Attachment F

Phase 1 Final Design Report

Dredge Resuspension Modeling

Prepared for:

General Electric Company

Prepared by:

Quantitative Environmental Analysis, LLC

Montvale, NJ

March 21, 2006

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Figure F-5-12. Three-hour average TSS at near field monitoring stations (100 m downstream) with no control structures and 0.70% loss from the source.

List of Acronyms

ADCP	Acoustic Doppler Current Profiler
BBL	Blasland, Bouck & Lee, Inc.
BMP	Baseline Monitoring Program
CDE	Critical Phase 1 Design Elements
EGIA	East Griffin Island Area
EPA	United States Environmental Protection Agency
NTIP	Northern Thompson Island Pool
PCB	Polychlorinated Biphenyl
Phase 1 IDR	Phase 1 Intermediate Design Report
ROD	Record of Decision
RPS	Resuspension Performance Standard
SSAP	Sediment Sampling and Analysis Program
TID	Thompson Island Dam
TIP	Thompson Island Pool
tPCB	Total Polychlorinated Biphenyl
TSS	Total Suspended Solids

F.1
INTRODUCTION

F.1.1 BACKGROUND

In the Record of Decision (ROD) for the Hudson River PCBs Superfund Site (United States Environmental Protection Agency [EPA] 2002), the EPA required the establishment of performance standards for, among other things, resuspension during dredging. The EPA undertook responsibility for developing the standards and issued the Hudson River Engineering Performance Standards (Hudson EPS) in 2004 (EPA 2004). The Hudson EPS for resuspension, hereafter referred to as the Resuspension Performance Standard or RPS, establishes limits for concentrations of polychlorinated biphenyls (PCBs) in river water and downstream transport of PCBs.

The RPS includes a primary standard of a not-to-exceed river water PCB concentration of 500 nanograms per liter (ng/L) (Standard), as well as two action levels (Evaluation and Control) that trigger efforts to identify and correct the cause of the exceedance. The action levels are defined by far-field (more than 1 mile downstream of dredging activities) and near-field (within 300 meters [m] of the dredging activities) criteria. The far-field criteria include PCB and total suspended solids (TSS) concentrations and PCB mass flux. The near-field criteria consist of TSS concentrations at specified distances from the dredging activities. These action level criteria as they apply to Phase 1 dredging in River Section 1 are listed in Tables F-1-1 and F-1-2, below.

Table F-1-1. Resuspension Performance Standard Criteria for Far-Field Stations[3]

Parameter	Evaluation Level	Control Level
7-day Running Average Total PCB Concentration		350 ng/L
7-day Running Average Total PCB Load	300 g/d	600 g/d
7-day Running Average Tri+ PCB Load	100 g/d	200 g/d
Dredging Season Cumulative Total PCB Load		65 kg
Dredging Season Cumulative Tri+ PCB Load		22 kg
TSS (6 hr average or average of day's dredging period if less)	12 mg/L1	24 mg/L2

Notes: [1]6-hour running average or average of day's dredging period if less.
[2]24-hour running average or average of day's dredging period if less.
[3]PCB load and TSS are net above baseline conditions.
g/d = grams per day
mg/L = milligrams per liter
kg = kilograms

Table F-1-2. Resuspension Performance Standard Criteria for Near-Field Stations[4]

Parameter	Evaluation Level	Control Level
TSS @ 100 m (or channel side of dredging)	700 mg/L[1]	
TSS @ 300 m	100 mg/L[2]	100 mg/L[3]

Notes: [1]3-hour running average.
[2]6-hour running average or average of day's dredging period if less.
[3]24-hour running average or average of day's dredging period if less.
[4]TSS values are net above baseline conditions.

F.1.2 SCOPE AND PREVIOUS MODELING

Evaluation of the effects of sediment and PCB resuspension during dredging operations on water column concentrations at near-field and far-field locations is accomplished through application of a mathematical model. This model was developed as part of the Phase 1 Intermediate Design. A full description of the model development, calibration, and validation is presented in Attachment E to the *Phase 1 Intermediate Design Report* (Phase 1 IDR) (Blasland, Bouck & Lee, Inc. [BBL] 2005). Comparison of the model prediction of TSS at the near-field stations (100 and 300 m downstream of the dredging operation) and TSS and PCB concentrations (and PCB loads) at the far-field station (Thompson Island Dam or TID) to the Evaluation, Control, and Standard Levels of the RPS are presented in Section E.7 of the Phase 1 IDR. These results are based on simulation of the Phase 1 Intermediate Design Dredge Schedule provided in the Phase 1 IDR.

The Phase 1 Intermediate Design Dredge Schedule has been modified since publication of the Phase 1 IDR. This report presents the results of model simulations based on the updated Phase 1 Final Design Dredge Schedule presented in the *Phase 1 Final Design Report* (Phase 1 FDR) (BBL, 2006) and compares those results to the RPS. In addition, while the model framework remains unchanged, there have been updates since the Phase 1 IDR to the model application to River Section 1. This report also presents the details of those model application updates. Furthermore, an additional model sensitivity analysis for sediment settling velocity is presented herein.

As specified in the Critical Phase 1 Design Elements (CDE) attachment to the Consent Decree for Hudson River Remedial Action (EPA/GE 2005), for purposes of determining the need for resuspension controls the resuspension modeling results will be compared to the following Control Level triggers set forth in or derived from EPA's RPS – i.e., a total PCB (tPCB) concentration of 350 nanograms per liter (ng/L) (7-day running average) at far-field stations; a net increase (over baseline) in tPCB load of 65 kilograms (kg) for Phase 1 at far-field stations (pro-rated to each dredge area in Phase 1); a net increase (over upstream levels) in TSS concentration of 100 milligrams per liter (mg/L) (for the daily dredging period) at the 300-m near-field stations; and a net increase (over baseline) in TSS concentration of 24 mg/L (for the daily dredging period) at far-field stations. The pro-rating of the annual flux to each dredge area is not included herein, but will be developed once the contractor selected to conduct the dredging has produced a final dredge plan.

F.1.3 MODEL OVERVIEW

The model is used to simulate the transport and fate of resuspended sediment and PCBs in River Section 1 (i.e., Thompson Island Pool [TIP]) during the 5-month dredging season, which extends from May through November. The modeling makes it possible to quantitatively predict and analyze the effects of various dredging plans on TSS and PCB concentrations, and associated PCB loads, at the nearest far-field station. Similarly, this approach provides a means to evaluate the ability of various control options (e.g., silt curtains, silt barriers, sheet piling, or other physical barriers) to reduce downstream transport and water column concentrations to levels at or below the Control Level of the RPS.

The modeling framework involves the use of three linked sub-models: 1) hydrodynamics; 2) sediment transport; and 3) PCB fate and transport (see Figure F-1-1). Figure F-1-2 shows a generalized conceptual diagram of the modeling framework. The primary fate and transport mechanisms considered are:

- Resuspension of sediment and particulate-bound PCBs due to dredging;
- Hydrodynamic advection and dispersion of suspended sediment and PCBs;
- Deposition of suspended sediment and associated sorbed PCBs;
- Sorption and desorption of PCBs; and
- Volatilization of dissolved phase PCBs.

This model addresses only the fate and transport of resuspended material as a result of dredging activity. Moreover, the dredge resuspension simulated is only that sediment resuspended in the water column from direct dredge operations, and does not include other dredge-related sources of resuspension such as debris removal, installation and removal of sheet piling and silt curtains, and barge movement. High-flow event resuspension (erosion) is not considered because dredging activities will not be taking place during such river conditions. Other non-dredging related sources of sediment and PCBs known to be present in the river (e.g., upstream and tributary inputs) are also not considered, although for the far-field absolute PCB concentration standard, a baseline concentration resulting from the Baseline Monitoring Program (BMP) data is added to the PCBs predicted to result from dredging. This approach is in accordance with the RPS because the standards are generally based on net increase of suspended sediment and PCBs as a result of dredging.

F.1.4 SUMMARY OF GENERAL RESULTS

The application of the model during the Phase 1 Intermediate Design revealed certain general results regarding hydrodynamics, sediment transport, and PCB transport. These are described in Section E.7.3 of Attachment E to the Phase 1 IDR and the main points are briefly summarized here:

- Plume characteristics are strongly dependent on the relative location of the dredge head in the channel.
- Under median flow conditions, resuspended sand settles out in the near-field (50-100 m) while resuspended silt and clay are often carried to the far-field station.
- The PCB initially sorbed to the fine-grained sediments contributes the majority of the PCB that passes the far-field station.
- The bulk of the desorption occurring takes place in the vicinity (100 m) of the dredge head.
- Nearly two-thirds of the PCB reaching the far-field station is dissolved phase.

F.2
HYDRODYNAMIC MODEL UPDATES

F.2.1 BATHYMETRY

Multibeam bathymetry data collected during a 2005 survey was incorporated into the model to represent the up-to-date bathymetry at TIP. A graphical representation of the updated TIP bathymetry is shown on Figure F-2-1 (a through e).

F.2.2 WATER SURFACE ELEVATION AT TID

Water surface elevation (or stage height) at TID was specified as a function of river flow rate. This function was modified to improve the predictive capability of the model.

$$\eta_{dam} = 117.2 + \eta' = 117.2 + [3.57(\frac{Q}{10000})^{0.44} - 1] \qquad \text{(F-2-1)}$$

where: η_{dam} is water surface elevation [feet with respect to NAVD 88], η' is water surface elevation above dam crest [feet], and Q is flow rate [cfs].

F.2.3 CALIBRATION AND VALIDATION

Model calibration and validation, similar to that presented in the Phase 1 IDR, were conducted using the updated bathymetry and water surface elevation at TID.

Model calibration was accomplished using stage height data obtained during the 1983 spring flood at Gauge 119, which is located near the entrance to the Champlain Canal lock at Fort Edward. The same effective bottom roughness of 1 centimeter (cm) was used. Comparison between observed and predicted stage heights during the 1983 flood is shown on Figure F-2-2. These results indicate that the updated model adequately predicts stage height in the project area.

Model validation was performed by comparing model predictions of stage height and velocity to acoustic Doppler current profiler (ADCP) and stage height data collected during June 2004. Sampling locations are presented on Figures E-3-4 through E-3-7 in Attachment E to the Phase 1 IDR. No model parameters were adjusted during the validation exercise. Comparisons between predicted and measured current velocities at stations BMP1 and SEDC1 to SEDC5 are shown on Figures F-2-3 through F-2-8. Comparison between predicted and measured stage heights at these stations are shown on Figure F-2-9. The updated inputs improve the model capability predicting high flow events. These results indicate that the updated model is able to adequately reproduce observed current velocities and stage heights in the TIP.

F.2.4 APPLICATION

Simulations with 50% flow rates listed in Table E-3-1 of Attachment E to the Phase 1 IDR were executed using the updated bathymetry and water surface elevation at TID. The impacts of the updated hydrodynamics on the sediment transport and PCB fate are included in the model results presented in Section F.5, below.

F.3
SEDIMENT TRANSPORT/CHEMICAL FATE MODEL UPDATES

F.3.1 MAGNITUDE AND COMPOSITION OF RESUSPENSION FROM DREDGING

The predicted magnitude and composition of resuspension from dredging have been modified since the Phase 1 IDR due to two factors. One factor is the availability of additional sediment PCB data that were obtained subsequent to the Phase 1 IDR analysis. These data are presented in Trends in Upper Hudson River Sediment PCB Contamination towards the Shoreline (QEA 2005).

The other factor is an update of the methodology used for calculating sediment composition and PCB concentrations, which are used to generate sediment and PCB input loads for the resuspension modeling. The sediment class composition and PCB concentrations for each class of sediment to be dredged in each grid cell were estimated based on the primary visual texture description and measured PCB concentration of the various sections of Sediment Sampling and Analysis Program (SSAP) cores. The sequence of these calculations is outlined as follows:

1. For each sediment core, the fraction of the core in each primary visual class is calculated from:

$$f_j^i = \frac{\sum_n^{DoC_j} \delta_{i,VC_{j,n}} * \Delta Z_{j,n}}{\sum_n^{DoC_j} \Delta Z_{j,n}} \qquad \text{(F-3-1)}$$

Where:

i = sediment type (visual class) index;

j = core index;

n = core segment index;

DoC_j	=	depth of contamination of core *j;*
$VC_{j,n}$	=	visual classification of segment *n* of core *j;*
$\delta_{i,VCj,n}$	=	delta function; and
$\Delta Z_{j,n}$	=	depth interval of segment n of core *j*.

Note that $\delta_{i,VCj,n} = 1$ when $i=VC_{j,n}$ and 0 when $i \neq VC_{j,n}$.

2. Similarly, the average PCB concentration of sediment type *i* in core *j* (c^i_j) is calculated from:

$$c^i_j = \frac{\sum_n^{DoC_j} \delta_{i,VC_{j,n}} * \Delta Z_{j,n} * c_{j,n}}{\sum_n^{DoC_j} \delta_{i,VC_{j,n}} * \Delta Z_{j,n}} \quad \text{(F-3-2)}$$

Where:

$c_{j,n}$	=	PCB concentration of segment n of core *j*

3. For a small number of abandoned locations, the sediment was assumed to be classified as gravel and assigned an average PCB concentration of other gravel SSAP core segments (33.8 μg/g).

4. To define the areal extent of a particular core, Theissen polygons were generated about each core.

5. The fraction of the contaminated column of sediments in model cell k that is sediment type i (F^i_k) is calculated from:

$$F^i_k = \frac{\sum_j f^i_j * A_{j,k} * DoC_j}{\sum_j A_{j,k} * DoC_j} \quad \text{(F-3-3)}$$

Where:

k = model cell index; and

$A_{j,k}$ = Area of Theissen polygon associated with core j that lies within cell k.

6. Similarly, the average PCB concentration of sediments in cell k on sediment type i (C^i_k) is calculated from:

$$C_k^i = \frac{\sum_j f_j^i * c_j^i * A_{j,k} * DoC_j}{\sum_j f_j^i * A_{j,k} * DoC_j} \tag{F-3-4}$$

7. To generate grain size fractions and PCB concentrations based on the class sizes used in the resuspension modeling, correlations were made between the primary visual classification and the grain sizes measured on a subset of the Phase 1 SSAP core samples. The average grain size composition of each primary visual classification is shown on Figure F-3-1.

8. The fraction of the contaminated column of sediments in model cell k that is model sediment class m (F_k^m) is calculated from:

$$F_k^m = \sum_i F^{i,m} * F_k^i \tag{F-3-5}$$

Where:

m = model sediment class index; and

$F^{i,m}$ = average fraction of model sediment class m in primary visual class i.

9. Similarly, the average PCB concentration of sediments in cell k on sediment class m (C^m_k) is calculated from:

$$C_k^m = \frac{\sum_i F^{i,m} * C_k^i * F_k^i}{\sum_i F^{i,m} * F_k^i} \tag{F-3-6}$$

These values for the sediment volume fraction and average PCB composition computed for each individual model grid cell are used to calculate sediment and PCB input loads for the Phase 1 Final Design resuspension modeling. The average sediment composition of dredged areas for the three sediment classes is shown on Figures F-3-2 through F-3-4. Figures F-3-5 through F-3-7 show the average total PCB concentrations for the three sediment classes.

F.4
DREDGING OPERATIONS

F.4.1 UPDATE OF THE DREDGE PLAN

The main body of the Phase 1 FDR gives the details of the Phase 1 Final Design Dredge Schedule. It is anticipated that four inventory dredges will operate during a 120 day period. The resuspension analysis assumes that Phase 1 will be conducted from May 21 to September 18 according to the dredge schedule presented in this Phase 1 FDR (Table 2-1). The actual schedule of dredging is subject to change, as described in Section 4 of this Phase 1 FDR. The resuspension model doesn't consider potential residual dredging operations because the location and scope of residual dredging is unknown. The dredging schedule is based on the same numerical grid used in the resuspension modeling and is presented in Table F-4-1. A graphical representation is provided on Figures F-4-1a through F-4-1c. Dredging operations are assumed suspended during Sundays and holidays.

F.4.2 UPDATE OF THE CONTROL SYSTEMS

Control structures are proposed for two TIP locations. One set of control structures is planned in the East Channel at Rogers Island (Figure F-4-2). A rock berm is designed at the northern entrance to the channel. This structure will divert the majority of the flow to the West Channel, but is designed to allow a small portion of the flow (100 cubic feet per second [cfs] assumed for modeling) to enter the East Channel. This modest flow will be sustained in order to maintain water quality above the New York State Water Quality Standards in the East Channel, which receives effluent from the Washington County #2 Waste Water Treatment Plant. This analysis is provided in Attachment G of the Phase 1 FDR. A silt curtain is planned at the southern end of the East Channel (Figure F-4-2) to reduce downstream transport of resuspended sediment. The other set of control structures is planned along the eastern shoreline near Griffin Island. This set of structures is the same as that which was proposed for this area in Attachment E to the Phase 1 IDR (Section E.6.3), consisting of sheet pile enclosing about 1.7 acres and silt curtains enclosing another 2.9 acres as shown on Figure F-4-3.

The schedule for the use of the control structures is determined by the Phase 1 Final Design Dredge schedule. The Rogers Island silt curtain will be in place until completion of the dredging of the enclosed East Channel sediments. This lasts for 87 days from May 21 to August 16. The Rogers Island rock berm will remain in place for an additional month, lasting a total of 118 days from May 21 to September 16. Similarly, the Griffin Island silt curtain will be in place for 18 days from July 2 to July 20 and the Griffin Island sheet pile will remain an additional month until August 20. These dates are assumed for modeling purposes only. Actual dates for installation and removal of control structures will be based on contractor plans and dredging productivity.

F.5
RESULTS OF MODEL SIMULATIONS

F.5.1 BASELINE FAR-FIELD CONCENTRATIONS

The BMP data for the far-field station at the TID were reanalyzed to include data updates since the Phase 1 IDR. Average monthly tPCB concentrations at the TID are given in Table F-5-1, below.

Table F-5-1. Baseline TID Total PCB Concentration

Month	PCB Concentration (ng/L)
May	34.5
June	58.5
July	53.2
August	26.6
September	30.8
October	41.2

F.5.2 DREDGING WITH NO CONTROL STRUCTURES

The modeling predicts that distinct peaks in water PCB levels due to dredge resuspension occur around day 20, day 55, and day 80. The first peak is associated with dredging in the East Griffin Island area. The second peak primarily comes from dredging in the East Channel at Rogers Island with smaller contributions from the East Griffin Island area and the West Channel at Rogers Island. The third peak is mainly produced by the dredging occurring in the East Channel at Rogers Island. The East Channel at Rogers Island contribution to the second peak results from dredging just downstream of Bond Creek, whereas the third peak occurs due to dredging further downstream just above where the channel bends to the west. All of these areas contain higher than average PCB concentrations and higher percentages of fine-grained sediments.

The design resuspension loss rate (0.35%) produces PCB concentrations at TID that remain below the Control Level (7-day average concentration of 350 ng/L) and the Primary Standard (24-hour average of 500 ng/L) for the entire season. The 7-day average PCB concentration at TID fluctuates between about 25 and 160 ng/L (Figure F-5-1). The 24-hour average concentration at this location ranges between 25 and 250 ng/L.

The 7-day average net PCB flux at TID resulting from application of the 0.35% loss rate varies from near zero to about 750 g/d (Figure F-5-2). It exceeds the Evaluation Level of 300 g/d for about 32% of the dredging season. The Control Level of 600 g/d is exceeded for about 5% of the dredging season. Despite the period of elevated 7-day average fluxes, the total flux over the dredging season remains below the Control Level of 65 kg (Figure F-5-3). The total downstream flux for the dredging season is about 30 kg.

The elevated PCB concentrations and fluxes predicted at TID are not associated with elevated TSS. The model indicates that 6-hour average net TSS concentrations at the TID never exceed 1 mg/L (Figure F-5-4). Near-field net TSS concentrations remain relatively low and always below the RPS criteria. At the station 300 m downstream of the dredging, TSS concentrations are typically less than 20 mg/L (Figure F-5-5) except during a period from about day 95 to day 115 for Dredge 2. The highest concentration of about 60 mg/L occurs when dredging fine sediments in shallow water along the western shore in NTIP02G (Dredge 2 on Figure F-5-5). Additionally, comparison to Figure F-5-2 shows that elevated TSS concentration in the near-field is not associated with elevated far-field PCB. At the station 100 m downstream of the dredging, TSS concentrations typically remain below 50 mg/L (Figure F-5-6) except for the dredging of the same NTIP02G area where concentrations reach 200 mg/L. For the entire season, the 100 m TSS concentrations never exceed the RPS.

The resuspension loss rate of 0.70% produces higher PCB and TSS levels and the associated loads are nearly twice that under 0.35% loss. For the higher loss rate, PCB concentrations at TID still remain below the Control Level and the Primary Standard for the entire season. The 7-day average PCB concentration at TID ranges between about 25 and 260 ng/L (Figure F-5-7). The 24-hour average concentration at this location fluctuates widely between 25 and 450 ng/L.

The 7-day average net PCB flux at TID resulting from the 0.70% loss rate ranges from near zero to about 1,500 g/d (Figure F-5-8). The Evaluation Level is exceeded for about 58% of the dredging season. The Control Level is exceeded for about 32% of the dredging season. The total flux over the dredging season is about 59 kg, remaining below the Control Level of 65 kg (Figure F-5-9).

The increased loss rate of 0.70% results in predicted net TSS TID concentrations that reach a maximum of about 1 mg/L (Figure F-5-10), well below the RPS. The near-field net TSS concentration at the 300 m station (Figure F-5-11) is typically below the standard, except for one brief period of exceedance around day 102 predicted in the dredging of the NTIP02G area previously mentioned. The maximum concentration during dredging of this area is estimated to reach 115 mg/L. The net TSS concentration at the station 100 m downstream is predicted not to exceed the RPS (Figure F-5-12).

F.5.3 DREDGING WITH CONTROL STRUCTURES

The addition of the resuspension controls in East Channel at Rogers Island and East Griffin Island that are described in Section F.4.2 reduces downstream PCB fluxes by about 13%. For the 0.35% loss scenario, the flux of PCBs past TID over the entire Phase 1 program declines from about 30 kg to about 26 kg (Figure F-5-15) with the majority of the reduction coming from the East Griffin Island area. The 7-day average PCB concentration at TID remains below 125 ng/L for the entire season, whereas it reaches about 160 ng/L without controls (Figure F-5-13). The 24-hour average concentration exhibits a greater reduction overall than was predicted to occur without controls. For the entire season, the 24-hour average is below 210 ng/L.

The resuspension controls are predicted to be moderately effective in reducing the 7-day average net PCB flux at TID resulting from 0.35% loss rate to levels below the Control Level (Figure F-5-14). The maximum flux is reduced from about 750 g/d to about 575 g/d and does not exceed the Control Level. The fluxes remain above the Evaluation Level for about 30% of the dredging season. The reduction of the second peak is mainly due to the East Griffin Island controls and the smaller reduction of the third peak is associated with the controls in East

Channel at Rogers Island. The Rogers Island controls are less effective than those at East Griffin Island. Reducing flow through the East Channel at Rogers Island by limiting flow through the upstream entrance reduces the PCB flux from the channel only by a small amount because the lower flow is offset by a an increase of PCB concentrations within the channel.

The ability of the control structures to keep PCB levels under the standards with dredging rates set out in the Phase 1 Final Design Dredge Schedule was also evaluated assuming the higher loss rate of dredged material, i.e., 0.70% resuspension. For a loss rate of 0.70%, the 7-day average concentration past TID varied from about 40 ng/L to about 200 ng/L, well below the Control Level (Figure F-5-16). The daily average remained below the control level (350 ng/L) and the 500 ng/L threshold throughout the season, only reaching a maximum of about 320 ng/L.

The 7-day average net PCB flux at TID resulting from 0.70% loss rate varies from about 100 g/d to about 1,120 g/d (Figure F-5-17). It is predicted to exceed the Evaluation Level for about 58% of the dredging season and the Control Level for about 29% of the dredging season. The total flux for the dredging season remains below the Control Level (Figure F-5-18) reaching about 52 kg.

F.5.4 SETTLING SENSITIVITY

Model runs were conducted to assess the sensitivity of the model to sediment settling speed. The dredge simulation without control structures, 0.35% resuspension loss, and median flow was run assuming an increased settling velocity of twice the base values calculated as described in Section E.4.2 (Equations E-4-3 and E-4-7) of the Phase 1 IDR. A similar run was conducted assuming one half of the base settling velocity. This scaling of the settling speeds was applied to all sediment classes. Under increased sediment settling, the total PCB load past the TID is predicted to decrease to about 28 kg (Figure F-5-19). This reduction represents a 7% decrease and primarily appears as a reduction in the particulate component of the TID load. Figure F-5-19 also shows that decreased sediment settling is predicted to result in an increase in load to about 31 kg, a 4% increase over base settling. Although the settling speeds were adjusted by a factor or two, the overall transport is affected to a lesser degree because the majority of PCB load passing the far-field station is dissolved.

F.6
SUMMARY AND CONCLUSIONS

Model results were used to evaluate PCB concentrations in the river caused by resuspension during dredging operations without and with the proposed control structures and at 0.35% and 0.70% resuspension loss rate. For dredging with no control structures, the following conclusions are developed from the model results:

Total PCB concentrations at TID remain below the Control Level (7-day average concentration of 350 ng/L) and the Primary Standard (24-hour average of 500 ng/L) for the entire dredging season.

- The total flux over the dredging season (30 kg for 0.35% loss and 59 kg for 0.70%) is below the Control Level (65 kg).
- The PCB flux at TID consists on average of about two-thirds dissolved phase and one third particulate phase PCB.
- For 0.35 % loss rate, the 7-day average net PCB flux at TID exceeds the Evaluation Level (300 g/d) for about 32% of the dredging season. The Control Level (600 g/d) is exceeded for about 5% of the dredging season.
- For 0.70 % loss rate, the 7-day average net PCB flux at TID exceeds the Evaluation Level for about 58% of the dredging season. The Control Level is exceeded for about 32% of the dredging season.
- Elevated Total PCB concentrations and fluxes at TID are not associated with elevated TSS concentrations. Only one brief incidence of exceedance of the 300 m near-field standard is predicted under 0.70% loss assumption

For dredging with the proposed control structures (i.e., controls at East Channel at Rogers Island and East Griffin Island), model results indicate that:

- The addition of resuspension controls reduces downstream PCB transport by about 13%. For the 0.35% loss rate, the flux of tPCBs past TID during the dredging seasons declines from about 30 kg with no controls to about 26 kg with controls.
- The resuspension controls are moderately effective in reducing the 7-day average net PCB flux at TID to levels below the Control Level. For the 0.35% loss rate, fluxes remain above the Evaluation Level for about 30% of the dredging season but do not exceed the Control Level.
- Higher loss rates of dredge material will result in higher net PCB fluxes at TID. The season flux doubles from 26 to 52 kg when the loss rate doubles from 0.35% to 0.70%.
- For the 0.70% loss rate, fluxes remain above the Evaluation Level for about 58% of the dredging season and above the Control Level for about 29% of the dredging season.

F.7
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TABLES

Quantitative Environmental Analysis, LLC
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Table F-4-1. Phase 1 Design Dredge Schedule

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
20	20	NTIP01	1	24.96	0.81	05/21 00:00	05/21 00:48
20	21	NTIP01	1	455.87	12.64	05/21 00:48	05/21 13:26
20	22	NTIP01	1	676.68	21.87	05/21 13:26	05/22 11:19
20	23	NTIP01	1	87.84	2.84	05/22 11:19	05/22 14:09
21	19	NTIP01	1	134.07	4.34	05/22 14:09	05/22 18:30
21	20	NTIP01	1	1440.95	46.58	05/22 18:30	05/24 17:04
21	21	NTIP01	1	1934.91	108.76	05/24 17:04	05/31 05:50
21	22	NTIP01	1	1508.80	98.94	05/31 05:50	06/05 08:47
22	19	NTIP01	1	4.50	0.15	06/05 08:47	06/05 08:55
22	20	NTIP01	1	947.42	62.13	06/05 08:55	06/07 23:03
22	21	NTIP01	1	1622.58	91.20	06/07 23:03	06/12 18:15
22	22	NTIP01/NTIP02A	1	1717.67	112.64	06/12 18:15	06/18 10:54
22	23	NTIP01/NTIP02A	1	502.52	24.37	06/18 10:54	06/19 11:16
26	21	NTIP02A	1	21.13	0.95	06/20 00:00	06/20 00:57
26	22	NTIP02A	1	151.05	9.91	06/20 00:57	06/20 10:51
26	23	NTIP02A	1	30.45	1.48	06/20 10:51	06/20 12:20
27	20	NTIP02A	1	5.96	0.31	06/20 12:20	06/20 12:38
27	21	NTIP02A	1	210.64	11.84	06/20 12:38	06/21 00:29
27	22	NTIP02A/NTIP02B	1	348.11	34.24	06/21 00:29	06/22 10:43
27	23	NTIP02A	1	15.88	0.77	06/22 10:43	06/22 11:29
28	19	NTIP02B	1	12.10	0.29	06/23 00:00	06/23 00:17
28	20	NTIP02B	1	304.95	9.86	06/23 00:17	06/23 10:09
28	21	NTIP02B	1	488.91	13.55	06/23 10:09	06/23 23:41
28	22	NTIP02B	1	613.71	40.25	06/23 23:41	06/26 15:56
28	23	NTIP02B	1	77.01	1.87	06/26 15:56	06/26 17:48
29	19	NTIP02B	1	114.64	2.78	06/26 17:48	06/26 20:35
29	20	NTIP02B	1	478.58	23.54	06/26 20:35	06/27 20:07
29	21	NTIP02B	1	884.52	18.38	06/27 20:07	06/28 14:30
29	22	NTIP02B	1	594.97	14.43	06/28 14:30	06/29 04:56
29	23	NTIP02B	1	745.49	18.09	06/29 04:56	06/29 23:01
30	19	NTIP02B	1	488.94	11.85	06/29 23:01	06/30 10:52
30	20	NTIP02B	1	805.06	39.60	06/30 10:52	07/03 02:28
30	21	NTIP02B	1	926.80	19.26	07/03 02:28	07/03 21:44
30	22	NTIP02B	1	25.57	1.08	07/03 21:44	07/03 22:48
30	23	NTIP02B	1	62.46	1.52	07/03 22:48	07/05 00:19
31	19	NTIP02B	1	856.26	42.11	07/05 00:19	07/06 18:26
31	20	NTIP02B	1	1316.85	27.37	07/06 18:26	07/07 21:48
31	21	NTIP02B	1	1113.29	23.14	07/07 21:48	07/09 20:56
31	22	NTIP02B	1	743.76	27.05	07/09 20:56	07/10 23:59
31	23	NTIP02B	1	38.20	0.93	07/10 23:59	07/11 00:55
32	18	NTIP02B	1	68.06	1.65	07/11 00:55	07/11 02:34
32	19	NTIP02B	1	1992.15	48.30	07/11 02:34	07/13 02:52
32	20	NTIP02B	1	2423.57	50.37	07/13 02:52	07/16 05:14
32	21	NTIP02B	1	1768.96	36.76	07/16 05:14	07/17 17:59
32	22	NTIP02B	1	1296.04	47.13	07/17 17:59	07/19 17:08
32	23	NTIP02B	1	255.53	9.30	07/19 17:08	07/20 02:26
33	18	NTIP02B	1	68.13	2.48	07/20 02:26	07/20 04:54
33	19	NTIP02B	1	1155.09	42.01	07/20 04:54	07/21 22:55
33	20	NTIP02B	1	2609.88	94.91	07/21 22:55	07/26 21:50

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
33	21	NTIP02B	1	1265.43	46.02	07/26 21:50	07/28 19:51
33	22	NTIP02B	1	1562.54	56.87	07/28 19:51	08/01 04:43
33	23	NTIP02B	1	31.59	1.15	08/01 04:43	08/01 05:52
34	19	NTIP02B	1	1124.73	27.27	08/01 05:52	08/02 09:08
34	20	NTIP02B	1	2033.80	56.35	08/02 09:08	08/04 17:29
35	19	NTIP02B	1	759.59	24.55	08/04 17:29	08/06 18:03
35	20	NTIP02B	1	1650.87	45.74	08/06 18:03	08/08 15:47
36	19	NTIP02B	1	711.35	23.01	08/08 15:47	08/09 14:48
36	20	NTIP02B	1	2290.58	63.47	08/09 14:48	08/13 06:16
37	18	NTIP02B	1	9.53	0.23	08/13 06:16	08/13 06:30
37	19	NTIP02B	1	555.61	13.48	08/13 06:30	08/13 19:59
37	20	NTIP02B	1	1146.37	42.35	08/13 19:59	08/15 14:20
38	17	NTIP02B	1	68.94	1.67	08/15 14:20	08/15 16:01
38	18	NTIP02B	1	620.01	15.03	08/15 16:01	08/16 07:02
38	19	NTIP02B	1	784.18	19.01	08/16 07:02	08/17 02:03
39	16	NTIP02B	1	67.17	1.63	08/17 02:03	08/17 03:41
39	17	NTIP02B	1	636.67	15.44	08/17 03:41	08/17 19:07
39	18	NTIP02B	1	732.74	23.69	08/17 19:07	08/18 18:48
40	15	NTIP02B/NTIP02F	1	181.39	8.80	08/18 18:48	08/20 03:36
14	8	NTIP02C	2	29.20	1.21	06/04 00:00	06/04 01:12
15	2	NTIP02C	2	49.22	2.05	06/04 01:12	06/04 03:15
15	3	NTIP02C	2	112.10	4.66	06/04 03:15	06/04 07:55
15	4	NTIP02C	2	152.36	6.34	06/04 07:55	06/04 14:15
15	5	NTIP02C	2	187.64	15.82	06/04 14:15	06/05 06:04
15	6	NTIP02C	2	178.76	7.44	06/05 06:04	06/05 13:31
16	1	NTIP02C	2	102.23	4.96	06/05 13:31	06/05 18:28
16	2	NTIP02C	2	266.71	26.24	06/05 18:28	06/06 20:42
16	3	NTIP02C	2	206.56	8.59	06/06 20:42	06/07 05:18
16	4	NTIP02C	2	130.05	5.41	06/07 05:18	06/07 10:42
16	5	NTIP02C	2	120.05	4.99	06/07 10:42	06/07 15:42
16	6	NTIP02C	2	228.47	9.50	06/07 15:42	06/08 01:12
17	0	NTIP02C	2	16.76	0.81	06/08 01:12	06/08 02:01
17	1	NTIP02C	2	114.67	5.56	06/08 02:01	06/08 07:35
17	2	NTIP02C	2	138.27	5.75	06/08 07:35	06/08 13:20
17	3	NTIP02C	2	65.64	2.73	06/08 13:20	06/08 16:03
17	4	NTIP02C	2	54.08	2.25	06/08 16:03	06/08 18:18
17	5	NTIP02C	2	246.55	20.79	06/08 18:18	06/09 15:06
17	6	NTIP02C	2	259.34	10.78	06/09 15:06	06/11 01:52
18	3	NTIP02C	2	74.69	3.10	06/11 01:52	06/11 04:59
18	4	NTIP02C	2	260.41	10.82	06/11 04:59	06/11 15:48
18	5	NTIP02C	2	275.82	11.46	06/11 15:48	06/12 03:16
19	0	NTIP02C	2	24.24	1.18	06/12 03:16	06/12 04:26
19	1	NTIP02C	2	88.35	4.28	06/12 04:26	06/12 08:43
19	2	NTIP02C	2	134.26	5.58	06/12 08:43	06/12 14:18
19	3	NTIP02C	2	277.51	23.40	06/12 14:18	06/13 13:42
19	4	NTIP02C	2	303.54	12.62	06/13 13:42	06/14 02:19
19	5	NTIP02C	2	312.08	26.31	06/14 02:19	06/15 04:38
20	0	NTIP02C	2	3.87	0.38	06/15 04:38	06/15 05:01
20	1	NTIP02C	2	100.67	4.88	06/15 05:01	06/15 09:53
20	2	NTIP02C	2	246.24	20.76	06/15 09:53	06/16 06:39

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
20	3	NTIP02C	2	306.21	12.73	06/16 06:39	06/16 19:23
20	4	NTIP02C	2	321.42	13.36	06/16 19:23	06/18 08:44
21	0	NTIP02C	2	0.00	0.00	06/18 08:44	06/18 08:44
21	1	NTIP02C	2	165.60	16.29	06/18 08:44	06/19 01:02
21	2	NTIP02C	2	267.09	22.52	06/19 01:02	06/19 23:33
21	3	NTIP02C	2	330.93	27.90	06/19 23:33	06/21 03:27
21	4	NTIP02C	2	347.56	29.30	06/21 03:27	06/22 08:45
22	0	NTIP02C	2	2.00	0.15	06/22 08:45	06/22 08:54
22	1	NTIP02C	2	252.35	18.35	06/22 08:54	06/23 03:15
22	2	NTIP02C	2	380.61	27.68	06/23 03:15	06/25 06:56
22	3	NTIP02C	2	339.47	50.09	06/25 06:56	06/27 09:02
22	4	NTIP02C	2	363.61	26.45	06/27 09:02	06/28 11:28
22	5	NTIP02C	2	396.58	28.84	06/28 11:28	06/29 16:19
23	0	NTIP02C	2	54.16	1.97	06/29 16:19	06/29 18:17
23	1	NTIP02C	2	352.95	12.85	06/29 18:17	06/30 07:08
23	2	NTIP02C	2	365.85	15.42	06/30 07:08	06/30 22:34
23	3	NTIP02C	2	310.93	6.46	06/30 22:34	07/02 05:01
23	4	NTIP02C	2	329.34	6.84	07/02 05:01	07/02 11:52
23	5	NTIP02C	2	407.78	8.47	07/02 11:52	07/02 20:20
24	0	NTIP02C	2	18.06	0.44	07/02 20:20	07/02 20:47
24	1	NTIP02C	2	222.43	5.40	07/02 20:47	07/03 02:10
24	2	NTIP02C	2	401.61	8.35	07/03 02:10	07/03 10:31
24	3	NTIP02C	2	345.12	7.17	07/03 10:31	07/03 17:42
24	4	NTIP02C	2	267.29	11.27	07/03 17:42	07/05 04:58
24	5	NTIP02C	2	492.64	10.24	07/05 04:58	07/05 15:12
25	0	NTIP02C	2	26.90	0.98	07/05 15:12	07/05 16:11
25	1	NTIP02C	2	284.93	10.37	07/05 16:11	07/06 02:33
25	2	NTIP02C	2	828.68	61.14	07/06 02:33	07/09 15:41
25	3	NTIP02C	2	1325.22	48.19	07/09 15:41	07/11 15:53
25	4	NTIP02C	2	759.28	27.61	07/11 15:53	07/12 19:29
25	5	NTIP02C	2	1111.84	40.43	07/12 19:29	07/14 11:56
25	6	NTIP02C	2	1239.47	45.08	07/14 11:56	07/17 09:00
26	0	NTIP02C	2	16.70	0.41	07/17 09:00	07/17 09:24
26	1	NTIP02C	2	283.26	6.87	07/17 09:24	07/17 16:17
26	2	NTIP02C	2	514.86	12.48	07/17 16:17	07/18 04:46
26	3	NTIP02C	2	218.73	4.55	07/18 04:46	07/18 09:19
26	4	NTIP02C	2	346.25	7.20	07/18 09:19	07/18 16:30
26	5	NTIP02C	2	595.21	12.37	07/18 16:30	07/19 04:52
26	6	NTIP02C	2	458.04	9.52	07/19 04:52	07/19 14:24
27	0	NTIP02C	2	40.30	0.98	07/19 14:24	07/19 15:22
27	1	NTIP02C	2	207.35	5.03	07/19 15:22	07/19 20:24
27	2	NTIP02C	2	398.82	8.29	07/19 20:24	07/20 04:41
27	3	NTIP02C	2	193.09	4.01	07/20 04:41	07/20 08:42
27	4	NTIP02C	2	3.23	0.11	07/20 08:42	07/20 08:49
27	5	NTIP02C	2	127.08	3.08	07/20 08:49	07/20 11:54
27	6	NTIP02C	2	153.46	3.72	07/20 11:54	07/20 15:37
28	0	NTIP02C/NTIP02E	2	93.53	4.54	07/20 15:37	07/20 20:09
28	1	NTIP02C/NTIP02E	2	315.36	15.30	07/20 20:09	07/21 11:27
28	2	NTIP02C/NTIP02E	2	134.96	5.61	07/21 11:27	07/21 17:04
28	4	NTIP02E	2	9.06	0.22	07/23 00:00	07/23 00:13

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
28	5	NTIP02E	2	7.95	0.19	07/23 00:13	07/23 00:24
29	0	NTIP02E	2	187.01	6.81	07/23 00:24	07/23 07:13
29	1	NTIP02E	2	267.65	6.49	07/23 07:13	07/23 13:42
29	2	NTIP02E	2	189.86	3.95	07/23 13:42	07/23 17:39
29	3	NTIP02E	2	67.81	1.41	07/23 17:39	07/23 19:04
29	4	NTIP02E	2	178.69	4.33	07/23 19:04	07/23 23:24
29	5	NTIP02E	2	171.95	8.46	07/23 23:24	07/24 07:51
30	1	NTIP02E	2	263.28	6.39	07/24 07:51	07/24 14:14
30	2	NTIP02E	2	389.79	19.17	07/24 14:14	07/25 09:24
30	3	NTIP02E	2	430.67	8.95	07/25 09:24	07/25 18:21
30	4	NTIP02E	2	447.76	10.86	07/25 18:21	07/26 05:13
30	5	NTIP02E	2	355.05	8.61	07/26 05:13	07/26 13:50
31	1	NTIP02E	2	151.77	3.68	07/26 13:50	07/26 17:31
31	2	NTIP02E	2	394.59	9.57	07/26 17:31	07/27 03:05
31	3	NTIP02E	2	175.74	3.65	07/27 03:05	07/27 06:44
32	1	NTIP02E	2	160.85	3.90	07/27 06:44	07/27 10:38
32	2	NTIP02E	2	379.27	9.20	07/27 10:38	07/27 19:50
32	3	NTIP02E	2	485.32	10.09	07/27 19:50	07/28 05:55
33	1	NTIP02E	2	277.13	6.72	07/28 05:55	07/28 12:38
33	2	NTIP02E	2	486.02	13.86	07/28 12:38	07/30 02:30
33	3	NTIP02E	2	507.47	12.41	07/30 02:30	07/30 14:55
34	0	NTIP02E	2	27.83	0.79	07/30 14:55	07/30 15:42
34	1	NTIP02E	2	306.88	8.76	07/30 15:42	07/31 00:28
34	2	NTIP02E	2	452.74	10.99	07/31 00:28	07/31 11:27
34	3	NTIP02E	2	477.47	20.13	07/31 11:27	08/01 07:35
35	1	NTIP02E	2	249.78	6.06	08/01 07:35	08/01 13:38
35	2	NTIP02E	2	424.30	20.87	08/01 13:38	08/02 10:30
36	1	NTIP02E/NTIP02F	2	122.69	4.47	08/02 10:30	08/02 14:58
36	2	NTIP02E/NTIP02F	2	234.65	5.69	08/02 14:58	08/02 20:40
37	1	NTIP02F	2	116.69	2.83	08/03 00:00	08/03 02:49
37	2	NTIP02F	2	400.53	9.71	08/03 02:49	08/03 12:32
37	3	NTIP02F	2	414.53	17.48	08/03 12:32	08/04 06:00
37	4	NTIP02F	2	57.16	1.19	08/04 06:00	08/04 07:12
37	5	NTIP02F	2	20.39	0.42	08/04 07:12	08/04 07:37
37	6	NTIP02F	2	142.69	2.97	08/04 07:37	08/04 10:35
38	0	NTIP02F	2	6.70	0.24	08/04 10:35	08/04 10:50
38	1	NTIP02F	2	181.76	6.61	08/04 10:50	08/04 17:26
38	2	NTIP02F	2	391.67	12.66	08/04 17:26	08/06 06:06
38	3	NTIP02F	2	339.45	9.41	08/06 06:06	08/06 15:30
38	4	NTIP02F	2	271.84	7.53	08/06 15:30	08/06 23:02
38	5	NTIP02F	2	278.22	5.78	08/06 23:02	08/07 04:49
38	6	NTIP02F	2	377.64	7.85	08/07 04:49	08/07 12:40
39	0	NTIP02F	2	0.00	0.00	08/07 12:40	08/07 12:40
39	1	NTIP02F	2	119.10	4.33	08/07 12:40	08/07 17:00
39	2	NTIP02F	2	222.29	12.86	08/07 17:00	08/08 05:52
39	3	NTIP02F	2	261.88	6.40	08/08 05:52	08/08 12:16
39	4	NTIP02F	2	369.17	9.03	08/08 12:16	08/08 21:17
39	5	NTIP02F	2	367.49	8.98	08/08 21:17	08/09 06:16
39	6	NTIP02F	2	403.35	9.86	08/09 06:16	08/09 16:08
39	7	NTIP02F	2	539.85	13.20	08/09 16:08	08/10 05:20

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
40	1	NTIP02F	2	10.52	0.45	08/10 05:20	08/10 05:47
40	2	NTIP02F	2	20.51	0.58	08/10 05:47	08/10 06:22
40	3	NTIP02F	2	14.28	0.57	08/10 06:22	08/10 06:56
40	4	NTIP02F	2	48.58	1.19	08/10 06:56	08/10 08:07
40	5	NTIP02F	2	173.46	3.60	08/10 08:07	08/10 11:44
40	6	NTIP02F	2	272.72	11.50	08/10 11:44	08/10 23:13
40	7	NTIP02F	2	311.74	8.64	08/10 23:13	08/11 07:52
40	8	NTIP02F	2	292.22	8.10	08/11 07:52	08/11 15:58
41	1	NTIP02F	2	64.37	3.12	08/11 15:58	08/11 19:05
41	2	NTIP02F	2	102.17	3.30	08/11 19:05	08/11 22:23
41	3	NTIP02F	2	10.01	0.56	08/11 22:23	08/11 22:57
41	4	NTIP02F	2	14.15	0.64	08/11 22:57	08/11 23:35
41	5	NTIP02F	2	11.36	0.51	08/11 23:35	08/13 00:06
41	6	NTIP02F	2	51.29	1.07	08/13 00:06	08/13 01:10
41	7	NTIP02F	2	75.39	1.57	08/13 01:10	08/13 02:44
41	8	NTIP02F	2	115.86	2.41	08/13 02:44	08/13 05:08
41	9	NTIP02F	2	117.58	2.44	08/13 05:08	08/13 07:35
41	10	NTIP02F	2	21.72	0.73	08/13 07:35	08/13 08:19
41	11	NTIP02F	2	116.58	2.42	08/13 08:19	08/13 10:44
41	12	NTIP02F	2	212.06	4.41	08/13 10:44	08/13 15:08
41	13	NTIP02F	2	264.12	14.85	08/13 15:08	08/14 05:59
41	14	NTIP02F	2	345.69	9.58	08/14 05:59	08/14 15:34
42	0	NTIP02F	2	0.00	0.00	08/14 15:34	08/14 15:34
42	1	NTIP02F	2	121.46	5.89	08/14 15:34	08/14 21:27
42	2	NTIP02F	2	147.82	4.78	08/14 21:27	08/15 02:14
42	3	NTIP02F	2	317.03	6.59	08/15 02:14	08/15 08:49
42	4	NTIP02F	2	336.21	14.17	08/15 08:49	08/15 23:00
42	5	NTIP02F	2	237.85	6.59	08/15 23:00	08/16 05:35
42	6	NTIP02F	2	169.27	4.69	08/16 05:35	08/16 10:17
42	7	NTIP02F	2	133.84	3.71	08/16 10:17	08/16 13:59
42	8	NTIP02F	2	167.67	4.65	08/16 13:59	08/16 18:38
42	9	NTIP02F	2	239.73	6.64	08/16 18:38	08/17 01:16
42	10	NTIP02F	2	300.17	8.32	08/17 01:16	08/17 09:35
42	11	NTIP02F	2	283.32	7.85	08/17 09:35	08/17 17:27
42	12	NTIP02F	2	225.51	6.25	08/17 17:27	08/17 23:41
43	0	NTIP02F	2	3.17	0.15	08/17 23:41	08/17 23:51
43	1	NTIP02F	2	161.72	7.84	08/17 23:51	08/18 07:41
43	2	NTIP02F	2	85.06	2.06	08/18 07:41	08/18 09:45
43	3	NTIP02F	2	39.74	0.96	08/18 09:45	08/18 10:43
43	4	NTIP02F	2	40.50	1.37	08/18 10:43	08/18 12:05
43	5	NTIP02F	2	23.78	0.80	08/18 12:05	08/18 12:53
43	6	NTIP02F	2	128.50	2.67	08/18 12:53	08/18 15:33
43	7	NTIP02F	2	155.22	3.23	08/18 15:33	08/18 18:47
43	8	NTIP02F	2	204.41	4.25	08/18 18:47	08/18 23:01
43	9	NTIP02F	2	247.50	5.14	08/18 23:01	08/20 04:10
43	10	NTIP02F	2	222.35	4.62	08/20 04:10	08/20 08:47
43	11	NTIP02F	2	148.81	3.09	08/20 08:47	08/20 11:53
44	1	NTIP02F	2	5.91	0.21	08/20 11:53	08/20 12:06
44	2	NTIP02F	2	91.31	3.32	08/20 12:06	08/20 15:25
44	3	NTIP02F	2	148.80	3.61	08/20 15:25	08/20 19:02

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
44	4	NTIP02F	2	145.72	3.03	08/20 19:02	08/20 22:03
44	5	NTIP02F	2	81.62	1.70	08/20 22:03	08/20 23:45
44	6	NTIP02F	2	101.90	2.12	08/20 23:45	08/21 01:52
44	7	NTIP02F	2	182.22	3.79	08/21 01:52	08/21 05:39
44	8	NTIP02F	2	168.58	3.50	08/21 05:39	08/21 09:10
44	9	NTIP02F	2	132.74	2.76	08/21 09:10	08/21 11:55
44	10	NTIP02F	2	127.22	2.64	08/21 11:55	08/21 14:34
45	0	NTIP02F	2	0.00	0.00	08/21 14:34	08/21 14:34
45	1	NTIP02F	2	17.00	0.62	08/21 14:34	08/21 15:11
45	2	NTIP02F	2	55.77	2.03	08/21 15:11	08/21 17:13
45	3	NTIP02F	2	68.58	1.66	08/21 17:13	08/21 18:52
45	4	NTIP02F	2	62.19	1.51	08/21 18:52	08/21 20:23
45	5	NTIP02F	2	30.19	0.63	08/21 20:23	08/21 21:00
45	6	NTIP02F	2	0.60	0.02	08/21 21:00	08/21 21:02
46	2	NTIP02G	2	1.50	0.04	08/22 00:00	08/22 00:02
46	3	NTIP02G	2	41.56	1.01	08/22 00:02	08/22 01:02
46	4	NTIP02G	2	123.94	2.58	08/22 01:02	08/22 03:37
46	5	NTIP02G	2	144.03	6.07	08/22 03:37	08/22 09:41
46	6	NTIP02G	2	150.44	3.13	08/22 09:41	08/22 12:49
47	0	NTIP02G	2	1.14	0.03	08/22 12:49	08/22 12:50
47	1	NTIP02G	2	22.28	0.54	08/22 12:50	08/22 13:23
47	2	NTIP02G	2	61.99	1.50	08/22 13:23	08/22 14:53
47	3	NTIP02G	2	83.48	2.02	08/22 14:53	08/22 16:54
47	4	NTIP02G	2	93.21	2.26	08/22 16:54	08/22 19:10
47	5	NTIP02G	2	90.44	1.88	08/22 19:10	08/22 21:03
47	6	NTIP02G	2	114.41	4.82	08/22 21:03	08/23 01:52
48	1	NTIP02G	2	42.71	1.04	08/23 01:52	08/23 02:54
48	2	NTIP02G	2	73.85	1.79	08/23 02:54	08/23 04:42
48	3	NTIP02G	2	86.70	2.10	08/23 04:42	08/23 06:48
48	4	NTIP02G	2	98.83	4.17	08/23 06:48	08/23 10:58
48	5	NTIP02G	2	121.50	2.52	08/23 10:58	08/23 13:29
48	6	NTIP02G	2	159.10	3.31	08/23 13:29	08/23 16:48
49	0	NTIP02G	2	0.00	0.00	08/23 16:48	08/23 16:48
49	1	NTIP02G	2	123.50	3.00	08/23 16:48	08/23 19:48
49	2	NTIP02G	2	177.47	4.31	08/23 19:48	08/24 00:06
49	3	NTIP02G	2	184.47	4.47	08/24 00:06	08/24 04:34
49	4	NTIP02G	2	198.75	4.13	08/24 04:34	08/24 08:42
49	5	NTIP02G	2	226.04	4.70	08/24 08:42	08/24 13:24
49	6	NTIP02G	2	237.45	4.93	08/24 13:24	08/24 18:20
50	0	NTIP02G	2	5.82	0.14	08/24 18:20	08/24 18:29
50	1	NTIP02G	2	246.93	5.99	08/24 18:29	08/25 00:28
50	2	NTIP02G	2	407.43	9.89	08/25 00:28	08/25 10:21
50	3	NTIP02G	2	403.75	8.39	08/25 10:21	08/25 18:45
50	4	NTIP02G	2	367.31	7.63	08/25 18:45	08/27 02:23
50	5	NTIP02G	2	337.61	7.02	08/27 02:23	08/27 09:24
50	6	NTIP02G	2	345.24	7.17	08/27 09:24	08/27 16:34
51	0	NTIP02G	2	0.00	0.00	08/27 16:34	08/27 16:34
51	1	NTIP02G	2	149.62	3.63	08/27 16:34	08/27 20:12
51	2	NTIP02G	2	267.79	6.50	08/27 20:12	08/28 02:42
51	3	NTIP02G	2	298.70	7.24	08/28 02:42	08/28 09:56

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
51	4	NTIP02G	2	299.91	6.23	08/28 09:56	08/28 16:10
51	5	NTIP02G	2	307.31	6.39	08/28 16:10	08/28 22:33
51	6	NTIP02G	2	308.08	6.40	08/28 22:33	08/29 04:57
52	1	NTIP02G	2	120.50	2.92	08/29 04:57	08/29 07:53
52	2	NTIP02G	2	380.55	9.23	08/29 07:53	08/29 17:07
52	3	NTIP02G	2	408.54	9.91	08/29 17:07	08/30 03:01
52	4	NTIP02G	2	344.86	7.17	08/30 03:01	08/30 10:11
52	5	NTIP02G	2	344.96	7.17	08/30 10:11	08/30 17:21
52	6	NTIP02G	2	358.10	7.44	08/30 17:21	08/31 00:48
53	0	NTIP02G	2	34.86	0.85	08/31 00:48	08/31 01:39
53	1	NTIP02G	2	206.23	5.00	08/31 01:39	08/31 06:39
53	2	NTIP02G	2	318.31	7.72	08/31 06:39	08/31 14:22
53	3	NTIP02G	2	351.24	8.52	08/31 14:22	08/31 22:53
53	4	NTIP02G	2	383.39	7.97	08/31 22:53	09/01 06:51
53	5	NTIP02G	2	371.85	7.73	09/01 06:51	09/01 14:35
53	6	NTIP02G	2	367.24	7.63	09/01 14:35	09/01 22:13
53	7	NTIP02G	2	338.72	14.28	09/01 22:13	09/04 12:30
54	0	NTIP02G	2	0.00	0.00	09/04 12:30	09/04 12:30
54	1	NTIP02G	2	138.32	3.36	09/04 12:30	09/04 15:51
54	2	NTIP02G	2	315.92	7.67	09/04 15:51	09/04 23:31
54	3	NTIP02G	2	391.04	9.48	09/04 23:31	09/05 09:00
54	4	NTIP02G	2	439.75	9.14	09/05 09:00	09/05 18:08
54	5	NTIP02G	2	464.30	9.65	09/05 18:08	09/06 03:47
54	6	NTIP02G	2	425.00	8.83	09/06 03:47	09/06 12:37
54	7	NTIP02G	2	424.85	8.83	09/06 12:37	09/06 21:27
55	0	NTIP02G	2	0.00	0.00	09/06 21:27	09/06 21:27
55	1	NTIP02G	2	190.26	4.62	09/06 21:27	09/07 02:04
55	2	NTIP02G	2	336.08	8.15	09/07 02:04	09/07 10:13
55	3	NTIP02G	2	376.87	9.14	09/07 10:13	09/07 19:21
55	4	NTIP02G	2	448.83	9.33	09/07 19:21	09/08 04:41
55	5	NTIP02G	2	480.01	9.98	09/08 04:41	09/08 14:39
55	6	NTIP02G	2	492.45	10.23	09/08 14:39	09/10 00:53
55	7	NTIP02G	2	431.89	8.98	09/10 00:53	09/10 09:52
55	8	NTIP02G	2	433.43	9.01	09/10 09:52	09/10 18:52
56	0	NTIP02G	2	7.55	0.18	09/10 18:52	09/10 19:03
56	1	NTIP02G	2	202.54	4.91	09/10 19:03	09/10 23:58
56	2	NTIP02G	2	382.02	9.26	09/10 23:58	09/11 09:14
56	3	NTIP02G	2	408.05	9.89	09/11 09:14	09/11 19:07
56	4	NTIP02G	2	440.31	9.15	09/11 19:07	09/12 04:16
56	5	NTIP02G	2	381.78	7.93	09/12 04:16	09/12 12:12
56	6	NTIP02G	2	391.54	8.14	09/12 12:12	09/12 20:21
56	7	NTIP02G	2	348.22	7.24	09/12 20:21	09/13 03:35
57	0	NTIP02G	2	0.00	0.00	09/13 03:35	09/13 03:35
57	1	NTIP02G	2	139.94	3.40	09/13 03:35	09/13 06:59
57	2	NTIP02G	2	205.50	4.99	09/13 06:59	09/13 11:58
57	3	NTIP02G	2	250.95	6.08	09/13 11:58	09/13 18:03
57	4	NTIP02G	2	385.20	8.01	09/13 18:03	09/14 02:03
57	5	NTIP02G	2	406.54	17.14	09/14 02:03	09/14 19:11
57	6	NTIP02G	2	401.53	8.34	09/14 19:11	09/15 03:32
58	0	NTIP02G	2	4.73	0.11	09/15 03:32	09/15 03:39

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
58	1	NTIP02G	2	31.13	0.76	09/15 03:39	09/15 04:24
58	2	NTIP02G	2	68.13	3.35	09/15 04:24	09/15 07:45
58	3	NTIP02G	2	82.45	2.00	09/15 07:45	09/15 09:45
58	4	NTIP02G	2	141.07	3.42	09/15 09:45	09/15 13:11
58	5	NTIP02G	2	259.75	5.40	09/15 13:11	09/15 18:35
58	6	NTIP02G	2	437.91	18.46	09/15 18:35	09/17 13:02
58	7	NTIP02G	2	435.45	9.05	09/17 13:02	09/17 22:05
59	2	NTIP02G	2	8.17	0.20	09/17 22:05	09/17 22:17
59	3	NTIP02G	2	47.66	1.16	09/17 22:17	09/17 23:26
59	4	NTIP02G	2	100.89	2.45	09/17 23:26	09/18 01:53
59	5	NTIP02G	2	72.30	1.75	09/18 01:53	09/18 03:38
59	6	NTIP02G	2	59.75	1.24	09/18 03:38	09/18 04:53
59	7	NTIP02G	2	92.61	1.92	09/18 04:53	09/18 06:48
59	8	NTIP02G	2	142.56	2.96	09/18 06:48	09/18 09:46
59	9	NTIP02G	2	169.07	7.13	09/18 09:46	09/18 16:54
60	8	NTIP02G	2	10.64	0.22	09/18 16:54	09/18 17:07
60	9	NTIP02G	2	86.38	1.80	09/18 17:07	09/18 18:55
60	10	NTIP02G	2	89.47	1.86	09/18 18:55	09/18 20:46
60	11	NTIP02G	2	72.17	1.50	09/18 20:46	09/18 22:16
60	12	NTIP02G	2	54.47	1.13	09/18 22:16	09/18 23:24
60	13	NTIP02G	2	10.12	0.21	09/18 23:24	09/18 23:37
60	14	NTIP02G	2	0.02	0.00	09/18 23:37	09/18 23:37
14	9	NTIP02C	3	49.34	4.16	06/04 00:00	06/04 04:09
14	10	NTIP02C	3	0.68	0.03	06/04 04:09	06/04 04:11
15	7	NTIP02C	3	237.28	9.86	06/04 04:11	06/04 14:03
15	8	NTIP02C	3	353.36	29.79	06/04 14:03	06/05 19:50
15	9	NTIP02C	3	286.53	11.92	06/05 19:50	06/06 07:45
15	10	NTIP02C	3	49.67	2.07	06/06 07:45	06/06 09:49
16	7	NTIP02C	3	384.22	15.97	06/06 09:49	06/07 01:47
16	8	NTIP02C	3	427.45	17.77	06/07 01:47	06/07 19:33
16	9	NTIP02C	3	210.79	8.76	06/07 19:33	06/08 04:19
16	10	NTIP02C	3	212.65	17.93	06/08 04:19	06/08 22:15
16	11	NTIP02C	3	236.53	19.94	06/08 22:15	06/09 18:11
16	12	NTIP02C	3	133.54	5.55	06/09 18:11	06/09 23:45
16	13	NTIP02C	3	16.83	0.70	06/09 23:45	06/11 00:27
17	7	NTIP02C	3	241.70	10.05	06/11 00:27	06/11 10:29
17	8	NTIP02C	3	373.19	15.51	06/11 10:29	06/12 02:00
17	9	NTIP02C	3	346.29	14.39	06/12 02:00	06/12 16:24
17	10	NTIP02C	3	300.36	12.48	06/12 16:24	06/13 04:53
17	11	NTIP02C	3	240.97	10.02	06/13 04:53	06/13 14:54
17	12	NTIP02C	3	22.86	0.95	06/13 14:54	06/13 15:51
18	6	NTIP02C	3	171.94	14.50	06/13 15:51	06/14 06:21
18	7	NTIP02C	3	156.11	6.49	06/14 06:21	06/14 12:50
18	8	NTIP02C	3	57.30	3.86	06/14 12:50	06/14 16:42
18	9	NTIP02C	3	1.39	0.09	06/14 16:42	06/14 16:48
19	6	NTIP02C	3	281.94	11.72	06/14 16:48	06/15 04:31
19	7	NTIP02C	3	92.96	3.86	06/15 04:31	06/15 08:23
19	8	NTIP02C	3	0.63	0.04	06/15 08:23	06/15 08:25
19	9	NTIP02C	3	1.25	0.08	06/15 08:25	06/15 08:30
20	5	NTIP02C	3	338.19	28.51	06/15 08:30	06/16 13:01

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
20	6	NTIP02C	3	264.09	10.98	06/16 13:01	06/18 00:00
21	5	NTIP02C	3	358.34	30.21	06/18 00:00	06/19 06:13
21	6	NTIP02C	3	270.62	22.82	06/19 06:13	06/20 05:02
21	7	NTIP02C	3	123.62	5.99	06/20 05:02	06/20 11:01
21	8	NTIP02C	3	58.55	4.26	06/20 11:01	06/20 15:17
22	6	NTIP02C	3	444.62	16.17	06/20 15:17	06/21 07:27
22	7	NTIP02C	3	663.58	48.96	06/21 07:27	06/23 08:25
22	8	NTIP02C	3	198.79	7.24	06/23 08:25	06/23 15:39
23	6	NTIP02C	3	680.14	14.13	06/23 15:39	06/25 05:47
23	7	NTIP02C	3	641.49	27.04	06/25 05:47	06/26 08:49
23	8	NTIP02C	3	330.80	24.41	06/26 08:49	06/27 09:14
23	9	NTIP02C	3	30.40	0.74	06/27 09:14	06/27 09:58
24	6	NTIP02C	3	936.60	46.07	06/27 09:58	06/29 08:02
24	7	NTIP02C	3	759.26	37.34	06/29 08:02	06/30 21:22
24	8	NTIP02C/NTIP02D	3	819.61	40.31	06/30 21:22	07/03 13:41
24	9	NTIP02C/NTIP02D	3	452.06	10.97	07/03 13:41	07/05 00:39
25	7	NTIP02C	3	921.82	33.52	07/05 00:39	07/06 10:11
25	8	NTIP02C/NTIP02D	3	548.02	40.43	07/06 10:11	07/09 02:36
26	7	NTIP02C	3	570.62	11.86	07/09 02:36	07/09 14:28
26	8	NTIP02C	3	321.22	7.79	07/09 14:28	07/09 22:15
26	9	NTIP02C	3	102.95	2.50	07/09 22:15	07/10 00:45
27	7	NTIP02C	3	109.31	2.27	07/10 00:45	07/10 03:01
27	8	NTIP02C	3	206.35	4.29	07/10 03:01	07/10 07:19
27	9	NTIP02C	3	393.22	8.17	07/10 07:19	07/10 15:29
27	10	NTIP02C/NTIP02D	3	186.41	4.52	07/10 15:29	07/10 20:00
27	11	NTIP02C/NTIP02D	3	517.52	25.45	07/10 20:00	07/11 21:27
28	8	NTIP02C/NTIP02E	3	106.80	2.59	07/11 21:27	07/12 00:03
28	9	NTIP02C/NTIP02E	3	387.08	8.04	07/12 00:03	07/12 08:05
28	10	NTIP02C	3	284.50	6.90	07/12 08:05	07/12 14:59
28	11	NTIP02C	3	168.74	4.09	07/12 14:59	07/12 19:05
29	10	NTIP02C	3	79.11	1.92	07/12 19:05	07/12 21:00
29	11	NTIP02C	3	75.36	1.83	07/12 21:00	07/12 22:49
25	9	NTIP02D	3	513.75	18.70	07/13 00:00	07/13 18:41
25	10	NTIP02D	3	1010.72	74.57	07/13 18:41	07/17 21:15
25	11	NTIP02D	3	395.27	29.16	07/17 21:15	07/19 02:25
26	10	NTIP02D	3	315.29	7.65	07/19 02:25	07/19 10:04
26	11	NTIP02D	3	650.48	15.78	07/19 10:04	07/20 01:51
29	7	NTIP02E	3	146.30	3.55	07/21 00:00	07/21 03:32
29	8	NTIP02E	3	336.36	16.54	07/21 03:32	07/21 20:05
29	9	NTIP02E	3	10.14	0.21	07/21 20:05	07/21 20:18
30	6	NTIP02E	3	12.81	0.31	07/21 20:18	07/21 20:36
30	7	NTIP02E	3	575.18	13.96	07/21 20:36	07/23 10:34
30	8	NTIP02E	3	512.99	10.66	07/23 10:34	07/23 21:13
30	9	NTIP02E	3	66.66	2.81	07/23 21:13	07/24 00:02
31	4	NTIP02E	3	369.11	15.56	07/24 00:02	07/24 15:36
31	5	NTIP02E	3	524.19	12.71	07/24 15:36	07/25 04:18
31	6	NTIP02E	3	512.63	12.44	07/25 04:18	07/25 16:44
31	7	NTIP02E	3	713.53	35.09	07/25 16:44	07/27 03:50
31	8	NTIP02E	3	180.81	3.76	07/27 03:50	07/27 07:36
32	4	NTIP02E	3	502.77	10.45	07/27 07:36	07/27 18:02

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
32	5	NTIP02E	3	482.79	10.03	07/27 18:02	07/28 04:04
32	6	NTIP02E	3	472.11	9.81	07/28 04:04	07/28 13:53
32	7	NTIP02E	3	510.06	14.13	07/28 13:53	07/30 04:01
32	8	NTIP02E	3	25.78	0.71	07/30 04:01	07/30 04:44
33	4	NTIP02E	3	385.46	10.68	07/30 04:44	07/30 15:25
33	5	NTIP02E	3	333.65	9.25	07/30 15:25	07/31 00:40
33	6	NTIP02E	3	344.31	9.54	07/31 00:40	07/31 10:12
33	7	NTIP02E	3	424.61	11.77	07/31 10:12	07/31 21:58
33	8	NTIP02E	3	281.55	6.83	07/31 21:58	08/01 04:47
33	9	NTIP02E	3	43.62	1.06	08/01 04:47	08/01 05:51
34	4	NTIP02E	3	209.48	4.35	08/01 05:51	08/01 10:12
34	5	NTIP02E	3	149.52	3.11	08/01 10:12	08/01 13:19
34	6	NTIP02E	3	239.45	4.98	08/01 13:19	08/01 18:17
34	7	NTIP02E	3	203.56	4.23	08/01 18:17	08/01 22:31
34	8	NTIP02E	3	117.79	2.86	08/01 22:31	08/02 01:22
34	9	NTIP02E	3	55.28	1.34	08/02 01:22	08/02 02:43
35	3	NTIP02E	3	420.62	8.74	08/02 02:43	08/02 11:27
35	4	NTIP02E	3	316.65	6.58	08/02 11:27	08/02 18:02
35	5	NTIP02E	3	16.13	0.34	08/02 18:02	08/02 18:22
35	7	NTIP02E	3	2.94	0.10	08/02 18:22	08/02 18:28
36	3	NTIP02E/NTIP02F	3	92.32	1.92	08/02 18:28	08/02 20:23
36	4	NTIP02E	3	113.74	2.36	08/02 20:23	08/02 22:45
36	5	NTIP02E	3	17.81	0.37	08/02 22:45	08/02 23:07
36	7	NTIP02F	3	9.65	0.20	08/03 00:00	08/03 00:12
36	8	NTIP02F	3	98.09	3.57	08/03 00:12	08/03 03:46
36	9	NTIP02F	3	18.20	0.72	08/03 03:46	08/03 04:29
37	7	NTIP02F	3	307.94	6.40	08/03 04:29	08/03 10:52
37	8	NTIP02F	3	122.09	2.96	08/03 10:52	08/03 13:50
37	9	NTIP02F	3	0.00	0.00	08/03 13:50	08/03 13:50
38	7	NTIP02F	3	520.80	21.96	08/03 13:50	08/04 11:47
38	8	NTIP02F	3	289.53	6.02	08/04 11:47	08/04 17:48
38	9	NTIP02F	3	140.04	5.09	08/04 17:48	08/04 22:54
38	10	NTIP02F	3	9.68	0.23	08/04 22:54	08/04 23:08
39	8	NTIP02F	3	450.80	9.37	08/04 23:08	08/06 08:30
39	9	NTIP02F	3	226.17	8.23	08/06 08:30	08/06 16:44
39	10	NTIP02F	3	291.74	10.61	08/06 16:44	08/07 03:20
39	11	NTIP02F	3	301.37	10.97	08/07 03:20	08/07 14:18
39	12	NTIP02F	3	18.30	0.67	08/07 14:18	08/07 14:58
40	9	NTIP02F	3	248.82	5.17	08/07 14:58	08/07 20:09
40	10	NTIP02F	3	17.39	1.03	08/07 20:09	08/07 21:10
40	11	NTIP02F	3	112.06	2.72	08/07 21:10	08/07 23:53
40	12	NTIP02F	3	231.14	6.59	08/07 23:53	08/08 06:29
40	13	NTIP02F	3	219.56	6.26	08/08 06:29	08/08 12:45
40	14	NTIP02F	3	229.66	6.55	08/08 12:45	08/08 19:18
41	15	NTIP02F	3	327.10	9.06	08/08 19:18	08/09 04:21
41	16	NTIP02F	3	266.41	7.38	08/09 04:21	08/09 11:44
41	17	NTIP02F	3	177.47	4.34	08/09 11:44	08/09 16:05
41	18	NTIP02F	3	189.10	4.62	08/09 16:05	08/09 20:42
41	19	NTIP02F	3	189.80	3.94	08/09 20:42	08/10 00:39
41	20	NTIP02F	3	130.47	2.71	08/10 00:39	08/10 03:21

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
41	21	NTIP02F	3	174.03	6.33	08/10 03:21	08/10 09:41
41	22	NTIP02F	3	114.56	4.17	08/10 09:41	08/10 13:51
41	23	NTIP02F	3	526.73	25.54	08/10 13:51	08/11 15:24
42	13	NTIP02F	3	234.38	6.49	08/11 15:24	08/11 21:53
42	14	NTIP02F	3	263.50	7.30	08/11 21:53	08/13 05:11
42	15	NTIP02F	3	201.70	5.59	08/13 05:11	08/13 10:47
42	16	NTIP02F	3	200.63	5.56	08/13 10:47	08/13 16:20
42	17	NTIP02F	3	221.62	6.14	08/13 16:20	08/13 22:29
42	18	NTIP02F	3	203.50	5.64	08/13 22:29	08/14 04:07
42	19	NTIP02F	3	160.39	4.44	08/14 04:07	08/14 08:34
42	20	NTIP02F	3	143.83	3.99	08/14 08:34	08/14 12:33
42	21	NTIP02F	3	136.08	3.77	08/14 12:33	08/14 16:19
42	22	NTIP02F	3	102.74	2.85	08/14 16:19	08/14 19:10
42	23	NTIP02F	3	1590.75	51.42	08/14 19:10	08/16 22:35
43	12	NTIP02F	3	107.97	2.99	08/16 22:35	08/17 01:35
43	13	NTIP02F	3	108.61	3.01	08/17 01:35	08/17 04:35
43	14	NTIP02F	3	133.17	3.69	08/17 04:35	08/17 08:17
43	15	NTIP02F	3	110.86	3.07	08/17 08:17	08/17 11:21
43	16	NTIP02F	3	132.57	3.67	08/17 11:21	08/17 15:01
43	17	NTIP02F	3	139.15	7.82	08/17 15:01	08/17 22:51
43	18	NTIP02F	3	130.02	3.60	08/17 22:51	08/18 02:27
43	19	NTIP02F	3	93.19	2.58	08/18 02:27	08/18 05:02
43	20	NTIP02F	3	82.48	2.29	08/18 05:02	08/18 07:19
43	21	NTIP02F	3	60.62	1.68	08/18 07:19	08/18 09:00
43	22	NTIP02F	3	59.08	1.64	08/18 09:00	08/18 10:38
43	23	NTIP02F	3	475.20	15.36	08/18 10:38	08/20 02:00
44	11	NTIP02F	3	176.63	3.67	08/20 02:00	08/20 05:40
44	12	NTIP02F	3	193.47	4.02	08/20 05:40	08/20 09:41
44	13	NTIP02F	3	179.15	3.72	08/20 09:41	08/20 13:24
44	14	NTIP02F	3	147.05	6.20	08/20 13:24	08/20 19:36
44	15	NTIP02F	3	122.33	2.54	08/20 19:36	08/20 22:09
44	16	NTIP02F	3	59.07	1.23	08/20 22:09	08/20 23:23
44	17	NTIP02F	3	54.28	1.13	08/20 23:23	08/21 00:30
44	18	NTIP02F	3	45.92	0.95	08/21 00:30	08/21 01:28
44	19	NTIP02F	3	37.37	0.78	08/21 01:28	08/21 02:14
44	20	NTIP02F	3	23.83	0.50	08/21 02:14	08/21 02:44
44	21	NTIP02F	3	34.78	0.72	08/21 02:44	08/21 03:27
44	22	NTIP02F	3	50.79	1.23	08/21 03:27	08/21 04:41
44	23	NTIP02F	3	140.59	3.41	08/21 04:41	08/21 08:06
45	7	NTIP02F/NTIP02G	3	17.04	0.35	08/21 08:06	08/21 08:27
45	8	NTIP02F/NTIP02G	3	198.58	4.13	08/21 08:27	08/21 12:35
45	9	NTIP02F/NTIP02G	3	185.72	3.86	08/21 12:35	08/21 16:26
45	10	NTIP02F/NTIP02G	3	102.31	2.13	08/21 16:26	08/21 18:34
45	11	NTIP02F/NTIP02G	3	69.56	1.45	08/21 18:34	08/21 20:00
45	12	NTIP02F/NTIP02G	3	38.11	0.79	08/21 20:00	08/21 20:48
45	13	NTIP02F	3	44.07	0.92	08/21 20:48	08/21 21:43
45	14	NTIP02F	3	49.03	2.07	08/21 21:43	08/21 23:47
45	15	NTIP02F	3	2.96	0.10	08/21 23:47	08/21 23:53
46	7	NTIP02G	3	89.80	1.87	08/22 00:00	08/22 01:51
46	8	NTIP02G	3	118.61	2.46	08/22 01:51	08/22 04:19

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
46	9	NTIP02G	3	119.68	2.49	08/22 04:19	08/22 06:49
46	10	NTIP02G	3	69.90	2.95	08/22 06:49	08/22 09:45
46	11	NTIP02G	3	51.20	1.06	08/22 09:45	08/22 10:49
46	12	NTIP02G	3	35.08	0.73	08/22 10:49	08/22 11:33
46	13	NTIP02G	3	12.87	0.27	08/22 11:33	08/22 11:49
47	7	NTIP02G	3	120.01	2.49	08/22 11:49	08/22 14:19
47	8	NTIP02G	3	131.71	2.74	08/22 14:19	08/22 17:03
47	9	NTIP02G	3	118.16	2.46	08/22 17:03	08/22 19:30
47	10	NTIP02G	3	102.34	2.13	08/22 19:30	08/22 21:38
47	11	NTIP02G	3	89.21	3.76	08/22 21:38	08/23 01:23
47	12	NTIP02G	3	102.97	2.14	08/23 01:23	08/23 03:32
47	13	NTIP02G	3	131.51	2.73	08/23 03:32	08/23 06:16
47	14	NTIP02G	3	156.72	3.26	08/23 06:16	08/23 09:31
47	15	NTIP02G	3	97.46	2.03	08/23 09:31	08/23 11:33
47	16	NTIP02G	3	50.00	1.04	08/23 11:33	08/23 12:35
47	17	NTIP02G	3	9.96	0.21	08/23 12:35	08/23 12:48
47	18	NTIP02G	3	0.00	0.00	08/23 12:48	08/23 12:48
48	7	NTIP02G	3	167.76	3.49	08/23 12:48	08/23 16:17
48	8	NTIP02G	3	195.10	4.05	08/23 16:17	08/23 20:20
48	9	NTIP02G	3	274.20	5.70	08/23 20:20	08/24 02:02
48	10	NTIP02G	3	242.32	5.04	08/24 02:02	08/24 07:04
48	11	NTIP02G	3	211.41	4.39	08/24 07:04	08/24 11:28
48	12	NTIP02G	3	271.91	5.65	08/24 11:28	08/24 17:07
48	13	NTIP02G	3	326.30	6.78	08/24 17:07	08/24 23:54
48	14	NTIP02G	3	368.03	7.65	08/24 23:54	08/25 07:32
48	15	NTIP02G	3	384.19	7.98	08/25 07:32	08/25 15:31
48	16	NTIP02G	3	286.39	5.95	08/25 15:31	08/25 21:29
48	17	NTIP02G	3	118.24	2.46	08/25 21:29	08/25 23:56
48	18	NTIP02G	3	5.59	0.12	08/25 23:56	08/27 00:03
49	7	NTIP02G	3	162.03	3.37	08/27 00:03	08/27 03:25
49	8	NTIP02G	3	97.37	2.02	08/27 03:25	08/27 05:26
49	9	NTIP02G	3	104.54	2.17	08/27 05:26	08/27 07:37
49	10	NTIP02G	3	115.67	2.40	08/27 07:37	08/27 10:01
49	11	NTIP02G	3	86.31	1.79	08/27 10:01	08/27 11:49
49	12	NTIP02G	3	71.36	1.48	08/27 11:49	08/27 13:18
49	13	NTIP02G	3	94.64	1.97	08/27 13:18	08/27 15:16
49	14	NTIP02G	3	110.58	2.30	08/27 15:16	08/27 17:33
49	15	NTIP02G	3	106.62	2.22	08/27 17:33	08/27 19:46
49	16	NTIP02G	3	89.18	1.85	08/27 19:46	08/27 21:38
49	17	NTIP02G	3	63.02	1.31	08/27 21:38	08/27 22:56
49	18	NTIP02G	3	0.46	0.02	08/27 22:56	08/27 22:57
50	7	NTIP02G	3	286.25	5.95	08/27 22:57	08/28 04:54
50	8	NTIP02G	3	247.23	5.14	08/28 04:54	08/28 10:02
50	9	NTIP02G	3	66.90	1.39	08/28 10:02	08/28 11:26
50	10	NTIP02G	3	59.63	1.24	08/28 11:26	08/28 12:40
50	11	NTIP02G	3	74.57	1.55	08/28 12:40	08/28 14:13
50	12	NTIP02G	3	102.77	2.14	08/28 14:13	08/28 16:21
50	13	NTIP02G	3	109.61	2.28	08/28 16:21	08/28 18:38
50	14	NTIP02G	3	173.66	3.61	08/28 18:38	08/28 22:14
50	15	NTIP02G	3	172.81	3.59	08/28 22:14	08/29 01:50

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
50	16	NTIP02G	3	44.26	0.92	08/29 01:50	08/29 02:45
50	17	NTIP02G	3	0.00	0.00	08/29 02:45	08/29 02:45
51	7	NTIP02G	3	243.32	5.06	08/29 02:45	08/29 07:48
51	8	NTIP02G	3	238.03	4.95	08/29 07:48	08/29 12:45
51	9	NTIP02G	3	141.56	2.94	08/29 12:45	08/29 15:42
51	10	NTIP02G	3	98.58	2.05	08/29 15:42	08/29 17:45
51	11	NTIP02G	3	107.16	2.23	08/29 17:45	08/29 19:58
51	12	NTIP02G	3	150.99	3.14	08/29 19:58	08/29 23:07
51	13	NTIP02G	3	200.17	4.16	08/29 23:07	08/30 03:16
51	14	NTIP02G	3	180.68	3.75	08/30 03:16	08/30 07:01
51	15	NTIP02G	3	120.52	2.50	08/30 07:01	08/30 09:32
51	16	NTIP02G	3	11.51	0.39	08/30 09:32	08/30 09:55
51	17	NTIP02G	3	3.63	0.08	08/30 09:55	08/30 10:00
52	7	NTIP02G	3	273.40	5.68	08/30 10:00	08/30 15:40
52	8	NTIP02G	3	255.58	5.31	08/30 15:40	08/30 20:59
52	9	NTIP02G	3	263.54	5.48	08/30 20:59	08/31 02:28
52	10	NTIP02G	3	229.92	4.78	08/31 02:28	08/31 07:14
52	11	NTIP02G	3	194.20	4.04	08/31 07:14	08/31 11:17
52	12	NTIP02G	3	184.35	3.83	08/31 11:17	08/31 15:06
52	13	NTIP02G	3	201.88	4.20	08/31 15:06	08/31 19:18
52	14	NTIP02G	3	173.84	3.61	08/31 19:18	08/31 22:55
52	15	NTIP02G	3	159.31	3.31	08/31 22:55	09/01 02:14
52	16	NTIP02G	3	68.66	1.43	09/01 02:14	09/01 03:39
53	8	NTIP02G	3	304.30	6.32	09/01 03:39	09/01 09:59
53	9	NTIP02G	3	308.12	6.40	09/01 09:59	09/01 16:23
53	10	NTIP02G	3	320.03	13.49	09/01 16:23	09/04 05:52
53	11	NTIP02G	3	239.70	4.98	09/04 05:52	09/04 10:51
53	12	NTIP02G	3	218.05	4.53	09/04 10:51	09/04 15:23
53	13	NTIP02G	3	189.50	3.94	09/04 15:23	09/04 19:19
53	14	NTIP02G	3	133.37	2.77	09/04 19:19	09/04 22:06
53	15	NTIP02G	3	123.79	2.57	09/04 22:06	09/05 00:40
53	16	NTIP02G	3	83.06	3.50	09/05 00:40	09/05 04:10
53	17	NTIP02G	3	2.37	0.08	09/05 04:10	09/05 04:15
53	18	NTIP02G	3	1.93	0.07	09/05 04:15	09/05 04:19
53	19	NTIP02G	3	0.86	0.02	09/05 04:19	09/05 04:20
54	8	NTIP02G	3	446.64	9.28	09/05 04:20	09/05 13:37
54	9	NTIP02G	3	361.81	7.52	09/05 13:37	09/05 21:08
54	10	NTIP02G	3	271.41	5.64	09/05 21:08	09/06 02:46
54	11	NTIP02G	3	242.95	5.05	09/06 02:46	09/06 07:49
54	12	NTIP02G	3	276.41	5.74	09/06 07:49	09/06 13:34
54	13	NTIP02G	3	286.11	5.95	09/06 13:34	09/06 19:31
54	14	NTIP02G	3	176.24	3.66	09/06 19:31	09/06 23:10
54	15	NTIP02G	3	142.42	2.96	09/06 23:10	09/07 02:08
54	16	NTIP02G	3	103.72	2.16	09/07 02:08	09/07 04:17
54	17	NTIP02G	3	61.53	1.28	09/07 04:17	09/07 05:34
54	18	NTIP02G	3	21.88	0.74	09/07 05:34	09/07 06:18
54	19	NTIP02G	3	12.42	0.42	09/07 06:18	09/07 06:43
54	20	NTIP02G	3	0.00	0.00	09/07 06:43	09/07 06:43
55	9	NTIP02G	3	408.43	8.49	09/07 06:43	09/07 15:13
55	10	NTIP02G	3	393.79	8.18	09/07 15:13	09/07 23:24

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
55	11	NTIP02G	3	268.53	5.58	09/07 23:24	09/08 04:58
55	12	NTIP02G	3	234.62	4.88	09/08 04:58	09/08 09:51
55	13	NTIP02G	3	220.70	4.59	09/08 09:51	09/08 14:26
55	14	NTIP02G	3	195.44	4.06	09/08 14:26	09/08 18:30
55	15	NTIP02G	3	214.48	4.46	09/08 18:30	09/08 22:57
55	16	NTIP02G	3	161.36	3.35	09/08 22:57	09/10 02:19
55	17	NTIP02G	3	113.04	2.35	09/10 02:19	09/10 04:39
55	18	NTIP02G	3	151.51	3.15	09/10 04:39	09/10 07:48
55	19	NTIP02G	3	107.53	2.23	09/10 07:48	09/10 10:02
56	8	NTIP02G	3	366.64	7.62	09/10 10:02	09/10 17:40
56	9	NTIP02G	3	384.31	7.99	09/10 17:40	09/11 01:39
56	10	NTIP02G	3	355.76	7.39	09/11 01:39	09/11 09:02
56	11	NTIP02G	3	251.42	5.22	09/11 09:02	09/11 14:16
56	12	NTIP02G	3	196.28	4.08	09/11 14:16	09/11 18:21
56	13	NTIP02G	3	125.09	2.60	09/11 18:21	09/11 20:57
56	14	NTIP02G	3	127.21	2.64	09/11 20:57	09/11 23:35
56	15	NTIP02G	3	151.70	3.15	09/11 23:35	09/12 02:44
56	16	NTIP02G	3	149.01	3.10	09/12 02:44	09/12 05:50
56	17	NTIP02G	3	169.56	3.52	09/12 05:50	09/12 09:22
56	18	NTIP02G	3	114.64	2.38	09/12 09:22	09/12 11:45
56	19	NTIP02G	3	51.17	1.06	09/12 11:45	09/12 12:48
57	7	NTIP02G	3	330.37	6.87	09/12 12:48	09/12 19:40
57	8	NTIP02G	3	300.00	6.23	09/12 19:40	09/13 01:54
57	9	NTIP02G	3	271.66	5.65	09/13 01:54	09/13 07:33
57	10	NTIP02G	3	164.98	3.43	09/13 07:33	09/13 10:59
57	11	NTIP02G	3	158.31	3.29	09/13 10:59	09/13 14:16
57	12	NTIP02G	3	196.72	4.09	09/13 14:16	09/13 18:21
57	13	NTIP02G	3	161.91	3.36	09/13 18:21	09/13 21:43
57	14	NTIP02G	3	136.53	2.84	09/13 21:43	09/14 00:34
57	15	NTIP02G	3	139.97	2.91	09/14 00:34	09/14 03:28
57	16	NTIP02G	3	146.51	3.04	09/14 03:28	09/14 06:31
57	17	NTIP02G	3	128.79	2.68	09/14 06:31	09/14 09:11
57	18	NTIP02G	3	64.38	2.17	09/14 09:11	09/14 11:22
57	19	NTIP02G	3	28.79	0.60	09/14 11:22	09/14 11:58
58	8	NTIP02G	3	323.08	6.71	09/14 11:58	09/14 18:40
58	9	NTIP02G	3	324.64	6.75	09/14 18:40	09/15 01:25
58	10	NTIP02G	3	90.96	1.89	09/15 01:25	09/15 03:19
58	11	NTIP02G	3	139.19	2.89	09/15 03:19	09/15 06:12
58	12	NTIP02G	3	175.59	3.65	09/15 06:12	09/15 09:51
58	13	NTIP02G	3	101.86	2.12	09/15 09:51	09/15 11:58
58	14	NTIP02G	3	96.61	2.01	09/15 11:58	09/15 13:59
58	15	NTIP02G	3	96.79	2.01	09/15 13:59	09/15 15:59
58	16	NTIP02G	3	125.39	2.61	09/15 15:59	09/15 18:36
58	17	NTIP02G	3	140.66	2.92	09/15 18:36	09/15 21:31
58	18	NTIP02G	3	133.48	2.77	09/15 21:31	09/17 00:17
58	19	NTIP02G	3	140.76	2.93	09/17 00:17	09/17 03:13
58	20	NTIP02G	3	76.36	1.59	09/17 03:13	09/17 04:48
58	21	NTIP02G	3	1.48	0.05	09/17 04:48	09/17 04:51
59	10	NTIP02G	3	123.71	2.57	09/17 04:51	09/17 07:25
59	11	NTIP02G	3	73.78	1.53	09/17 07:25	09/17 08:57

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
59	12	NTIP02G	3	62.89	1.31	09/17 08:57	09/17 10:16
59	13	NTIP02G	3	38.75	0.81	09/17 10:16	09/17 11:04
59	14	NTIP02G	3	23.56	0.49	09/17 11:04	09/17 11:34
59	15	NTIP02G	3	3.81	0.08	09/17 11:34	09/17 11:38
59	16	NTIP02G	3	64.52	1.34	09/17 11:38	09/17 12:59
59	17	NTIP02G	3	119.20	2.48	09/17 12:59	09/17 15:27
59	18	NTIP02G	3	122.60	2.55	09/17 15:27	09/17 18:00
59	19	NTIP02G	3	130.33	2.71	09/17 18:00	09/17 20:43
59	20	NTIP02G	3	144.33	3.00	09/17 20:43	09/17 23:43
59	21	NTIP02G	3	30.99	0.64	09/17 23:43	09/18 00:21
60	15	NTIP02G/NTIP02I	3	25.29	0.53	09/18 00:21	09/18 00:53
60	16	NTIP02G/NTIP02I	3	83.44	1.73	09/18 00:53	09/18 02:37
60	17	NTIP02G/NTIP02I	3	75.98	1.58	09/18 02:37	09/18 04:12
60	18	NTIP02G/NTIP02I	3	24.67	0.83	09/18 04:12	09/18 05:02
60	19	NTIP02G/NTIP02I	3	37.92	1.28	09/18 05:02	09/18 06:18
60	20	NTIP02G	3	44.84	0.93	09/18 06:18	09/18 07:14
173	10	EGIA01A	4	0.00	0.00	06/04 00:00	06/04 00:00
173	11	EGIA01A	4	44.95	0.93	06/04 00:00	06/04 00:56
173	12	EGIA01A	4	53.32	1.11	06/04 00:56	06/04 02:02
173	13	EGIA01A	4	1.94	0.04	06/04 02:02	06/04 02:04
174	8	EGIA01A	4	5.69	0.12	06/04 02:04	06/04 02:12
174	9	EGIA01A	4	28.03	0.95	06/04 02:12	06/04 03:08
174	10	EGIA01A	4	75.07	3.16	06/04 03:08	06/04 06:18
174	11	EGIA01A	4	129.87	5.48	06/04 06:18	06/04 11:47
174	12	EGIA01A	4	41.37	0.86	06/04 11:47	06/04 12:38
175	7	EGIA01A	4	23.70	0.49	06/04 12:38	06/04 13:08
175	8	EGIA01A	4	146.78	3.05	06/04 13:08	06/04 16:11
175	9	EGIA01A	4	169.22	7.13	06/04 16:11	06/04 23:19
175	10	EGIA01A	4	157.62	3.28	06/04 23:19	06/05 02:35
175	11	EGIA01A	4	148.21	3.08	06/05 02:35	06/05 05:40
175	12	EGIA01A	4	96.67	2.01	06/05 05:40	06/05 07:41
175	13	EGIA01A/EGIA01B	4	24.13	0.50	06/05 07:41	06/05 08:11
175	14	EGIA01A/EGIA01B	4	32.54	0.68	06/05 08:11	06/05 08:51
176	6	EGIA01A	4	19.42	0.40	06/05 08:51	06/05 09:16
176	7	EGIA01A	4	51.94	1.08	06/05 09:16	06/05 10:20
176	8	EGIA01A	4	154.00	3.20	06/05 10:20	06/05 13:32
176	9	EGIA01A	4	169.60	3.52	06/05 13:32	06/05 17:04
176	10	EGIA01A	4	112.14	2.33	06/05 17:04	06/05 19:24
176	11	EGIA01A	4	114.77	2.39	06/05 19:24	06/05 21:47
176	12	EGIA01A	4	159.94	3.32	06/05 21:47	06/06 01:06
176	13	EGIA01A/EGIA01B	4	89.79	1.87	06/06 01:06	06/06 02:58
177	11	EGIA01A	4	45.34	0.94	06/06 02:58	06/06 03:55
177	12	EGIA01A/EGIA01B	4	39.28	0.82	06/06 03:55	06/06 04:44
173	20	EGIA01B	4	3.51	0.07	06/07 00:00	06/07 00:04
173	21	EGIA01B	4	70.29	1.70	06/07 00:04	06/07 01:46
173	22	EGIA01B	4	41.49	1.01	06/07 01:46	06/07 02:47
173	23	EGIA01B	4	2.14	0.05	06/07 02:47	06/07 02:50
174	20	EGIA01B	4	34.22	0.71	06/07 02:50	06/07 03:32
174	21	EGIA01B	4	109.51	2.66	06/07 03:32	06/07 06:12
174	22	EGIA01B	4	74.04	1.80	06/07 06:12	06/07 07:59

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
174	23	EGIA01B	4	0.00	0.00	06/07 07:59	06/07 07:59
175	15	EGIA01B	4	49.53	1.03	06/07 07:59	06/07 09:01
175	16	EGIA01B	4	59.27	1.23	06/07 09:01	06/07 10:15
175	17	EGIA01B	4	44.76	0.93	06/07 10:15	06/07 11:11
175	18	EGIA01B	4	14.98	0.31	06/07 11:11	06/07 11:30
175	19	EGIA01B	4	36.40	0.76	06/07 11:30	06/07 12:15
175	20	EGIA01B	4	109.56	2.28	06/07 12:15	06/07 14:32
175	21	EGIA01B	4	111.64	2.71	06/07 14:32	06/07 17:14
175	22	EGIA01B	4	28.60	1.04	06/07 17:14	06/07 18:17
176	14	EGIA01B	4	77.82	1.62	06/07 18:17	06/07 19:54
176	15	EGIA01B	4	119.03	2.47	06/07 19:54	06/07 22:22
176	16	EGIA01B	4	153.67	3.19	06/07 22:22	06/08 01:34
176	17	EGIA01B	4	149.42	3.11	06/08 01:34	06/08 04:40
176	18	EGIA01B	4	244.41	5.08	06/08 04:40	06/08 09:45
176	19	EGIA01B	4	277.67	5.77	06/08 09:45	06/08 15:31
176	20	EGIA01B	4	279.53	5.81	06/08 15:31	06/08 21:19
176	21	EGIA01B	4	291.77	7.08	06/08 21:19	06/09 04:24
176	22	EGIA01B	4	119.90	4.36	06/09 04:24	06/09 08:46
177	13	EGIA01B	4	99.65	2.07	06/09 08:46	06/09 10:50
177	14	EGIA01B	4	121.88	2.53	06/09 10:50	06/09 13:22
177	15	EGIA01B	4	194.36	4.04	06/09 13:22	06/09 17:25
177	16	EGIA01B	4	98.79	2.05	06/09 17:25	06/09 19:28
177	17	EGIA01B	4	0.00	0.00	06/09 19:28	06/09 19:28
177	18	EGIA01B	4	163.66	3.40	06/09 19:28	06/09 22:52
177	19	EGIA01B	4	362.33	7.53	06/09 22:52	06/11 06:24
177	20	EGIA01B	4	349.25	7.26	06/11 06:24	06/11 13:39
177	21	EGIA01B	4	428.00	10.38	06/11 13:39	06/12 00:02
177	22	EGIA01B	4	313.62	7.61	06/12 00:02	06/12 07:38
178	12	EGIA01B	4	63.76	1.32	06/12 07:38	06/12 08:58
178	13	EGIA01B	4	78.59	1.63	06/12 08:58	06/12 10:36
178	14	EGIA01B	4	51.89	1.08	06/12 10:36	06/12 11:41
178	15	EGIA01B	4	14.46	0.30	06/12 11:41	06/12 11:59
178	16	EGIA01B	4	42.49	0.88	06/12 11:59	06/12 12:52
178	17	EGIA01B	4	138.76	2.88	06/12 12:52	06/12 15:45
178	18	EGIA01B	4	235.19	4.89	06/12 15:45	06/12 20:38
178	19	EGIA01B	4	248.61	5.17	06/12 20:38	06/13 01:48
178	20	EGIA01B	4	415.65	8.64	06/13 01:48	06/13 10:26
178	21	EGIA01B	4	570.10	13.82	06/13 10:26	06/14 00:15
178	22	EGIA01B	4	545.45	13.23	06/14 00:15	06/14 13:29
178	23	EGIA01B	4	33.19	0.81	06/14 13:29	06/14 14:18
179	16	EGIA01B	4	57.83	1.20	06/14 14:18	06/14 15:30
179	17	EGIA01B	4	134.78	2.80	06/14 15:30	06/14 18:18
179	18	EGIA01B	4	250.58	5.21	06/14 18:18	06/14 23:30
179	19	EGIA01B	4	474.84	9.87	06/14 23:30	06/15 09:22
180	17	EGIA01B	4	62.18	1.29	07/02 00:00	07/02 01:17
180	18	EGIA01B	4	496.21	10.31	07/02 01:17	07/02 11:36
180	19	EGIA01B	4	534.37	19.43	07/02 11:36	07/03 07:02
181	16	EGIA01B	4	0.00	0.00	07/03 07:02	07/03 07:02
181	17	EGIA01B	4	92.40	1.92	07/03 07:02	07/03 08:57
181	18	EGIA01B	4	512.47	21.60	07/03 08:57	07/05 06:33

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
181	19	EGIA01B	4	631.43	13.12	07/05 06:33	07/05 19:41
181	20	EGIA01B	4	466.23	16.96	07/05 19:41	07/06 12:38
182	16	EGIA01B/EGIA01C	4	95.22	1.98	07/06 12:38	07/06 14:37
182	17	EGIA01B	4	410.77	17.32	07/06 14:37	07/07 07:56
182	18	EGIA01B	4	643.96	13.38	07/07 07:56	07/07 21:19
182	19	EGIA01B	4	557.84	23.52	07/07 21:19	07/09 20:50
182	20	EGIA01B	4	608.35	12.64	07/09 20:50	07/10 09:28
182	21	EGIA01B	4	690.54	50.94	07/10 09:28	07/12 12:25
182	22	EGIA01B	4	839.98	30.57	07/12 12:25	07/13 18:59
182	23	EGIA01B	4	130.49	3.17	07/13 18:59	07/13 22:09
179	20	EGIA01B	4	505.24	18.37	07/14 00:00	07/14 18:22
179	21	EGIA01B	4	519.08	10.79	07/14 18:22	07/16 05:09
179	22	EGIA01B	4	434.84	15.83	07/16 05:09	07/16 20:59
179	23	EGIA01B	4	19.47	0.71	07/16 20:59	07/16 21:41
180	20	EGIA01B	4	540.75	19.67	07/16 21:41	07/17 17:21
180	21	EGIA01B	4	455.81	11.05	07/17 17:21	07/18 04:24
180	22	EGIA01B	4	226.86	8.26	07/18 04:24	07/18 12:40
180	23	EGIA01B	4	0.00	0.00	07/18 12:40	07/18 12:40
181	21	EGIA01B	4	292.05	10.62	07/18 12:40	07/18 23:17
181	22	EGIA01B	4	521.95	19.00	07/18 23:17	07/19 18:17
183	12	EGIA01B/EGIA01C	4	12.81	0.27	07/20 00:00	07/20 00:15
183	13	EGIA01B/EGIA01C	4	154.39	3.21	07/20 00:15	07/20 03:28
183	14	EGIA01B/EGIA01C	4	250.80	5.21	07/20 03:28	07/20 08:41
183	15	EGIA01B/EGIA01C	4	391.98	16.52	07/20 08:41	07/21 01:12
183	16	EGIA01B	4	479.84	9.97	07/21 01:12	07/21 11:11
183	17	EGIA01B	4	604.60	12.56	07/21 11:11	07/21 23:44
183	18	EGIA01B	4	667.88	28.16	07/21 23:44	07/24 03:54
183	19	EGIA01B	4	657.41	13.66	07/24 03:54	07/24 17:33
183	20	EGIA01B	4	700.78	29.54	07/24 17:33	07/25 23:06
183	21	EGIA01B	4	724.14	17.70	07/25 23:06	07/26 16:48
183	22	EGIA01B	4	860.44	20.86	07/26 16:48	07/27 13:40
183	23	EGIA01B	4	272.18	9.91	07/27 13:40	07/27 23:34
184	13	EGIA01B	4	0.00	0.00	07/27 23:34	07/27 23:34
34	21	NTIP02B	4	1378.22	30.15	07/30 00:00	07/31 06:08
34	22	NTIP02B	4	1306.13	47.54	07/31 06:08	08/02 05:41
34	23	NTIP02B	4	6.99	0.25	08/02 05:41	08/02 05:56
35	21	NTIP02B	4	1433.97	34.77	08/02 05:56	08/03 16:42
35	22	NTIP02B	4	1126.02	40.95	08/03 16:42	08/06 09:39
35	23	NTIP02B	4	37.37	1.36	08/06 09:39	08/06 11:01
36	21	NTIP02B	4	2163.59	59.95	08/06 11:01	08/08 22:58
36	22	NTIP02B	4	1155.77	37.36	08/08 22:58	08/10 12:19
36	23	NTIP02B	4	276.30	13.41	08/10 12:19	08/11 01:44
37	21	NTIP02B	4	1164.63	24.20	08/11 01:44	08/13 01:56
37	22	NTIP02B	4	307.12	15.11	08/13 01:56	08/13 17:02
38	20	NTIP02B	4	606.24	16.80	08/13 17:02	08/14 09:50
38	21	NTIP02B	4	428.72	13.86	08/14 09:50	08/14 23:42
38	22	NTIP02B	4	164.58	7.04	08/14 23:42	08/15 06:44
38	23	NTIP02B	4	6.29	0.27	08/15 06:44	08/15 07:00
39	19	NTIP02B	4	572.90	11.91	08/15 07:00	08/15 18:55
39	20	NTIP02B	4	410.94	17.32	08/15 18:55	08/16 12:14

Grid ID		Dredge Area	Dredge ID	Eng. Consideration Dredge Weight	Design Factored Time	Start Time	Finish Time
I	J		(1,2,3,4)	(tons)	(hr)		
39	21	NTIP02B	4	209.78	8.84	08/16 12:14	08/16 21:05
39	22	NTIP02B	4	179.39	17.65	08/16 21:05	08/17 14:44
39	23	NTIP02B	4	21.86	1.06	08/17 14:44	08/17 15:47
40	16	NTIP02B/NTIP02F	4	226.81	14.87	08/17 15:47	08/18 06:40
40	17	NTIP02B/NTIP02F	4	305.06	7.40	08/18 06:40	08/18 14:03
40	18	NTIP02B/NTIP02F	4	251.49	5.23	08/18 14:03	08/18 19:17
40	19	NTIP02B/NTIP02F	4	246.47	5.12	08/18 19:17	08/20 00:24
40	20	NTIP02B/NTIP02F	4	189.88	3.95	08/20 00:24	08/20 04:21
40	21	NTIP02B/NTIP02F	4	121.95	4.43	08/20 04:21	08/20 08:47
40	22	NTIP02B/NTIP02F	4	38.37	1.40	08/20 08:47	08/20 10:11

FIGURES

Quantitative Environmental Analysis, LLC
∂c/∂t

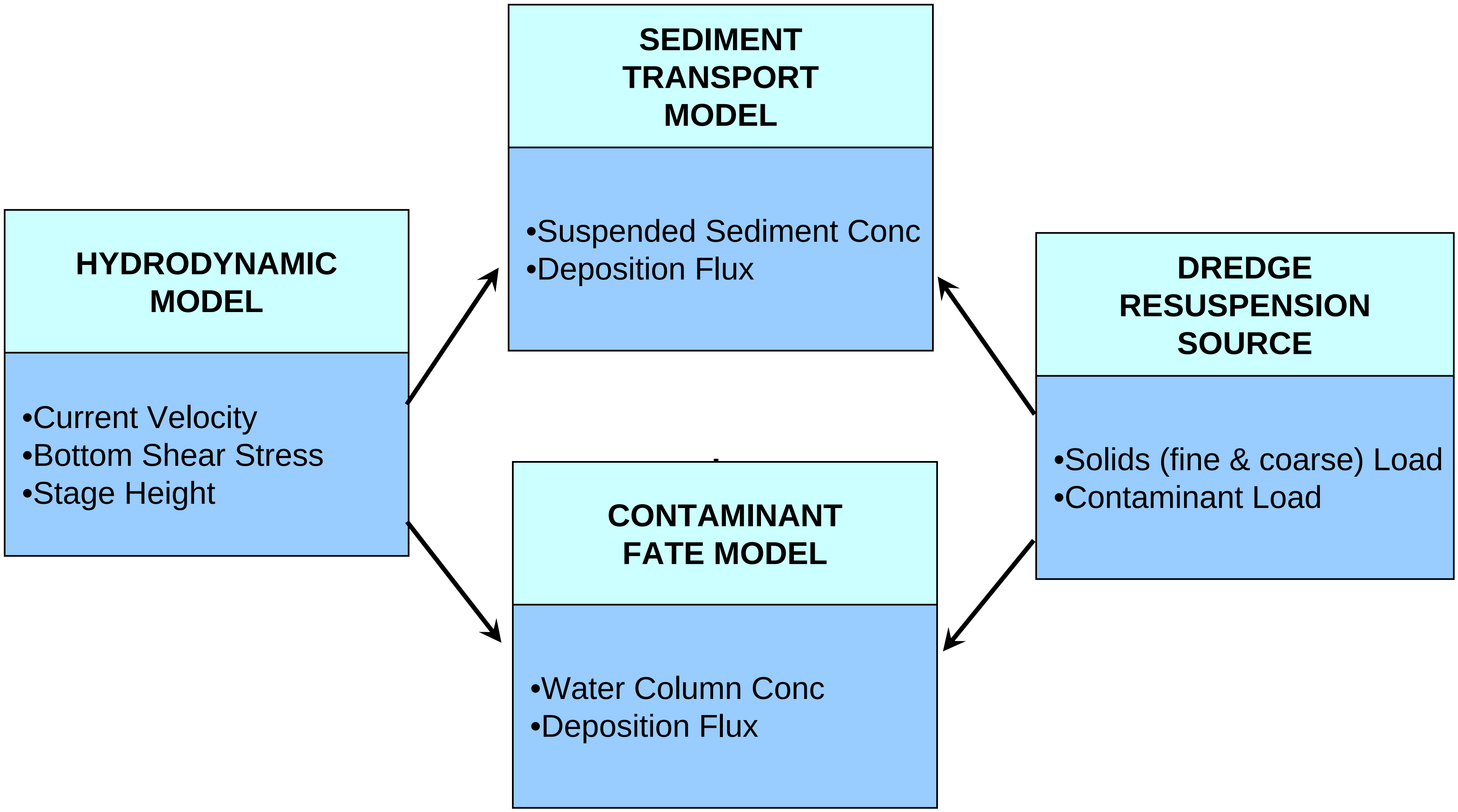


Figure F-1-1. Structure of the dredge resuspension modeling framework.

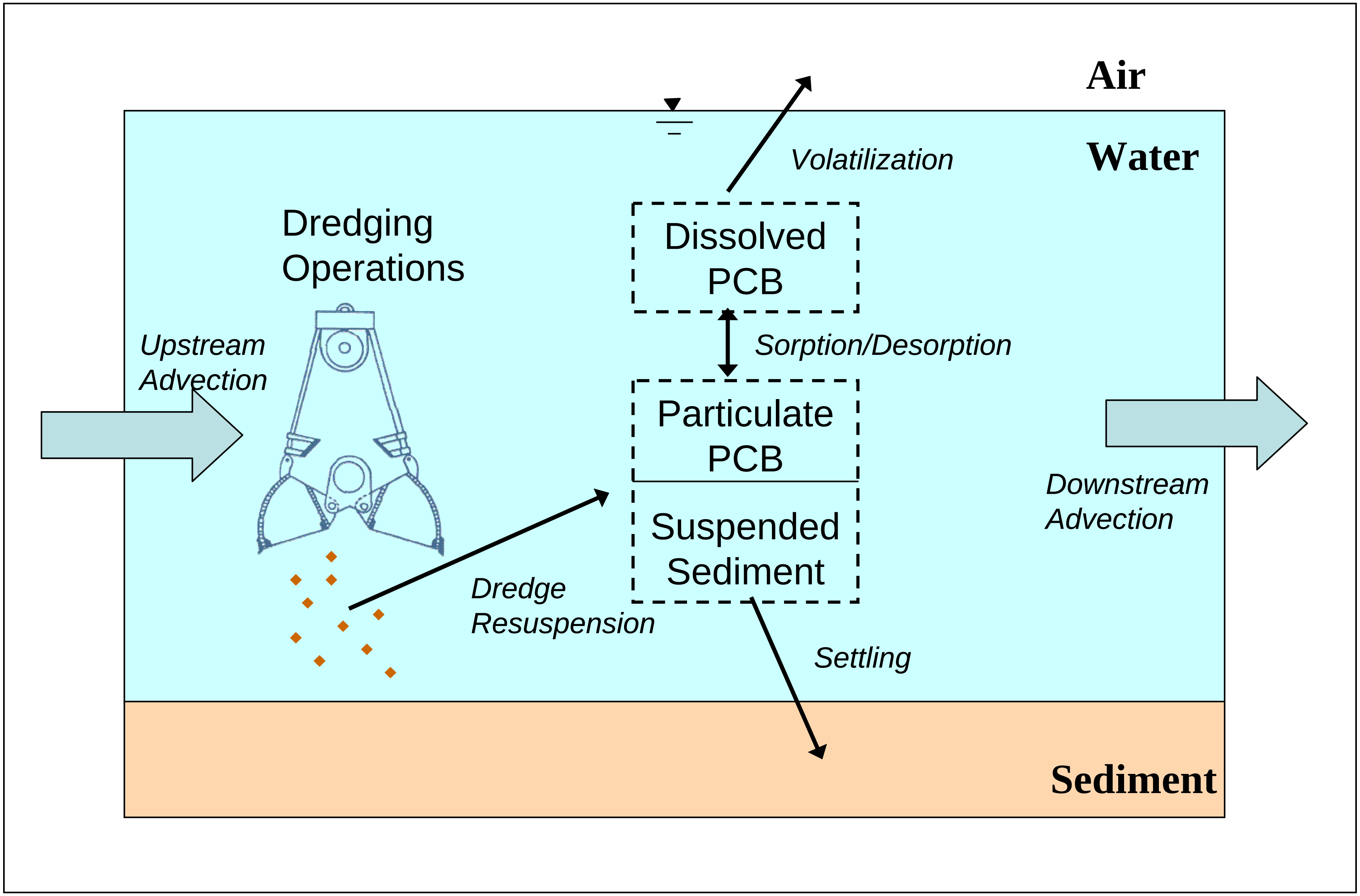
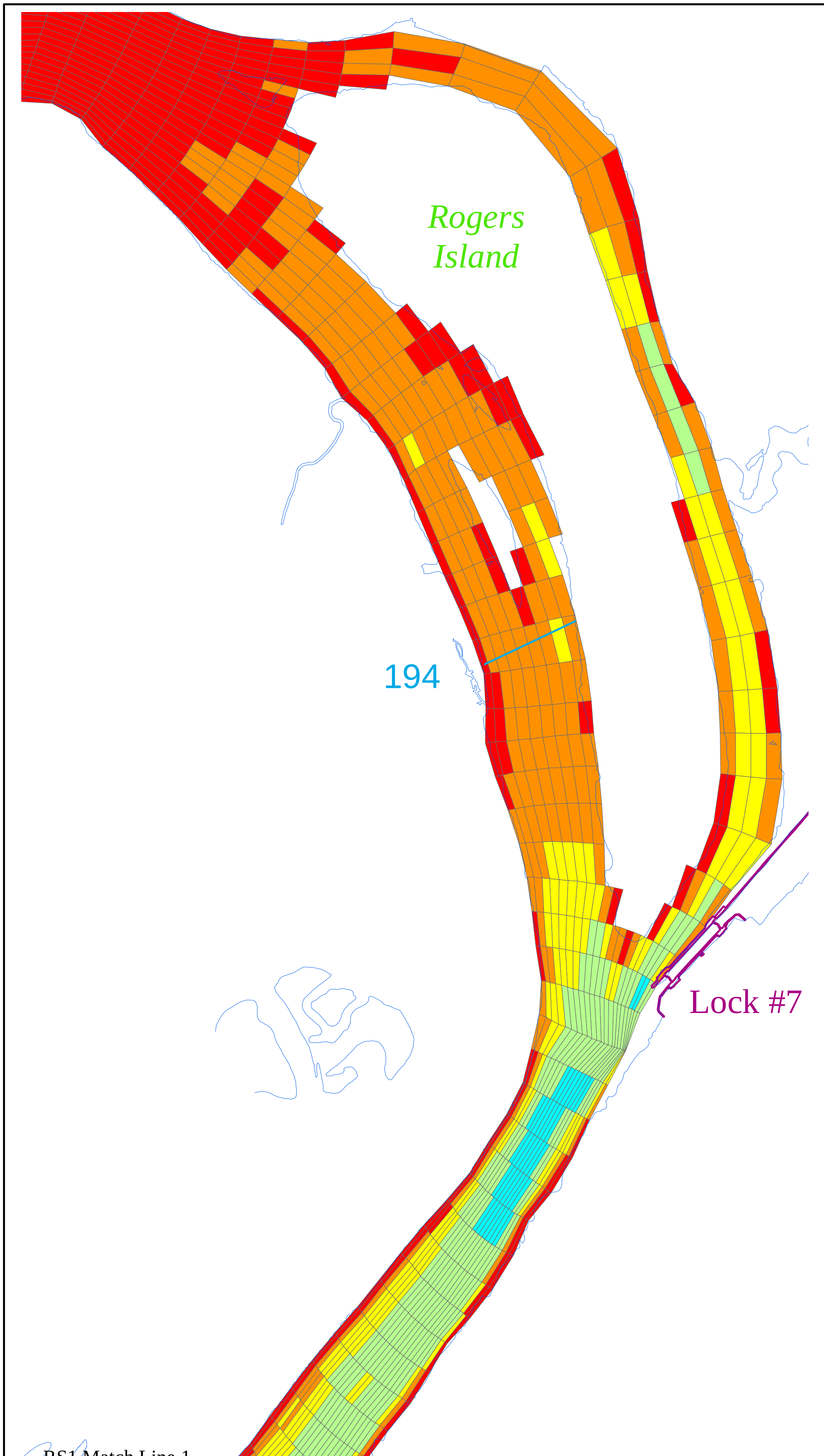
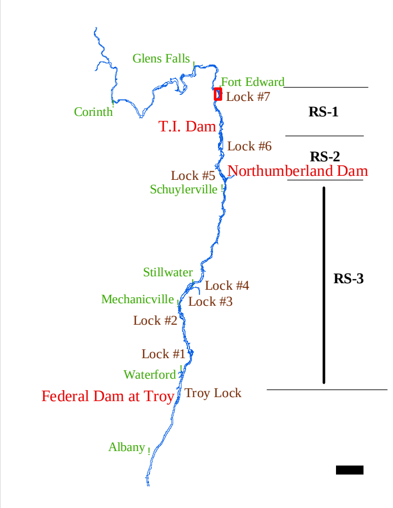


Figure F-1-2. Generalized conceptual diagram of resuspension modeling.



LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 250 500 Feet

LEGEND

- River Miles
- Shore Line
- Dams and Locks

Sediment Elev. (ft NAVD88)

- < 90
- 90 - 95
- 95 - 100
- 100 - 105
- 105 - 110
- 110 - 115
- > 115

UPPER HUDSON RIVER STUDY AREA

Figure F-2-1a. Bathymetry for Thompson Island Pool.

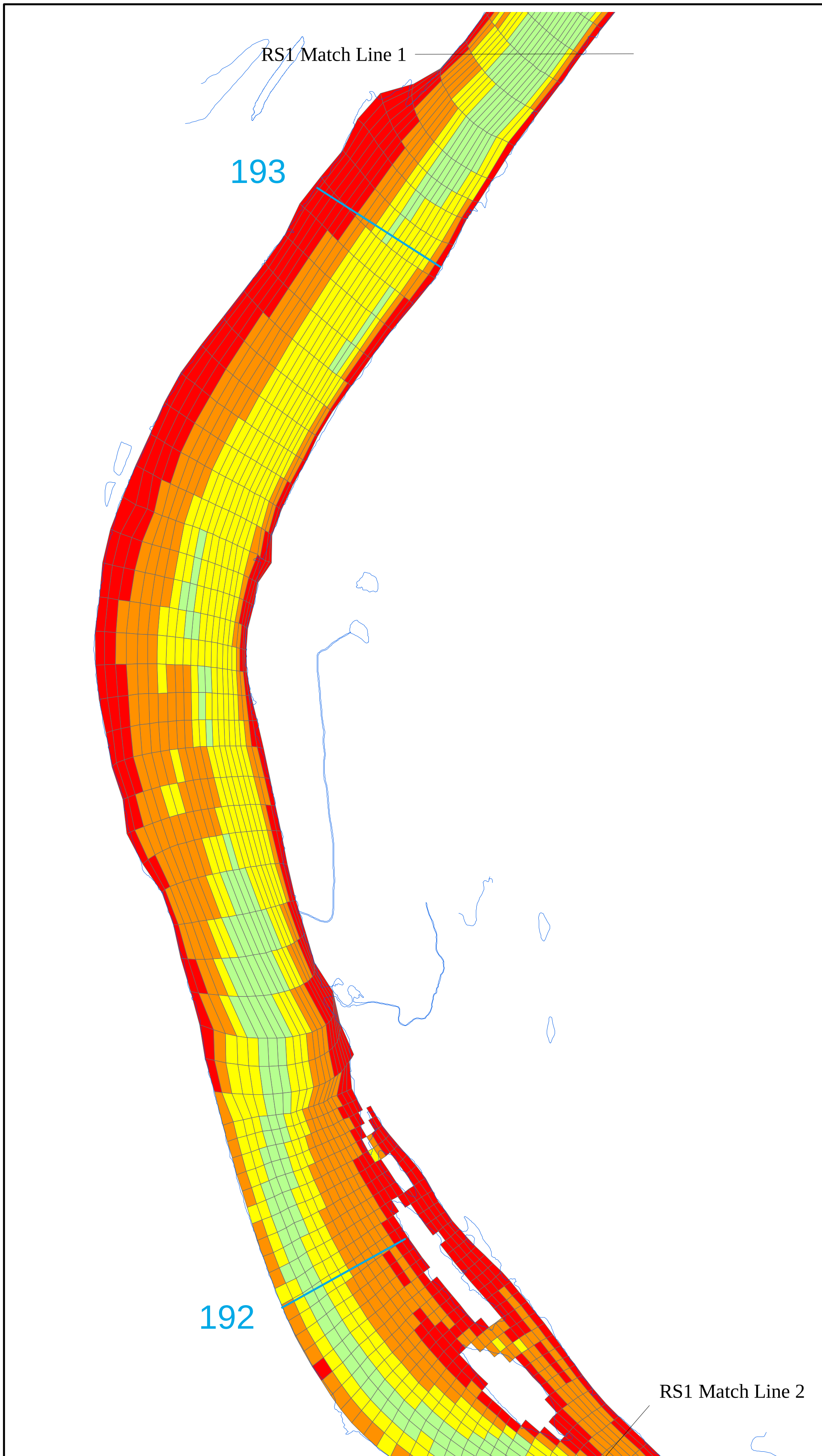
RM193 to RM194

QEA Quantitative Environmental Analysis, LLC

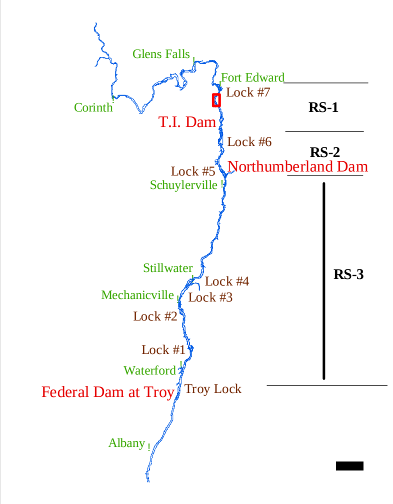
GENdes

Jul 29, 2005.

DN - \\Daleel\D_DRIVE\GENdes\Documents\Reports\IDR\Figure_E-3-2.mxd



LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 250 500 Feet

LEGEND

- River Miles
- Shore Line
- Dams and Locks

Sediment Elev. (ft NAVD88)

- < 90
- 90 - 95
- 95 - 100
- 100 - 105
- 105 - 110
- 110 - 115
- > 115

UPPER HUDSON RIVER STUDY AREA

Figure F-2-1b. Bathymetry for Thompson Island Pool.

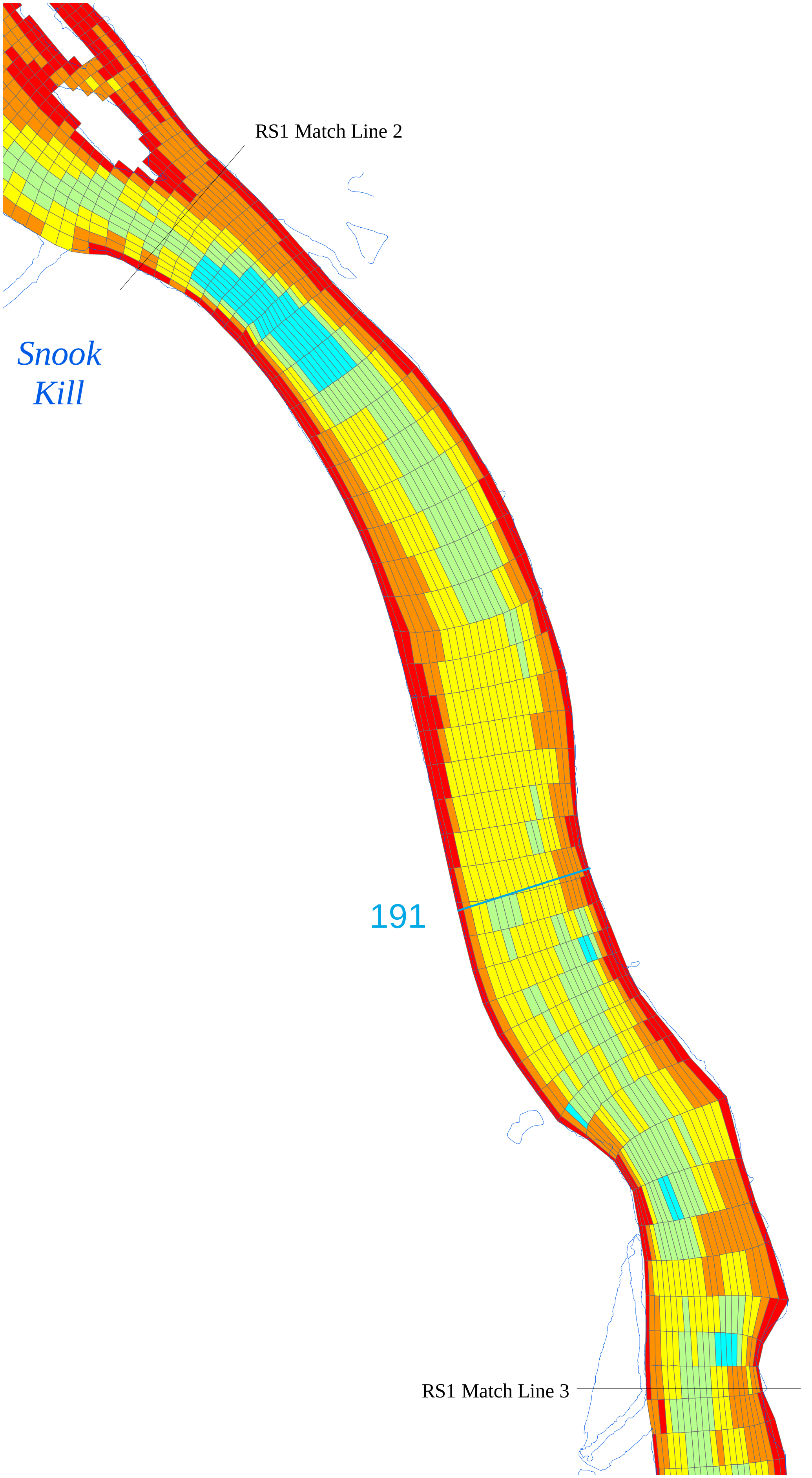
RM191 to RM193

Quantitative Environmental Analysis, LLC

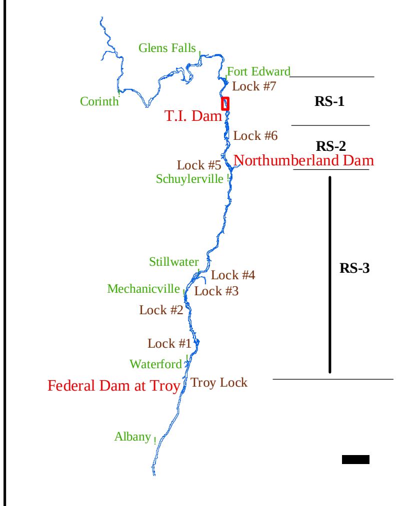
GENdes

Jul 29, 2005.

DN - \\Daleel\D_DRIVE\GENdes\Documents\Reports\IDR\Figure_E-3-2.mxd



LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 250 500 Feet

LEGEND

- River Miles
- Shore Line
- Dams and Locks

Sediment Elev. (ft NAVD88)

- < 90
- 90 - 95
- 95 - 100
- 100 - 105
- 105 - 110
- 110 - 115
- > 115

UPPER HUDSON RIVER STUDY AREA

Figure F-2-1c. Bathymetry for Thompson Island Pool.

RM190 to RM191

QEA Quantitative Environmental Analysis, LLC

GENdes

Jul 29, 2005.

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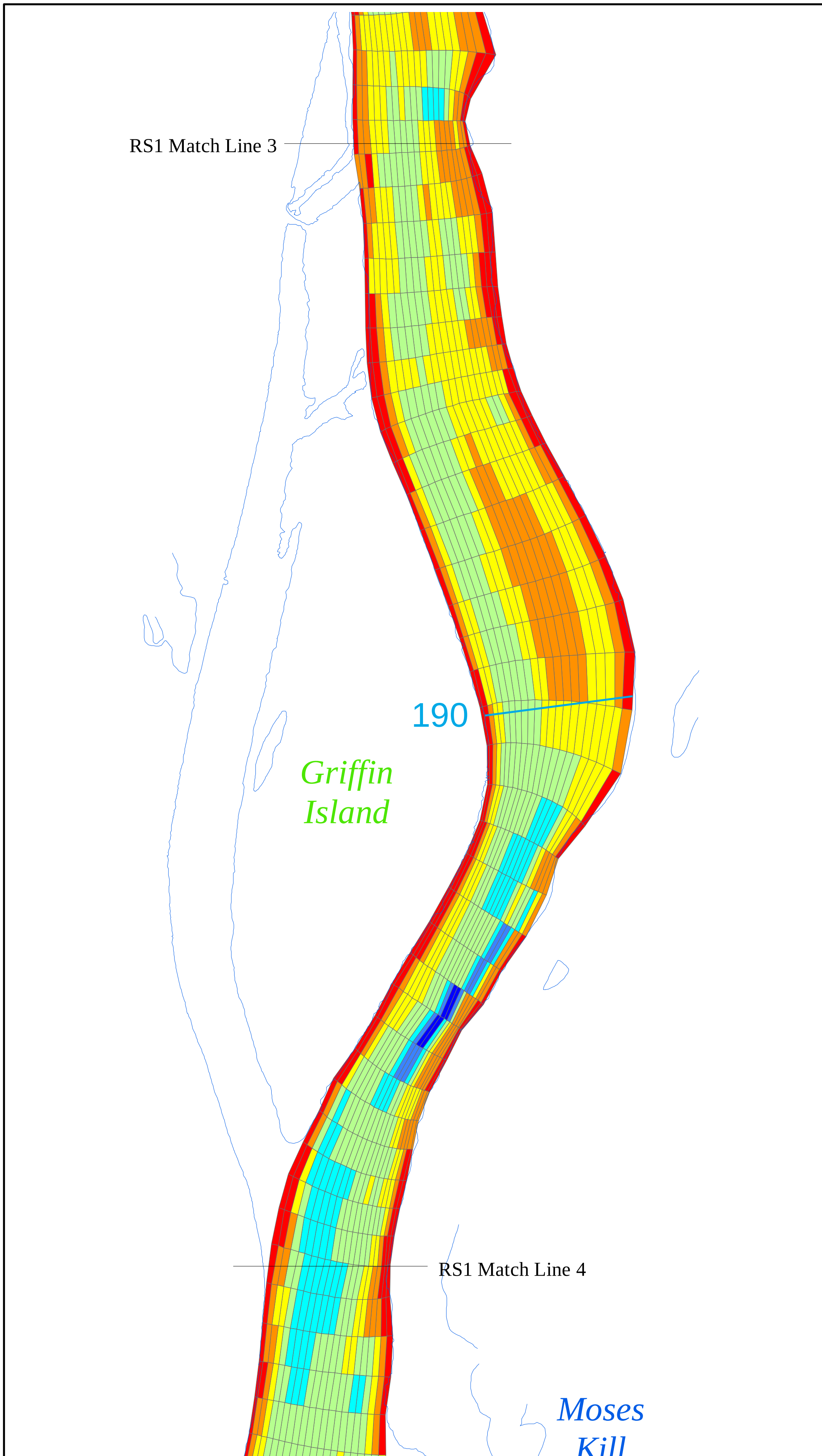
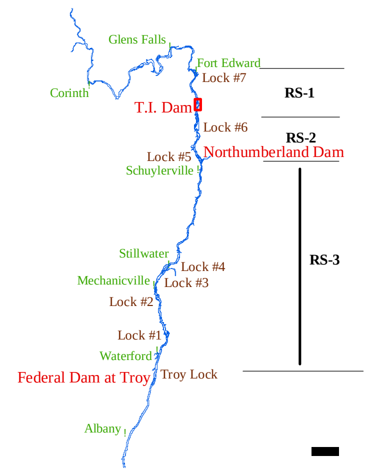


LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 250 500 Feet

LEGEND

- River Miles
- Shore Line
- Dams and Locks

Sediment Elev. (ft NAVD88)

- < 90
- 90 - 95
- 95 - 100
- 100 - 105
- 105 - 110
- 110 - 115
- > 115

UPPER HUDSON RIVER STUDY AREA

Figure F-2-1d. Bathymetry for Thompson Island Pool.

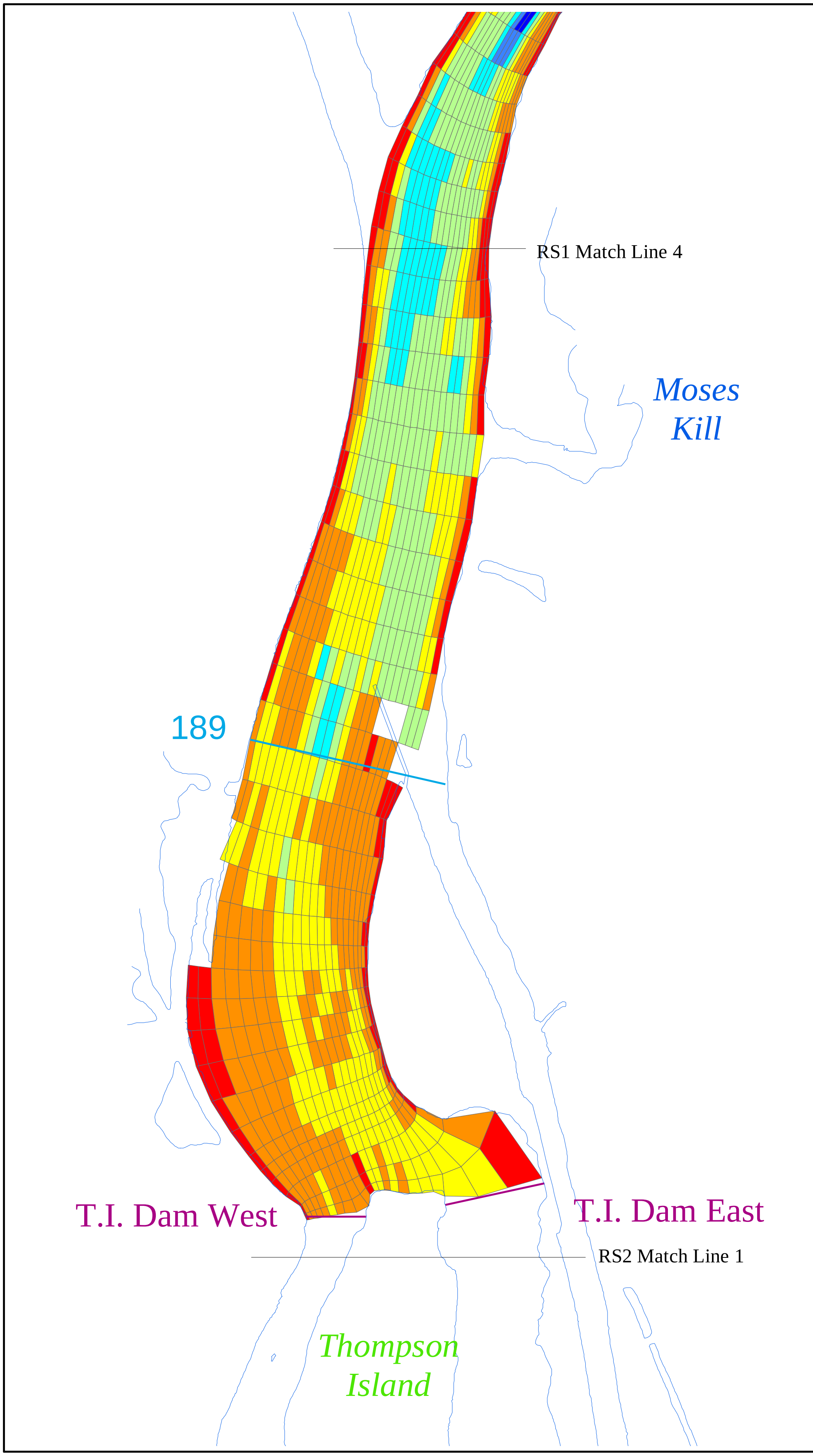
RM189 to RM190

QEA Quantitative Environmental Analysis, LLC

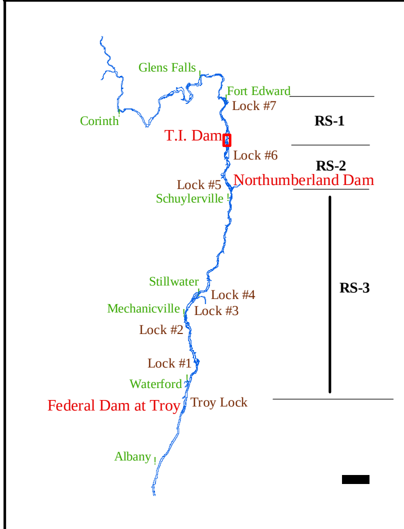
GENdes

Jul 29, 2005.

DN - \\Daleel\D_DRIVE\GENdes\Documents\Reports\IDR\Figure_E-3-2.mxd



LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 250 500 Feet

LEGEND

- River Miles
- Shore Line
- Dams and Locks

Sediment Elev. (ft NAVD88)

- < 90
- 90 - 95
- 95 - 100
- 100 - 105
- 105 - 110
- 110 - 115
- > 115

UPPER HUDSON RIVER STUDY AREA

Figure F-2-1e. Bathymetry for Thompson Island Pool.

RM188 to RM189

Quantitative Environmental Analysis, LLC

GENdes

Jul 29, 2005.

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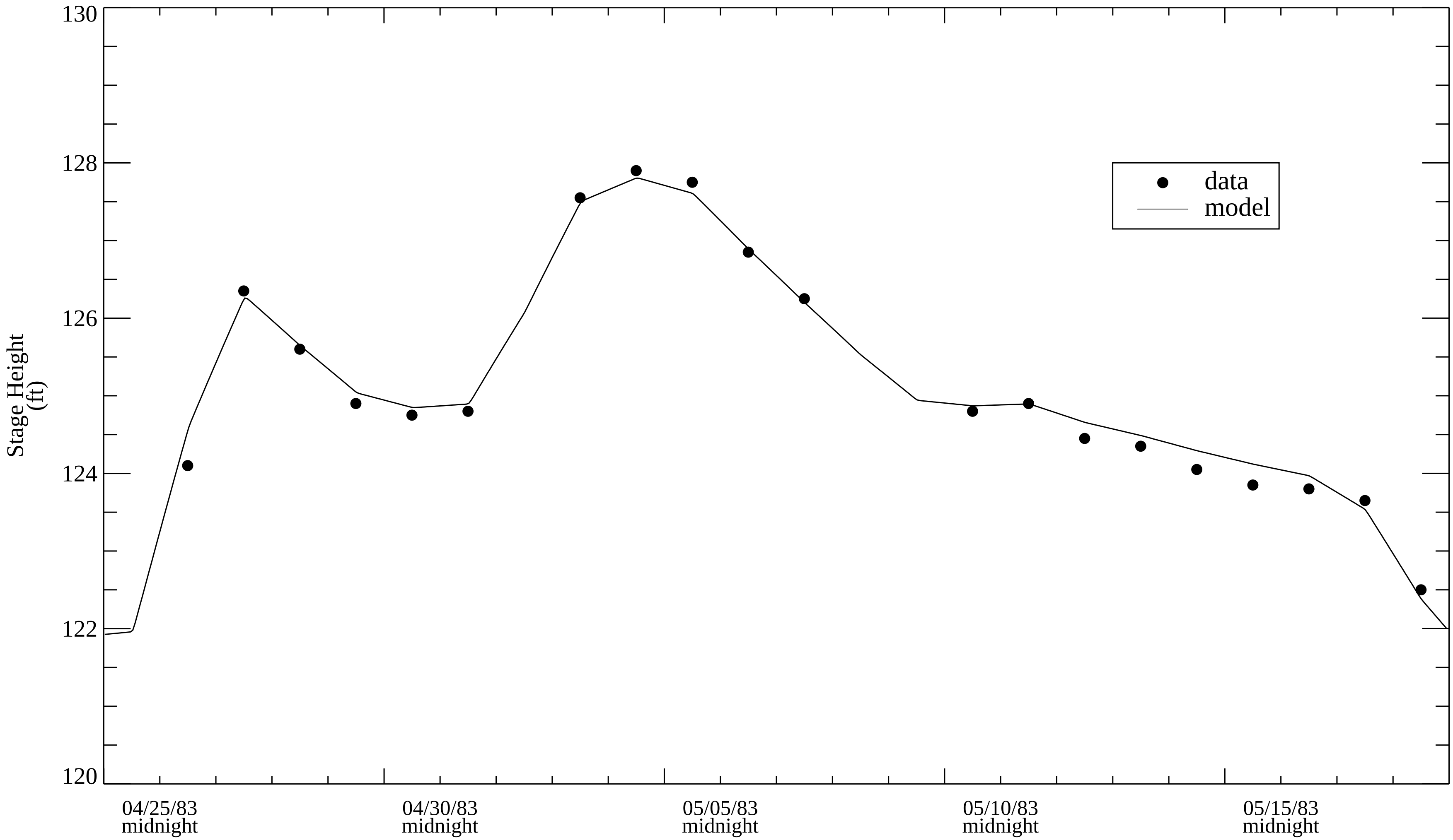


Figure F-2-2. Comparison of predicted and observed stage height in Reach 8 (at the entrance to Lock 7) during Spring 1983 flood.

lz - D:\GENdes\Analysis\Model_Outputs\Plot_r8_calib\plot_stage83.pro
Tue Jan 10 08:29:20 2006

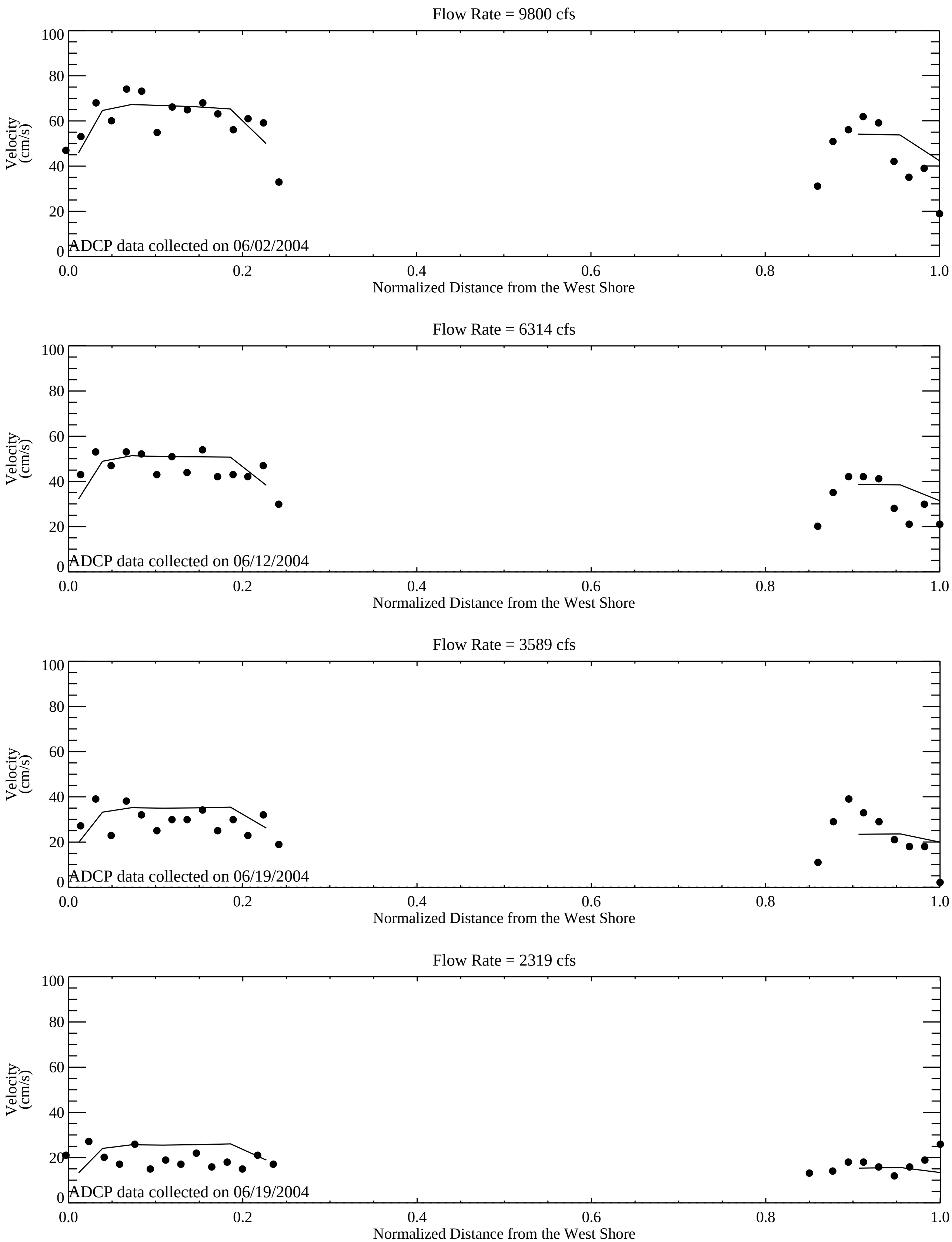


Figure F-2-3. Comparison of predicted and measured current velocities at transect BMP1 during June 2004.

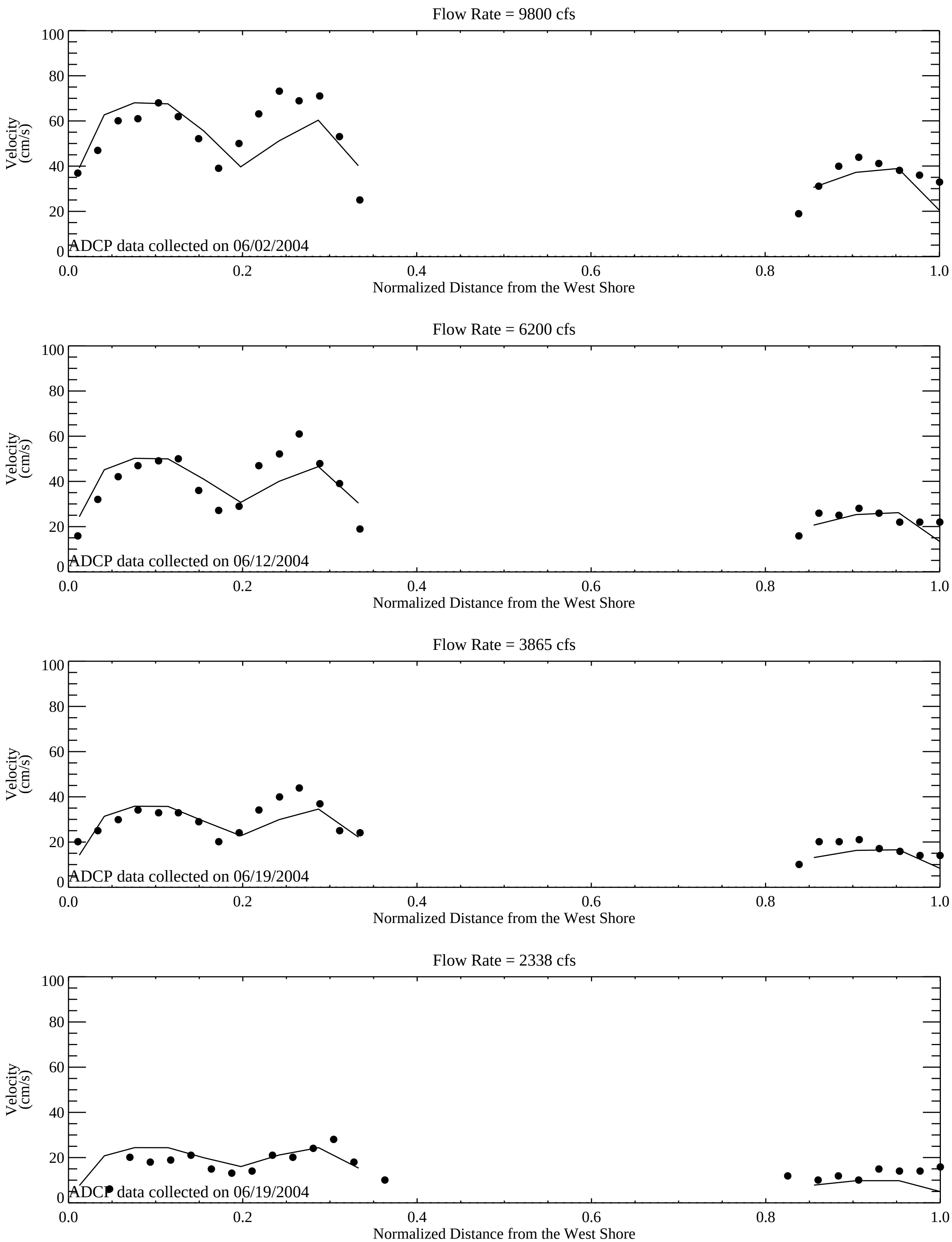


Figure F-2-4. Comparison of predicted and measured current velocities at transect SEDC1 during June 2004.

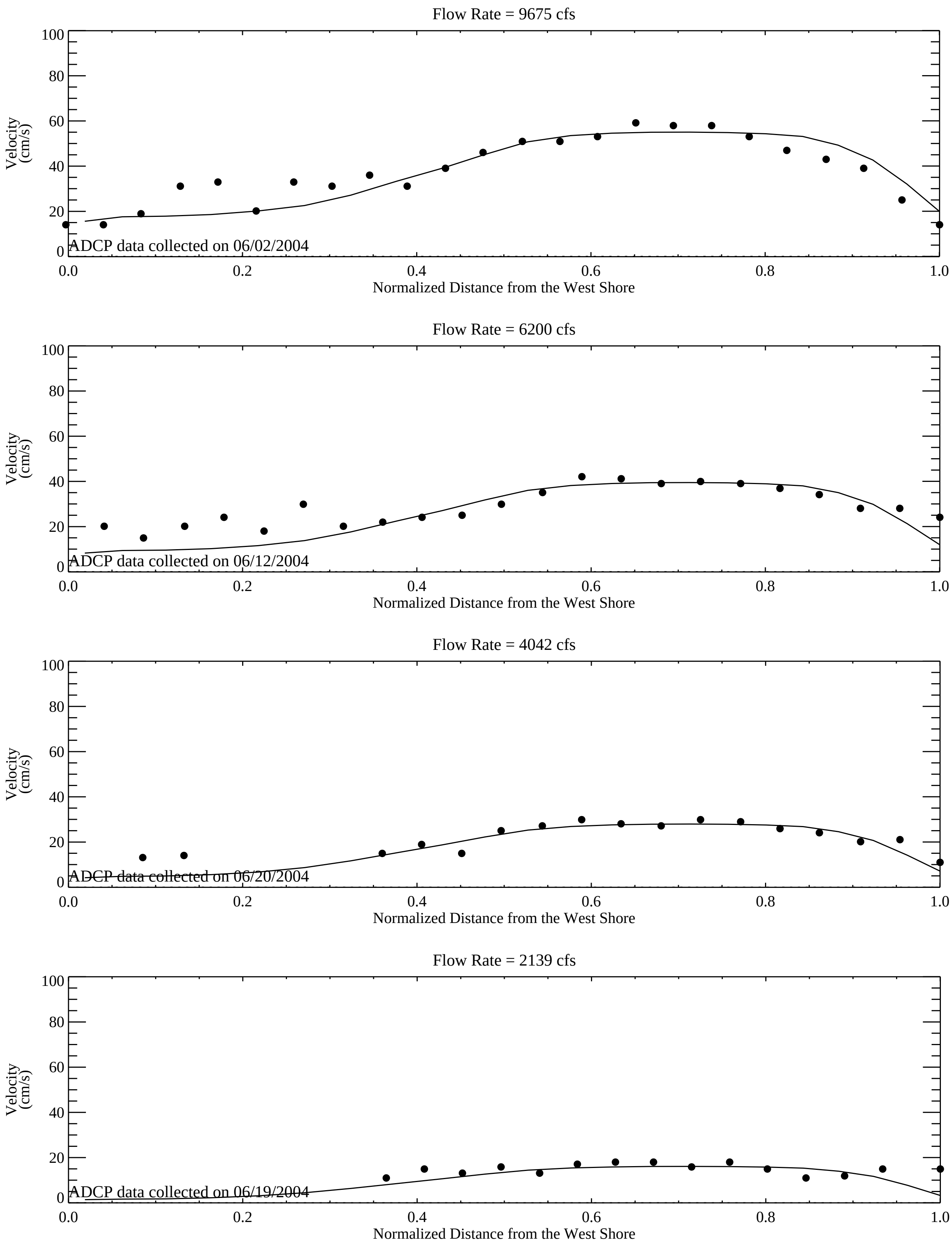


Figure F-2-5. Comparison of predicted and measured current velocities at transect SEDC2 during June 2004.

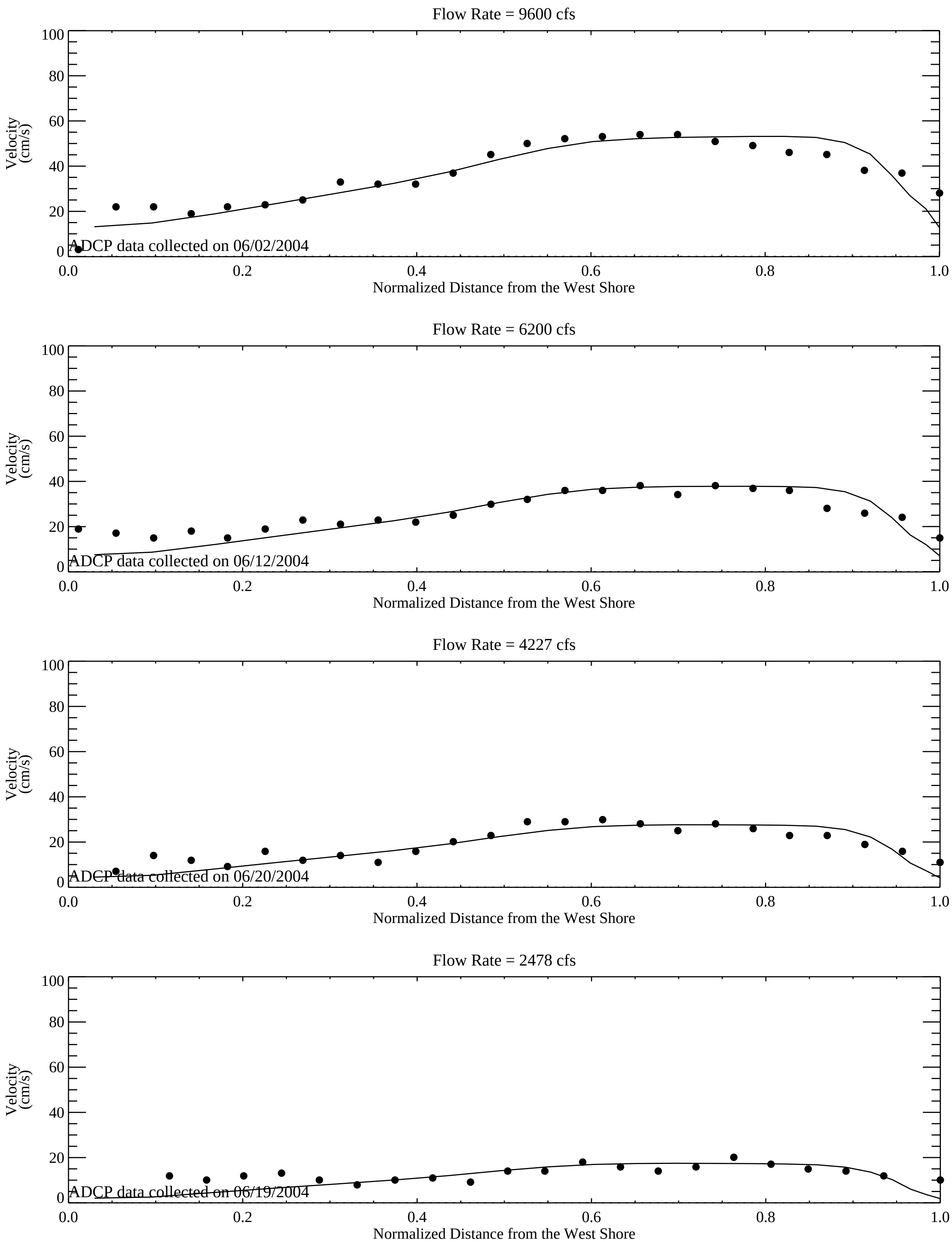


Figure F-2-6. Comparison of predicted and measured current velocities at transect SEDC3 during June 2004.

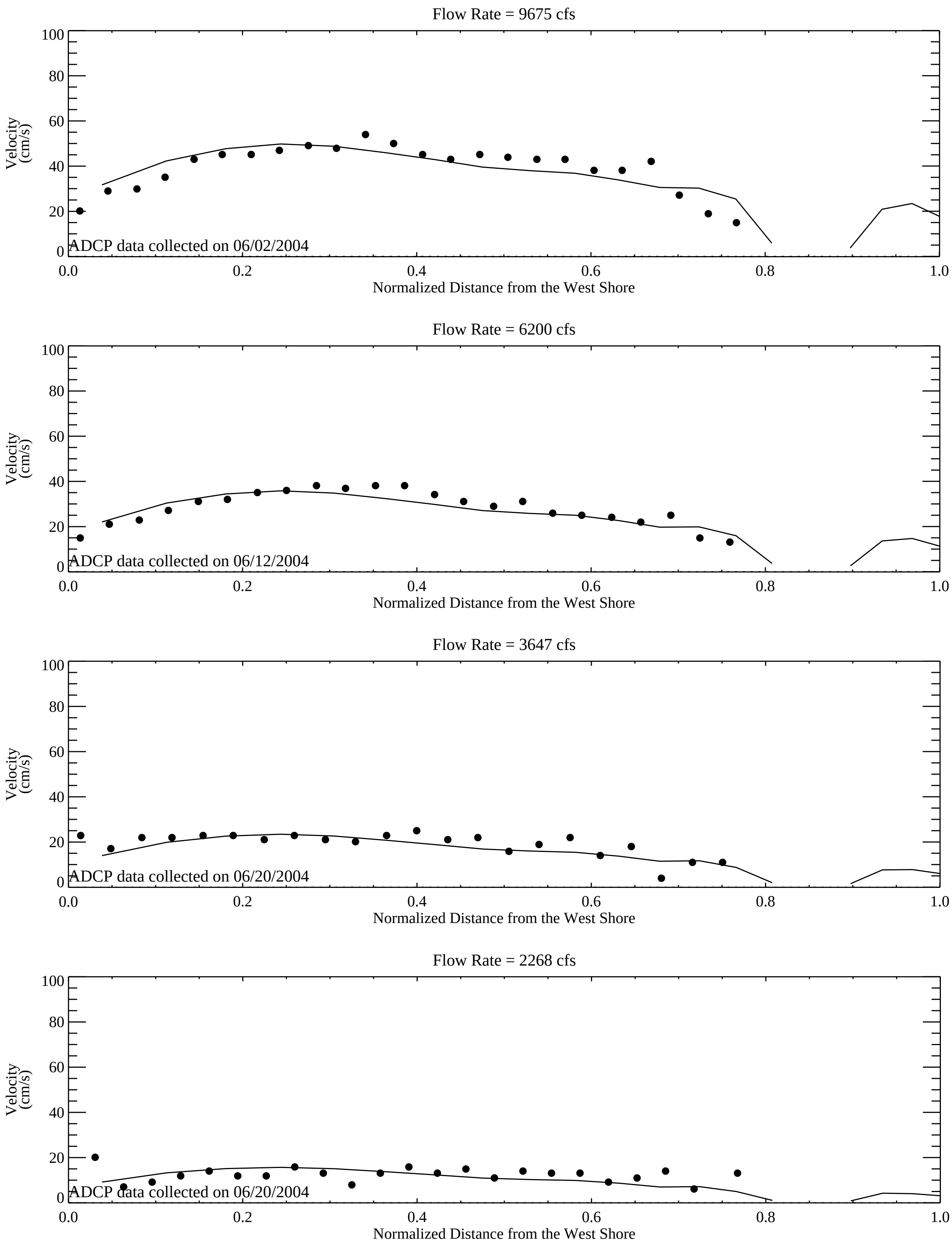


Figure F-2-7. Comparison of predicted and measured current velocities at transect SEDC4 during June 2004.

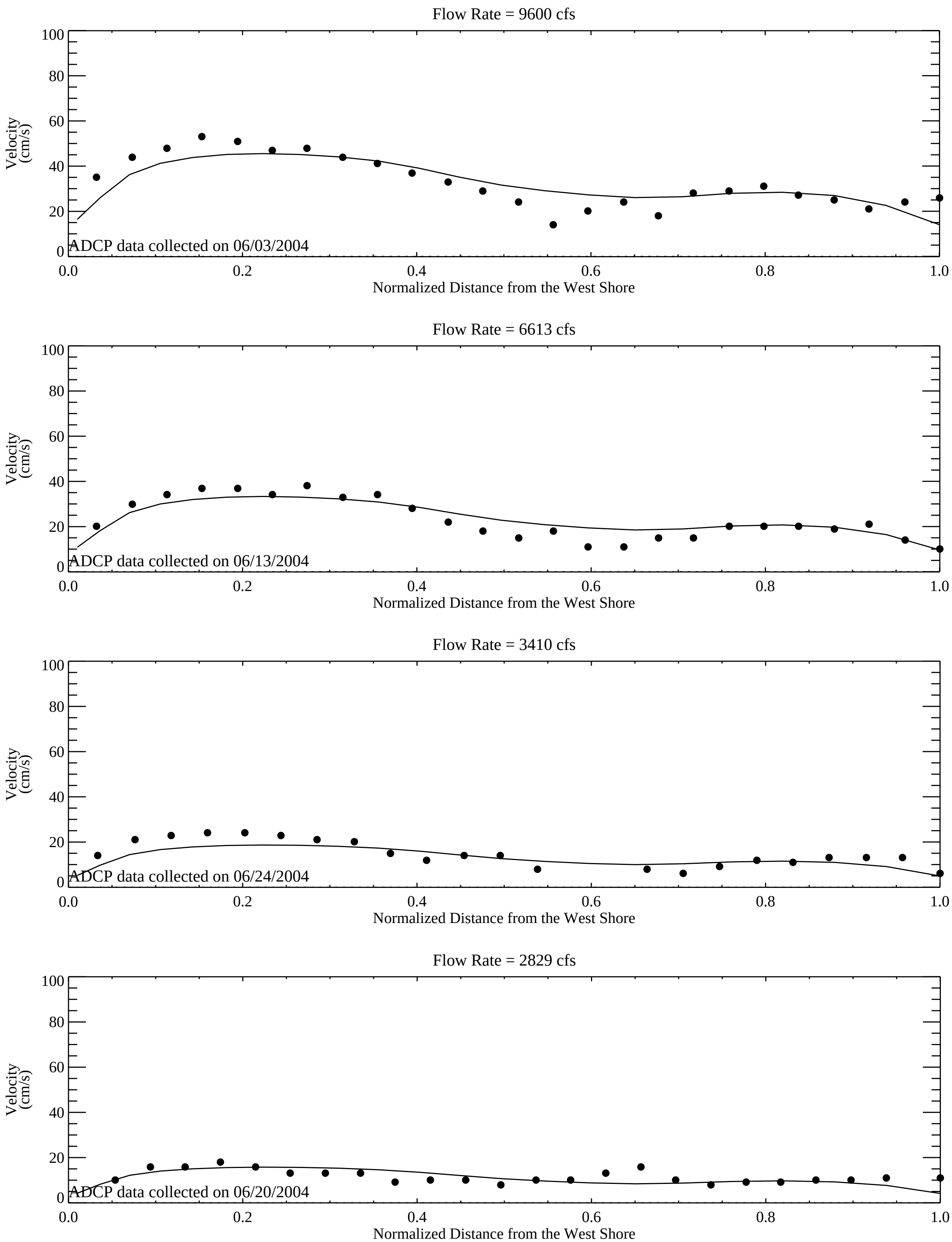


Figure F-2-8. Comparison of predicted and measured current velocities at transect SEDC5 during June 2004.

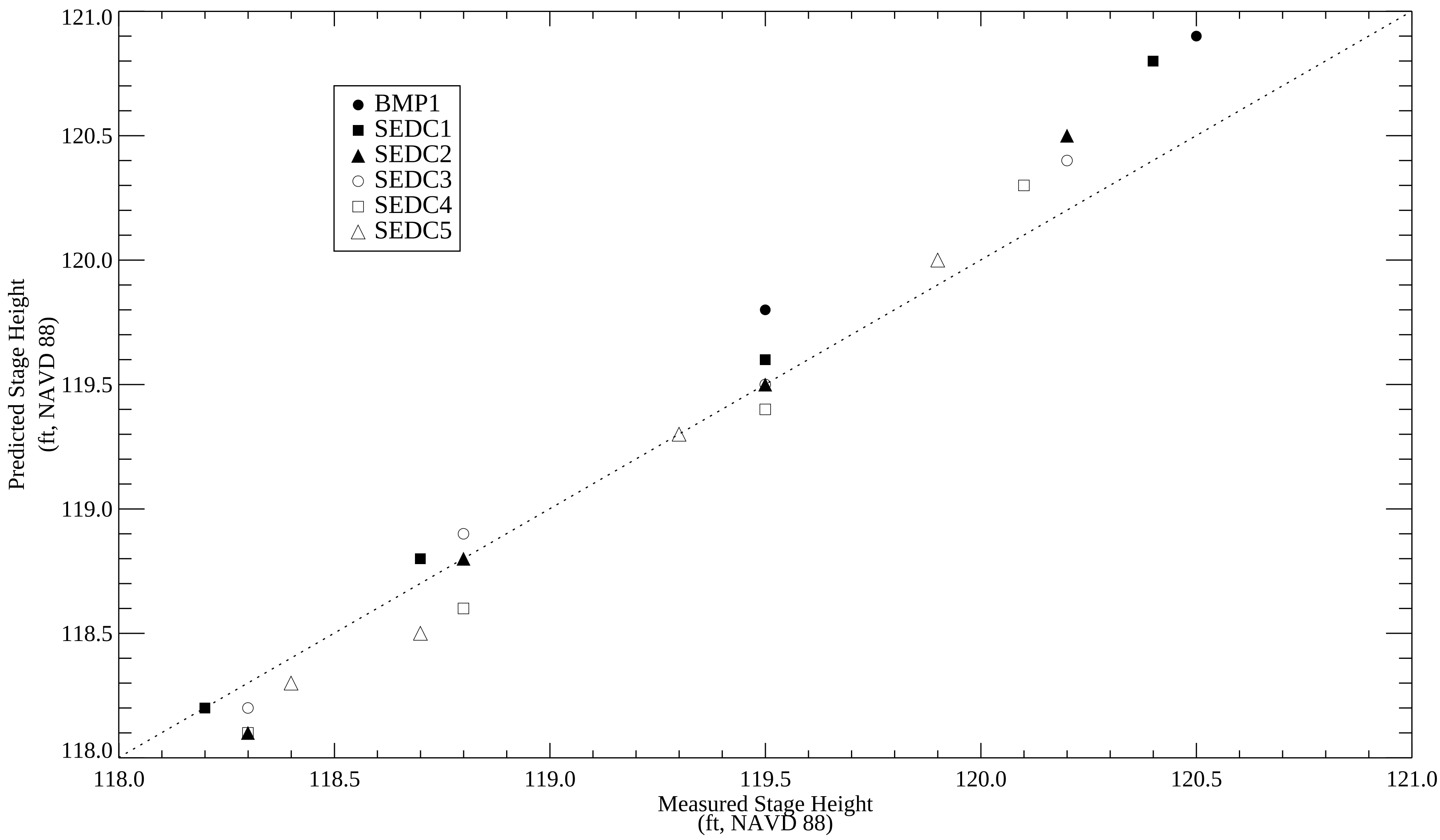


Figure F-2-9. Comparison of predicted and measured stage heights at various transects during June 2004.

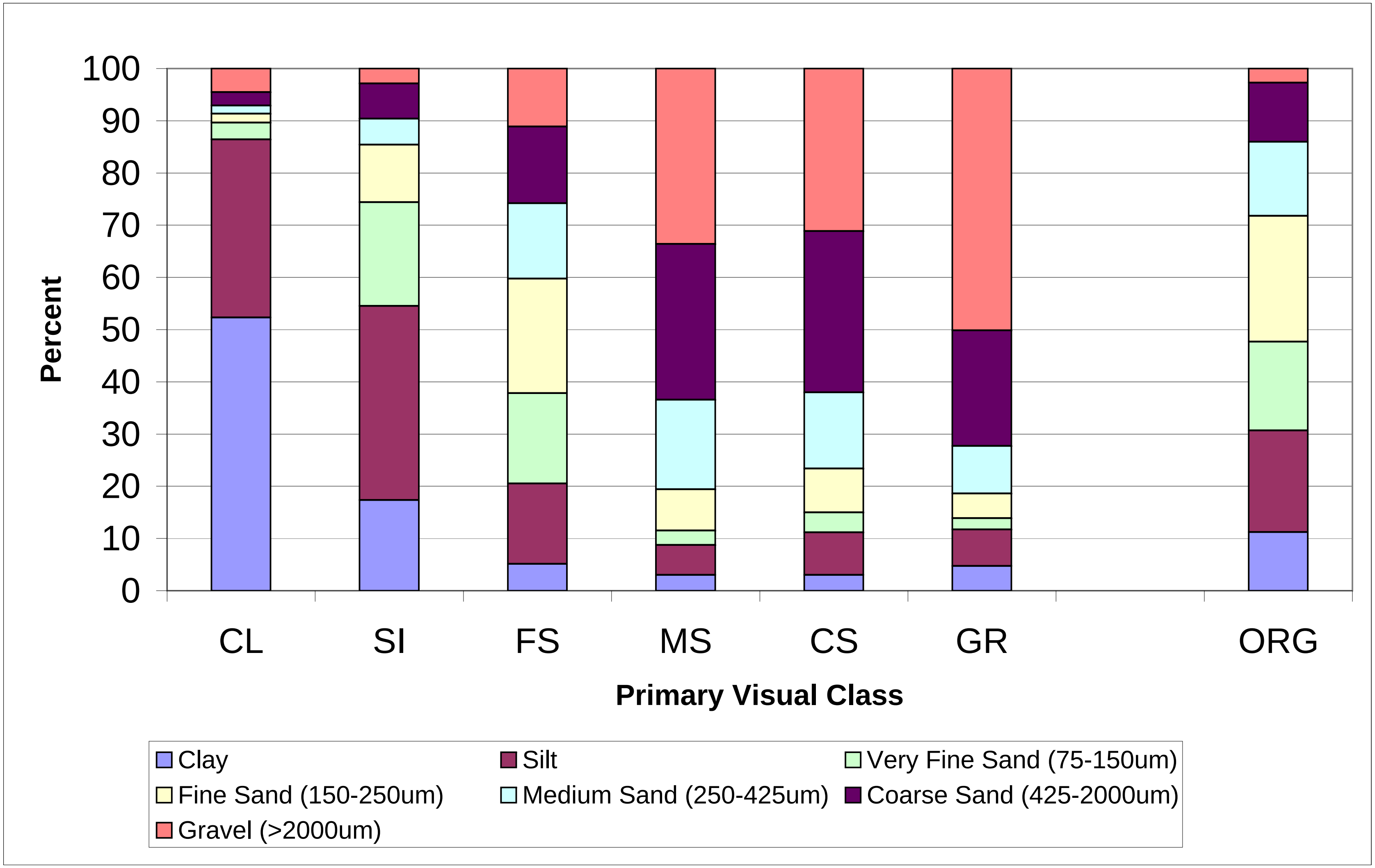
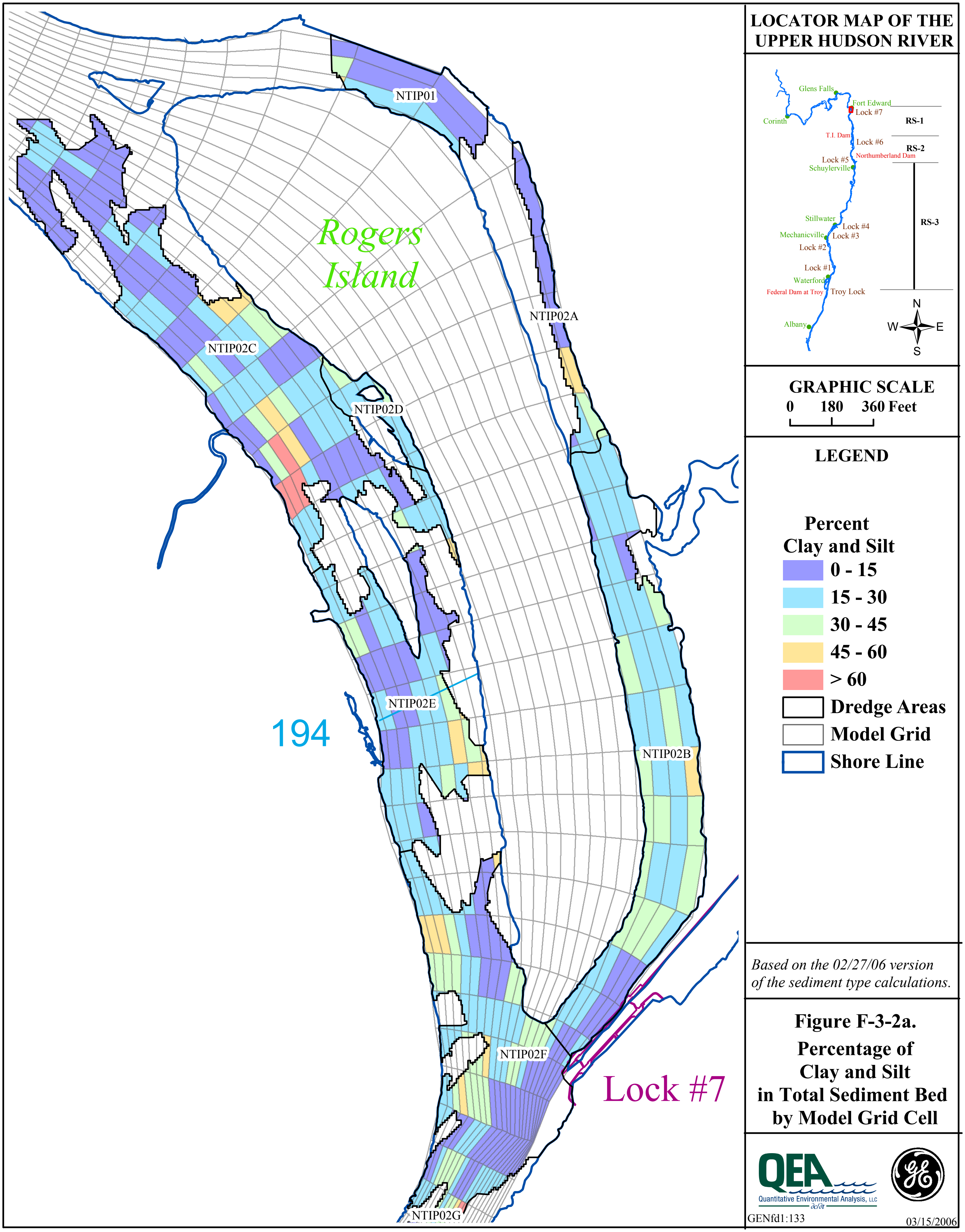


Figure F-3-1. Average grainsize composition of SSAP primary visual classes.



Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-2a. Percentage of Clay and Silt in Total Sediment Bed by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

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03/15/2006

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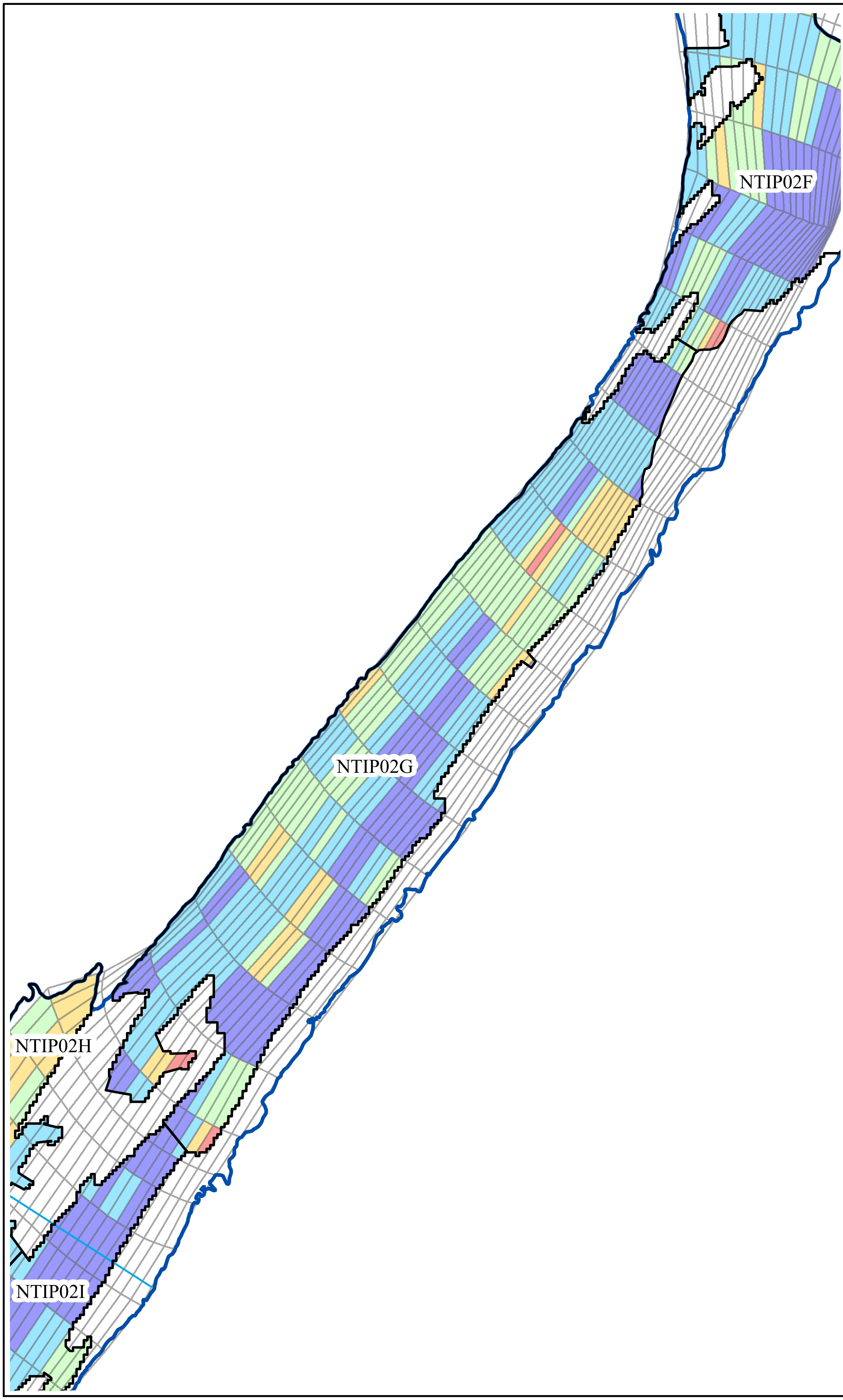
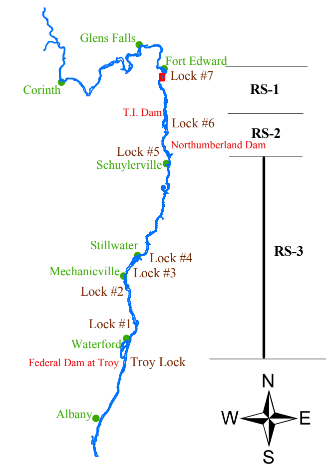


LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 130 260 Feet

LEGEND

Percent Clay and Silt

- **0 - 15**
- **15 - 30**
- **30 - 45**
- **45 - 60**
- **> 60**
- **Dredge Areas**
- **Model Grid**
- **Shore Line**

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-2b. Percentage of Clay and Silt in Total Sediment Bed by Model Grid Cell

Quantitative Environmental Analysis, LLC

GENfd1:133

03/15/2006

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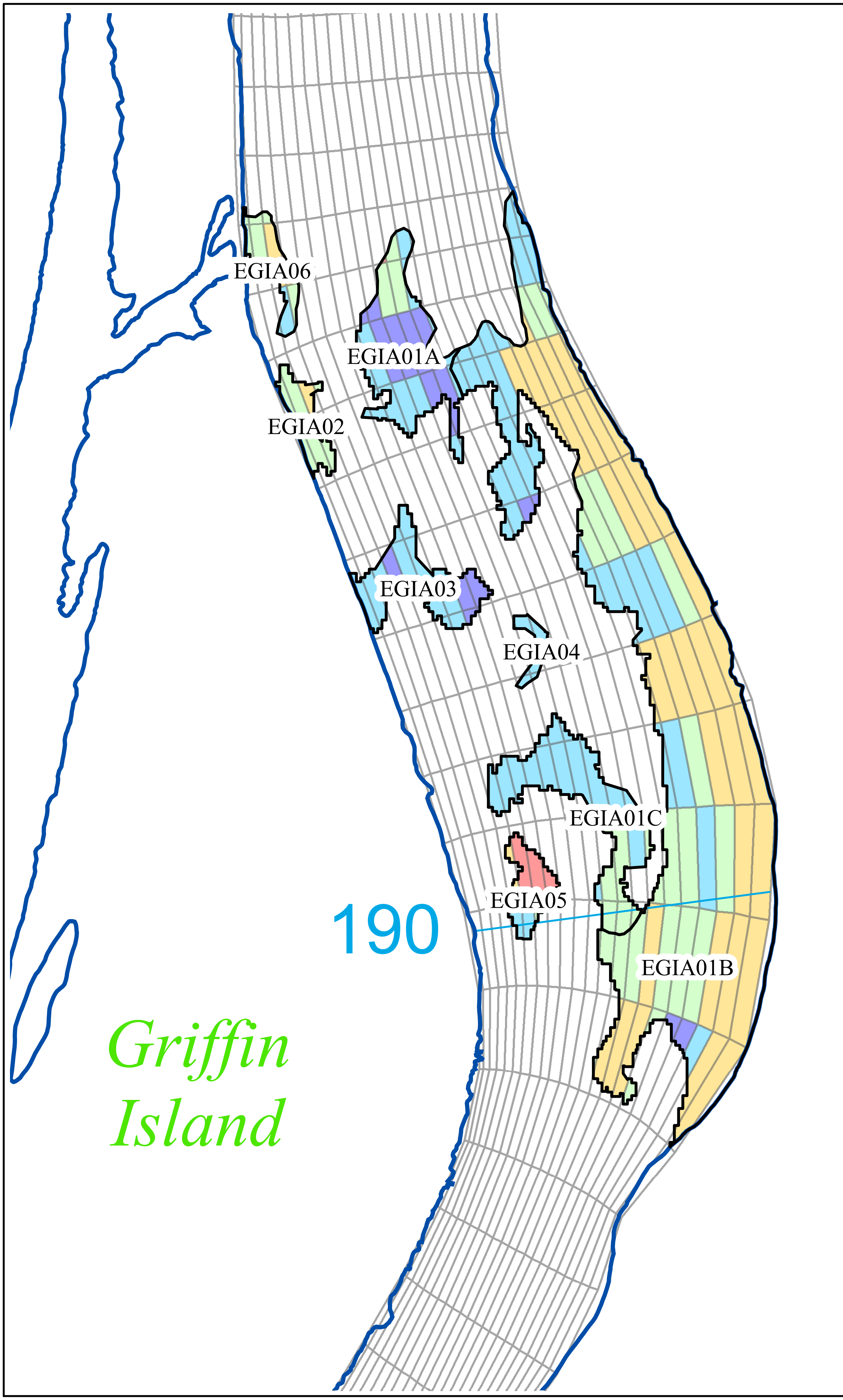
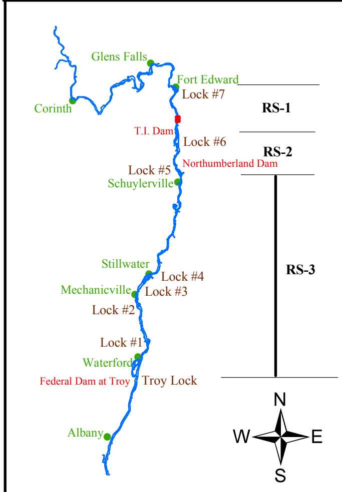


LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 110 220 Feet

LEGEND

Percent Clay and Silt

- 0 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- > 60
- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-2c. Percentage of Clay and Silt in Total Sediment Bed by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

GENfd1:133

03/15/2006

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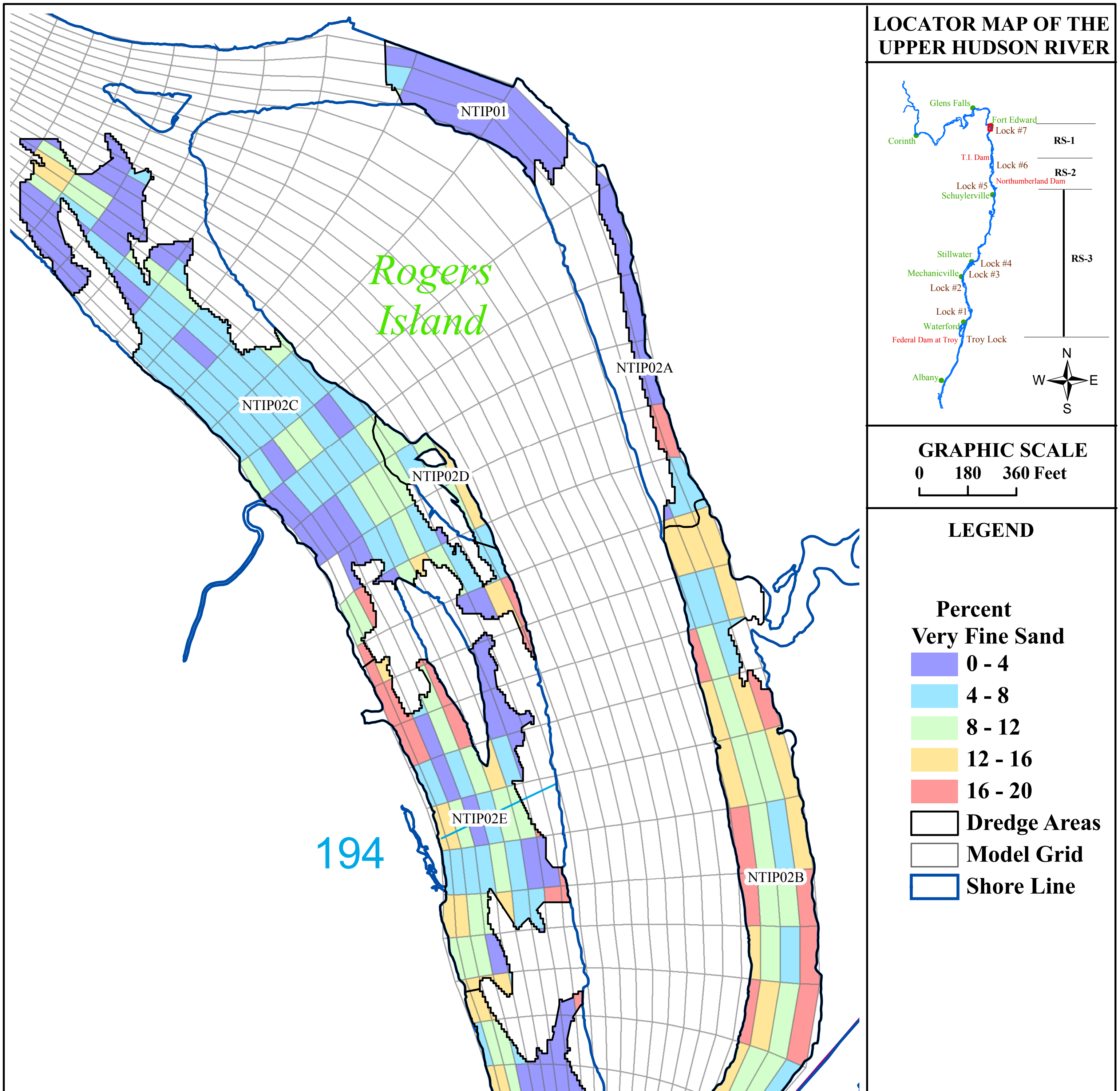

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-3a. Percentage of Very Fine Sand in Total Sediment Bed by Model Grid Cell

GENfd1:133

03/15/2006

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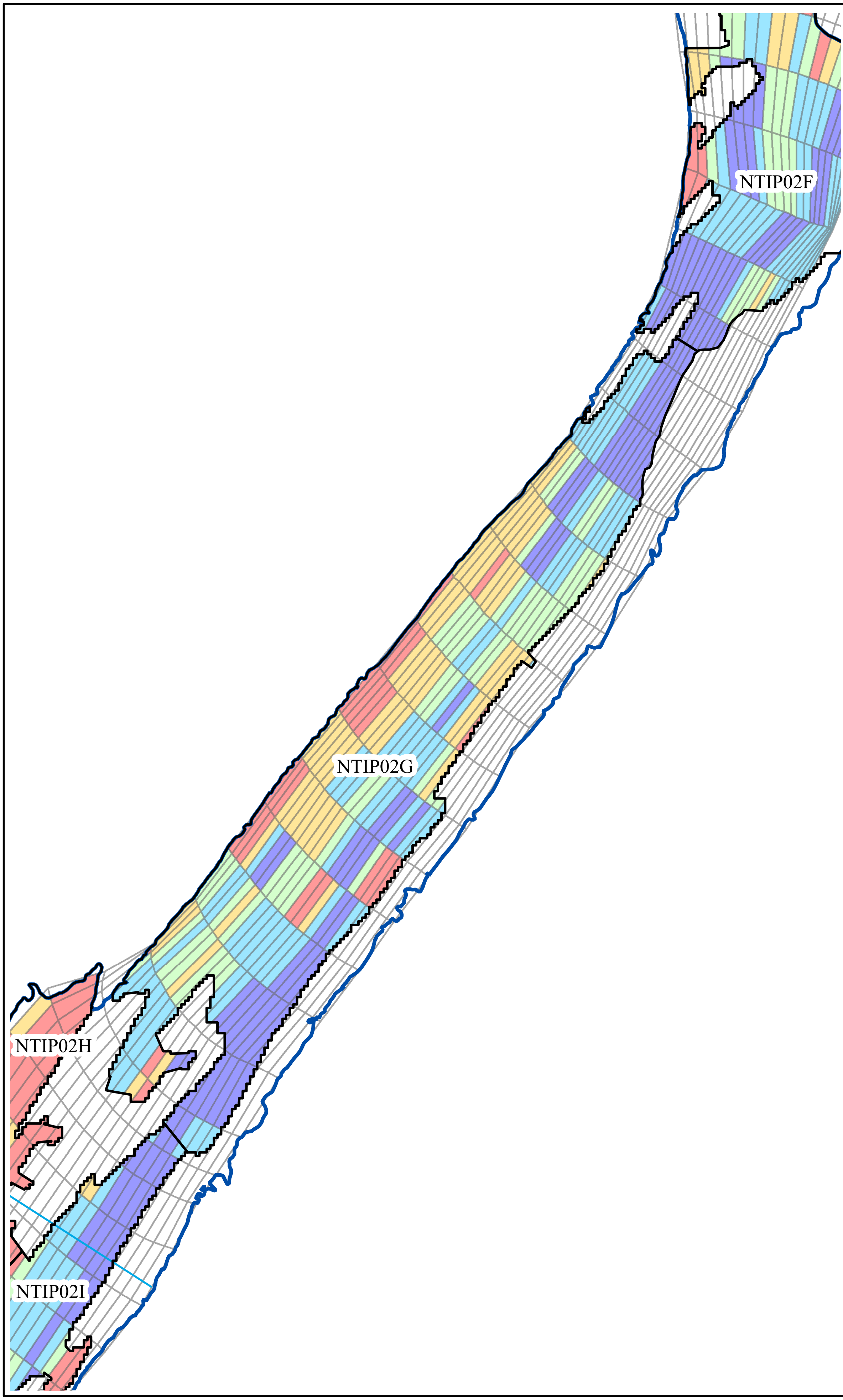
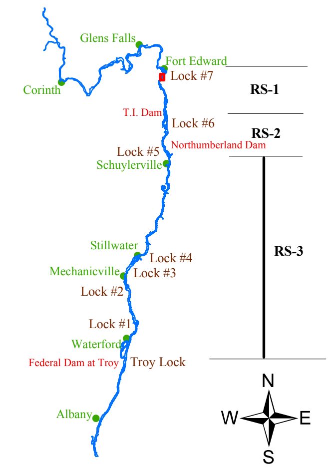


LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 130 260 Feet

LEGEND

Percent Very Fine Sand

- 0 - 4
- 4 - 8
- 8 - 12
- 12 - 16
- 16 - 20
- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-3b. Percentage of Very Fine Sand in Total Sediment Bed by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

GENfd1:133

03/15/2006

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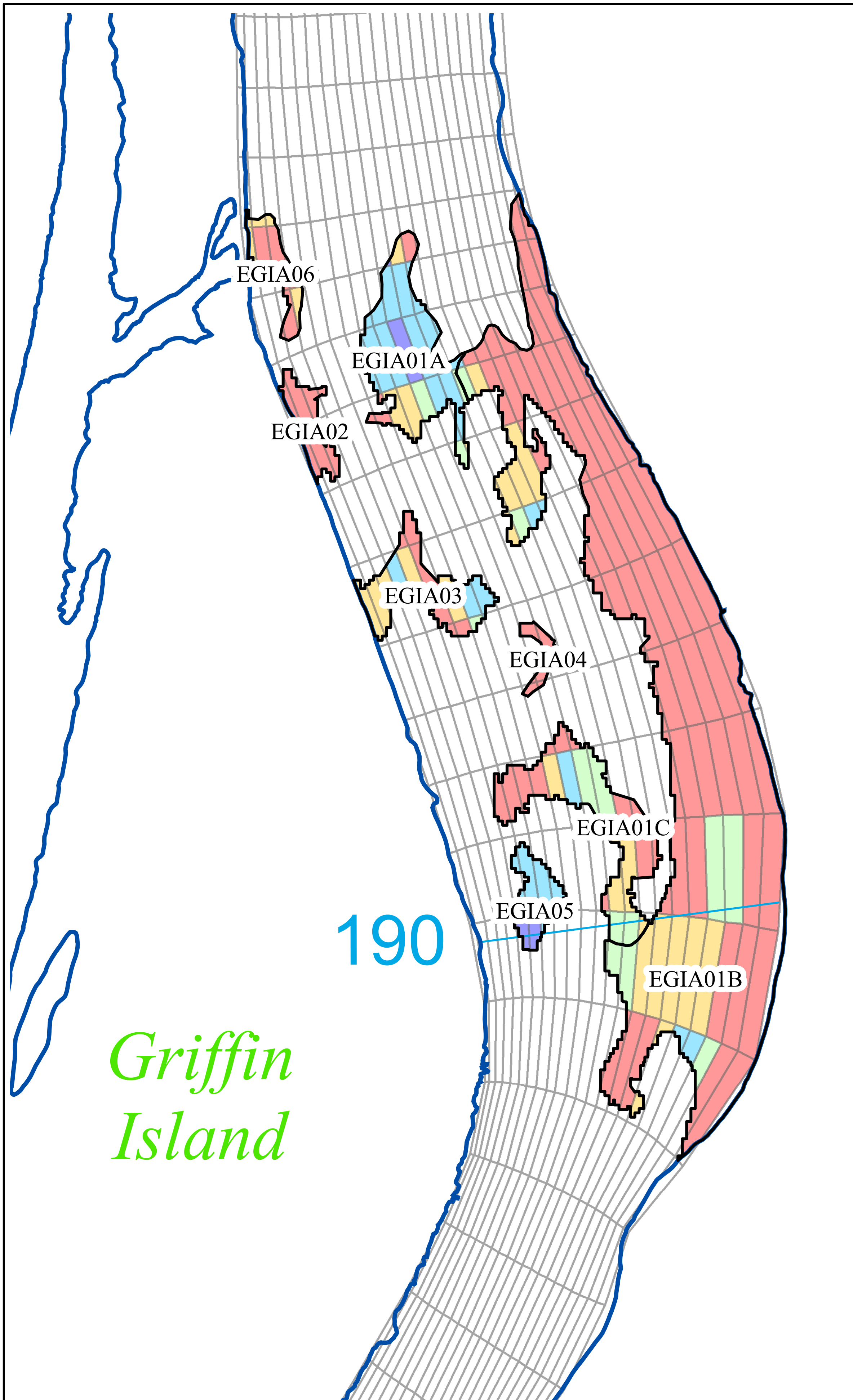
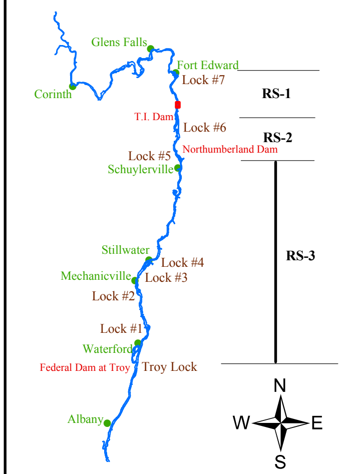


LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 110 220 Feet

LEGEND

Percent Very Fine Sand

- 0 - 4
- 4 - 8
- 8 - 12
- 12 - 16
- 16 - 20
- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-3c. Percentage of Very Fine Sand in Total Sediment Bed by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

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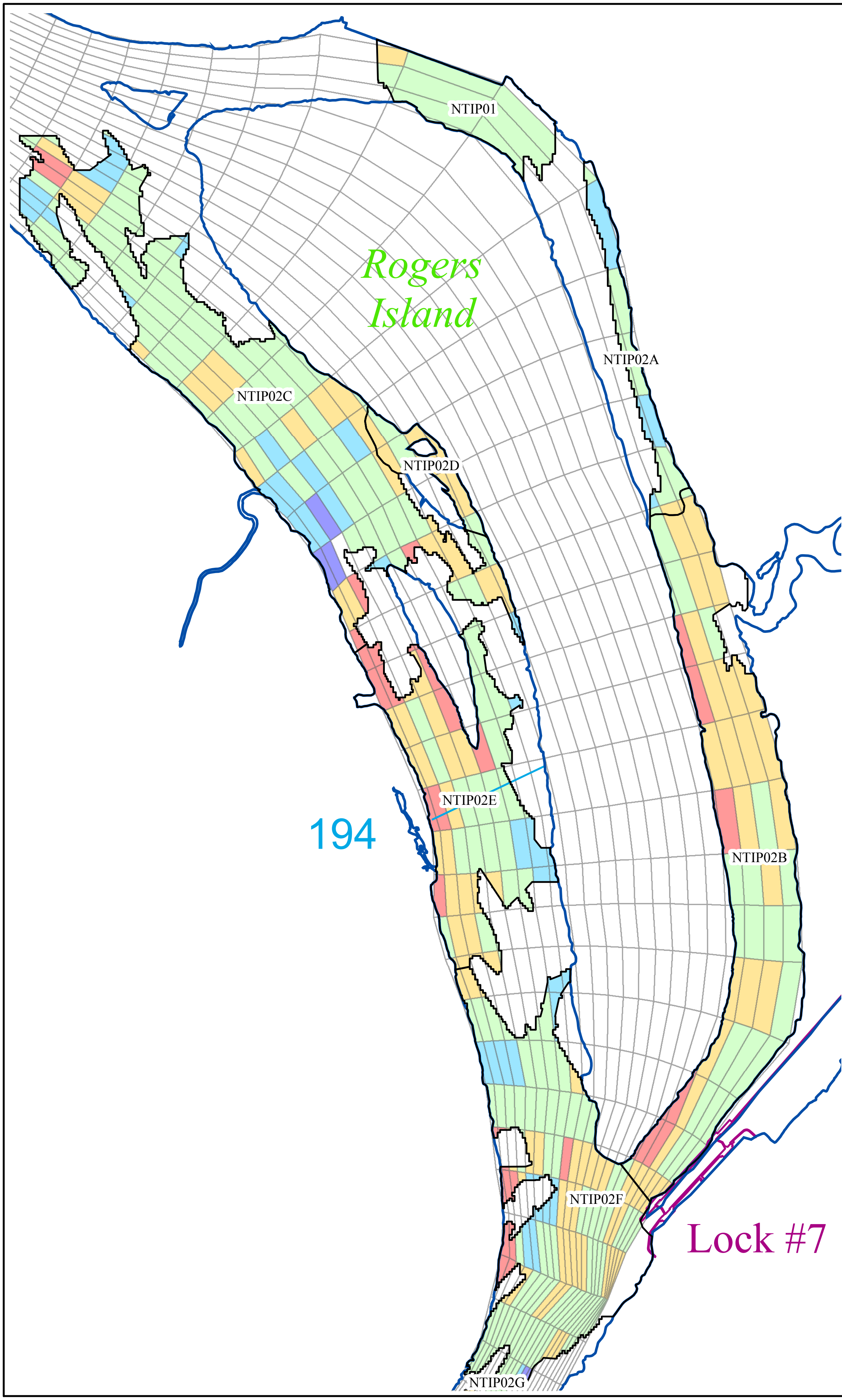
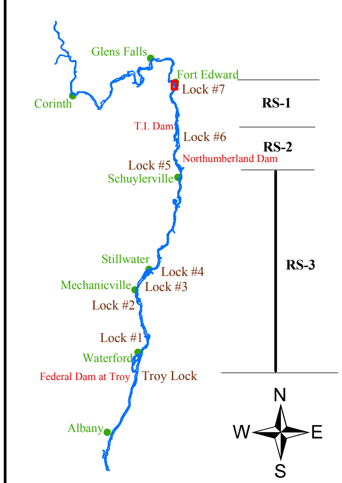


LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 180 360 Feet

LEGEND

Percent Fine & Medium Sand

- 0 - 8
- 8 - 16
- 16 - 24
- 24 - 32
- 32 - 40
- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-4a. Percentage of Fine and Medium Sand in Total Sediment Bed by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

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03/15/2006

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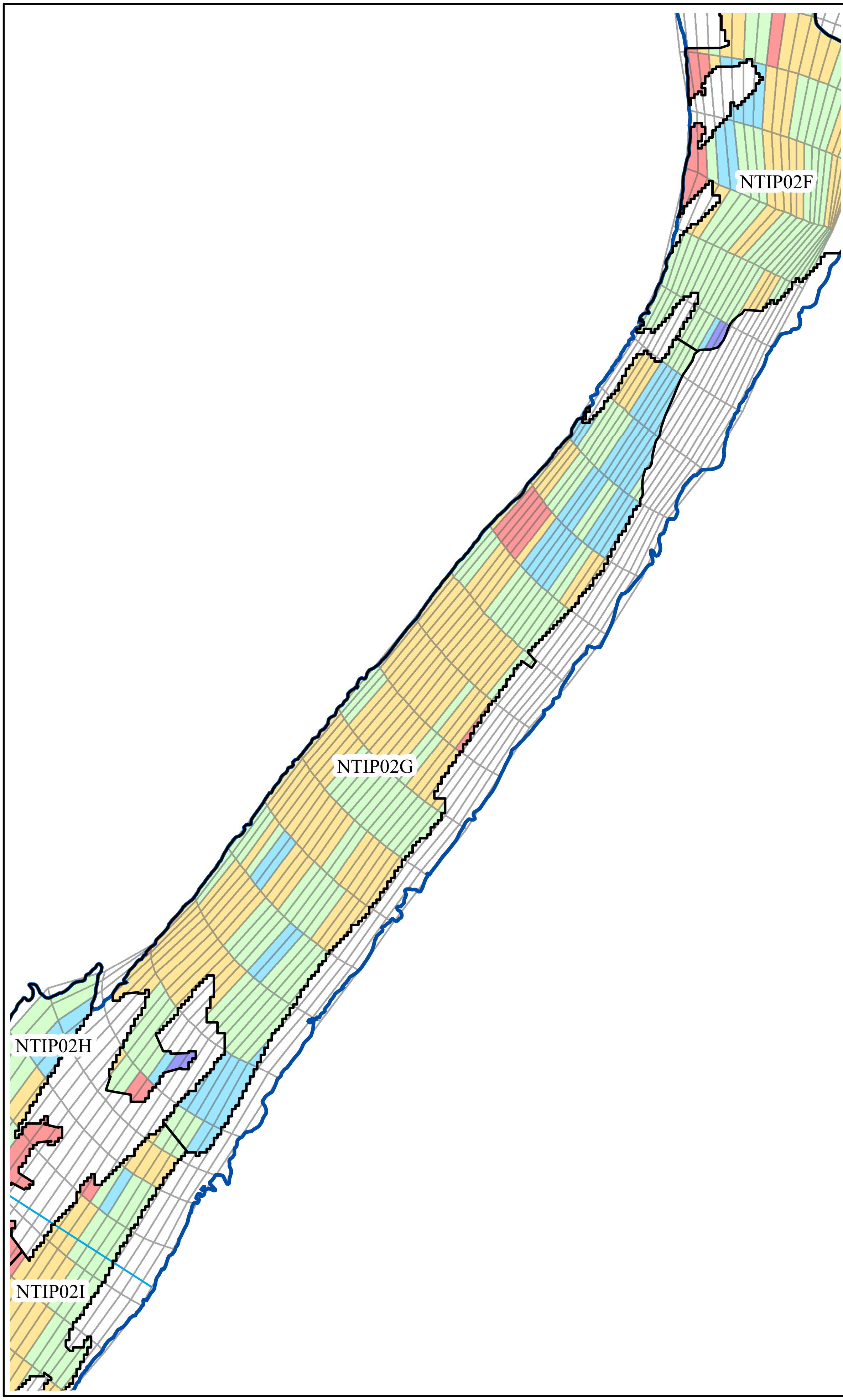
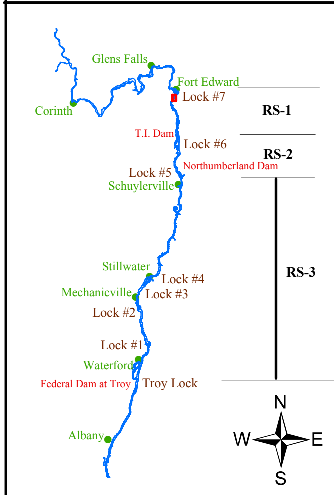


LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 130 260 Feet

LEGEND

Percent Fine & Medium Sand

- 0 - 8
- 8 - 16
- 16 - 24
- 24 - 32
- 32 - 40
- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-4b. Percentage of Fine and Medium Sand in Total Sediment Bed by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

GENfd1:133

03/15/2006

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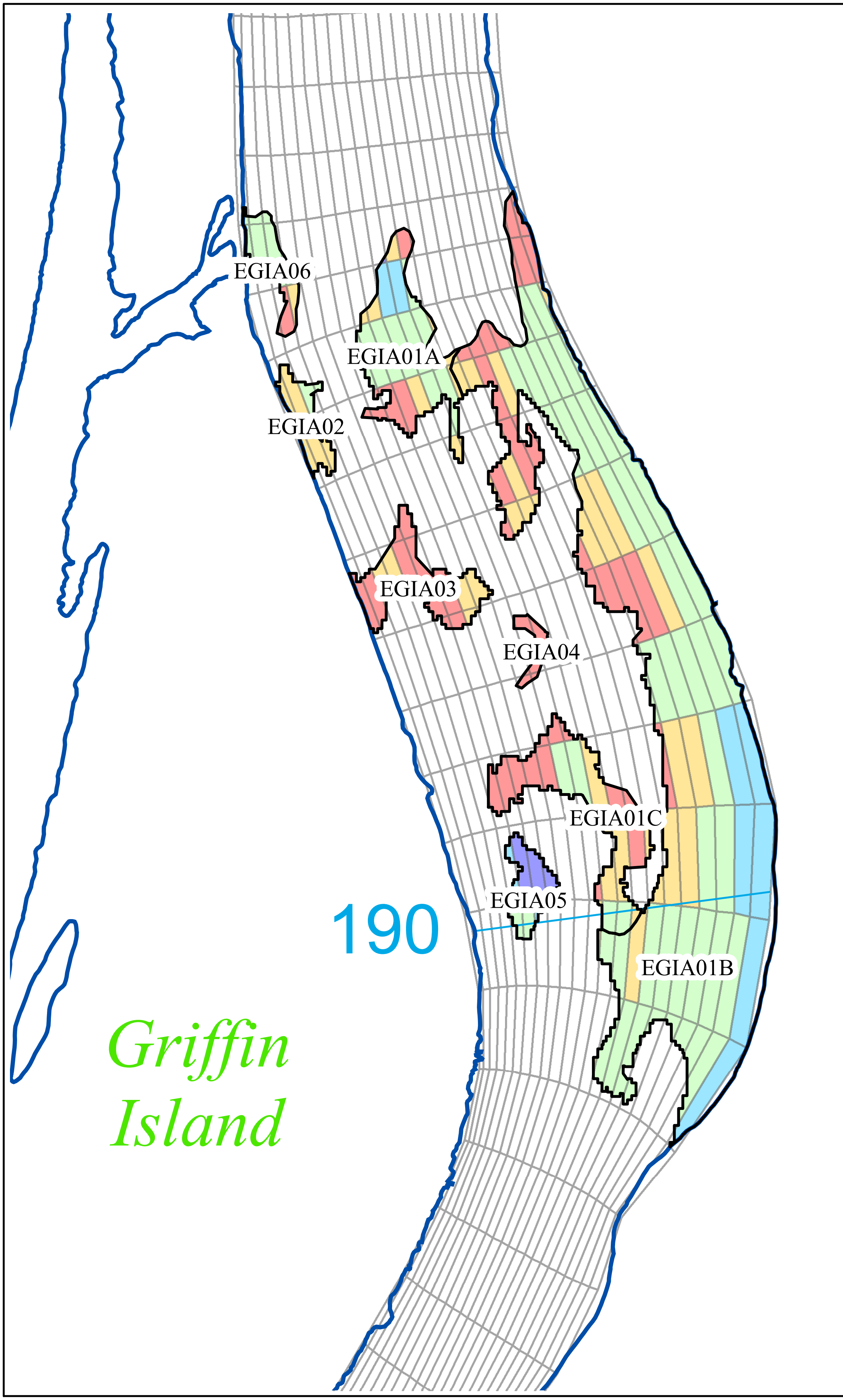
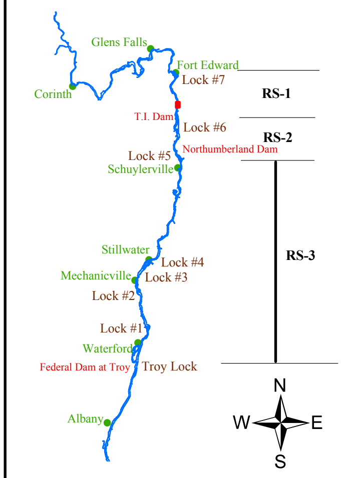


LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 110 220 Feet

LEGEND

Percent Fine & Medium Sand

- **0 - 8**
- **8 - 16**
- **16 - 24**
- **24 - 32**
- **32 - 40**
- **Dredge Areas**
- **Model Grid**
- **Shore Line**

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-4c. Percentage of Fine and Medium Sand in Total Sediment Bed by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

GENfd1:133

03/15/2006

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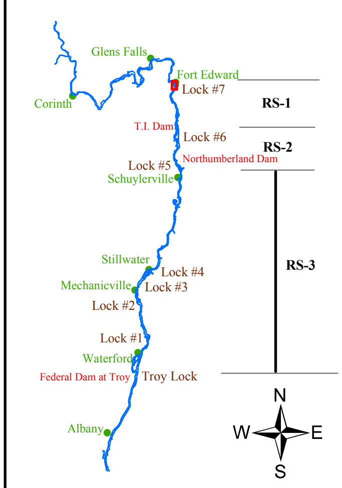
LOCATOR MAP OF THE UPPER HUDSON RIVER



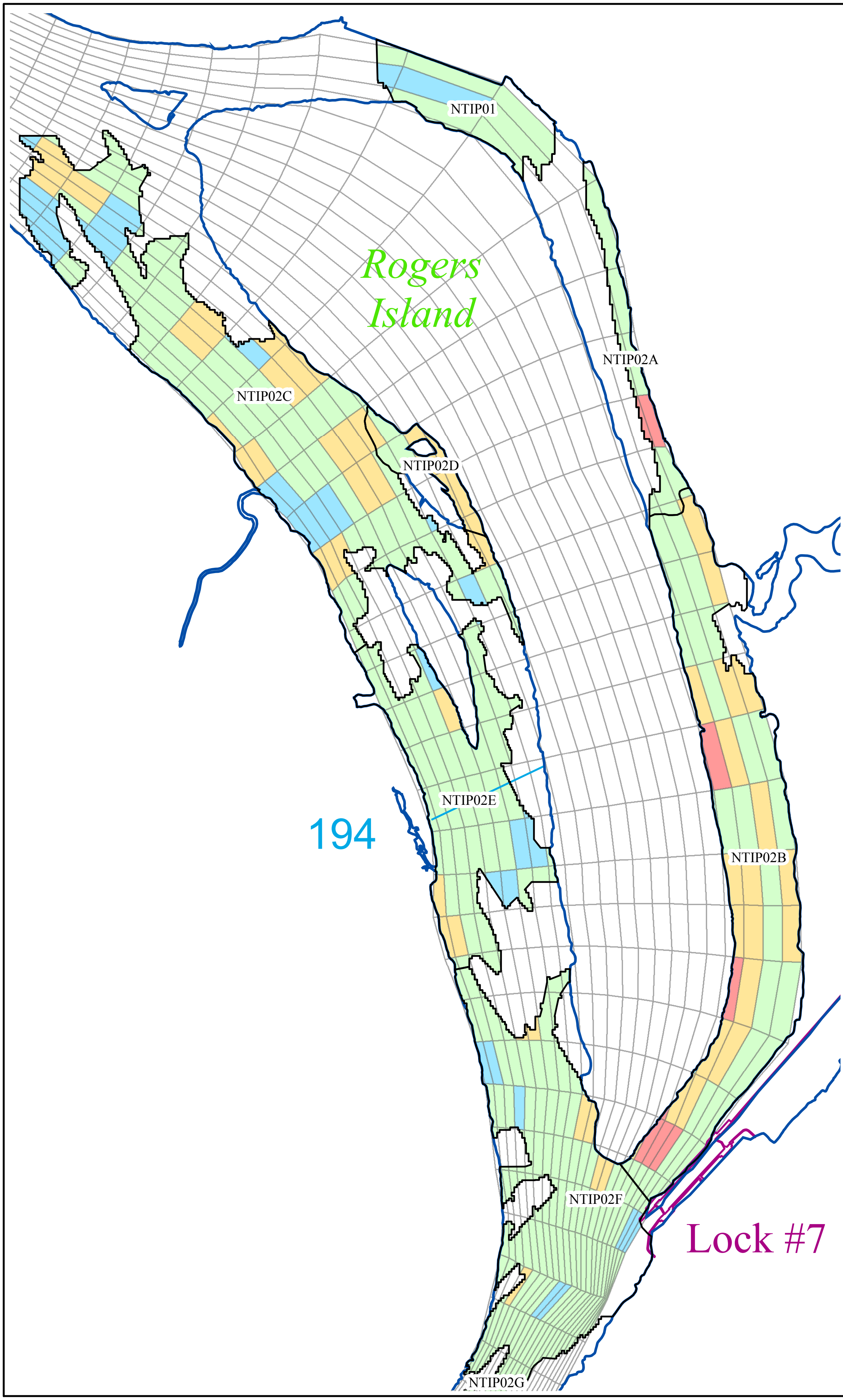
GRAPHIC SCALE

0 170 340 Feet

LEGEND

Avg Total PCB Conc (ug/g) in Clay and Silt

- 0 - 1
- 1 - 10
- 10 - 100
- 100 - 1000
- >1000
- Dredge Areas
- Model Grid
- Shore Line



Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-5a.
Average Total PCB Concentration in Clay and Silt by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

GENfd1:133

03/15/2006

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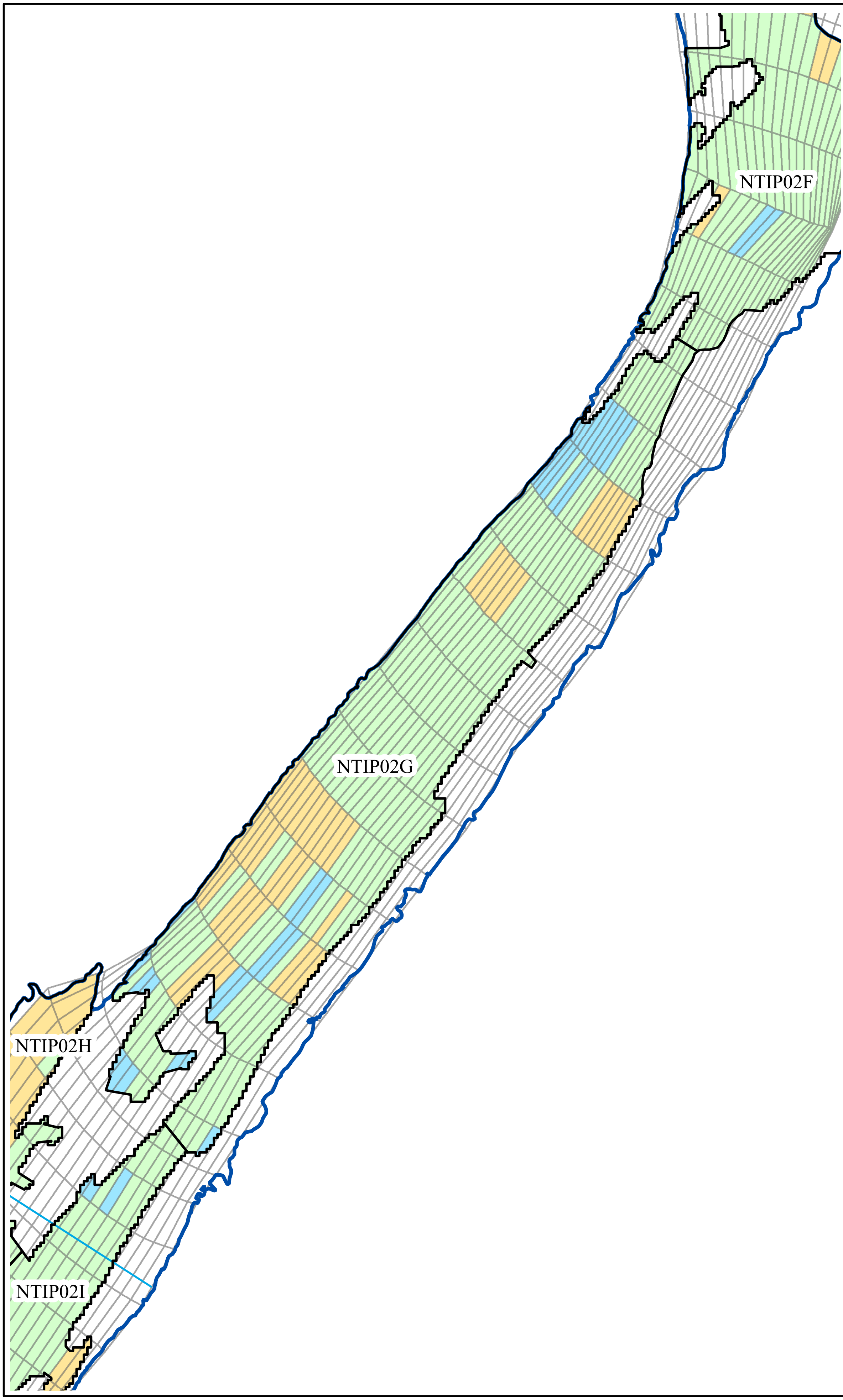
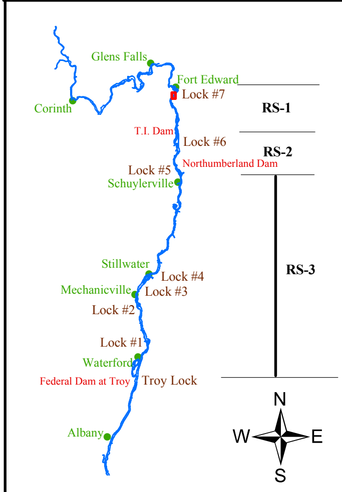


LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 125 250 Feet

LEGEND

Avg Total PCB Conc (ug/g) in Clay and Silt

- **0 - 1**
- **1 - 10**
- **10 - 100**
- **100 - 1000**
- **>1000**
- **Dredge Areas**
- **Model Grid**
- **Shore Line**

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-5b.

Average Total PCB Concentration in Clay and Silt by Model Grid Cell

Quantitative Environmental Analysis, LLC

GENfd1:133

03/15/2006

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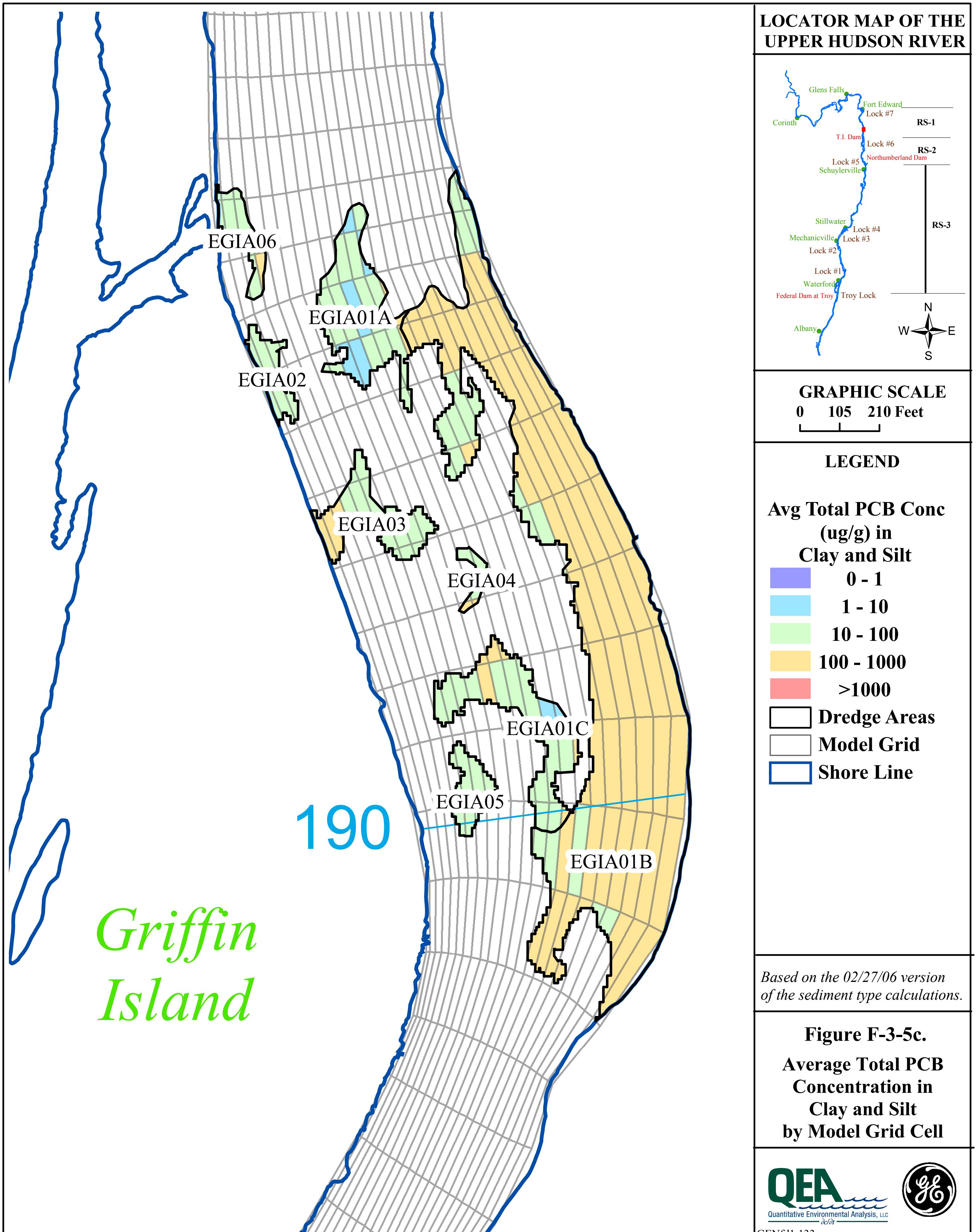

GRAPHIC SCALE

0 105 210 Feet

LEGEND

Avg Total PCB Conc (ug/g) in Clay and Silt

- 0 - 1
- 1 - 10
- 10 - 100
- 100 - 1000
- >1000
- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-5c.

Average Total PCB Concentration in Clay and Silt by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

GENfd1:133

03/15/2006

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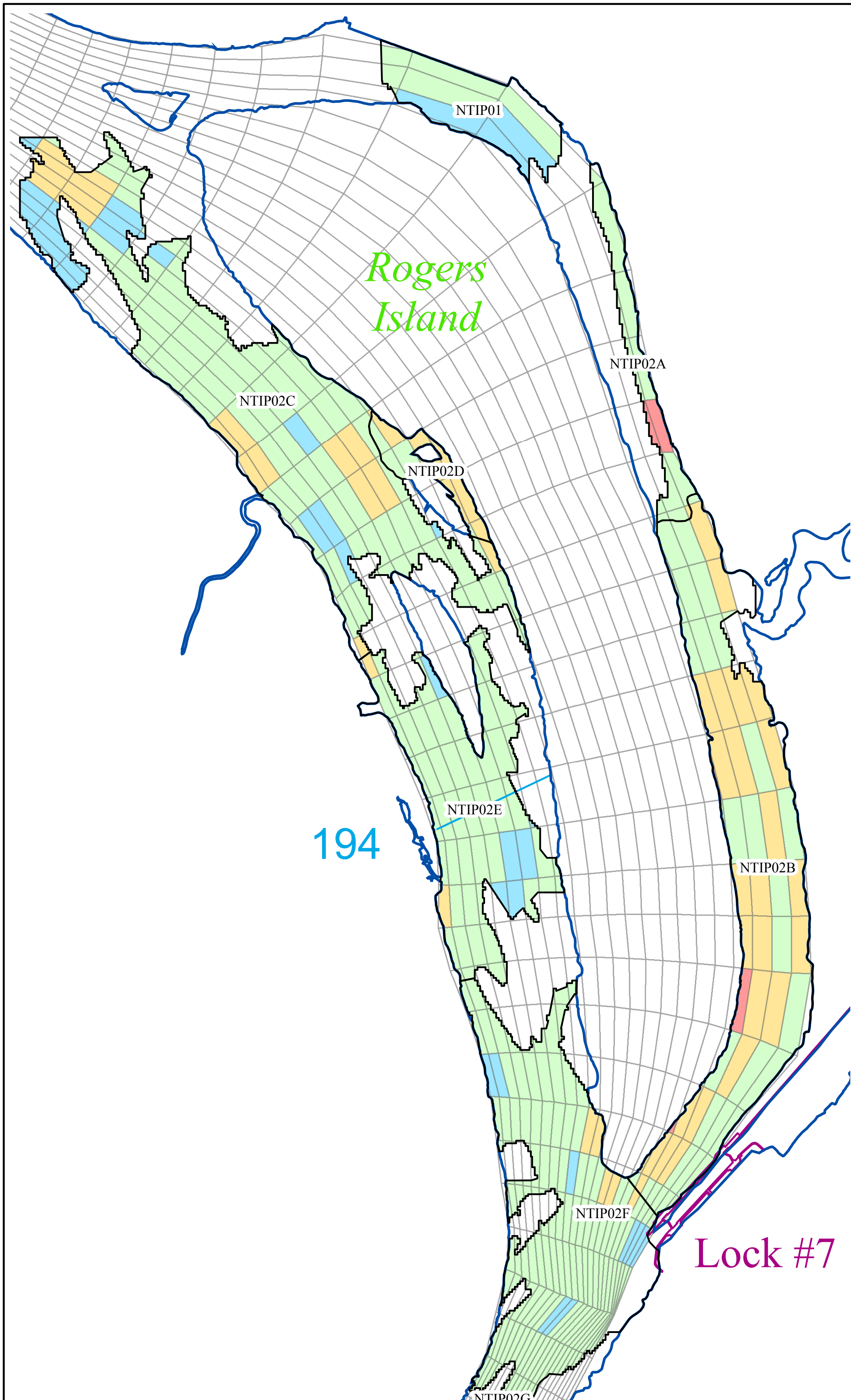
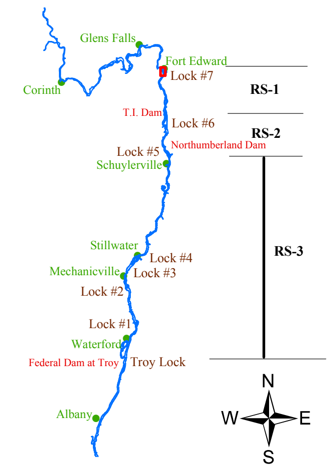


LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 170 340 Feet

LEGEND

Avg Total PCB Conc (ug/g) in Very Fine Sand

- 0 - 1
- 1 - 10
- 10 - 100
- 100 - 1000
- >1000
- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-6a. Average Total PCB Concentration in Very Fine Sand by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

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03/15/2006

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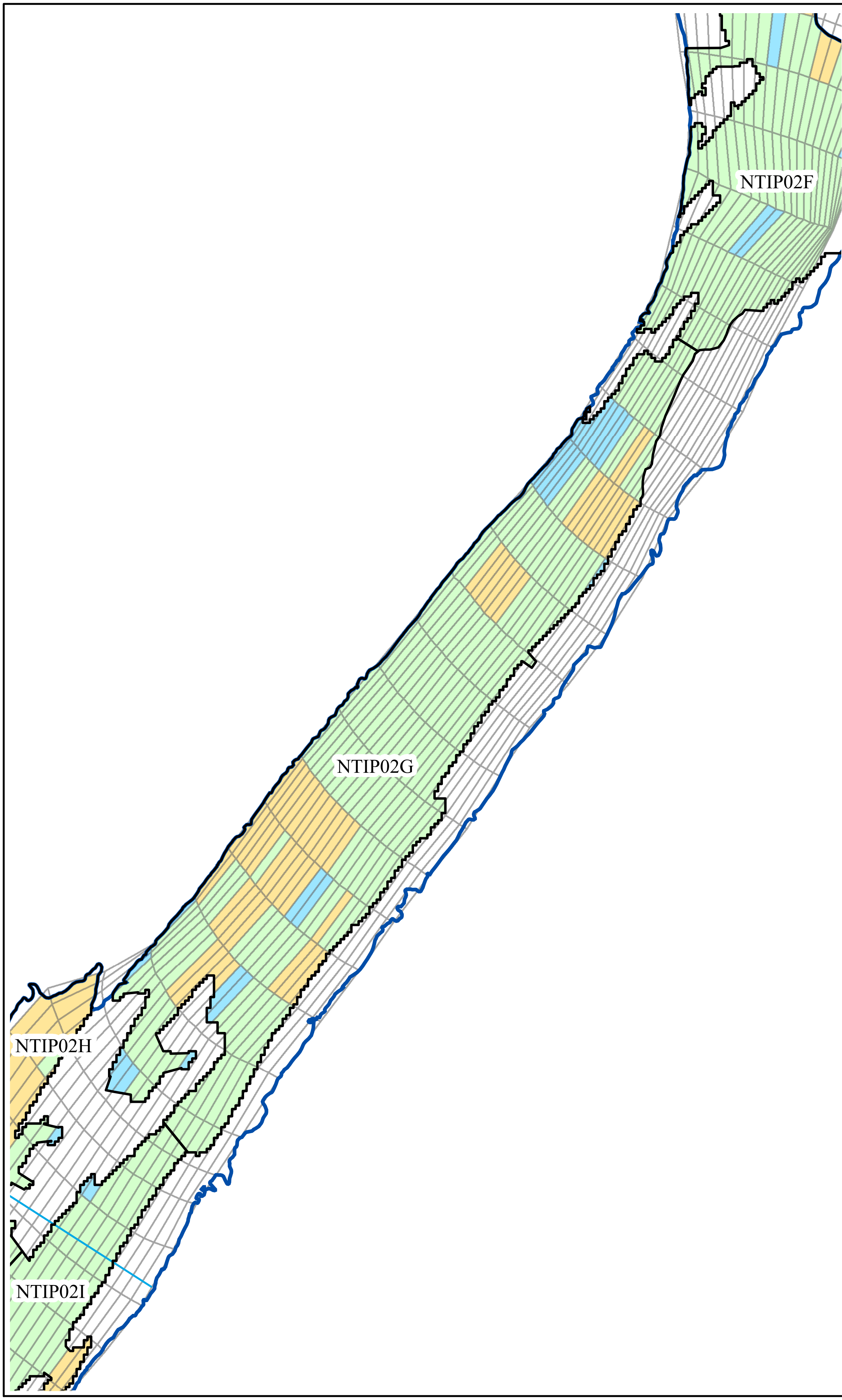
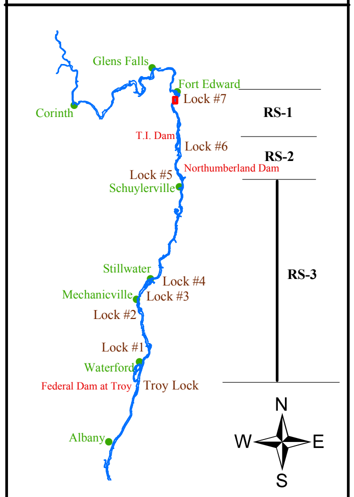




GRAPHIC SCALE

0 125 250 Feet

LEGEND

Avg Total PCB Conc (ug/g) in Very Fine Sand

- 0 - 1
- 1 - 10
- 10 - 100
- 100 - 1000
- >1000
- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-6b.

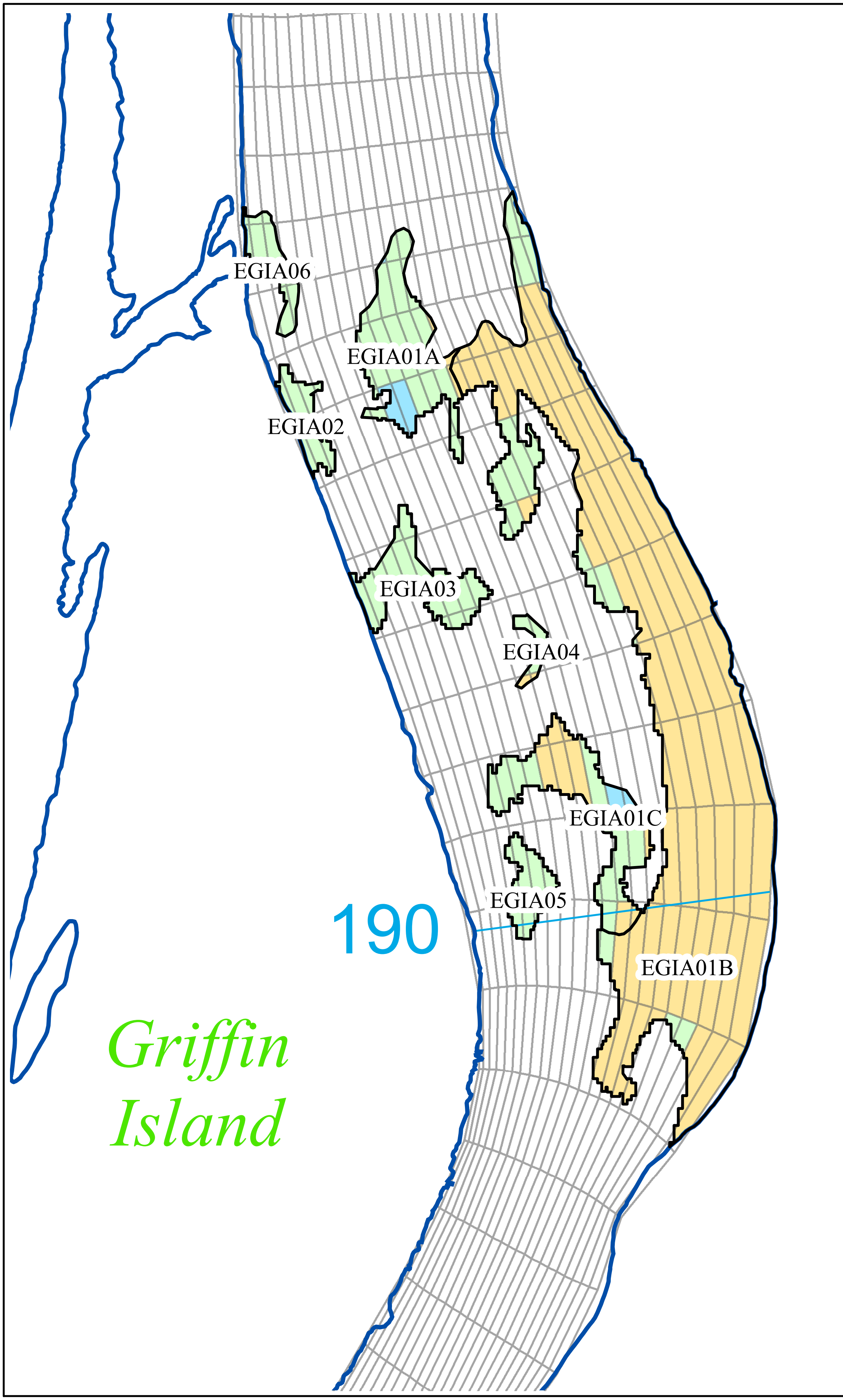
Average Total PCB Concentration in Very Fine Sand by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

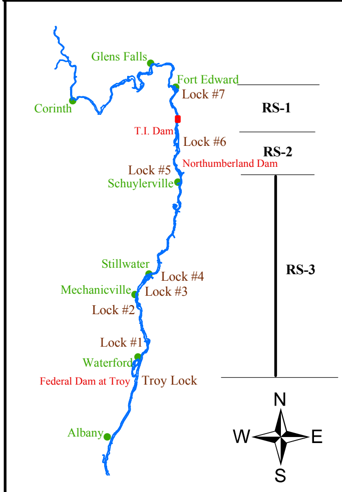
GENfd1:133

03/15/2006

MS - \\Zeus\E_drive\GENrem\Working\GIS\maps\model\maps\Dredge_Schedule_20060210.mxd



LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 105 210 Feet

LEGEND

Avg Total PCB Conc (ug/g) in Very Fine Sand

- **0 - 1**
- **1 - 10**
- **10 - 100**
- **100 - 1000**
- **>1000**
- **Dredge Areas**
- **Model Grid**
- **Shore Line**

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-6c.

Average Total PCB Concentration in Very Fine Sand by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

GENfd1:133

03/15/2006

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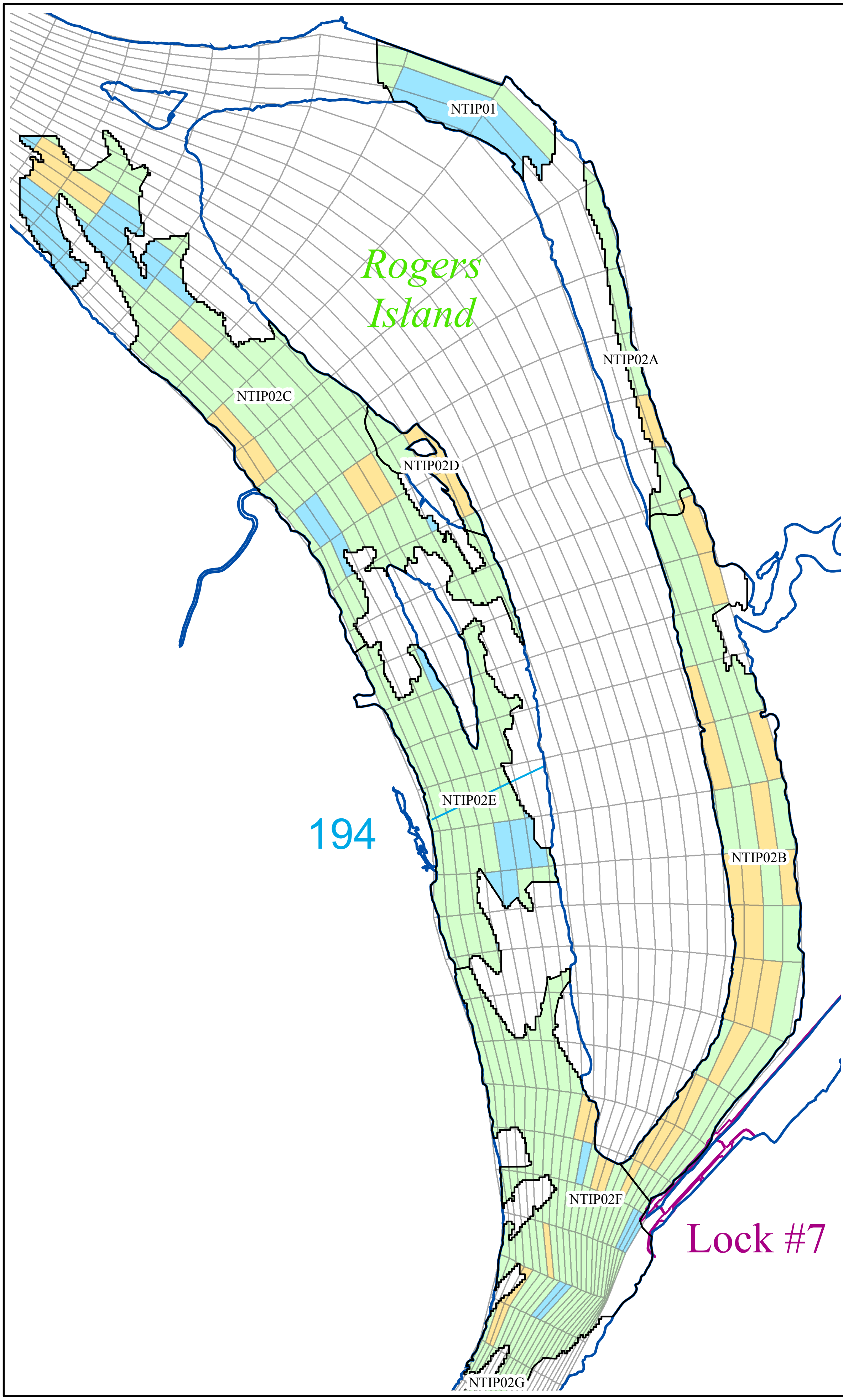
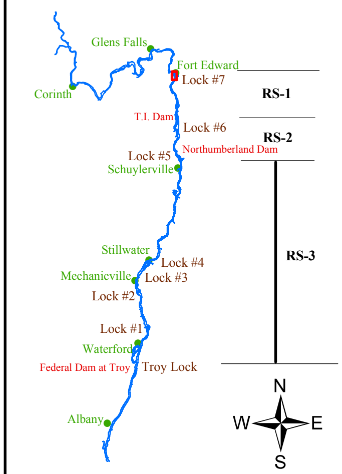


LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 175 350 Feet

LEGEND

Avg Total PCB Conc (ug/g) in Fine & Medium Sand

- 0 - 1
- 1 - 10
- 10 - 100
- 100 - 1000
- >1000
- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-7a.

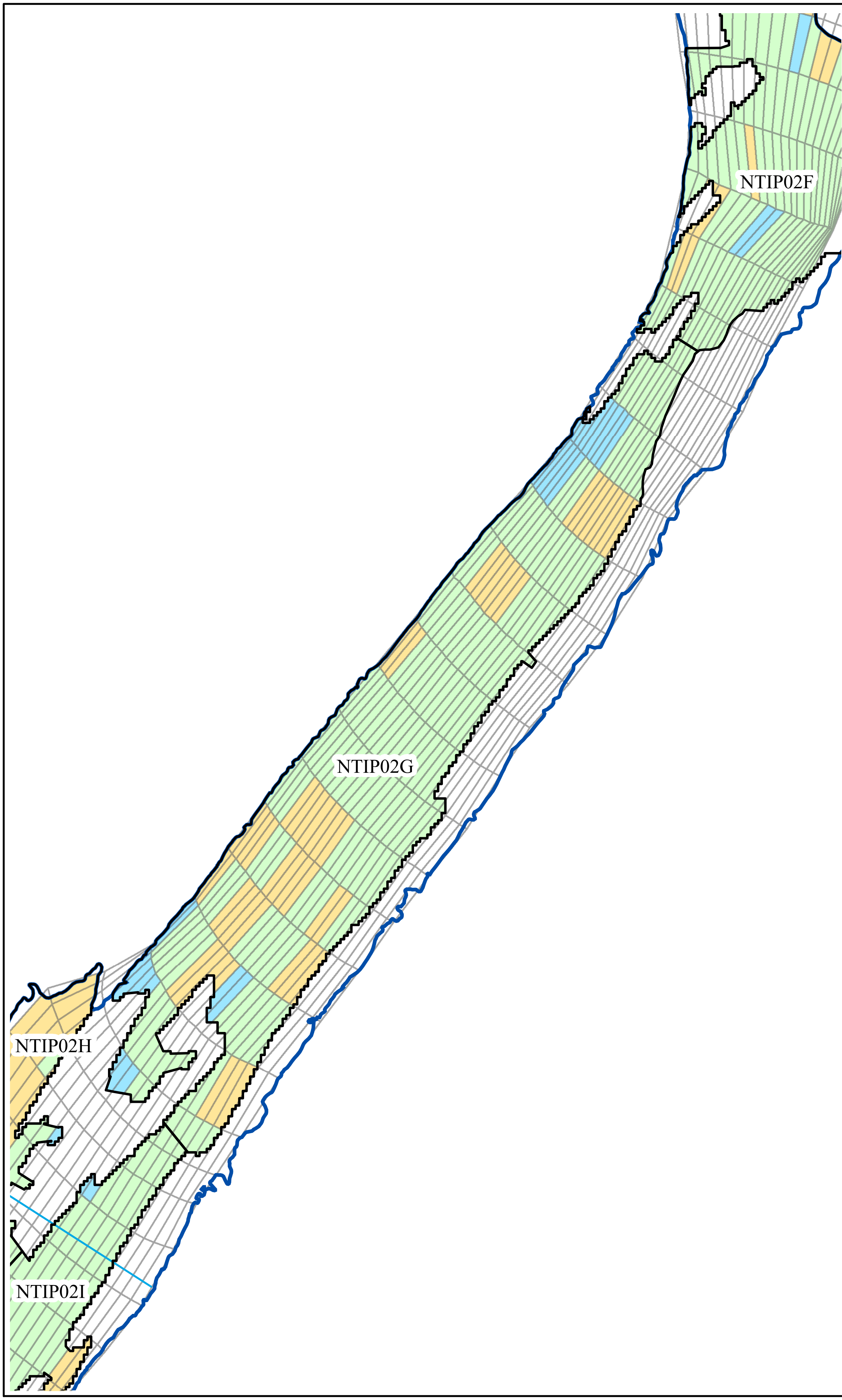
Average Total PCB Concentration in Fine and Medium Sand by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

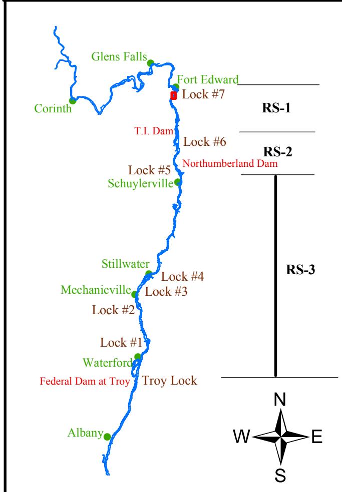
GENfd1:133

03/15/2006

MS - \\Zeus\E_drive\GENrem\Working\GIS\maps\model\maps\Dredge_Schedule_20060210.mxd



LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 125 250 Feet

LEGEND

Avg Total PCB Conc (ug/g) in Fine & Medium Sand

- 0 - 1
- 1 - 10
- 10 - 100
- 100 - 1000
- >1000
- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-7b.

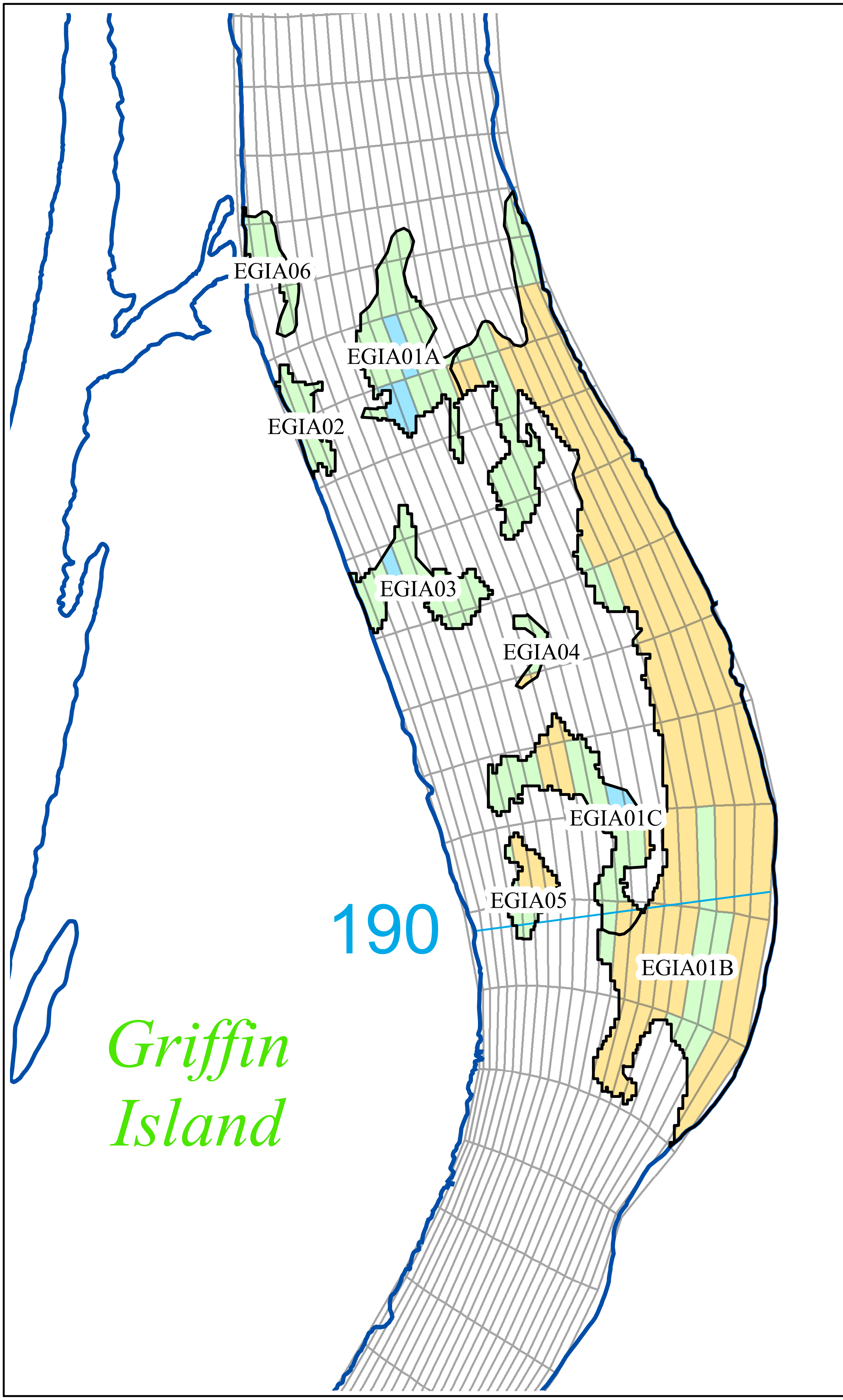
Average Total PCB Concentration in Fine and Medium Sand by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

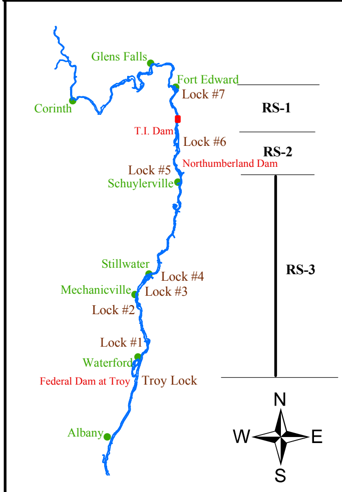
GENfd1:133

03/15/2006

MS - \\Zeus\E_drive\GENrem\Working\GIS\maps\model\maps\Dredge_Schedule_20060210.mxd



LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 105 210 Feet

LEGEND

Avg Total PCB Conc (ug/g) in Fine & Medium Sand

- 0 - 1
- 1 - 10
- 10 - 100
- 100 - 1000
- >1000
- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/27/06 version of the sediment type calculations.

Figure F-3-7c.

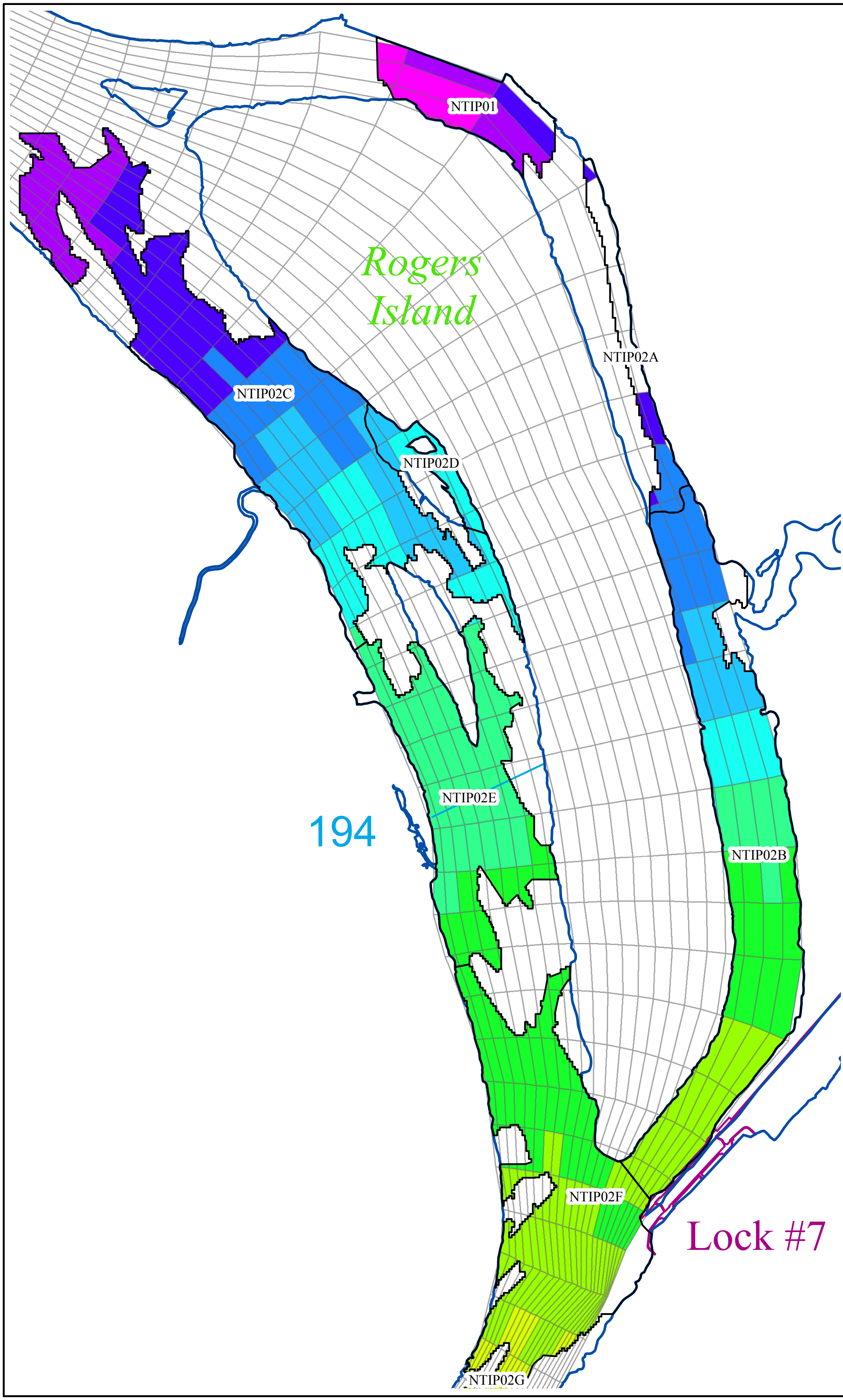
Average Total PCB Concentration in Fine and Medium Sand by Model Grid Cell

QEA Quantitative Environmental Analysis, LLC

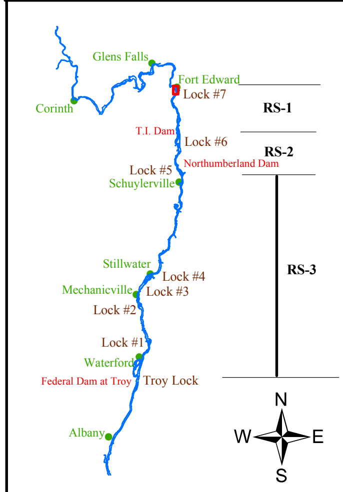
GENfd1:133

03/15/2006

MS - \\Zeus\E_drive\GENrem\Working\GIS\maps\model\maps\Dredge_Schedule_20060210.mxd



LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 180 360 Feet

LEGEND

Dredge Schedule

- May 21 - May 31
- June 1 - June 10
- June 11 - June 20
- June 21 - June 30
- July 1 - July 10
- July 11 - July 20
- July 21 - July 31
- Aug 1 - Aug 10
- Aug 11 - Aug 20
- Aug 21 - Aug 31
- Sep 1 - Sep 10
- Sep 11 - Sep 20

- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/10/06 version of the dredge schedule.

Figure F-4-1a.

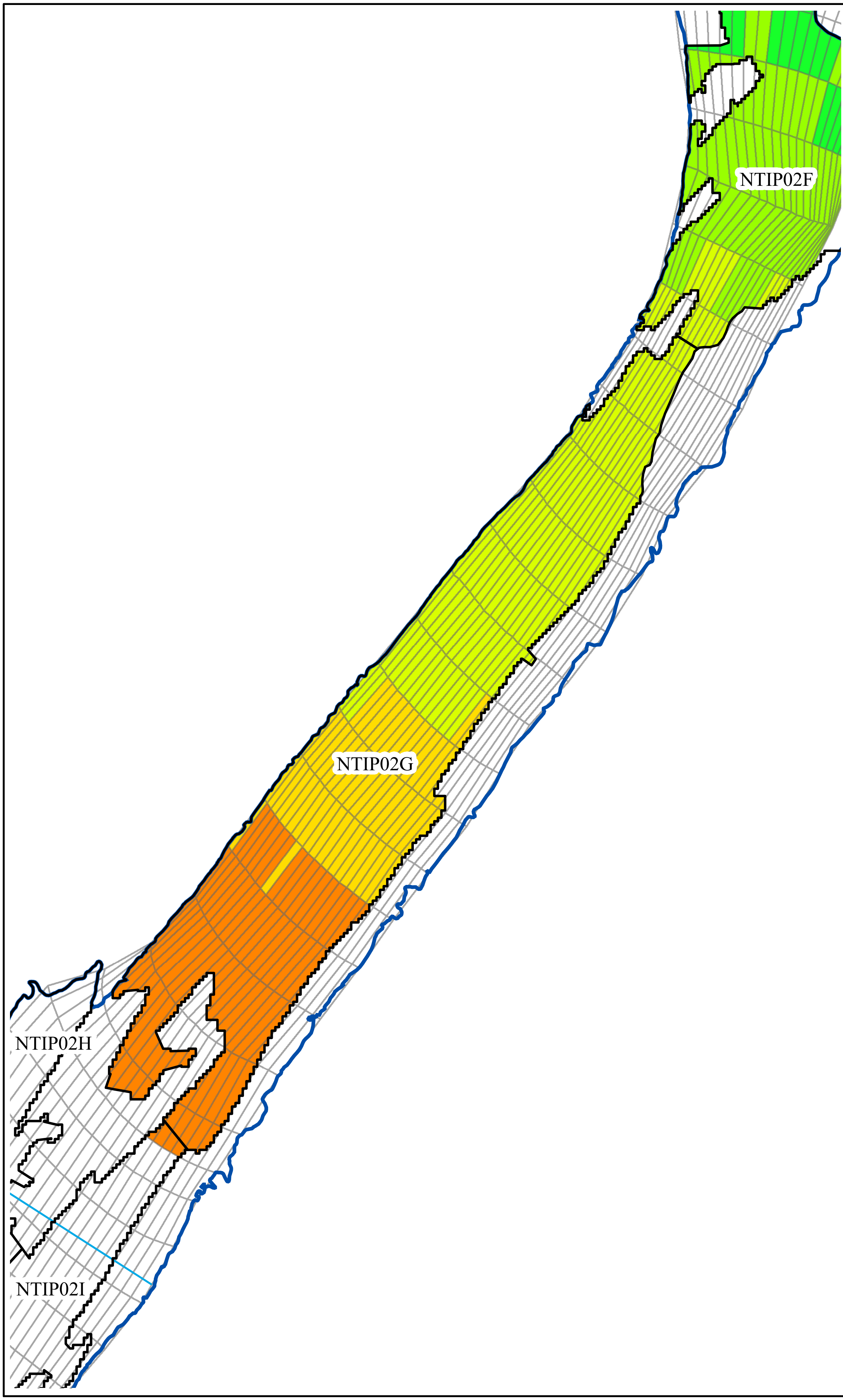
Model Application of Phase 1 Dredge Schedule

QEA Quantitative Environmental Analysis, LLC

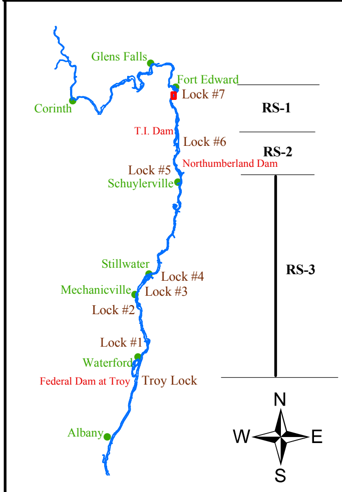
GENfd1:133

03/02/2006

MS - \\Zeus\E_drive\GENrem\Working\GIS\maps\model\maps\Dredge_Schedule_20060210.mxd



LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 130 260 Feet

LEGEND

Dredge Schedule

- May 21 - May 31
- June 1 - June 10
- June 11 - June 20
- June 21 - June 30
- July 1 - July 10
- July 11 - July 20
- July 21 - July 31
- Aug 1 - Aug 10
- Aug 11 - Aug 20
- Aug 21 - Aug 31
- Sep 1 - Sep 10
- Sep 11 - Sep 20

- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/10/06 version of the dredge schedule.

Figure F-4-1b.

Model Application of Phase 1 Dredge Schedule

QEA Quantitative Environmental Analysis, LLC

GENfd1:133 03/02/2006

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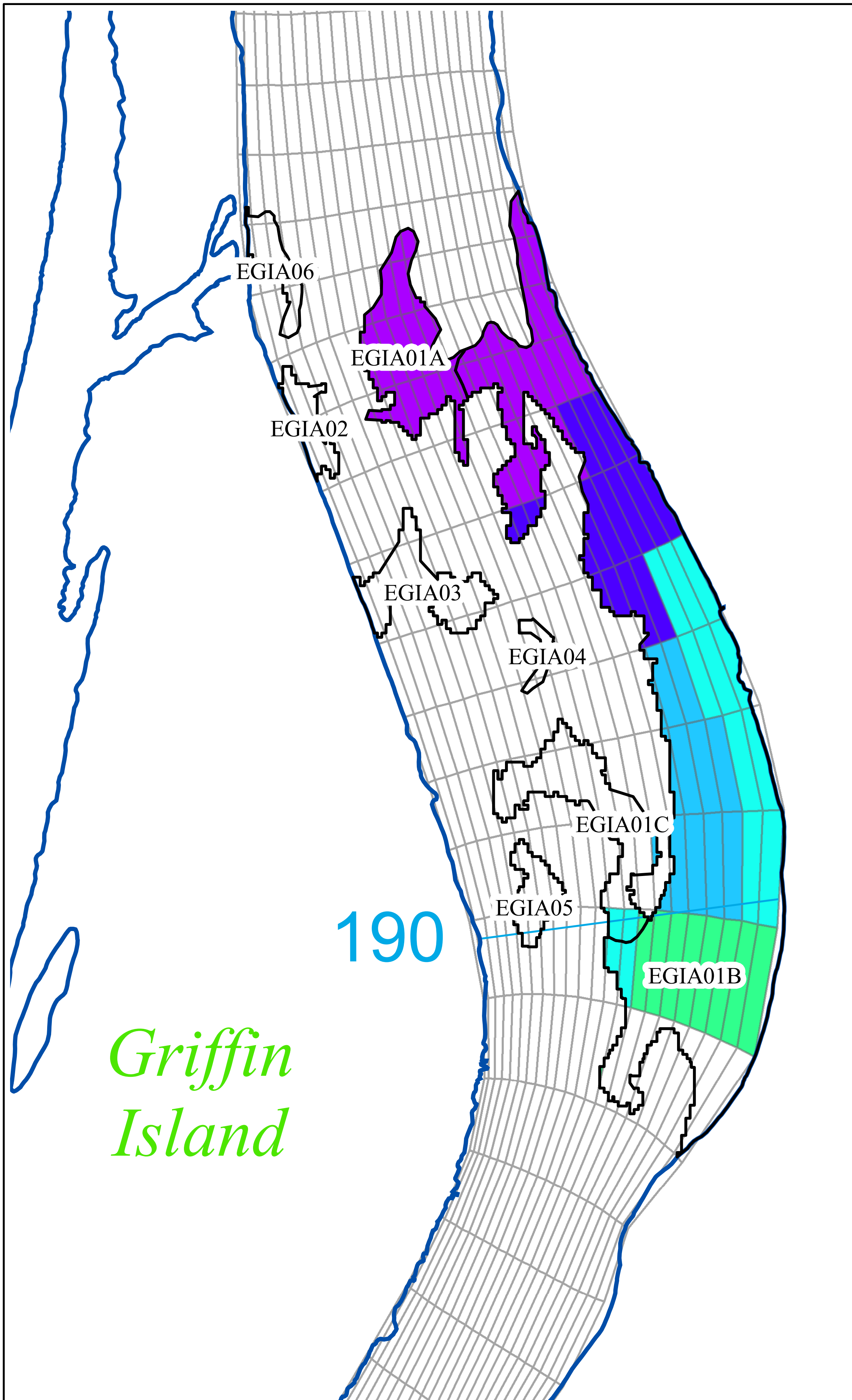

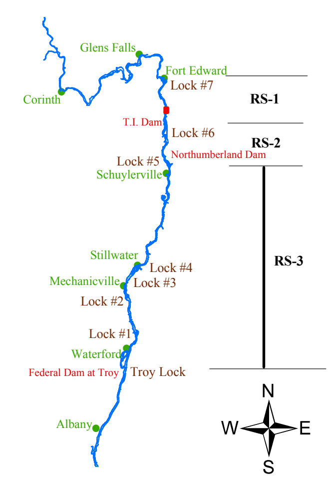

GRAPHIC SCALE

0 110 220 Feet

LEGEND

Dredge Schedule

- May 21 - May 31
- June 1 - June 10
- June 11 - June 20
- June 21 - June 30
- July 1 - July 10
- July 11 - July 20
- July 21 - July 31
- Aug 1 - Aug 10
- Aug 11 - Aug 20
- Aug 21 - Aug 31
- Sep 1 - Sep 10
- Sep 11 - Sep 20

- Dredge Areas
- Model Grid
- Shore Line

Based on the 02/10/06 version of the dredge schedule.

Figure F-4-1c.

Model Application of Phase 1 Dredge Schedule

QEA Quantitative Environmental Analysis, LLC

GENfd1:133

03/02/2006

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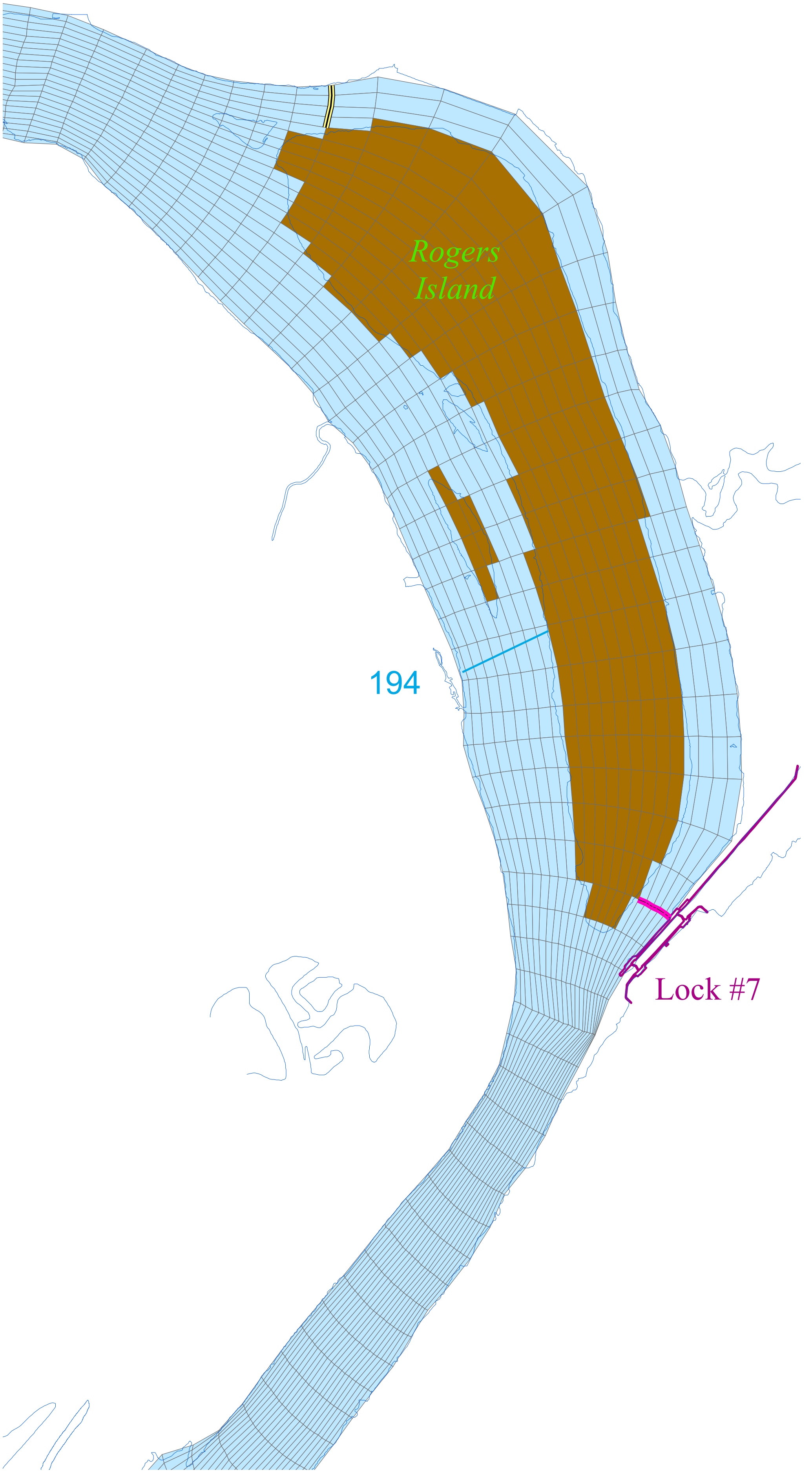
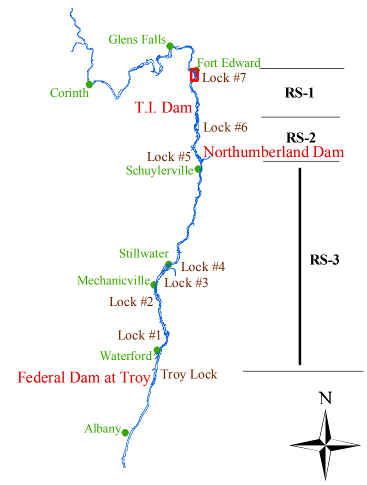


LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 250 500 Feet

LEGEND

- River Miles
- Shore Line
- Dams and Locks
- Island/Land Elements
- Channel Elements
- Silt Curtain
- Rock Berm

UPPER HUDSON RIVER STUDY AREA

Figure F-4-2.

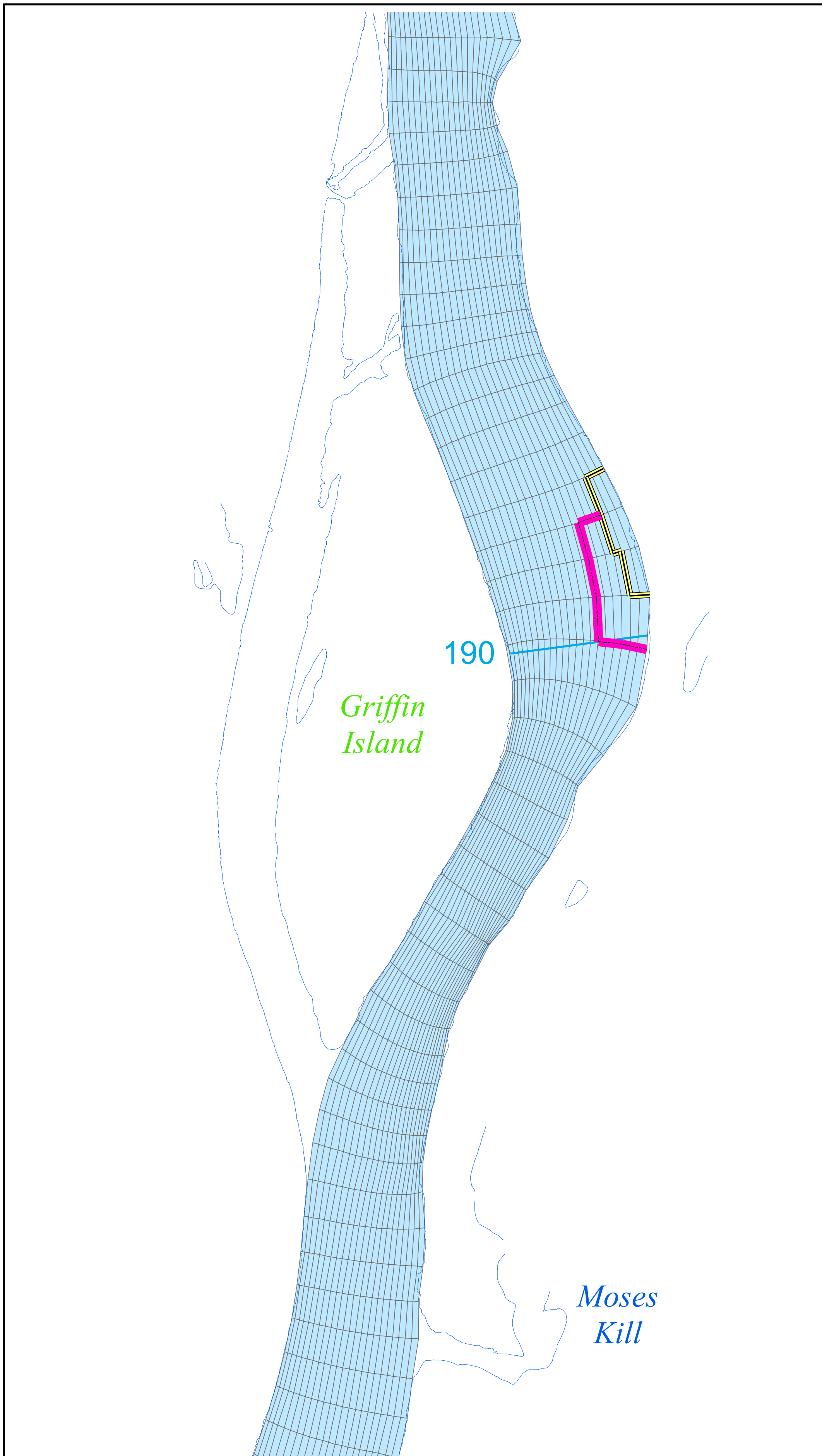
Model implementation of the rock berm and silt curtain near Rogers Island

Quantitative Environmental Analysis, LLC

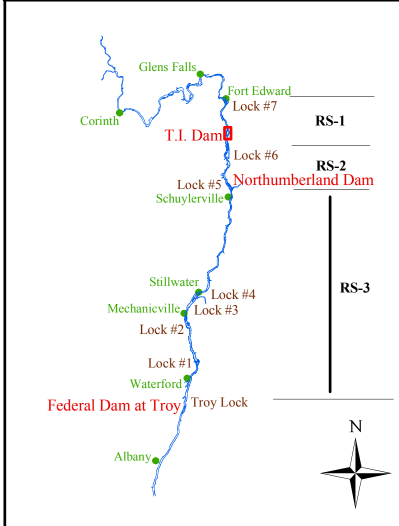
GENdes

Jul 29, 2005.

DN - \\daleel\d_drive\GENdes\Documents\Reports\IDR\Figure_E-6-2.mxd



LOCATOR MAP OF THE UPPER HUDSON RIVER



GRAPHIC SCALE

0 250 500 Feet

LEGEND

- River Miles
- Shore Line
- Dams and Locks
- Island/Land Elements
- Channel Elements
- Sheetpile
- Silt Curtain

UPPER HUDSON RIVER STUDY AREA

Figure F-4-3.

Model implementation of the sheet pile and silt curtain near Griffin Island.

Quantitative Environmental Analysis, LLC

GENdes

Jul 29, 2005.

DN - \\Daleel\D_DRIVE\GENdes\Documents\Reports\IDR\Figure_E-6-3.mxd

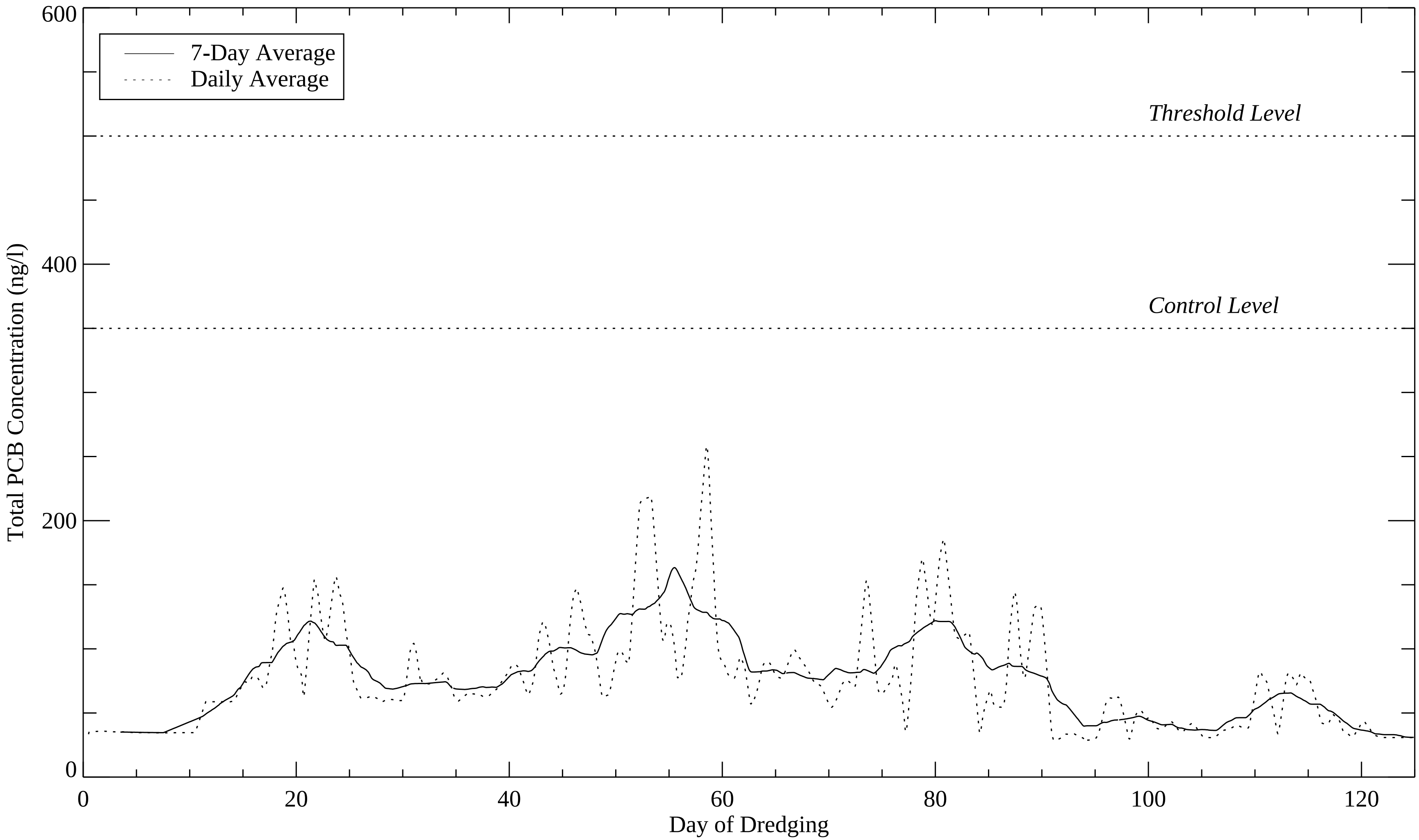


Figure F-5-1. Average TID total PCB concentration (including baseline) for dredging with no control structures, 0.35% loss and median flow.

Dredge Plan 060208

model run: plan0602-05

haz - D:\Harry\GENdes\Report\FDR\figures\tid_avg_pcb_7day.pro
Wed Mar 15 16:44:10 2006

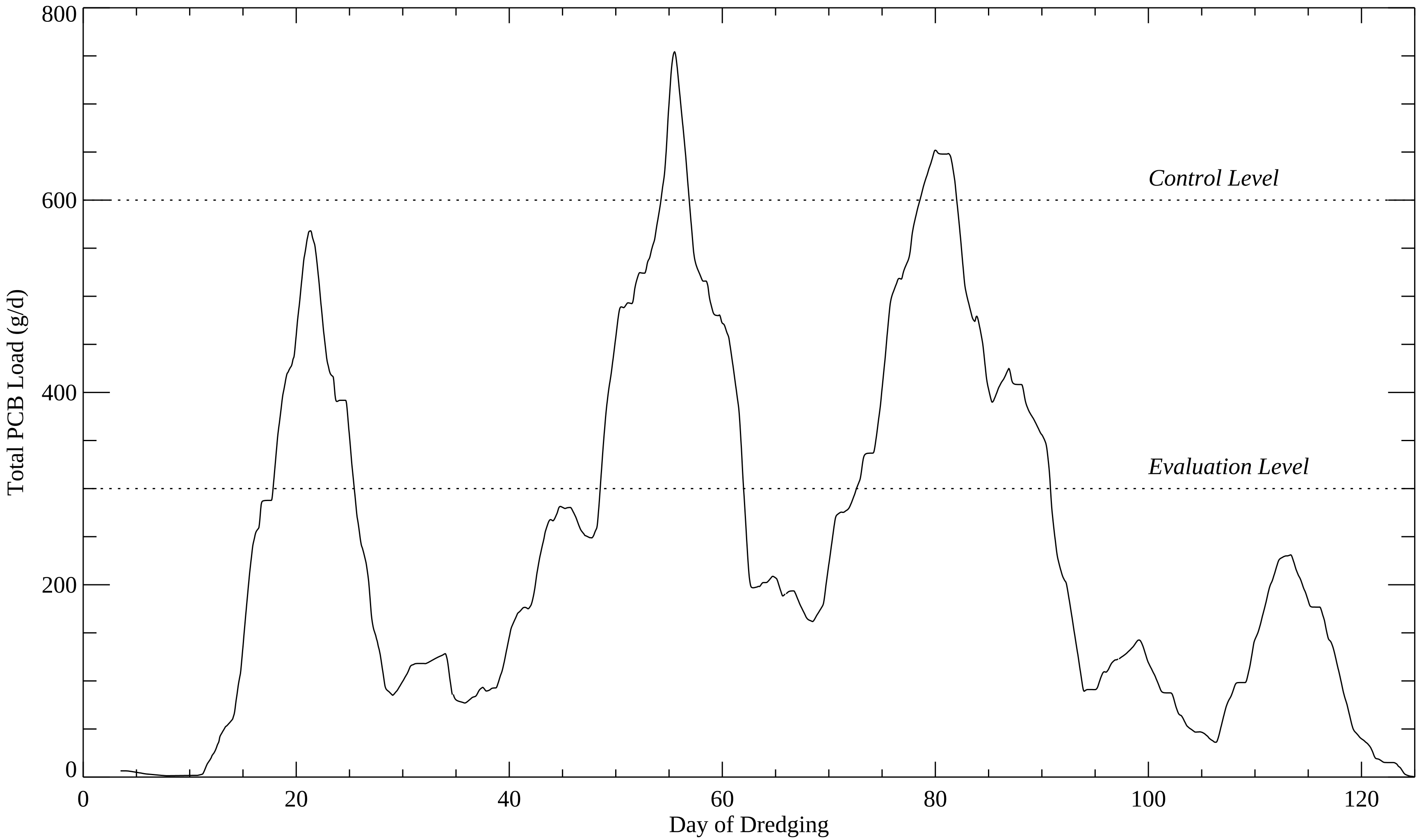


Figure F-5-2. Seven-day average TID total PCB load above baseline for dredging with no control structures, 0.35% loss and median flow.

Dredge Plan 060208

model run: plan0602-05

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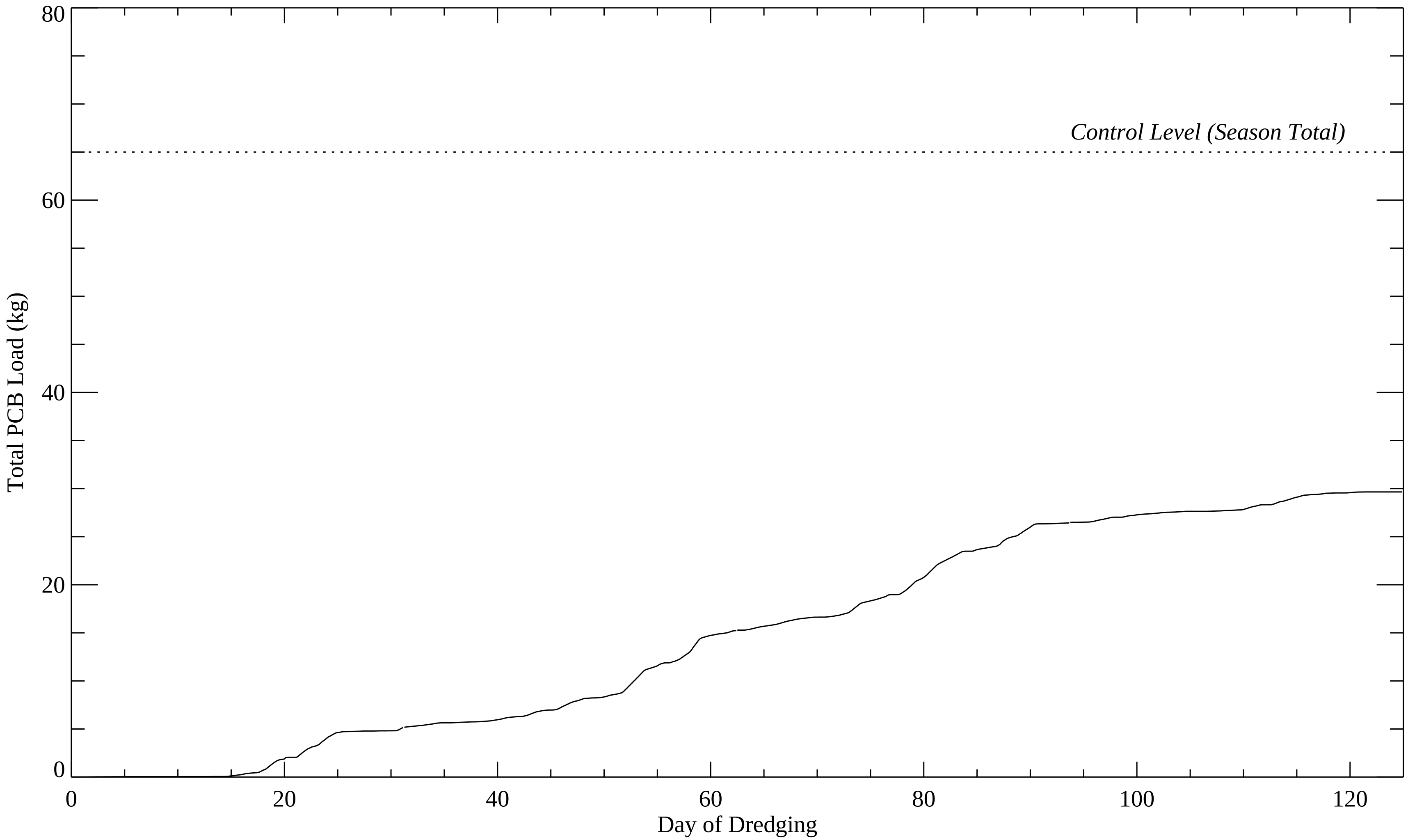

Figure F-5-3. Cumulative TID total PCB load above baseline for dredging with no control structures, 0.35% loss and median flow.

Dredge Plan 060208

model run: plan0602-05

haz - D:\Harry\GENdes\Report\FDR\figures\tid_pcb_load_cum.pro
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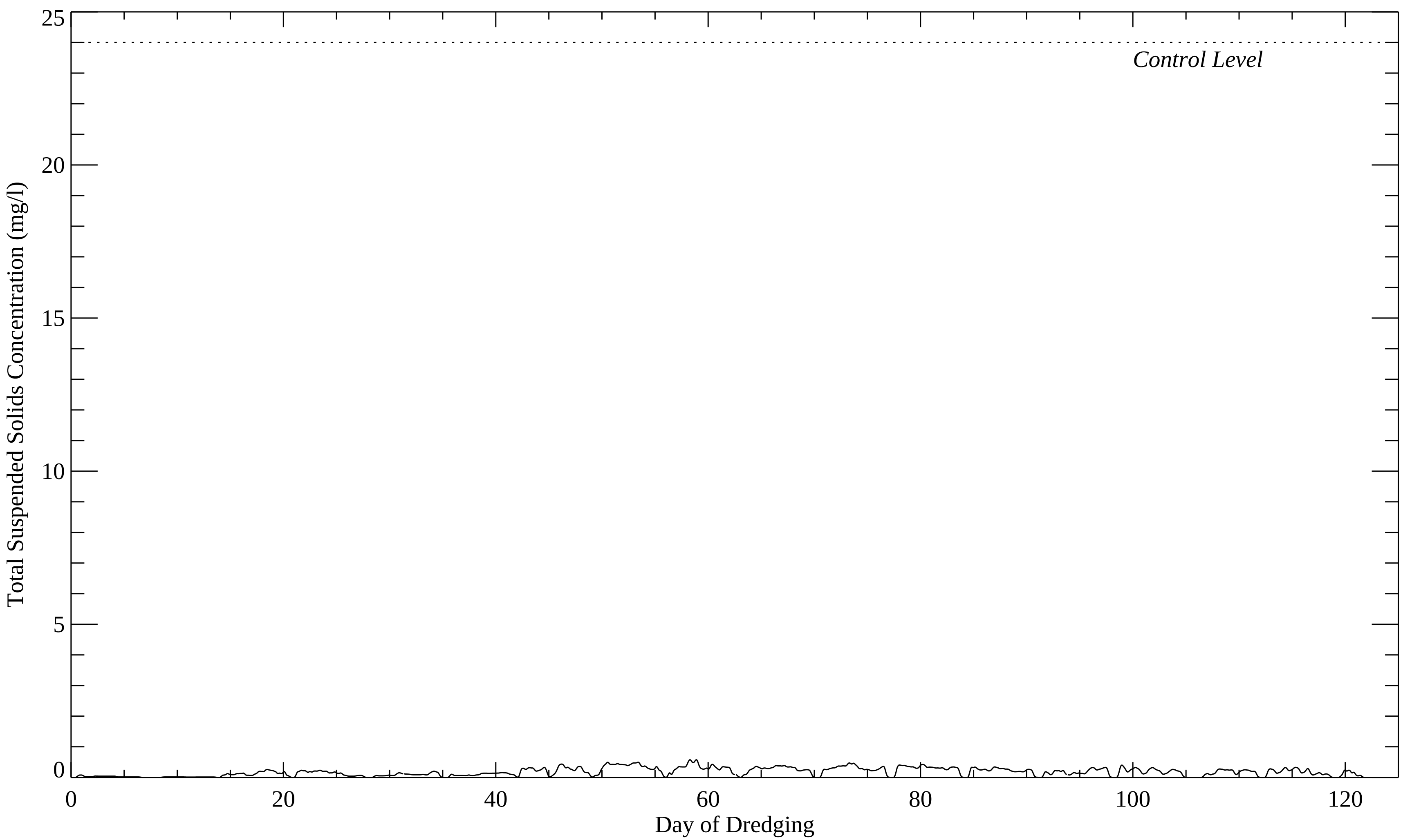

Figure F-5-4. Six-hour average TID total TSS concentration above baseline for dredging with no control structures, 0.35% loss and median flow.

Dredge Plan 060208

model run: plan0602-05

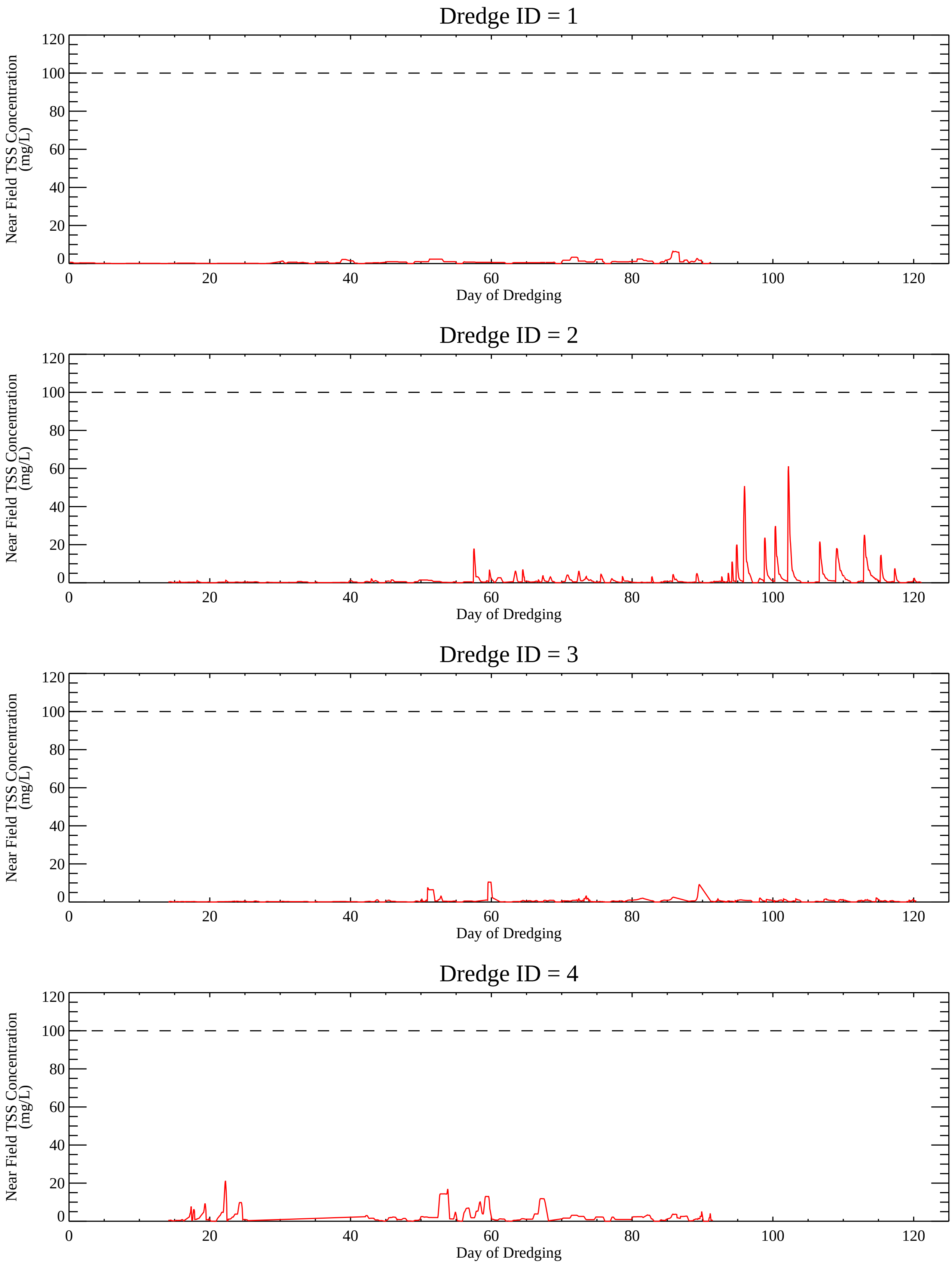

Figure F-5-5. Six-hour average TSS at near field monitoring stations (300 m downstream) with no control structures and 0.35% loss from the source.

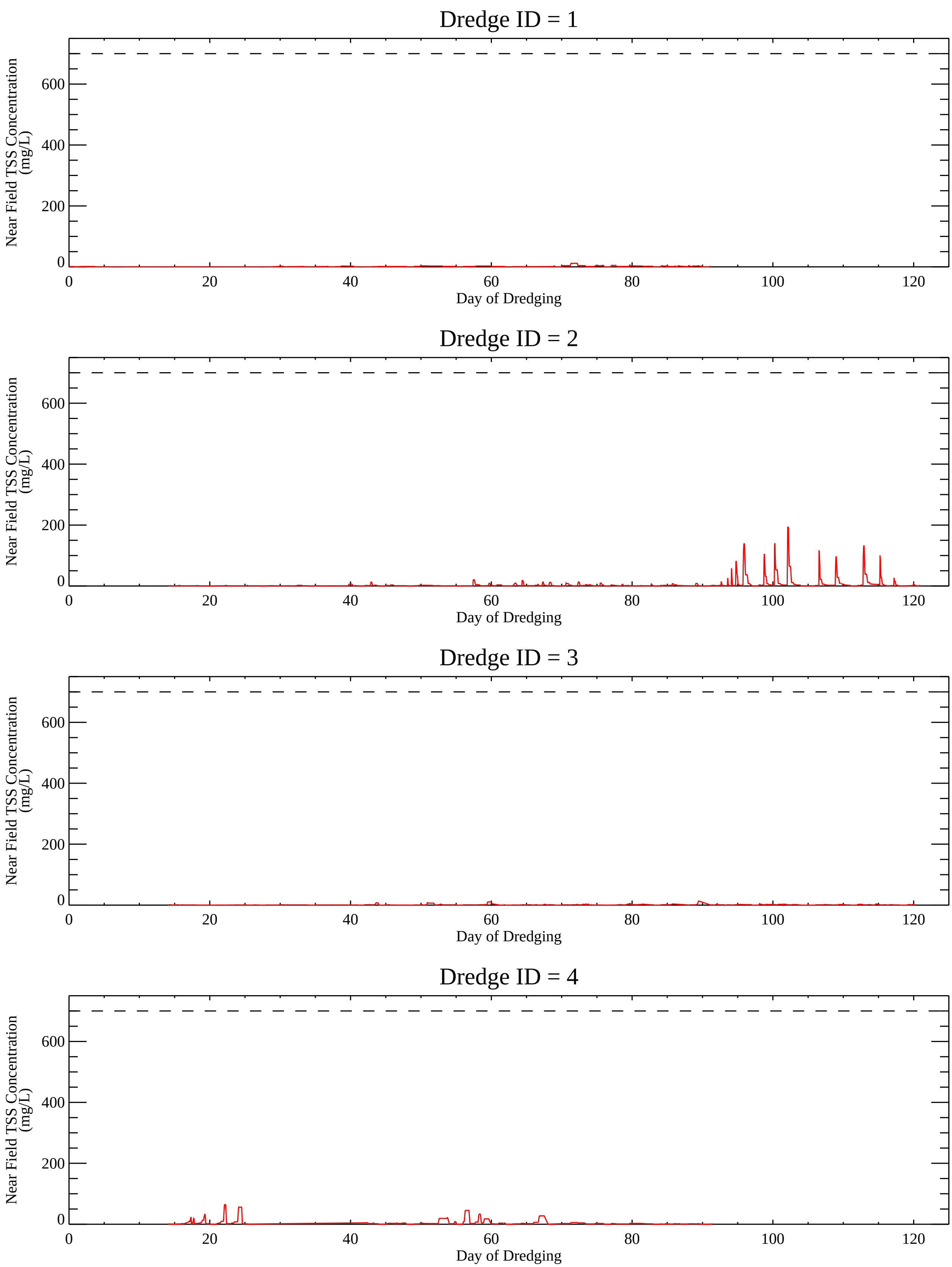

Figure F-5-6. Three-hour average TSS at near field monitoring stations (100 m downstream) with no control structures and 0.35% loss from the source.

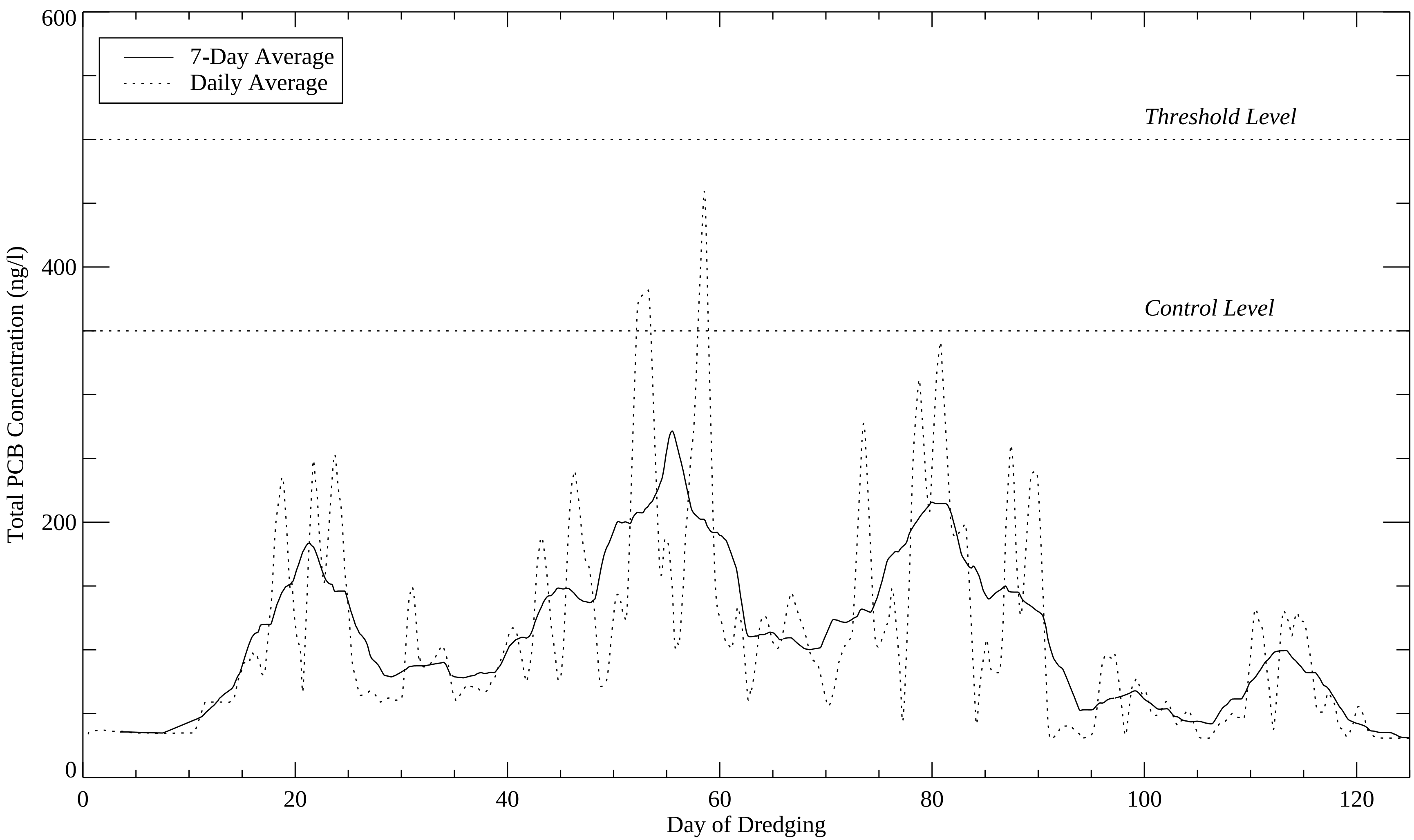

Figure F-5-7. Average TID total PCB concentration (including baseline) for dredging with no control structures, 0.70% loss and median flow.

Dredge Plan 060208

model run: plan0602-06

haz - D:\Harry\GENdes\Report\FDR\figures\tid_avg_pcb_7day.pro
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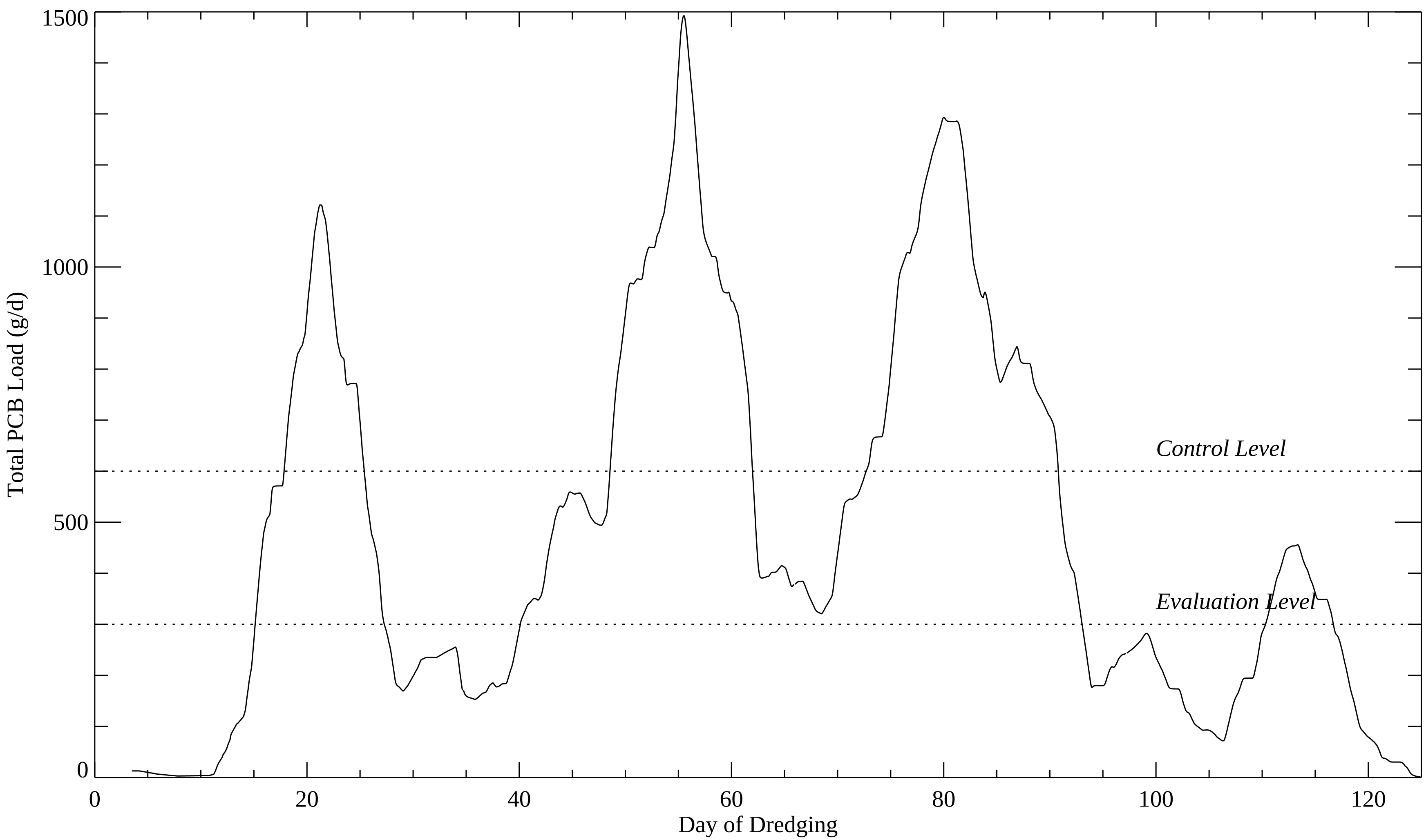

Figure F-5-8. Seven-day average TID total PCB load above baseline for dredging with no control structures, 0.70% loss and median flow.

Dredge Plan 060208

model run: plan0602-06

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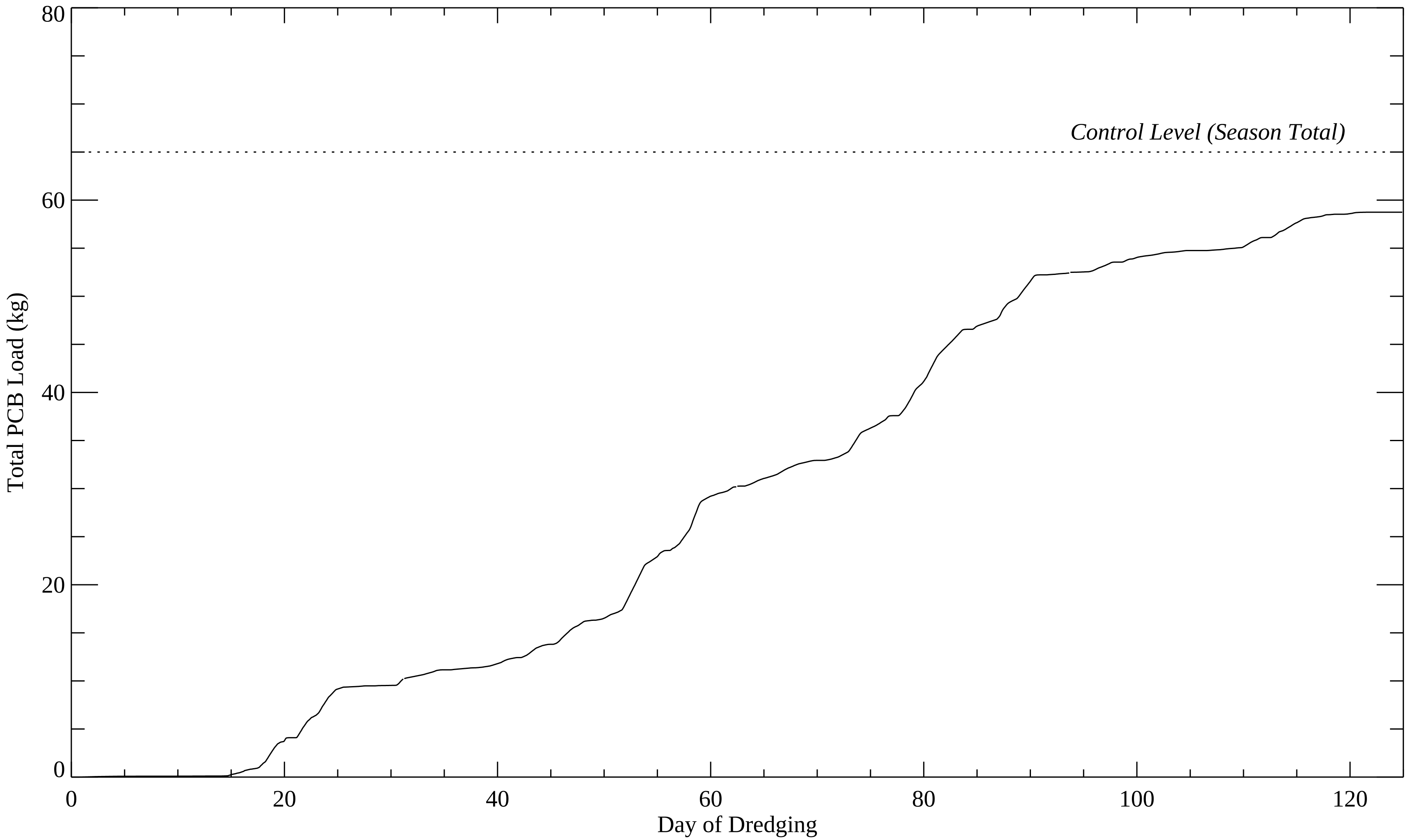

Figure F-5-9. Cumulative TID total PCB load above baseline for dredging with no control structures, 0.70% loss and median flow.

Dredge Plan 060208

model run: plan0602-06

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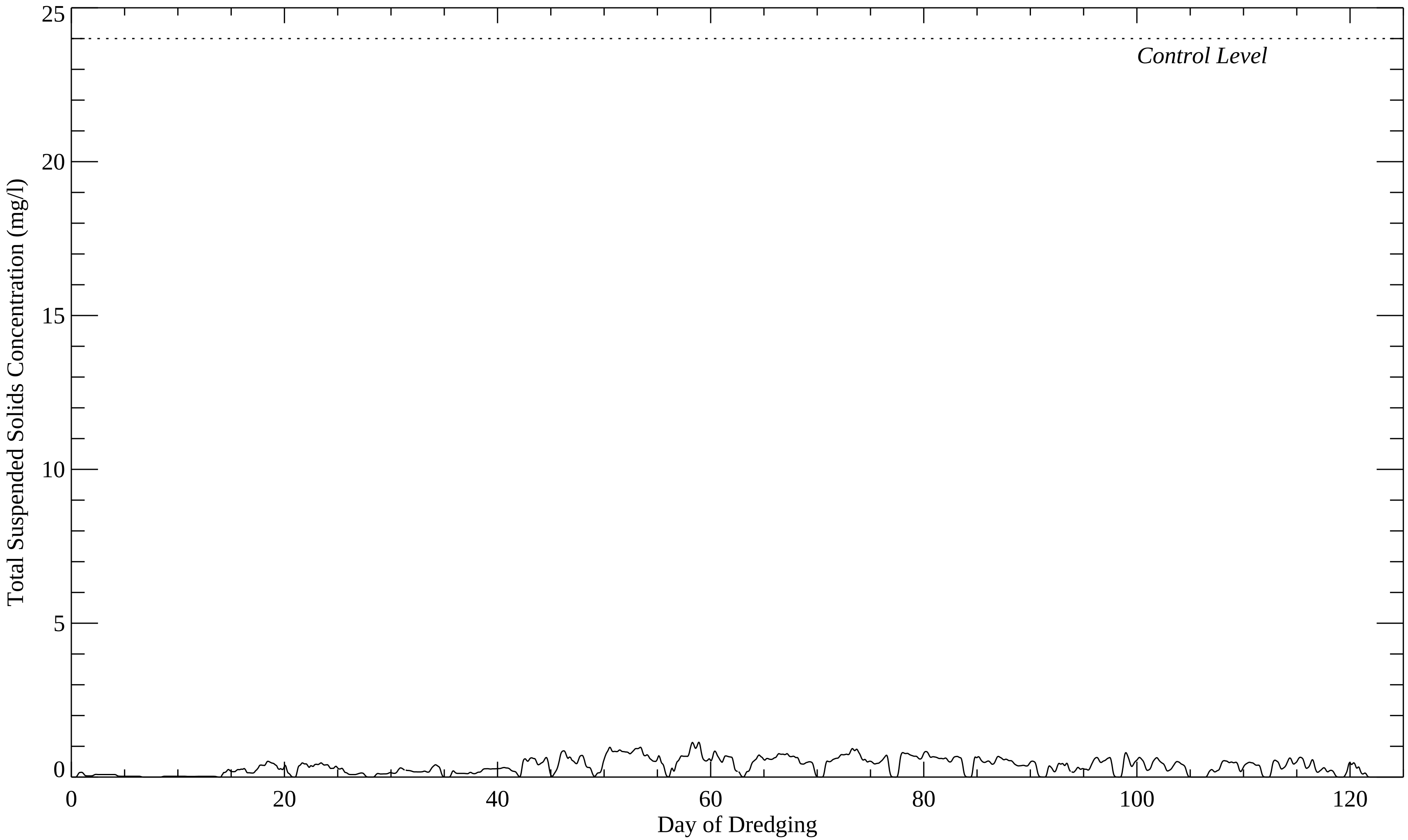

Figure F-5-10. Six-hour average TID total TSS concentration above baseline for dredging with no control structures, 0.70% loss and median flow.

Dredge Plan 060208

model run: plan0602-06

haz - D:\Harry\GENdes\Report\FDR\figures\tid_avg_tss_6hour.pro
Wed Mar 15 17:02:12 2006

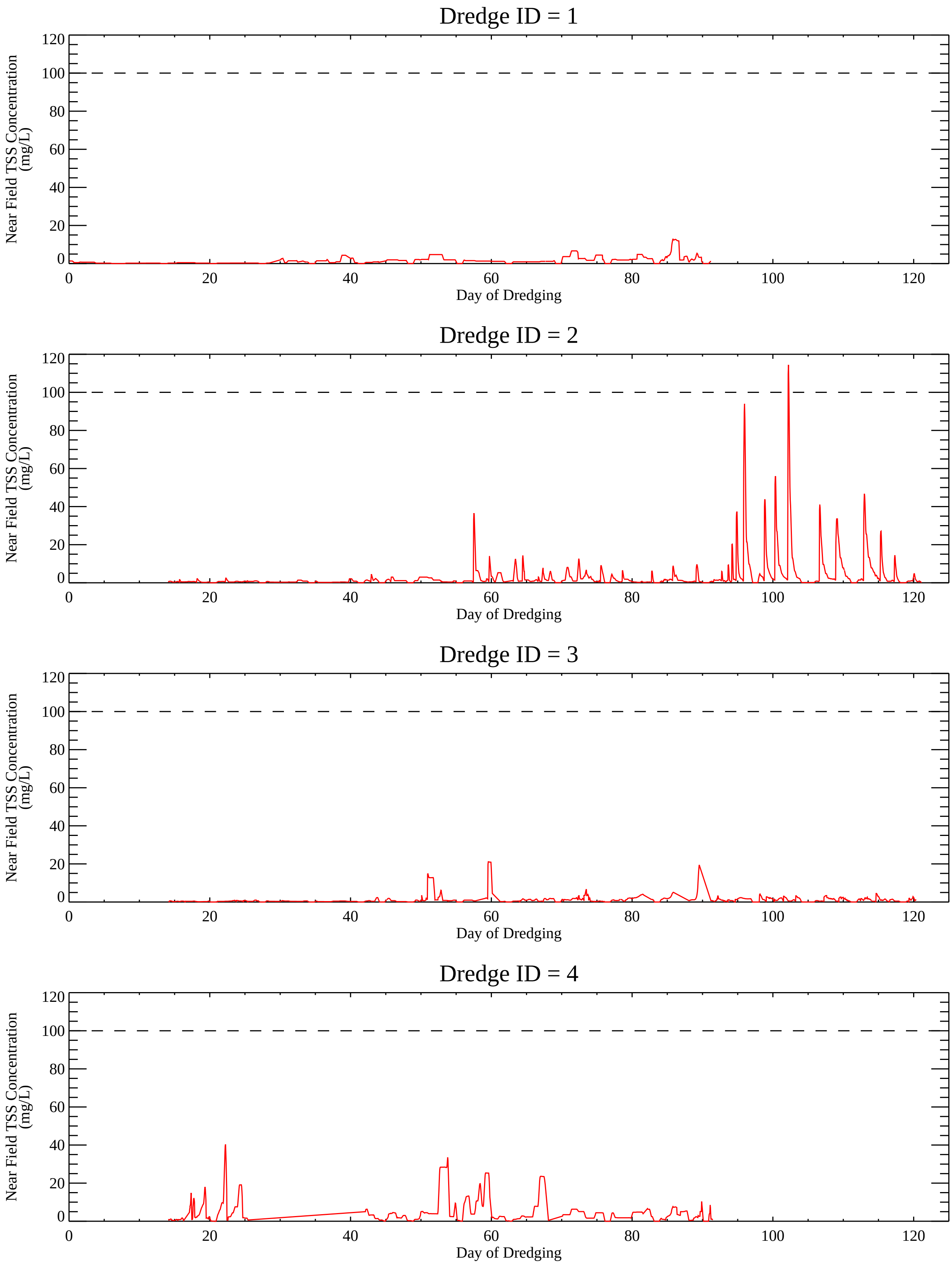

Figure F-5-11. Six-hour average TSS at near field monitoring stations (300 m downstream) with no control structures and 0.70% loss from the source.

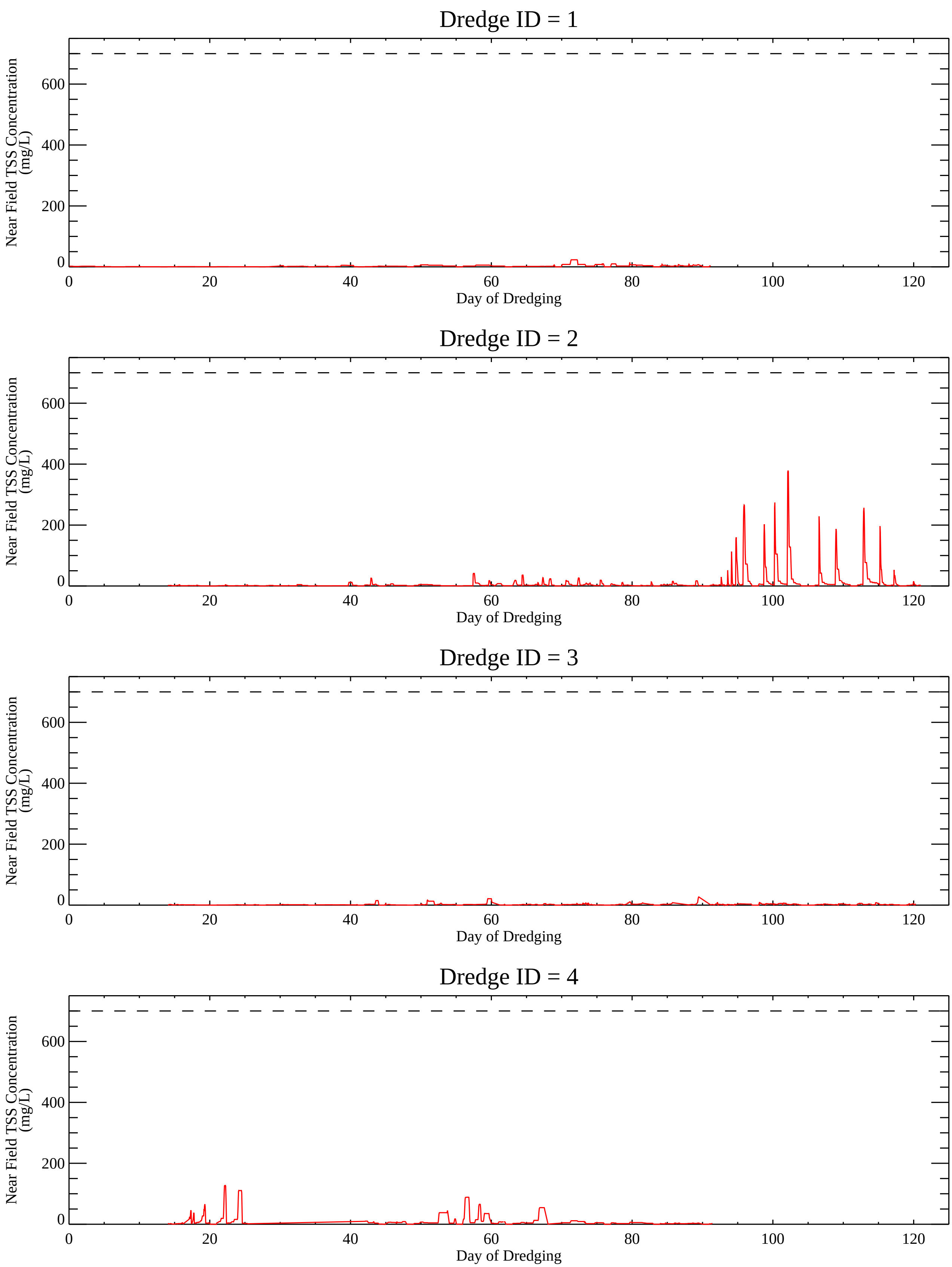

Figure F-5-12. Three-hour average TSS at near field monitoring stations (100 m downstream) with no control structures and 0.70% loss from the source.

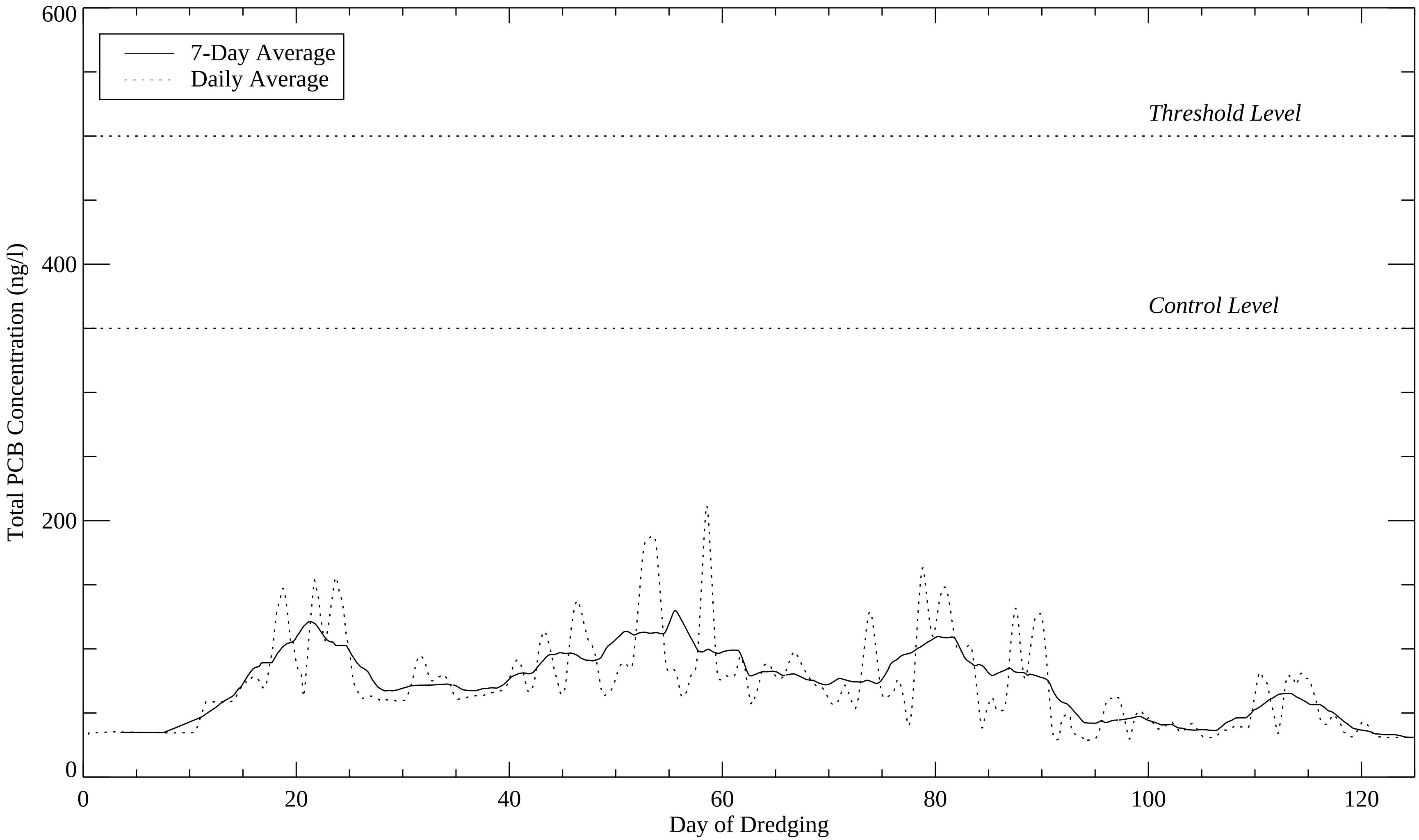

Figure F-5-13. Average TID total PCB concentration (including baseline) for dredging with NTIP and EGIA control structures, 0.35% loss and median flow.

Dredge Plan 060208

model run: plan0603-01

haz - D:\Harry\GENdes\Report\FDR\figures\tid_avg_pcb_7day.pro
Wed Mar 15 16:44:11 2006

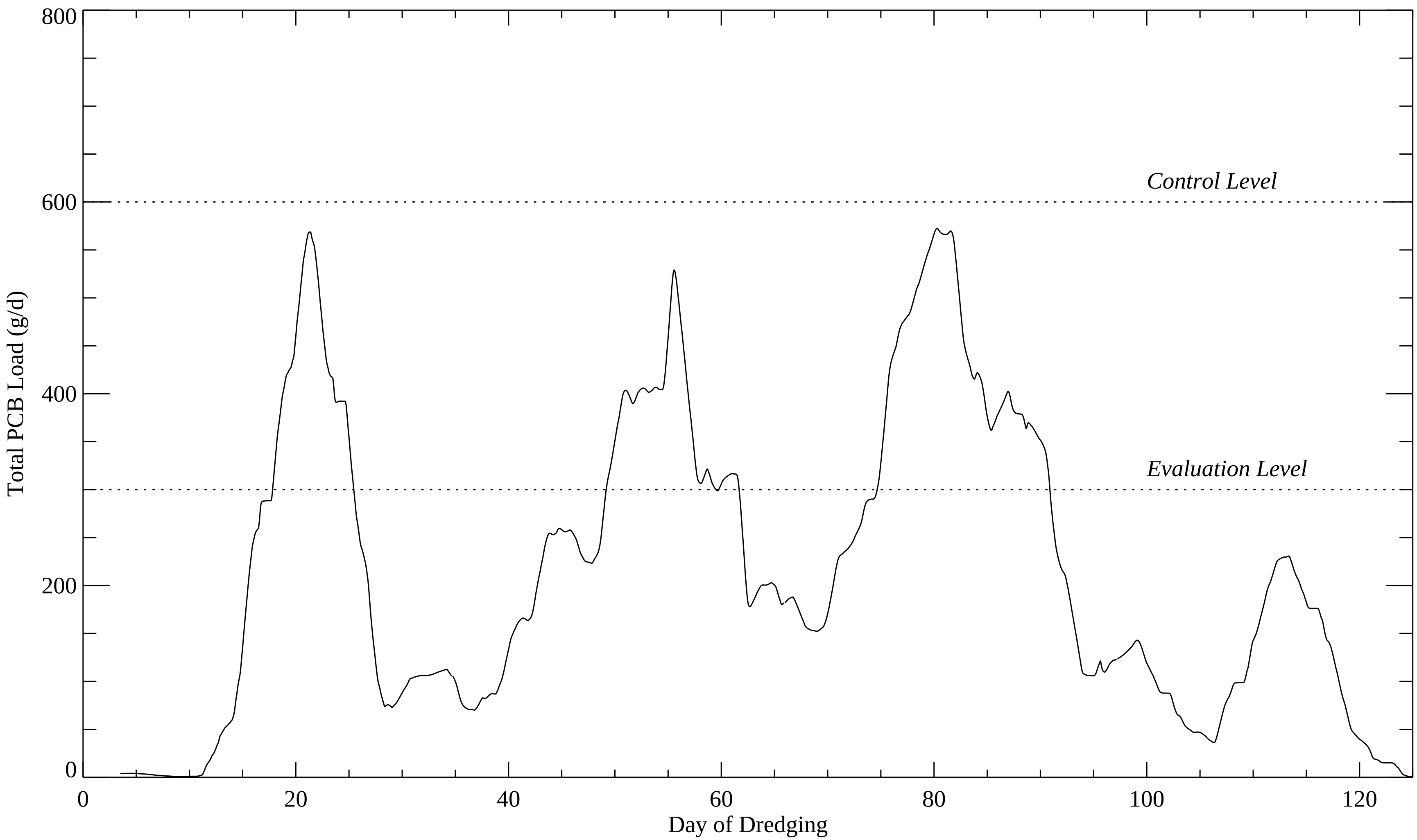

Figure F-5-14. Seven-day average TID total PCB load above baseline for dredging with NTIP and EGIA control structures, 0.35% loss and median flow.

Dredge Plan 060208

model run: plan0603-01

haz - D:\Harry\GENdes\Report\FDR\figures\tid_pcb_load_7day.pro
Wed Mar 15 16:52:05 2006

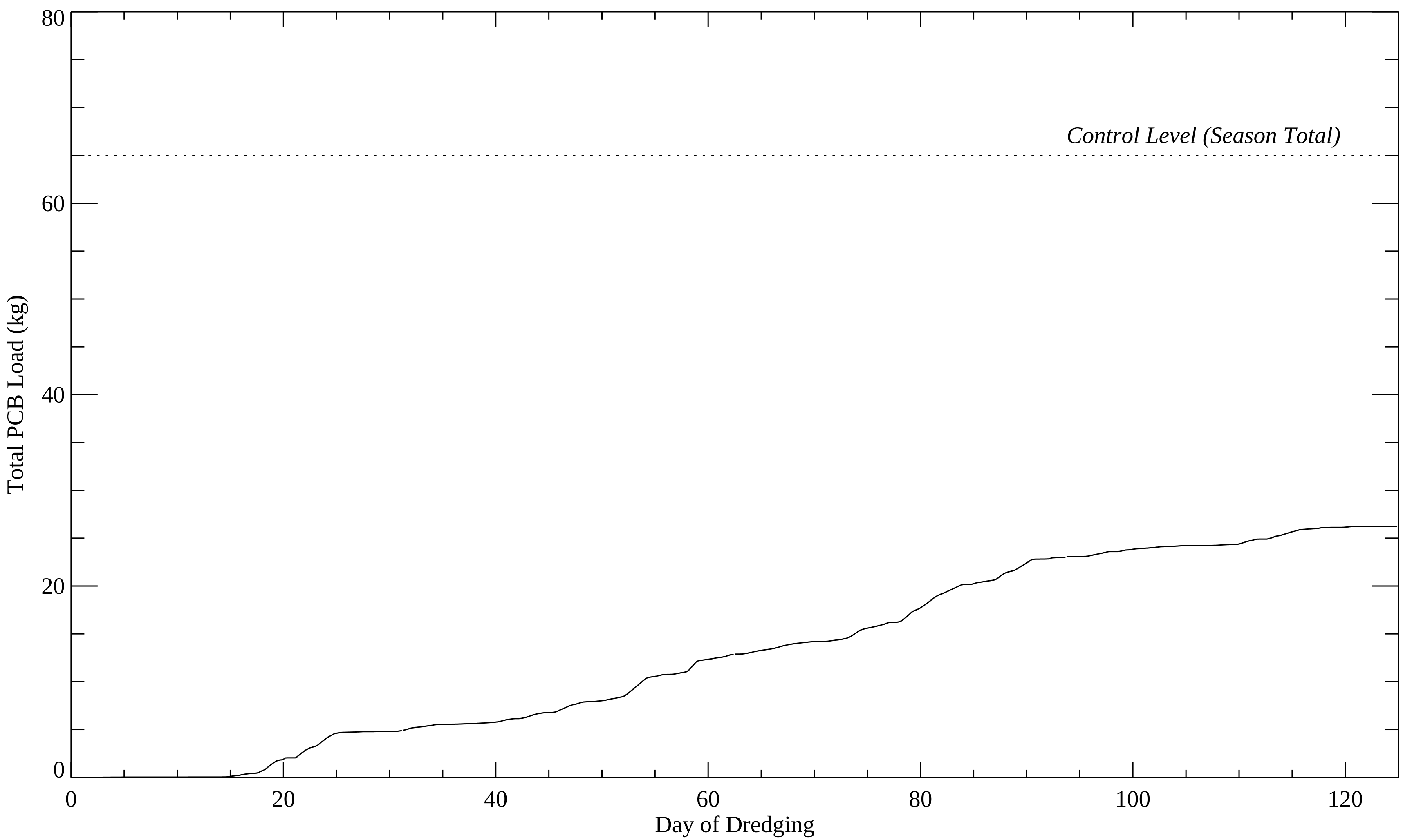

Figure F-5-15. Cumulative TID total PCB load above baseline for dredging with NTIP and EGIA control structures, 0.35% loss and median flow.

Dredge Plan 060208

model run: plan0603-01

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Wed Mar 15 16:51:34 2006

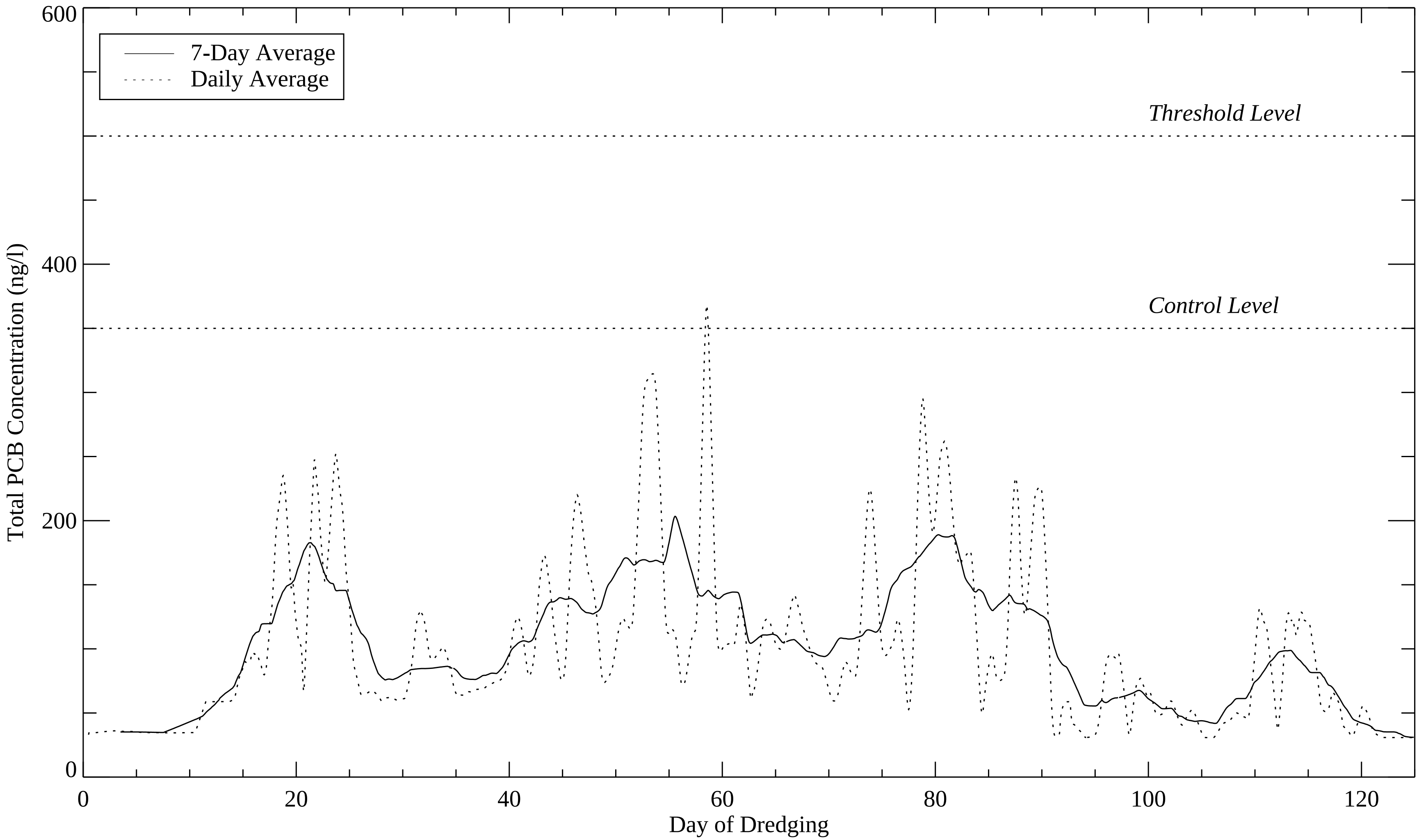

Figure F-5-16. Average TID total PCB concentration (including baseline) for dredging with NTIP and EGIA control structures, 0.70% loss and median flow.

Dredge Plan 060208

model run: plan0603-02

haz - D:\Harry\GENdes\Report\FDR\figures\tid_avg_pcb_7day.pro
Wed Mar 15 16:44:12 2006

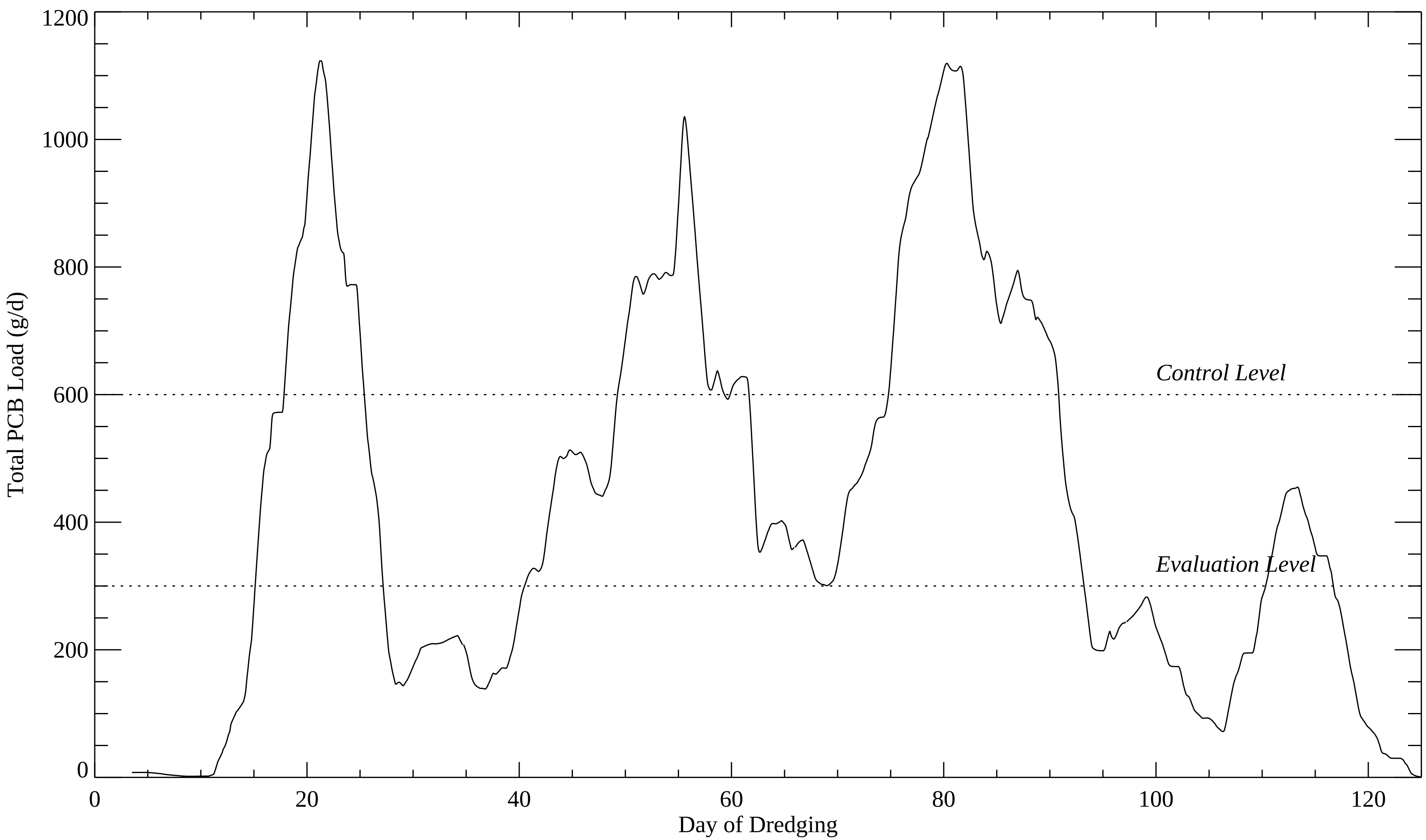

Figure F-5-17. Seven-day average TID total PCB load above baseline for dredging with NTIP and EGIA control structures, 0.70% loss and median flow.

Dredge Plan 060208

model run: plan0603-02

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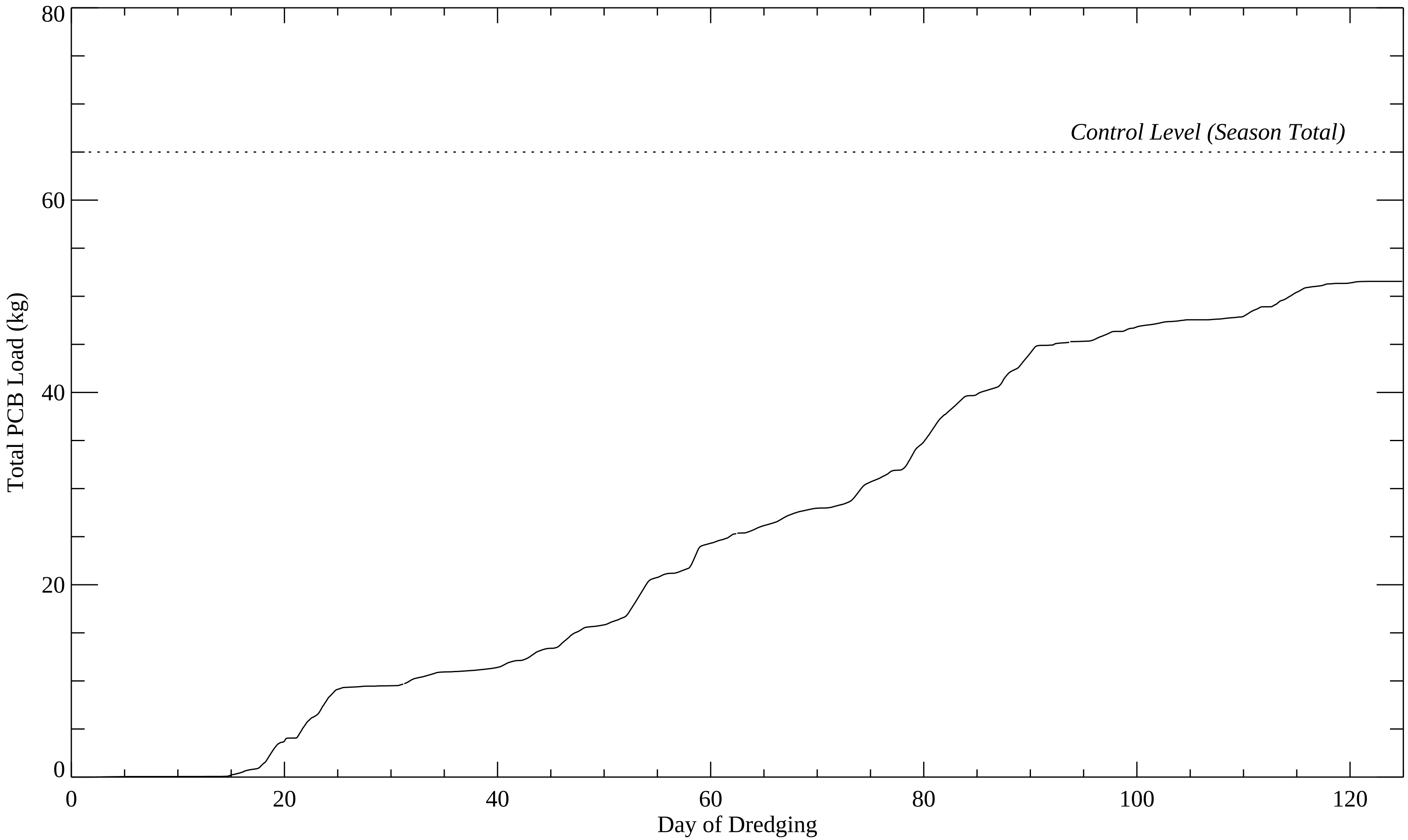

Figure F-5-18. Cumulative TID total PCB load above baseline for dredging with NTIP and EGIA control structures, 0.70% loss and median flow.

Dredge Plan 060208

model run: plan0603-02

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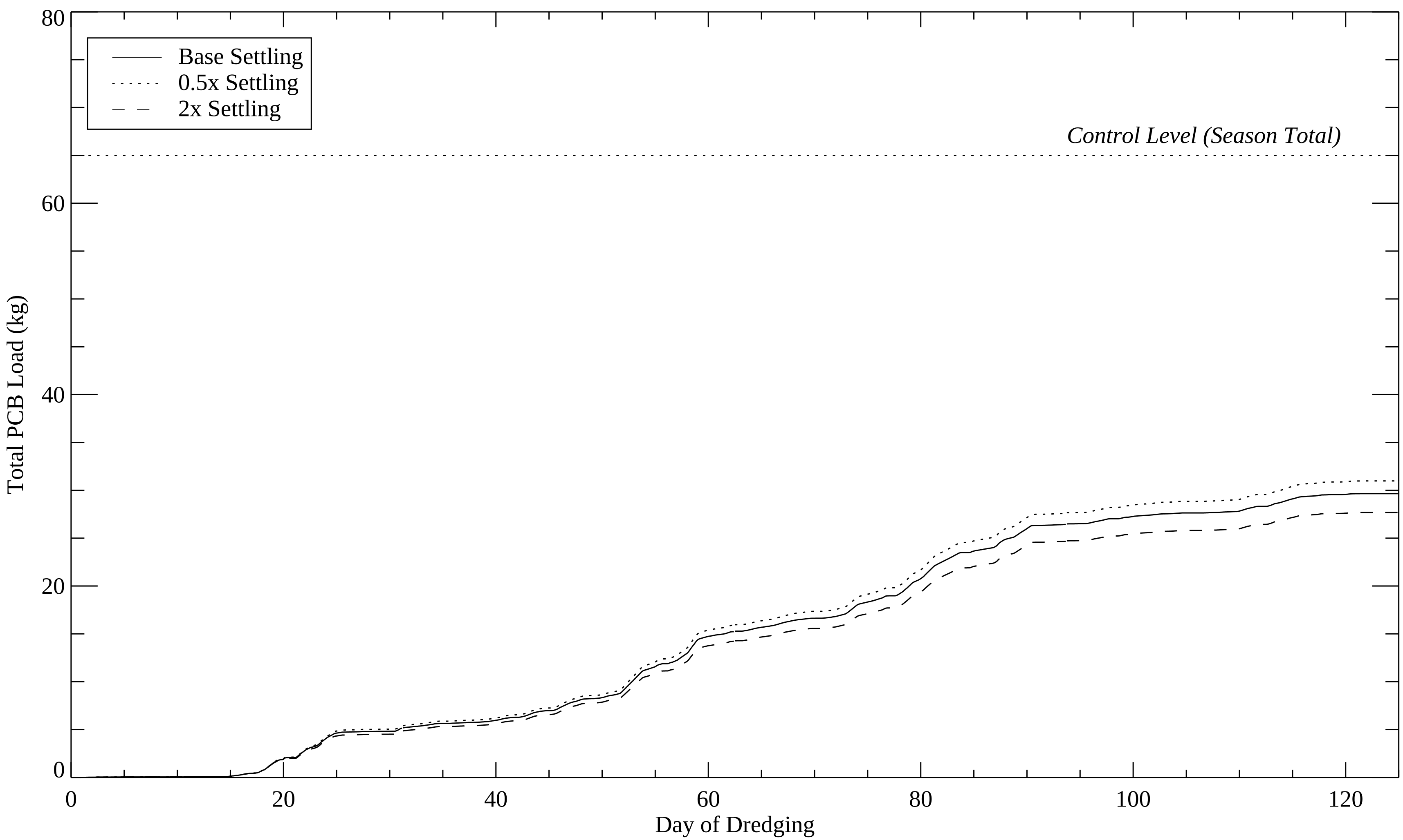

Figure F-5-19. Model sediment settling speed sensitivity of cumulative TID total PCB load above baseline for dredging with no control structures, 0.35% loss and median flow.

Dredge Plan 060208

model run: plan0602-05, plan0603-04, plan0603-03

haz - D:\Harry\GENdes\Report\FDR\figures\tid_pcb_load_cum.pro
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