Site

bcc: John Haggard
Sheri Moreno
Darci DeLisle
Bob Gibson
Scott Blaha
Cathy Beebe
Andrew Inglis
Jim Bieke

Timothy A. Kruppenbacher, P.E.
Operations Manager

GE
Hudson River Project Office
381 Broadway – Bldg. 40-2
Fort Edward, NY 12828

T 518 746-5247
F 518 746-5701
Timothy.Kruppenbacher@ge.com

July 6, 2009

David H. King, P.E.
Director and Project Coordinator, Hudson River Field Office
United States Environmental Protection Agency, Region 2
421 Lower Main Street
Hudson Falls, NY 12839

Subject: Hudson River PCBs Superfund Site – Consent Decree (Civil Action No. 1:05-CV-1270): Follow-up on Productivity Concerns from Meeting of July 1, 2009

Dear Mr. King:

I wanted to clarify a couple of issues raised at our regular weekly meeting on Wednesday, July 1. During the meeting we spoke at length about several points you raised regarding your observations from June 30 regarding the productivity of both the processing facility and the dredging operations. Although we responded to your concerns during the meeting I wanted to provide you a summary of the discussion with respect to each of the issues you've raised and some additional information.

With respect to the processing facility, you raised three separate issues – the level of activity at the wharf, the method in which we handled material on the deck and cycle times of the trucks moving material from the unloading wharf to the staging areas. I have confirmed that none of these issues caused any production delays on the project during this week. On June 30, over 1650 CY were unloaded in the 24-hour period, over 90% of the material was processed through the trommel. Here are the details on the three issues you raised.

1. Unloading Wharf Activities

   You stated that during your site visit, you noted that a barge was at the wharf not being unloaded, the unloader had no operator in it, and other workers appeared to be taking their time moving about the wharf, but not unloading the barge. Your impression was that there was unnecessary down time as a result. That was not the case.

   The reason the barge was not being unloaded at the time you saw it was because it had just been docked and was being dewatered. This process takes approximately 45-60 minutes to complete. The initial step in unloading is to set the pump in the barge and pump out the excess water. After approximately 30 minutes, depending on the type of sediments (fine v. coarse), the excavator begins unloading the dewatered sediment.

   During the dewatering step in the process the unloader is not operated and, therefore, the operator takes his break avoiding breaks during operating times.

We meet daily with the contractors to review performance of the work and weekly to review productivity and potential improvements. Then, we implement any changes either through the week or during the next weekend maintenance period. As a result of those meetings, over the first month of the project, we have implemented many refinements to procedures to improve productivity.

These include:

- Installation of an "on-deck" barge-dewatering pump to dewater the barge prior to moving it to the unloader so the unloader is not waiting on the dewatering process.
- Installation of a high solids pump at the unloading position so that solids will be removed as part of the dewatering process to improve the efficiency of that operation.
- Revisions to steps in trommel operation to improve efficiencies and cycle times.
- Use of a remote control Bobcat to assist by pushing the last 12 inches of material in the bottom of the barge to the unloader.
- Continuous cycle time monitoring and evaluation of the unloading movements.
- Use of a dedicated tug for barge movement at the unloading wharf in lieu of the barge haul system.
- Modifications to the intermediate screen to maximize its capacity.
- Instructions to the dredging contractor to maximize sediments in barges based on available draft, including topping off of barges prior to shipment to the unloading wharf.

In short, we believe that these refinements have vastly improved our efficiency while keeping our focus on workplace safety and compliance with the consent decree. We will continue to look at ways to improve the performance and efficiency of the unloading operation. Of course, we welcome your comments on any improvements you believe would increase or improve the process.

2. Rehandling of material placed on the deck by the unloader

Depending on the exact time you were at the wharf, the material on the deck was from either unloading the last material in the prior barge, a direct off-load barge with high solids, or piling material to continue unloading while waiting for trucks. At the end of the barge unloading cycle, the last of the free-draining coarse material found at the bottom of the barge is placed on the pavement in the unloading area to finish draining prior to being loaded into the truck. The unloader, or a rubber-tired loader, then loads it into the trucks for hauling to the coarse staging area.

This process gives the contractor the flexibility to complete unloading the barge and return it into circulation without waiting for a truck to return from its cycle to finish unloading. This actually speeds up the process. Once that barge is completely unloaded, and while dewatering of the next barge is occurring, the contractor completes loading of the stacked material to the trucks to transport to the staging area. Although this process requires rehandling, it allows unloading to continue even while trucks are cycling, and allows the contractor to return barges to the river sooner.

3. Truck cycle time, and maneuvering

During the afternoon of June 30th, there was a slight delay in removing the dewatered material from the unloading wharf to the staging areas. The contractor had one truck broken down and being repaired, and one of the truck drivers was assisting with filter cake dumpster movements. Therefore, for a short period, only one truck, instead of three, was operating to haul coarse material to the staging area. To address potential breakdowns we have required the contractor to add a fourth truck that is now on site as a backup should the need arise. However, this did not reduce any activity in the river nor impact rail shipments. As you know, the material staging areas provide a productivity buffer between the river and rail operations.

However, we have made additional process improvements. To improve cycle times on the trucks, the method of staging the material in the coarse material bins is being revised. A loader or dozer will be used to maintain the face of the pile and to maintain a platform that the trucks can back up and dump on. Once that approach is implemented, the trucks will only need to back up rather than driving up on the pile and turning around. This should result in shorter cycle times for moving material from the unloading wharf and the staging areas.

4. You also told us that when you cross the bridge into/out of Ft. Edward you often do not see the dredges actually in the process of digging sediment.

This is not surprising. There are several steps in the dredging process that are required but are not actual digging steps. These include barge movements, repositioning of the dredges, barge change out when full, crew changes, waiting on surveys to be conducted, refueling, minor equipment repairs, and equipment calibration checks. It is not possible for the dredges to be constantly removing material.

In addition, all dredging is driven by the flow of the river, which dictates our ability to operate. As you are aware, in the west channel, we continue to have to shut down dredging operations almost daily due to high river flows. As of June 30th, 45 days into the process, we have been shut down the equivalent of more than 18 full days because of high flows in west channel of the river. We continue to make adjustment to allow for dredging in spite of the river flows. During the recent heavy rains and subsequent high flows, we moved dredges out of the west channel into other parts of the river so we could continue to remove material from those areas. This allowed us to keep all but two dredges working, even though flows exceeded 8,000 cfs for several days. The crews from those two dredges were moved to other equipment elsewhere in the river where they could continue working.

Additionally, and perhaps most importantly, productivity in the river has been reduced this week and last week because we are in a phase of work in CU-1 and CU-2 that, as expected, results in smaller amounts of material being removed from the river.

- Under the CU Acceptance process, approved by the Agency, the contractor may not conduct inventory dredging in more than two consecutive CU's. This prevents inventory dredging from beginning in a third CU until the inventory dredging is complete in the most upstream CU, i.e., grade has been accepted within each 10x10 foot grid in the CU. This avoids recontamination in a downstream CU, from resuspended material from an adjacent upstream CU. This limits the progression of bulk inventory dredging until after the inventory "cleanup" of a CU, using smaller, lower production buckets (i.e., 1 cubic yard vs. 5 cubic yard), is complete.
- The process to get each 10x10 foot grid to grade is time consuming.
- This process includes clean up dredging passes, field surveys and evaluation of grade, including performing calculations that need to be done in the field office. These dredging passes are over areas of the river where dredging is essentially complete. It is "cleanup" or a final pass and since the areas have already been dredged the amount of material taken out is, by design, less than in undredged areas.

- During this clean up process, we also encountered new areas in the 10x10 foot grid that changed grade - likely from equipment movement in the area. Specifically, these new high spots were likely caused by spuds, bucket movement and vessel movement that occurred during the clean up process. Most of the high spots were in the range of 0.1 to 0.3 feet above the required tolerance. The requirement is to be less than .25 feet above grade on average over the 10x10 foot grid. This requires that the dredge be sent back into this area to remove relatively small amounts of material-again a low productivity step. CU2 is an example of the characteristics of the river complicating the process. CU-2 contains a large amount of small debris. This affects our ability to quickly complete the grade required by the approved final design. As we have discussed, we will be taking some underwater photography to investigate the conditions that exist in that CU. This should be available next week and we will be prepared to discuss how to obtain acceptance of the inventory grade with you at that time.

Finally, in CU-5 and CU-6, the contractor continues to encounter bedrock at higher grades than expected. As a result in some areas the contractor cannot achieve the required depth because the bedrock is above that grade. This results in lower productivity due to not only the lack of sediments but also the need to slowly probe for sediment in these areas. As we have reviewed with you, the contractor is probing with a bucket on port, center and starboard positions to determine if bedrock exists, marking those locations and moving the dredge ahead. In areas where there is material to dig, the contractor is dredging. Bucket bites encountering bedrock are being marked. Again, as discussed, we will be obtaining underwater photography to document the conditions encountered. We will be prepared to meet with you next week regarding the acceptance process for these types of areas.

I trust this clarifies the issues we discussed and better explains the process you observed. As we both know this is a very complex project and we constantly look for ways to improve the day-to-day operations. Over the past weeks we have made changes that we believe have helped overall project efficiency and productivity.

We welcome any suggestions that you have in that regard.

Sincerely,

Timothy A. Kruppenbacher, P.E.
Operations Manager

cc: A. Inglis, GE
S. Blaha, GE
R. Gibson, GE
L. Hartman, Parsons
K. Diel, Parsons

Benny Conetta/R2/USEPA /US
07/31/2009 10:36 PM

To
"Gibson, Bob (GE, Corporate)" <bob.gibson@ge.com>

cc
"DeLisle, Darci (GE, Corporate)" <darci.delisle@ge.com>, David King/R2/USEPA/US@EPA, egarvey@pirnie.com, "John Connolly" <jconnolly@anchorqea.com>, "James Rhea" <jrhea@anchorqea.com>, "Mark LaRue" <mlarue@anchorqea.com>, <GKlawinski@ene.com>, Doug Garbarini/R2/USEPA/US@EPA

Subject
Fw: Comments on GE Baseline Memo of July 13, 2009

Hi Bob,

Attached please find our review of the approach proposed by GE. EPA, as is GE, is interested in having the most appropriate evaluation and calculation of load for the project. As such, we did spend a large amount of time evaluating the proposal and the data underlying the load calculations. At this time, the approach as defined in the EPS still seems to be the best estimate of load at Waterford as well as the other stations. We do appreciate GE's intent and effort in trying to calculate the loads. We are available to discuss once you have had a chance to review.

Thanks (See attached file: 2009-07-31 MPI Baseline PCB Loads at Waterford-final text and figures.pdf)

Interoffice Correspondence

Date: July 31, 2009

To: B. Conetta

From: E. Zamek, S. Gbondo-Tugbawa and E. Garvey

Re: Estimation of Baseline PCB Loads at the Waterford Far-Field Station during the Dredging Season (May to November)

Summary

The BMP data at Waterford show no correlation between Total PCB, TSS and flow. The basic premises of GE's model do not appear to be supported by the data (*i.e.*, erosion load is <u>not</u> directly proportional to the suspended solids load generated at high flow and that average loads are <u>not</u> the best means of representing monthly conditions under low flow conditions). In addition, GE's model cannot be used to construct the baseline conditions defined as the 95% UCL of BMP observation in the Resuspension Performance Standards. The best approach to determine baseline is to estimate the 95% UCL for Total PCB and Tri+ concentrations for each month (as opposed to loads), and use these concentrations under all flow conditions. This observation applies to the other far-field stations as well. Finally, during discussions GE suggested that Tri+ loads are conservatively translated downstream from Schuylerville to Waterford. This memo will present evidence to show this is not the case currently (although it may have been in the past) and, in fact, Tri+ appears to be lost relative to the lighter fractions of PCBs.

Detailed Analysis

In order to identify and evaluate total polychlorinated biphenyl (Total PCB) loads introduced into the water column due to dredging activities, baseline PCB loads and the inherent variability associated with these loads must first be established. Baseline loads were calculated for the Rogers Island, Thompson Island (TID-West and TID-PRW2), and Schuylerville during development of the Engineering Performance Standard (EPS) for Resuspension using statistical analysis on data collected by GE post-1996 during the weekly ongoing sampling program. Correlation between Total PCBs, TSS, and flow were investigated during this process, and were applied where significant and useful; minor correlations with flow were ignored if the magnitude of the change in concentration or load was small. Based on these analyses, which are detailed in Attachment A to the EPS for Resuspension, it was determined that if an observed concentration exceeded the 95% UCL, than the result was most likely a result of the dredging operation. This is an important component of the Performance Standard in that it recognizes that baseline loads and concentrations have significant variations that should not be attributed to dredging. . Not sure this adds anything.

The approach proposed to estimate the annual (May to November) load at Waterford in the GE memo dated July 13, 2009 rests on two basic assumptions associated with the relationships between Total PCB load and Total Suspended Solids (TSS) Load:

- That the baseline load is relatively constant when groundwater/porewater input is dominant, attributed to flow conditions less than 5000 cfs and that the monthly mean concentrations can be used to estimate baseline load values for Total PCBs and TSS.

- That the Total PCB load will be directly proportional to the TSS Load under high flow conditions.

To assess these assumptions, several plots involving flow, TSS and Tri+ PCB and Total PCB concentrations and loads were made. A summary of the observations from these plots are as follows:

- There is no predictive relationship between Total PCB concentration and flow (Figure 1a) and between Tri+ PCB concentration and flow (Figure 1b), at either high or low flow conditions, a basic requirement of both assumptions above. There are some slight differences in observed monthly concentrations of Total PCB and Tri+ PCBs. Concentrations are not significantly different below and above 5000 cfs, with the exception of the three observations above 30,000 cfs. For example, observed concentrations for September remain relatively constant despite an order-of-magnitude range in flows, indicating that monthly load does not remain constant but rather monthly concentration does, thus representing a better basis for estimating baseline conditions.

- There is little variability in TSS concentrations below 20,000 cfs flow (Figure 2). TSS concentrations are higher above 20,000 cfs but show no structure with flow.

- There is no predictive relationship between Total PCB and TSS concentration at any flow (Figure 3). Thus, given the absence of correlation between TSS and Total PCBs, the premise of a predictable TSS-driven PCB load at Waterford is not supported by the existing data.

- The relationship between Total PCB load and flow (Figure 4; flows < 30,000 cfs shown) indicates Total PCB load increases and becomes more variable with increasing flow. This suggests that simple ratio estimators are the best linear methods for calculating annual load or loads over any period using this BMP data. The correlations noted by GE for PCB load and flow are simply the result of flow appearing on both sides of the regression and do not represent an improved predictor for the PCB component.

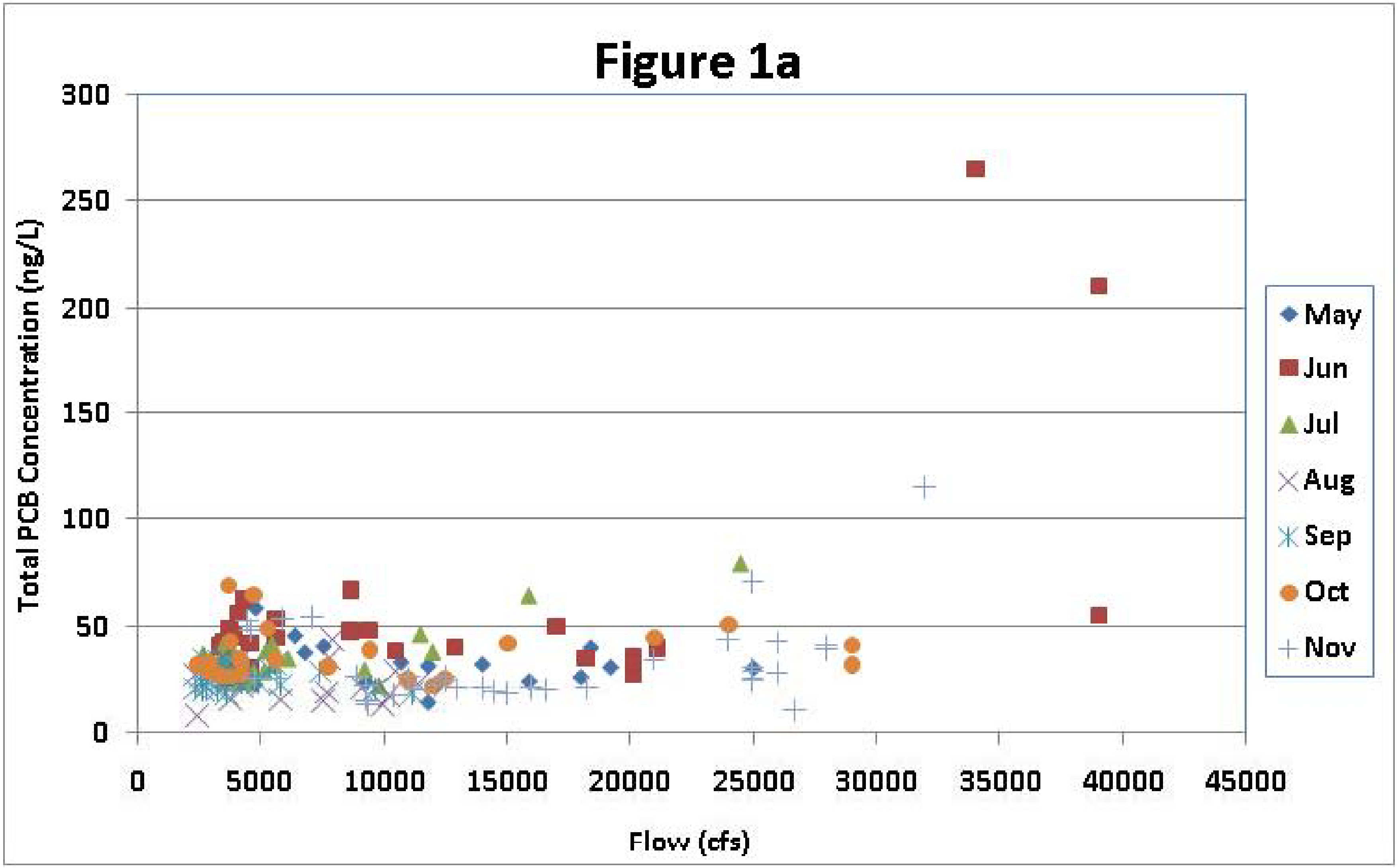
- There is no relationship between Total PCB load and TSS load (Figure 5), with significant scatter at higher flows and higher loads. GE's model in fact performed poorly when compared with observed high Total PCB loads (Figure 6) and thus does not represent a better basis to predict loads at higher flows.

The model provided by GE produces average loads at lower flows <10,000 which are the flows for which dredging is planned. However, baseline loads clearly vary from day to day and are better predicted by recognizing that baseline concentrations remain constant over a range of flows in a given month. Thus the baseline load on any day can be estimated as the product of the mean concentration and the actual observed flow on that day. Additionally, the performance standards define baseline loads as the 95% UCL (in recognition of both the uncertainty in the prediction process as well as the model forecasts of dredging-related PCB impacts relative to baseline), and this cannot be constructed from GE's proposed model. Therefore, since concentrations and flow are not correlated, the best approach to determining baseline is to estimate the 95% UCL for Total PCB and Tri+ concentrations for each month. This conclusion is consistent with previous conclusions in the Resuspension Performance Standard.

In related discussions with GE, it has been suggested that Tri+ PCBs are translated downstream more conservatively than Total PCBs or the lighter PCB congeners. The evidence to date does not support this suggestion, as presented in Figures 7, 8 and 9. In Figure 7, the Tri+ to Total PCB ratio is plotted as a function of time for the 2009 dredging program, using the GBM results at TI, Lock 5 and Waterford. While variability is clearly evident, it is also evident that the Tri+ to Total PCB ratio is very similar at all locations, with no readily identified increase downstream, as would be expected if the Tri+ fraction were transported more conservatively. This assertion is more rigorously tested in Figures 8 and 9. In Figure 8, the Tri+ to Total PCB ratio is examined for Total PCB levels less than 195 ng/L, a breakpoint suggested by a separate data analysis. For these relatively low PCB concentrations, the Tri+ to Total PCB ratio averages around 0.5, with a consistent but not statistically significant decline in the ratio from upstream to downstream. Note the stations are arranged alphabetically and not by river mile. In Figure 9, the same analysis is presented for the Tri+ to Total PCB ratio for Total PCB concentrations greater than 195 ng/L. In this instance, there is insufficient data for Waterford but the decline in the Tri+ to Total PCB ratio between TI and Schuylerville is statistically significant.

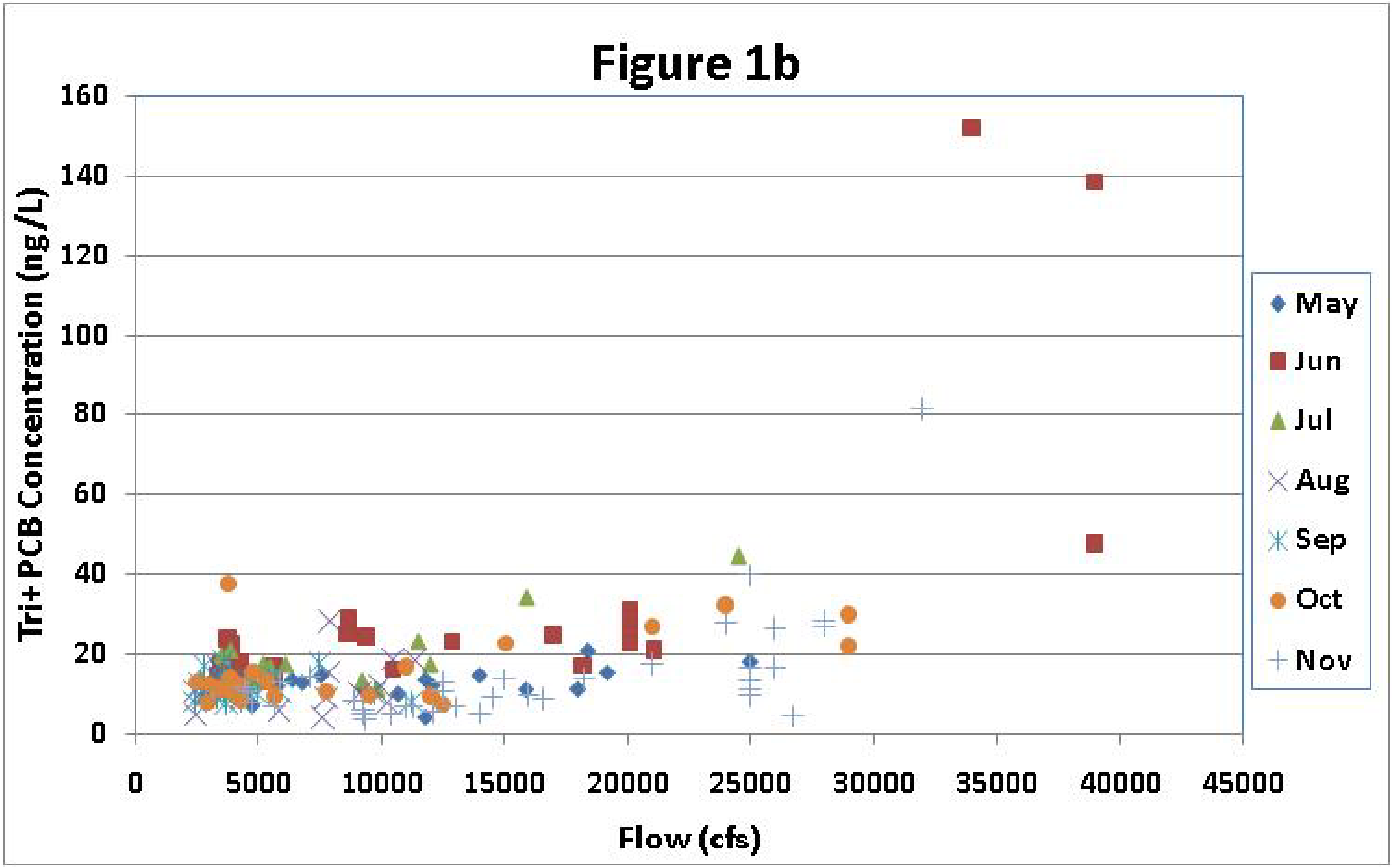
These analyses indicate that the Tri+ to Total PCB ratio either remains constant, or more likely, declines with transport downstream. Based on this trend, it is clearly evident that Tri+ PCBs are not transported more conservatively than Total PCBs (or the lighter congeners), and in fact, appear to preferentially lost relative to the lighter congeners.

In summary, the above analyses show that the basic assumptions underlying the GE model for Waterford are not supported by the data and thus the model does not provide a better predictive tool for estimating PCB loads. Additionally, the model does not provide a 95^{th} percentile UCL as required by the standard. Lastly, it does not appear that GE's suggestion that Tri+ PCB transport is more conservative is supported by the observations.



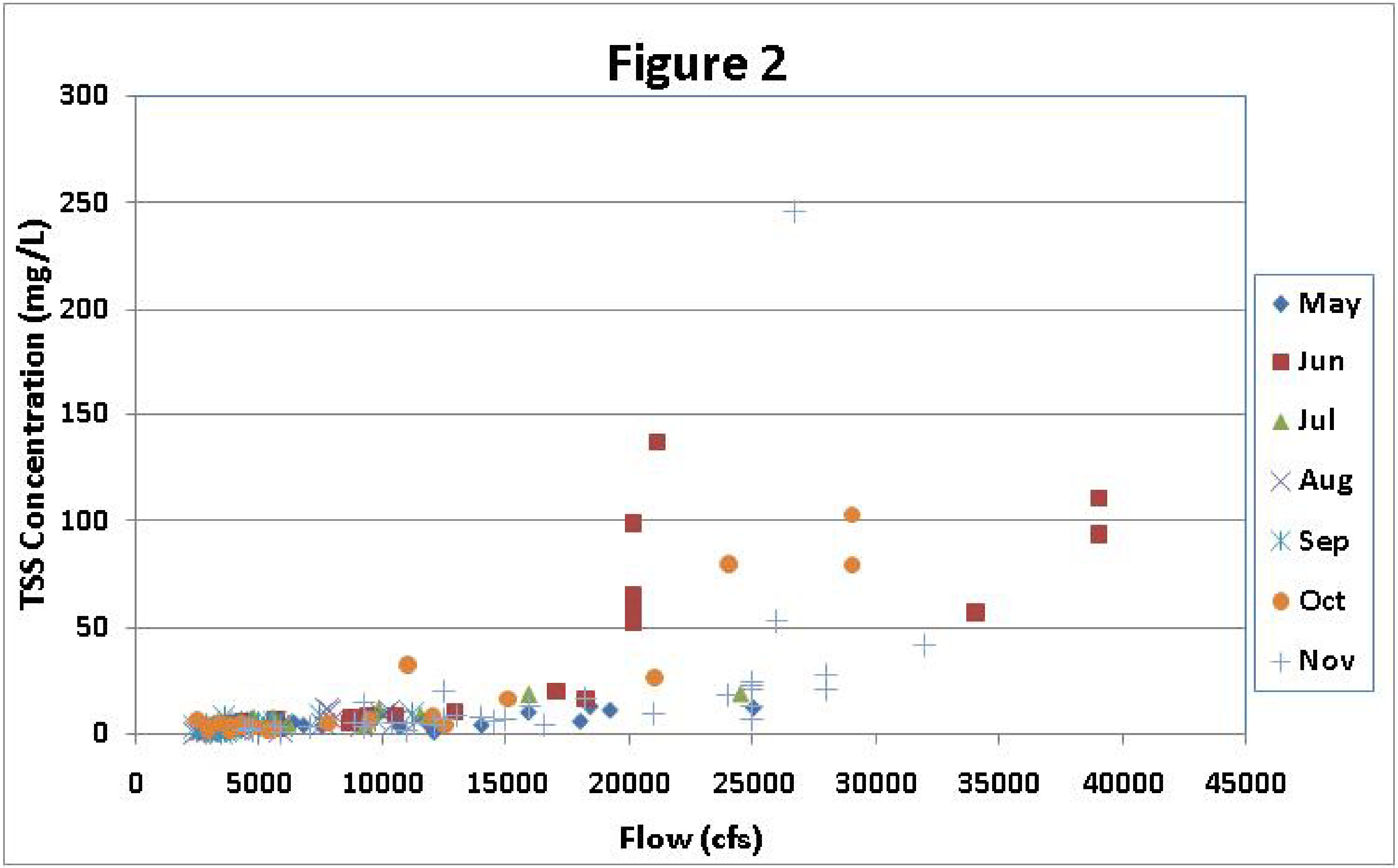
Total PCB Concentration *vs.* Flow at Waterford

Malcolm Pirnie, Inc.



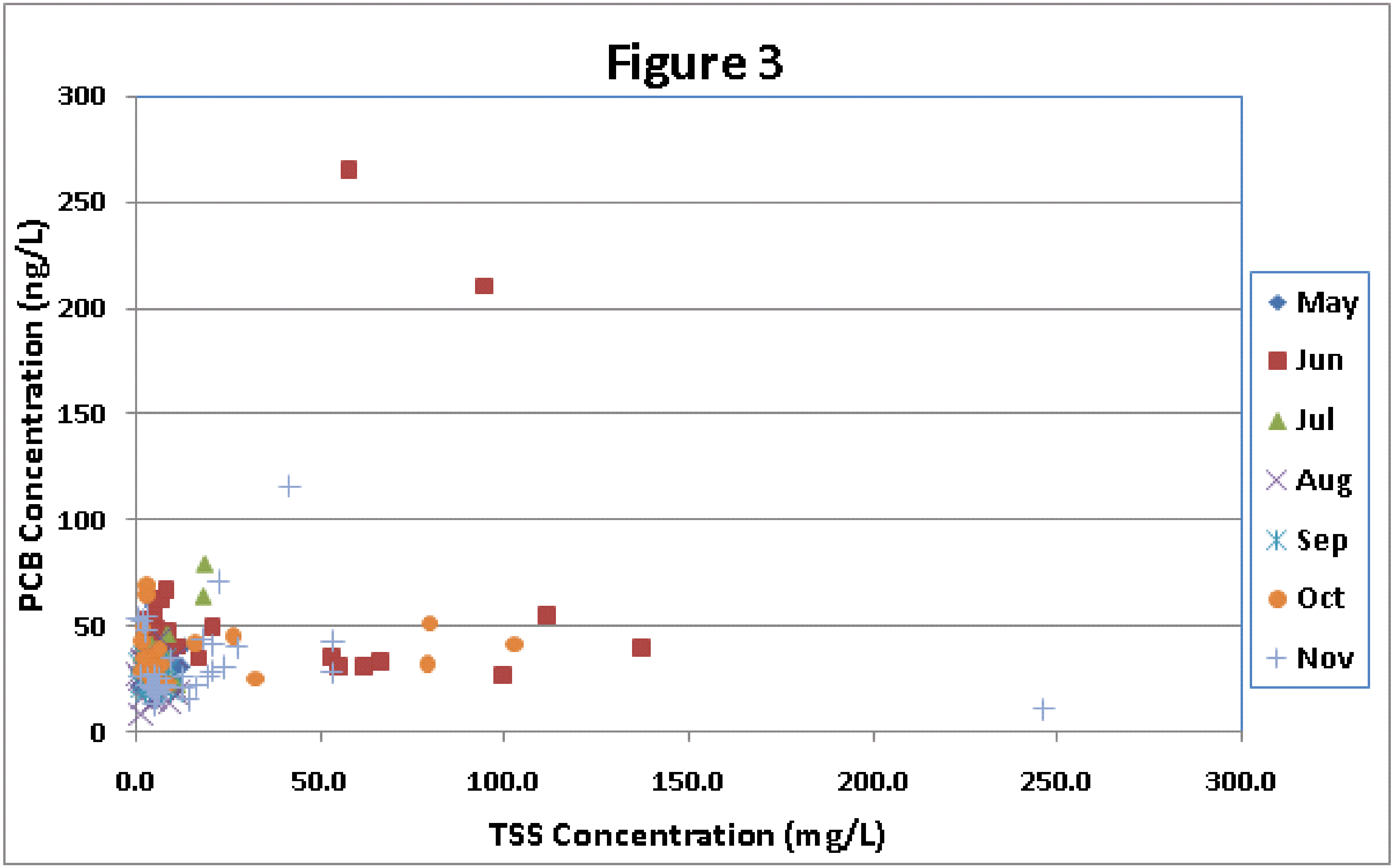
Tri+ PCB Concentration *vs.* Flow at Waterford

Malcolm Pirnie, Inc.



TSS Concentration *vs.* Flow at Waterford

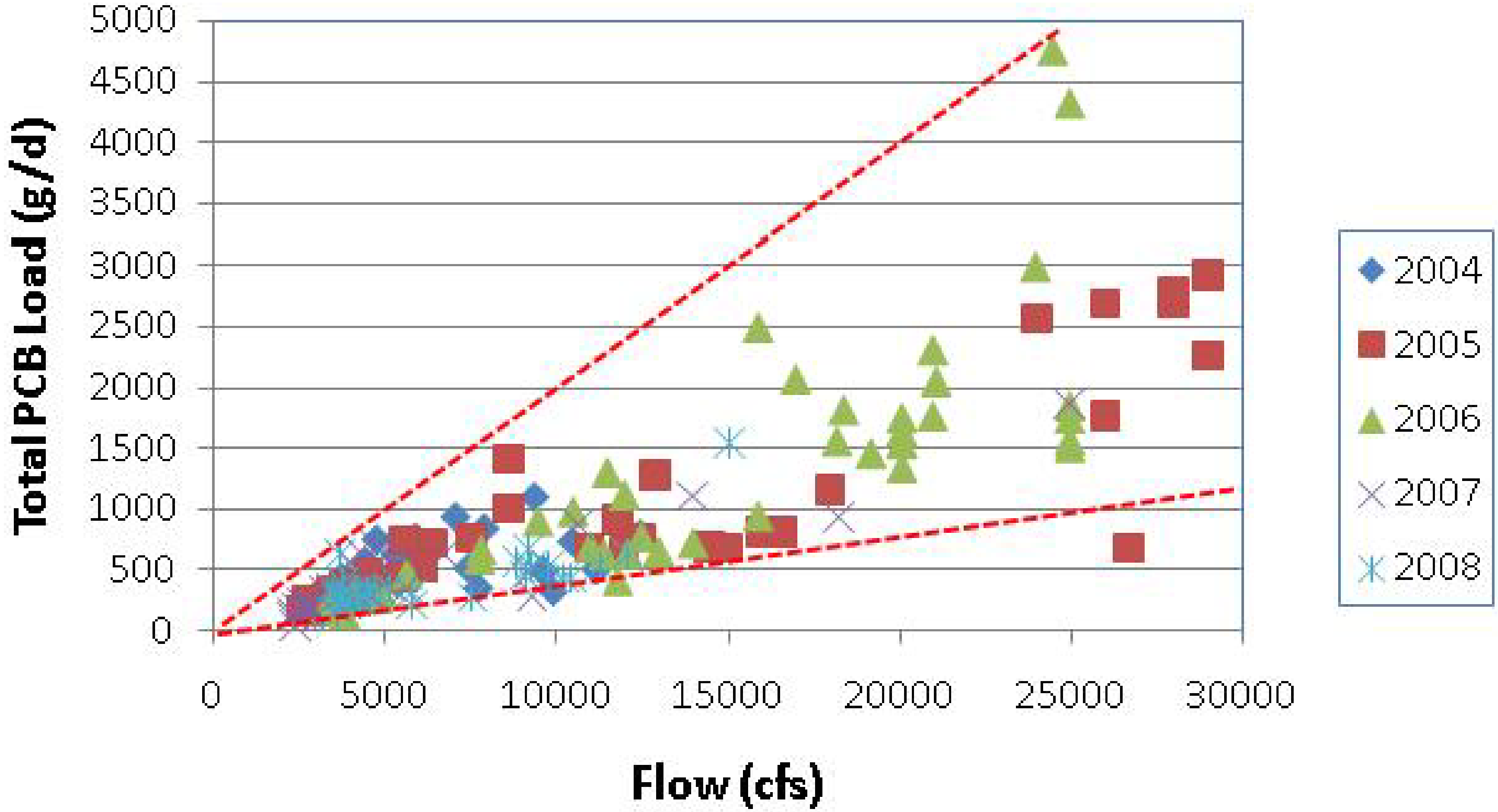
Malcolm Pirnie, Inc.



Total PCB Concentration *vs.* TSS Concentration at Waterford

Malcolm Pirnie, Inc.

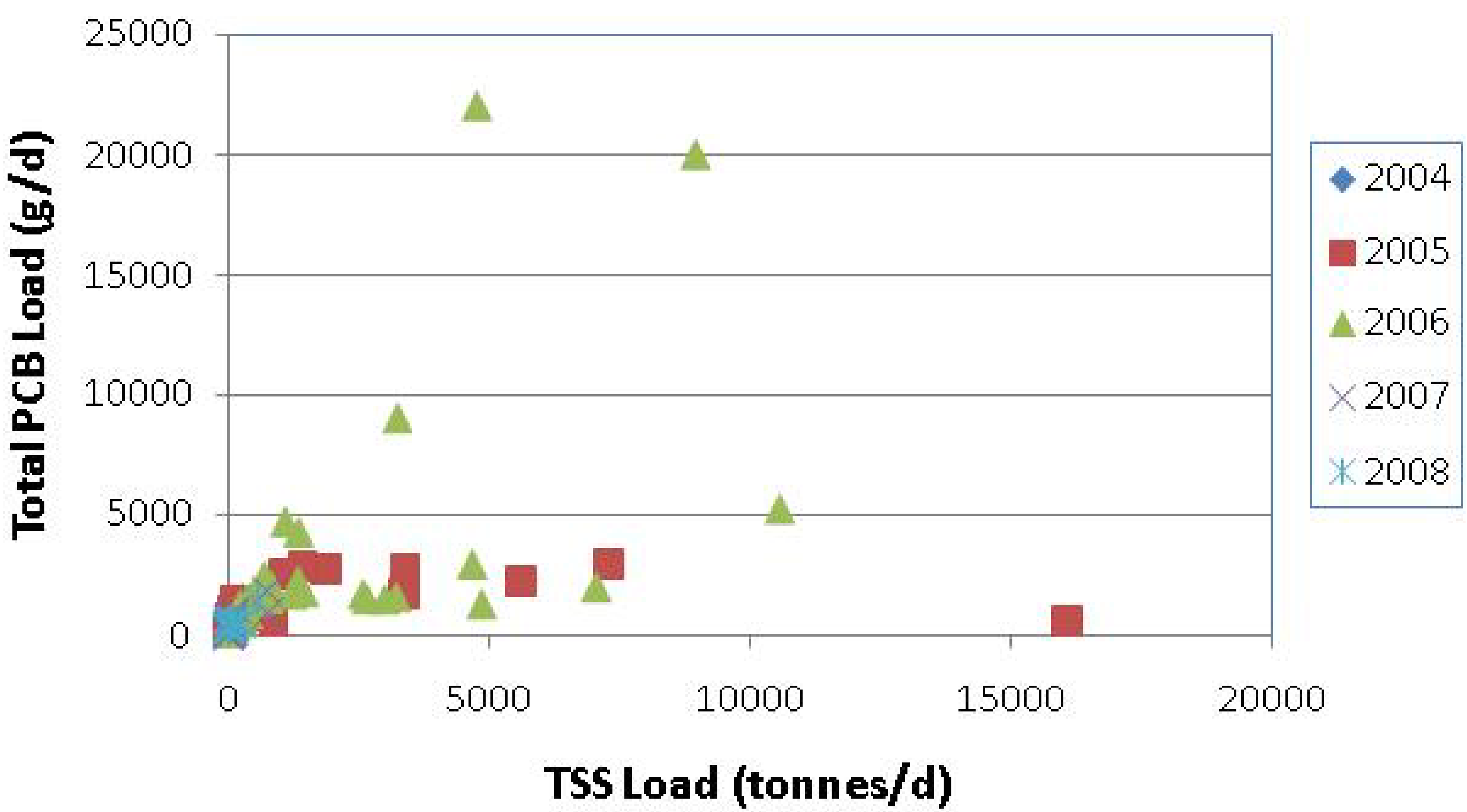
Figure 4



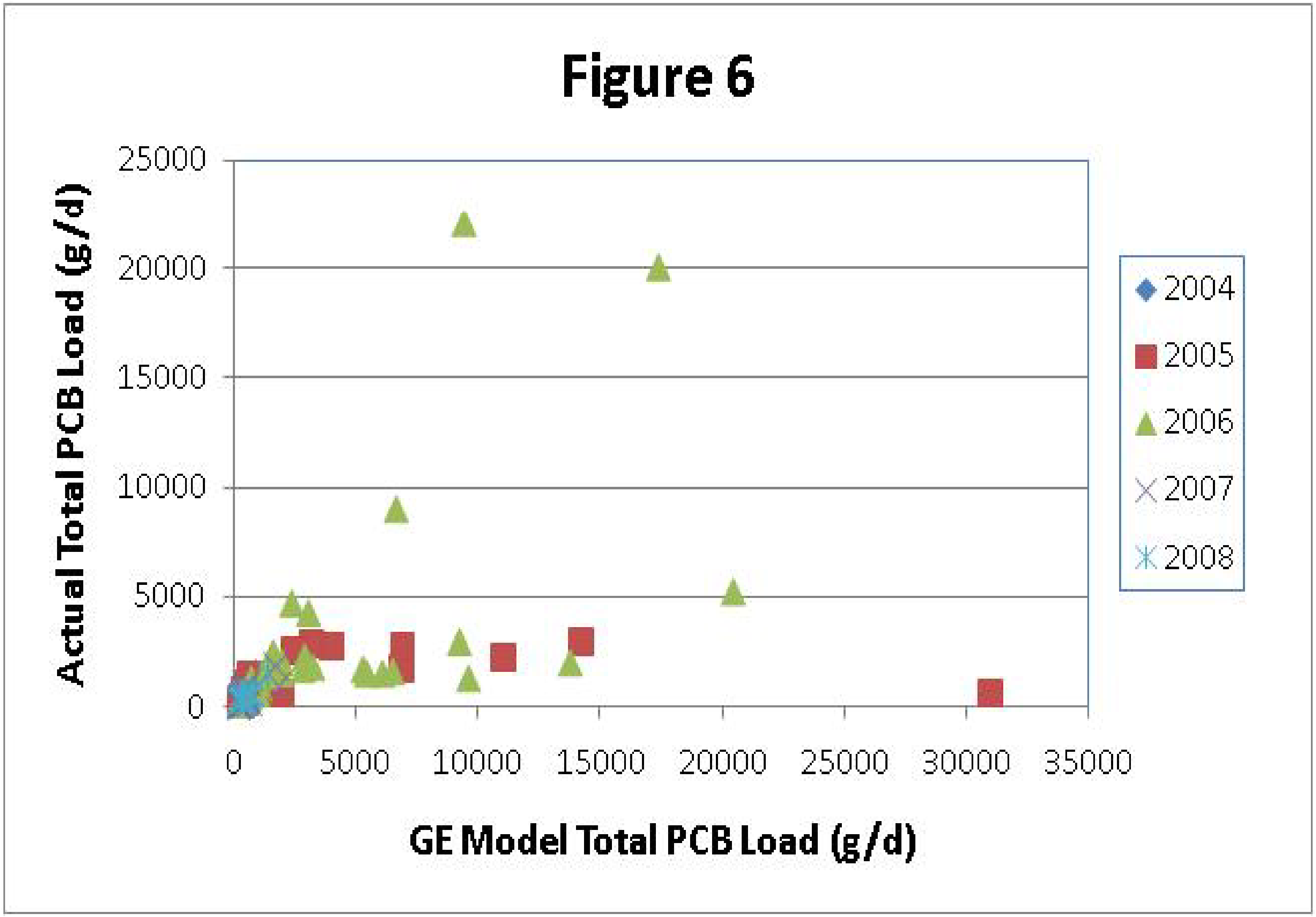
Total PCB Load *vs.* Flow at Waterford
(Flows less than 30,000 cfs)

Malcolm Pirnie, Inc.

Figure 5



Total PCB Load *vs.* TSS Load at Waterford



Actual Total PCB Load *vs.* Model Predicted Load at Waterford
(Individual Measurements Shown)

Malcolm Pirnie, Inc.

Figure 7

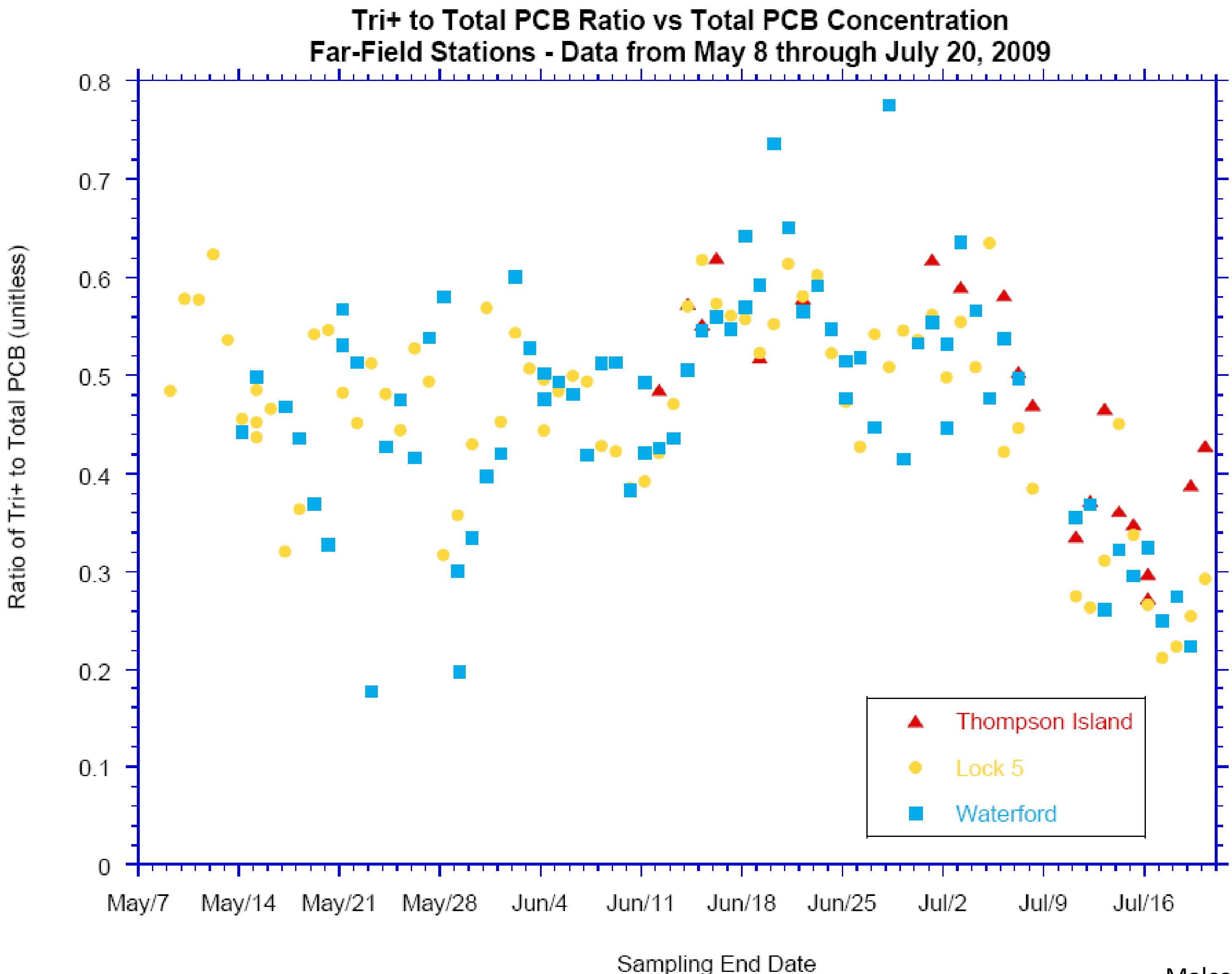

Tri+ to Total PCB Ratio vs Total PCB Concentration
Far-Field Stations - Data from May 8 through July 20, 2009
Ratio of Tri+ to Total PCB (unitless)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
May/7
May/14
May/21
May/28
Jun/4
Jun/11
Jun/18
Jun/25
Jul/2
Jul/9
Jul/16
Sampling End Date
Thompson Island
Lock 5
Waterford

Figure 8
Oneway Analysis of Tri+/TPCB ratio By Station
Samples with TPCB Less than or equal to 195 ng/L

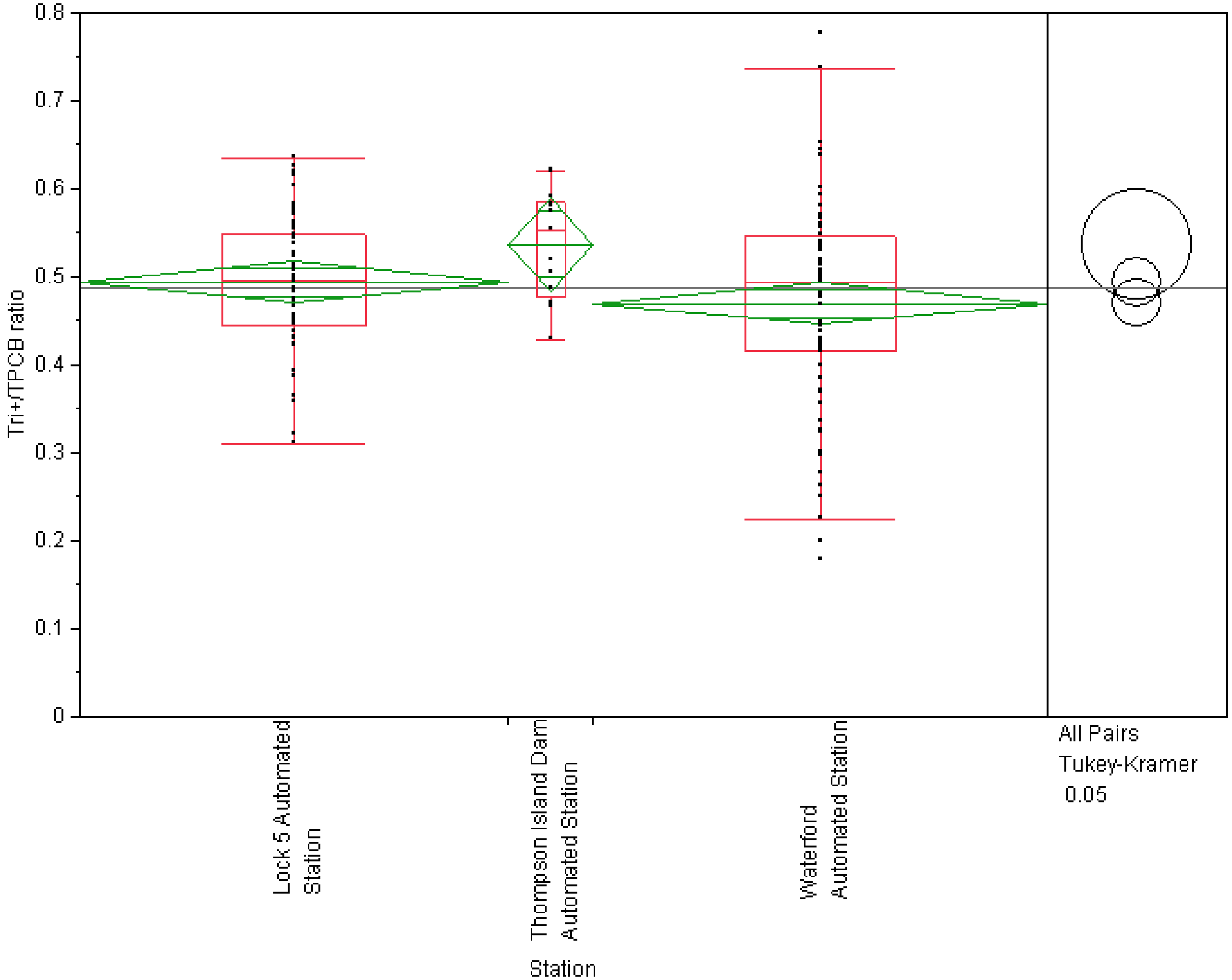
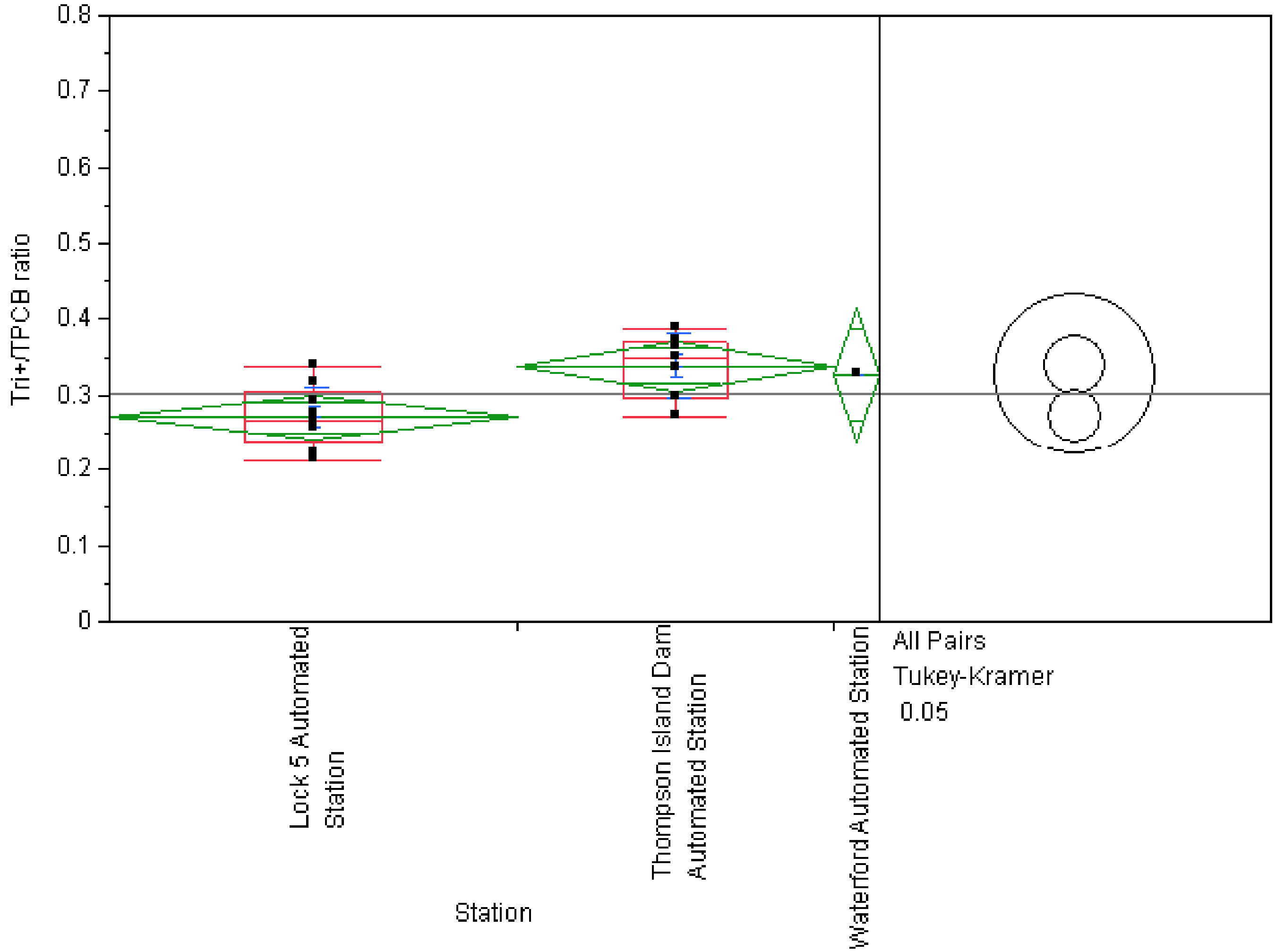


Figure 9
Oneway Analysis of Tri+/TPCB ratio By Station
Samples with TPCB Greater than 195 ng/L



Timothy A. Kruppenbacher P.E.
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timothy.kruppenbacher@ge.com

August 13, 2009

David H. King, P.E.
Director and Project Coordinator, Hudson River Field Office
United States Environmental Protection Agency, Region 2
421 Lower Main Street
Hudson Falls, New York 12839

Re: Hudson River PCBs Superfund Site – EPA Directives on Changes to Dredging Operations

Dear Mr. King:

GE has been working closely with EPA throughout the Phase 1 project to identify and put into place a series of best management practices for the dredging operations to limit resuspension of PCBs as well as PCB air emissions. On August 7, 2009, we received your e-mail recommending that we consider a number of additional changes to our operations. After further discussions, you provided a revised list of directions on August 10, 2009.

This letter documents the additional measures that GE will implement, based on EPA's directives and our discussions with you. For clarity, this letter sets out each of the six directives as presented in your August 10 e-mail, with GE's responses below each one.

EPA directive #1

All dredges loading to hopper barges should not decant water for any reason. The procedure for maintaining water cover on the hoppers must be strictly followed to control air emissions. To evaluate the impact of decanting the water, testing of decant water should include samples from the water immediately downstream of the bucket before a bite of the sediment, a sample from the decant water directly from the bucket overflow and an additional downstream sample in the river after the bucket pass. This should be performed in several different CUs to evaluate the resuspension potential from decanting the water back into the river.

GE Response: We already have implemented a process to eliminate decanting during loading to hopper barges. As you previously agreed, decanting is restricted solely to dredges that are loading mini-hopper barges. GE will again review the decanting restrictions with the dredging contractor and the CM inspection staff. In regards to the sediment water cover procedure, GE will continue to strictly follow the procedure provided to EPA on July 28, 2009 and accepted during our meeting of July 29, 2009.

With respect to sampling of dredge bucket decant water and river water immediately upstream and downstream of the bucket, as we have discussed previously, we are concerned that this program will not provide data that will help quantify the PCB loading from this potential source of resuspension. We believe that the program we put in place during the dredging restart, as detailed in our letter on August 11, will provide data to better understand PCB resuspension from the entire dredge operation. However, we will agree to perform a limited number of tests you have requested. Specifically we will perform testing once in each of three different CUs. We will make this data available to EPA prior to August 19 and the data will be reported in the engineering evaluation report described in our August 11 letter.

EPA directive #2

The use of containment booms and sorbent booms should be used on all barge operations regardless of the presence or absence of sheens. Until sufficient length of boom arrives on site, the booms should be deployed in high PCB concentration dredge areas first and placed downstream of the dredge bucket to contain sheens and collect sheens as much as possible.

GE Response: While GE is already deploying oil containment and sorbent when sheens are present, we agree that booms will now be used at all dredging operations, even in the absence of sheens, as dredging operations restart. As discussed on August 7, additional booms will need to be procured to support this request. This may take up to 3 weeks. It was also agreed that in the absence of sufficient booms to deploy immediately at all dredges, available booms would be prioritized for deployment in high concentration areas, until such time that the remaining boom materials are received.

EPA directive #3

Sorbent blankets, pom poms and/or Peat Sorb should be available on all dredges or response vessels and deployed immediately when sheens are observed. This should be required of the dredge captain and not wait for Parsons to instruct them to do it. A written protocol needs to be provided to Cashman so all dredge captains know what their responsibilities are for control of sheens.

GE Response: GE is procuring additional sorbent materials to equip all 385 dredge platforms. As discussed with you on August 7, most dredges require another vessel to assist in deployment. To that end we agreed that the response vessels will be equipped with materials to support the 320 dredge platforms and assist with the 385 dredge platforms. Additionally, GE has instructed Cashman to employ an additional response vessel and associated labor to support containment of dredging related sheens. This response vessel and crew were mobilized to the site on August 10. Initial testing indicates that Peat Sorb appears less effective than sorbent blankets at containing sheens. GE will evaluate the merits of adding Peat Sorb to the sheen control materials inventory once that testing is completed. A written protocol for sheen response was provided to you on August 12, 2009.

EPA directive #4

Use of mini-hoppers should be held to a minimum. Decanting to control water in the minis should be limited to buckets that are closed. Mini-hoppers should be tarped at all times except when being loaded including transport. Tarps for the hoppers should be able to be deployed using the dredge bucket to minimize personnel walking on the edge of the minis. Due to the low PCB levels remaining in CU-1, decanting will still be allowed to complete the residual pass for that CU.

GE Response: As EPA is aware, GE is already using mini-hoppers only when necessary. There are some circumstances (e.g., CU-5, CU-6 and shoreline areas) where mini-hoppers are necessary due to shallow water.

With respect to decanting of the water from the buckets, based on your direction, if any debris is stopping the bucket from closing, the contractor will move the bucket directly to the mini-hopper for unloading as quickly as reasonable. During bucket movement water will return to the river. In the case were the bucket is fully closed (no visible debris present), the contractor will be instructed to allow the water to decant from the bucket back to the river prior to moving the bucket to the hopper. The overall effect of this direction will be to increase the amount of water in the barges compared to sediment, requiring more frequent mini-hopper movements. This will likely lead to a reduction in productivity, but to what extent is unknown.

As has been previously discussed with EPA, the use of mini-hoppers requires that the water in the hopper be limited and carefully monitored. The mini-hopper barges can become unstable if too much water is present in them. As we continue through Phase 1 we will evaluate if your approach results in any stability issues and will adjust this procedure accordingly.

We understand from your direction that you want us to tarp the mini-scows in an attempt to reduce PCB air emissions. As we have explained even during the project design stage, this presents additional safety concerns for workers trying to put large tarps on barges, especially the mini-hoppers, which have no handrails, tie-offs and only 18 inches of walkway. GE is discussing with Cashman the development of a safe protocol for deploying the tarps using the dredge buckets. Cashman will be testing several methods for tarp deployment this week as part of the restart. GE will finalize the protocol following testing and will submit it separately to EPA for approval. Recognize that the barges when being loaded will not have tarps and the overall benefit of tarping is highly uncertain. As we continue through Phase 1 we will evaluate if your approach results in any significant reduction in PCB air levels. If not, we will propose to stop using the tarps.

EPA directive #5

The silt curtain in the east channel should be kept closed at all times except when vessels are entering or leaving the channel. If a crew has to stay there to insure this then that is OK. A sorbent boom "sweep" should be used at the gate to prevent surging of sheens when the gate is opened.

GE Response: GE has revisited the operation of the silt curtain gate with Cashman and the CM and is requiring that the silt curtain gate be closed in the East Channel whenever possible. GE and the CM staff will continue to monitor the operation of the gate. Cashman has installed a sorbent boom on the upstream side of the silt curtain. When the silt curtain is opened, it is opened to the north and the interior sorbent boom contains any sheen that has accumulated on the upstream side of the curtain.

EPA directive #6

Multiple attempts to cut to a fine DOC line rather than taking a full bite of the bucket to clear the remaining inventory or residual sediment mobilizes additional PCBs into the water column and reduces production. Positive removal rather than surgical removal will reduce the resuspension. I realize this may not be consistent with the QAPP, but Phase 1 is to try to do the work by the design and also to *adjust operations to meet the standards. To implement this, the first inventory pass should be to a six inch overcut to reduce the number of passes to meet the DOC cut line. Since redredging will be necessary anyway, minor excursions above this deeper line will not require additional passes before coring can begin.*

> GE Response: We are not aware of any data that would support your conclusion that re-dredging attempts are having any significant impact on PCB loads measured at the far field compliance stations. However, having to re-dredge an area multiple times does impact overall productivity of the inventory dredging. Meeting the tolerance for final grade (within +/- 3 inches in each 10'x10' grid) in areas of heavy debris, cobbles or boulders requires multiple bucket bites and several iterations. This has been clearly demonstrated by a comparison of CU-2 and CU-17. As discussed previously with EPA, the high volume of debris has been a primary contributor to the number of bucket bites. A potentially larger impact on productivity and re-dredging results from having to redredge multiple times to achieve the very low residual PCB levels established by EPA in the performance standards. Over the next 2 months we will gather data on the impact of residual dredging on overall project productivity.
>
> Your proposal for a general overcut in Phase 1 areas raises significant issues, not the least of which is inconsistency with the approved project design. From the onset, the project was designed to achieve accurate dredge cuts – a surgical approach rather than the traditional navigational dredging approach focused on high production. We believe a better approach is to apply a broader acceptance tolerance for elevation of the bulk (initial) inventory pass, thereby allowing sampling of residual sediments to occur as quickly as possible. Not only will this reduce the number of bucket bites, it will also reduce the amount of time required to complete a CU.
>
> From a practical perspective, to implement the directive you have described (optimizing bucket bites) Cashman must reprogram its computer system that controls the depth of cuts. To do this would take a dedicated engineering team several weeks.
>
> In any event, GE understands from discussions with you that the deeper cuts prescribed in this direction are to be applied as a test in CU-2. As a limited test to help learn from Phase 1 experiences we will agree to do this. We also suggest we try the GE approach outlined above for CU3.

As discussed above, not all of the equipment will be in place to implement some of these measures as dredging operations restart (for example, GE needs to procure tarps for the mini-hoppers). We understand that EPA has directed GE to continue with dredging in accordance with the startup schedule, using existing means and methods pending implementation of these additional measures.

Finally, I want to address the statement in your e-mail that the purpose of Phase 1 is "to try to do the work by the design and also to adjust operations to meet the standards." As a result, you have suggested that EPA can direct GE to implement certain changes – in this case, involving the depth of bucket cuts – even if the changes are not consistent with the approved design.

To clarify GE's position, we will implement the measures as discussed above, but at the same time we believe it is important to note that EPA's ability to make changes to the project during Phase 1 is limited by the consent decree that governs this work. Paragraph 20.a of the consent decree states that any modification that EPA makes to the SOW or work plans during Phase 1 "may only be required pursuant to this subparagraph to the extent that it is consistent with, and would not materially expand, the scope of the remedy selected in the ROD, and to the extent that it would not materially expand the scope of the Work required by the SOW or the attachments thereto." Other key limits on EPA's ability to direct changes during Phase 1 appear in the "Critical Phase 1 Design Elements" in Attachment A to the SOW. In a similar vein, the PSCP Scope (Attachment C to the SOW) states that GE will not be required during the Phase 1 season "to make equipment modifications or additions for that season that are not reasonably available from a schedule or cost standpoint. . . ." Taken as a whole, these limits represent the parties' expectation that EPA's directions during Phase 1 will not change the overall scope of the work that GE has agreed to implement.

Please let me know if you have any questions.

Sincerely,

Timothy A. Kruppenbacher
Operations Manager

cc:
Doug Garbarini, Chief
Special Projects Branch
Emergency and Remedial Response Division
United States Environmental Protection Agency, Region 2
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Chief, New York/Caribbean Superfund Branch
Office of Regional Counsel
United States Environmental Protection Agency, Region 2
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New York, New York 10007-1866
Attn: Hudson River PCBs Superfund Site Attorney

Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611
Re: DJ #90-11-2-529

Director, Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, New York 12233-7011
Attn: Hudson River PCBs Superfund Site

Lisa Rosman
Coastal Resource Coordinator
NOAA
290 Broadway, 18th Floor
New York, NY 10007-1866

Robert Foley
Hudson River Case Manager
U.S. Fish and Wildlife Service
U.S. Department of the Interior
300 Westgate Center Drive
Hadley, MA 01035

Director, Bureau of Environmental Exposure Investigation
New York State Department of Health
547 River Street
Troy, New York 12180
Attn: Hudson River PCBs Superfund Site

David
King/R2/USEPA/US

08/17/2009 10:31 AM

To

"Kruppenbacher, Timothy A (GE, Corporate)"
<timothy.kruppenbacher@ge.com>

Cc
"Inglis, Andrew A (GE, Corporate”
<andrew.inglis@ge.com>,
"Gibson, Bob (GE, Corporate)"
<bob.gibson@ge.com>,
Douglas Fischer/R2/USEPA/US,
garbarini.doug@epa.gov,
Benny Conetta/R2/USEPA/US

-Subject

Re: Response to 6 Point Email
(Document link: Benny Conetta)

Tim,
I have reviewed your response to my e-mail on operational changes and have the following comments on your response to item # 6.

1. Para. 1 - While no data has been collected until the recent near field transects to support a conclusion that redredging attempts are having an impact on PCB loads, common sense would dictate that the more often sediment is moved by the buckets, the greater the potential for mobilizing contaminants.

2. Para. 2 - In our discussion we all agreed that taking a 6 inch overcut on the initial inventory dredging pass would reduce the need to redredge small areas that may have been missed in the first pass. We also agreed that we would not require redredging at this point if there were a few areas above the cut line since a residual pass would be necessary anyway. That was the agreement and it made sense to avoid time consuming redredging for a very small addition to the total volume of inventory sediment. This helps to improve productivity and allows dredges to be used elsewhere in the project.

3. Para. 3 - The contention that adjusting the cut line to accommodate the 6 inch overcut would "take a dedicated engineering team several weeks" is not consistent with past practice of the dredge contractor.
Cashman adjusts the cutline on a sub CU level daily just to make "operator specific" adjustments. Relocating the cut line is standard practice every day.

Finally, EPA is well aware of the limitations on making changes to the project as described in the consent decree. We are also aware that Phase 1 was separated from the rest of the project to test the design and identify modifications that will improve the efficiency and control dredging impacts to the environment. I know that together we will be able to determine the changes necessary to insure the success of the program.

Dave

"Kruppenbacher, Timothy A (GE, Corporate)" <timothy.kruppenbacher@ge.com>	To	David King/R2/USEPA/US@EPA
08/13/2009 02:26 PM	cc	"Inglis, Andrew A (GE, Corporate)" <andrew.inglis@ge.com>, "Gibson, Bob (GE, Corporate)" <bob.gibson@ge.com>
	Subject	Response to 6 Point Email

Dave - Please find our response to your email from August 7. Hard copies are in the mail. Thanks.

<<2009-08-13 Ltr to EPA - Response to 6 points email.PDF>>

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GE imagination at work

(See attached file: 2009-08-13 Ltr to EPA - Response to 6 points email.PDF)

From: Benny Conetta/R2/USEPA/US
Sent: 09/01/2009 06:31 PM
To: "Gibson, Bob (GE, Corporate)" <bob.gibson@ge.com>

cc: "Yates, Chris (GE, Corporate, non-ge)" <cyates@anchorqea.com>, "DeLisle, Darci (GE, Corporate)" <darci.delisle@ge.com>, David King/R2/USEPA/US@EPA, EGARVEY@PIRNIE.com, "John Connolly" <jconnolly@anchorqea.com>, "Haggard, John (GE, Corporate)" <john.haggard@ge.com>, "Mark LaRue" <mlarue@anchorqea.com>, Doug Garbarini/R2/USEPA/US@EPA, Douglas Fischer/R2/USEPA/US@EPA

Subject: Re: Draft Baseline Load Memorandum(Document link: Benny Conetta)

Hi Bob,

EPA expended a significant effort in developing a basis for estimating baseline loads as part of the development of the RPS. This basis and process was extensively reviewed by a peer review panel. The original procedure provided in the RPS is based on an analysis intended to identify dredging-related releases that are clearly above the natural variation in river conditions and uses a 95% UCL on concentration for calculating load. The use of the 95% UCL on concentration is also the basis for the method discussed, approved and agreed to by GE and EPA after GE's Phase 1 RAM QAPP submittal (this occurred in mid to late May with the agreed to approach forwarded by David Glaser with spreadsheets and graphs concerning this approach later forwarded by John Connolly and yourself).

As we have stated in the past, EPA, as I am sure is GE, is interested in having the most appropriate evaluation and calculation of load for the project. As such, EPA expended a large amount of time evaluating GE’s previous proposals for calculating loads as well as the data underlying the GE’s load calculations. These evaluations were conducted in May (the QAPP submittal) and July (your email dated July 14). Each time deficiencies in the approaches were noted and EPA concluded that the method using the 95% UCL on concentration for calculating the load
was still the best and only acceptable approach. Furthermore, EPA believes it is incorrect and misleading to suggest that the load calculations using the 95% UCL on concentration is deficient when compared to the proposals developed by GE.

EPA will not conduct a comprehensive review of this recent approach at this time as we have an approved and acceptable methodology and, as a result, do not believe it is appropriate to keep evaluating different methodology's for calculation of the load. The fact that this is a 3rd approach for the calculation suggests that this is for lack of a better term a "moving target" and further solidifies EPA's belief that the method using the 95% UCL on concentration is the most prudent way to calculate load at this time.

I did, however, read this recent proposal by GE and have serious concerns regarding this approach as well. It is highly questionable that a better approach (as the memo suggests) to calculating baseline concentrations is one in which only 3 of the 5 years in which baseline data was collected are used to evaluate baseline loads. It is unclear why any years in which the data was collected would be excluded, as it is expected that there would be natural variations in baseline concentrations from year to year. Some other simple observations that do not involve an in depth review can be noted. Do three years provide enough data to develop a baseline concentration? The 2009 dredging year seems to be an unusually high flow year. As such, does the fact that 2007 (based on the graphs in the memo) seems to be a low flow year make its inclusion in your approach appropriate? Does the inclusion of the 2007 low flow year in the approach introduce a bias that would again seem to underestimate actual baseline loads and overestimate dredging loads? Would it be appropriate to include baseline levels from only higher flow years and remove the lower flow years such as 2007? If we keep removing years and data, we would really have no basis for determining baseline concentrations.

In addition, attached please find a final version of the draft memo I had previously forwarded in an email dated July 31. As noted in the memo, there is little correlation between concentration and flow, hence there is no need to exclude high flow years. In addition, it should be noted that the evaluation of the UCL does not include data points above the 10,000 cfs level thus also eliminating the need to identify high flow years. The application of 95% UCL for concentration was designed to take into account baseline variability while accounting for the actual observed flow conditions during dredging periods. Given the variability associated with the calculation of a baseline load, the approach which uses the 95% UCL for concentration still provides the best and only acceptable method to estimate load at Waterford. This conclusions applies to the other stations as well.

The method using the 95% UCL on concentration for calculation of load reveals that the load numbers at Waterford have yet to be reached. The data currently being collected suggests it may be some time before we actually reach those numbers at Waterford. Please let me know if you want to discuss the 95% UCL method or load issues in general.

Thanks.

(See attached file: 2009-07-31 Waterford Load Memo+Figs-final.pdf)

From: "Gibson, Bob (GE, Corporate)" bob.gibson@ge.com
Sent: 08/31/2009 01:42 PM
To: Benny Conetta/R2/USEPA/US@EPA, David King/R2/USEPA/US@EPA, <EGARVEY@PIRNIE.com>
cc: "John Connolly" <jconnolly@anchorqea.com>, "Mark LaRue" <mlarue@anchorqea.com>, "Yates, Chris (GE, Corporate, non-ge)" <cyates@anchorqea.com>, "DeLisle, Darci (GE, Corporate)" <darci.delisle@ge.com>, "Haggard, John (GE, Corporate)" <john.haggard@ge.com>
Subject: Draft Baseline Load Memorandum

<<Baseline Calc memo 8-31.pdf>>
Ben

Attached is a memo that describes the methodology we believe should be employed for calculating net PCB load. The memo describes the approach taken and compares it to the UCL approach. I'd like to review this information with your team at your convenience. Thanks.

Bob Gibson
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GE imagination at work [attachment "Baseline Calc memo 8-31.pdf" deleted by Benny Conetta/R2/USEPA/US]

From: Benny Conetta/R2/USEPA/US
Sent: 09/25/2009 04:46 PM
To : "Gibson, Bob (GE, Corporate)" <bob.gibson@ge.com>
cc David King/R2/USEPA/US@EPA, "Klawinski, Gary" <GKlawinski@ene.com>, EGARVEY@PIRNIE.com
Subject Re: Hudson River Dredging Project - Supplemental Non-Target Area Downstream Contamination Study (Document link: Benny Conetta)

Hi Bob,

We have not been able to discuss, so I thought we'd send off these comments and maybe we can discuss once you've had a chance to go over them.

The plan objectives are
1. to determine the extent to which redeposited sediments cover the river bottom downstream of the dredging and
2. the influence of these sediments on the PCB concentration in surficial sediment.

EPA has some concerns as to whether the sampling plan as proposed can likely satisfy either of these objectives for the following reasons:

a) The necessary data prior to the onset of dredging to establish the naturally occurring sediment deposition in these regions was not collected. Since both natural and dredging-related deposition is occurring downstream of the operations, any observed rates of sediment deposition that might be established cannot be separated to identify the dredging-related component.

b) In a similar manner, the levels of PCB contamination that might be caught by their trap design prior to the onset of dredging were not established. Thus, again, it is not possible to establish the dredging-related component and the naturally occurring component.

c) The sediment trap design deployed does not establish the net deposition rates. The materials caught by the traps are in fact related to the gross rates of sediment transport and not the net rates of deposition. A literature search conducted in this regard did not yield any references wherein such traps were used in riverine settings to establish net rates of deposition.

d) The plan for sediment coring, like the sediment trap program, did not obtain cores prior to dredging at sufficient vertical resolution nor at sufficient sampling density, to be used as a basis to examine the impact of dredging-related deposition over naturally occurring deposition.

In addition, we also make the following observations:

- Dredging is not the only operation potentially responsible for sediment resuspension and PCB transport. This study does not attempt to isolate the various possible sources and may miss other potentially important release mechanisms and inadvertently identify dredging itself as the main source of PCB release. For instance, tug boat traffic may have a larger impact than the actual dredging.
- The evidence collected to date indicates that the periods of greatest PCB release coincide with the appearance of oil sheens shown to be PCB bearing, with little or no appreciable increase in suspended solids. Thus a focus on suspended solids and particle deposition will not examine the most important source of PCB release.
- The extensive suspended solids data set shows little to no increase in suspended solids across individual dredging operations. Thus it is unlikely that a substantive mass of PCB-contaminated solids deposits will be identified by direct measurements such as coring. If such deposits are identified, it would appear that they would be unrelated to the actual dredge operation since so little is observed in the water column. Otherwise, observations of substantive dredging-related deposition would require that the solids monitoring program be inaccurate and unrepresentative.
- Visual characterization is not a basis to identify recently deposited sediments. It is unlikely to be able to discern deposition due to recent natural events (such as the spring 2009 runoff) from dredging-related sediment deposition. It is unlikely that any "residual or fluff" layer will be seen in these cores.
- At this point in the process, any such study would need to continue well into 2010 in order to attempt to establish baseline transport.
- The observations to date suggest that the PCB levels on the suspended matter decrease downstream of the main areas of operation. This decrease in PCB concentration cannot be easily translated into loads or loss to the river bottom, without taking into account plume dispersion and mixing.
- Any further study by sediment traps should be accompanied by water column measurements of PCBs borne by suspended matter to aid in the interpretation of the sediment trap data. We would expect that these two measurements would be similar in terms of PCB concentration per unit mass of solids but this should be demonstrated.

From: "Gibson, Bob (GE, Corporate)"<bob.gibson@ge.com>
Sent: 09/21/2009 10:16 AM
To: David King/R2/USEPA/US@EPA, Doug Garbarini/R2/USEPA/US@EPA, Benny Conetta/R2/USEPA/US@EPA, Douglas Fischer/R2/USEPA/US@EPA, <kxfarrar@gw.dec.state.ny.us>, <dmr13@health.state.ny.us>, <Lisa.Rosman@noaa.gov>, <Robert_Foley@fws.gov>

cc
"Haggard, John (GE, Corporate)" <john.haggard@ge.com>, "Moreno, Sheri L (GE, Corporate)" <sheri.moreno@ge.com>, "Kruppenbacher, Timothy A (GE, Corporate)" <timothy.kruppenbacher@ge.com>, "Inglis, Andrew A (GE, Corporate)" <andrew.inglis@ge.com>, "Blaha, Scott R (GE, Corporate)" <scott.blaha@ge.com>, "Beebe, Cathy A (GE, Corporate)" <cathy.beebe@ge.com>, "DeLisle, Darci (GE, Corporate)" <darci.delisle@ge.com>, "John Connolly" <jconnolly@anchorqea.com>, "Mark LaRue" <mlarue@anchorqea.com>, "Yates, Chris (GE, Corporate, non-ge)" <cyates@anchorqea.com>

Subject
Hudson River Dredging Project - Supplemental Non-Target Area Downstream Contamination Study

<<Supplemental Traps _09212009.pdf>>
Dave/Ben -

As discussed last week, attached is a scope of work for additional investigation related to the non-target area downstream contamination special study. The sediment traps downstream of CU4 were installed near the mooring posts on Friday. Please let me know if you have any questions about this work. Thanks.

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GE imagination at work [attachment "Supplemental Traps _09212009.pdf" deleted by Benny Conetta/R2/USEPA/US]