Foth Infrastructure & Environment, LLC
Memorandum

August 1, 2007

TO: Bill Hartman, GW Partners

CC: JP Causey, WTM1
Skip Missimer, Glatfelter
Pat Zaepfel, Meyer, Unkovic & Scott
Nancy Peterson, Q&B
Jeanne Tarvin, STS
Mike Jury, CH2M Hill
Steve Laszewski, Foth
Tony Vogel, Q&B

FR: Denis Roznowski, Sharon Felix, Steve Lehrke

RE: OU1 2007 Sub-Area C RDMU-5C-A, Area 6B TSCA Core Averaging and Remodeling

Introduction

This memo serves to document implementation of the core averaging process and remodeling in OU1 Sub-Area C, RDMU-5C-A, Area 6B during the 2007 RA. The core averaging procedures were carried out in accordance with the approved procedures outlined in the Foth November 7, 2006 memorandum regarding "OU1 Core Averaging Procedures to Delineate TSCA-Level Sediment in Areas of High PCB Residuals".

The attached Table 1 lists the PCB results which drove the need to apply the core averaging procedure. The secondary sample results at location 6B were 59 and 50 ppm respectively for the 0-.5 ft and .5 -1 ft intervals. As a result, and in accordance with the approved core averaging procedures, step-out cores were collected at four locations surrounding the 6B location. These samples were composited for each interval. Results of the composite samples are also presented in Table 1. Figure 1 shows the secondary sample location (6B), the step-out core locations (6B1 thru 6B4), and other post-dredge soft sediment thickness measurements made with "mini-cores" as part of high subgrade confirmation or special sampling around the 6B area.

Soft sediment was recovered from all four step-out core samples in the 0 -.5 ft interval, and the composite result was 27 ppm PCB. Locations 6B3 and 6B4 did not have adequate soft sediment available to collect a second interval sample. Only samples 6B1 and 6B2 had second interval samples. After compositing, these two samples yielded a PCB result of 84 ppm for the .5-1 ft interval. The 6B1 and 6B2 locations did not have adequate soft sediment available to collect a third interval.

As shown in Table 1, application of the approved core averaging procedure at this location yields an average PCB concentration of 48.1 ppm. The sediment in this area is therefore not regulated under TSCA and can be handled as non-TSCA material.

Remodeling of the 2007 Subarea C redredge areas was performed to recharacterize remaining soft sediment PCB concentrations and PCB mass. The data used in the remodeling of the 2007 redredge areas was limited to 2007 post-dredge sample core, mini-core and poling results. Post-dredge interpolations, from which area, volume and mass estimates are made, were generated for PCB concentration, percent solids and sediment thickness. While the interpolations were made for the entire 2007 redredge area, model results were limited to Area 6B boundaries to provide information for Area 6B only. The interpolations were created as follows:

Sediment Thickness:
Post dredge sample core log and mini-core data were used to develop a post-dredge sediment thickness prism. Core logs provided a depth to clay at each core location. If a core log indicated all soft sediment, the corresponding poling (to refusal) result was used. Linear interpolation was used to estimate sediment thickness over the 2007 dredge region where possible. For certain areas near the Subarea boundaries, linear interpolation could not be used since these areas fell outside data limits. Here inverse distance weighted (IDW) interpolation was used with the same two-dimensional parameter settings as the BODR Subarea C GMS-Sed model.

PCB Concentration and Percent Solids:
PCB and percent solids interpolations were created from the three-dimensional 2007 post-dredge core data. In Area 6B, the PCB data was limited to the sample 6B step-out core average of 33.4 ppm for the 0"-6" interval and 72.7 ppm for the 6"-12" interval, and also to the sample 6P result of 0.11 ppm in the top interval. Three dimensional IDW interpolation was used to develop the PCB and percent solids interpolations with the same parameter settings as the BODR Subarea C GMS-Sed model with one exception. Here the vertical anisotropy was set to 0.01 (a vertical scaling factor of 100) instead of 0.00266 (a vertical scaling factor of 375). In this case the parameter adjustment was needed for the interpolation to correctly capture the sample 6P result.

Remodel Results

Modeling of the 2007 Subarea C, redredge area 6B indicates an area of soft sediment ≥10 ppm PCB within area 6B of 0.14 acres, with a volume of 90 cubic yards, and a mass of 1.4 kilograms. This area is shown on Figure 2 and model results are summarized in Table 1. Water depth in Area 6B is illustrated in Figure 1 and remaining sediment thickness in Area 6B is illustrated in Figure 2.

Conclusions

GW Partners proposes to address the 6B area as part of the 2008 RA since all major equipment for sand cover or dredging is north of the former train trestle for the duration of the 2007 RA. This area was dredged in 2006, and then redredged in 2007. Therefore, the likely method of addressing this area will be to apply a sand cover followed by post-sand coring and PCB analysis for resultant residual PCB concentration confirmation. Water depth in this area will also need to be taken into consideration. The post-dredge water depth (based on low water datum conditions) in the affected area ranges from 2 to 4 feet.

A formal proposal to address this area will be made as part of the 2008 RAWP.

Table 1
GW Partners
Lower Fox River - OU 1
TSCA Core Averaging Results, Sub-Area C, RDMU-5C-A, Sample Area 6

Results

Secondary Sample			
PCB result (ppm PCB)			
	0-0.5 ft	0.5-1 ft	> 1 ft
A	NSS	NA	NA
B	59	50	NSS

Step out Coring			
PCB result (ppm PCB)			
	0-0.5 ft	0.5-1 ft	> 1 ft
6B1	27	84	NSS
6B2	27	84	NSS
6B3	27	NSS	NA
6B4	27	NSS	NA

Core Averaging

Layer Averages		ppm PCB	
0 - 0.5 ft	[(27*4)+(59*1)]/5 =	33.4	=Step out core composite result (0-0.5 ft)*Number of samples+Original result (0-0.5 ft)*Number of Samples/Total Samples
0.5-1 ft	[(84*2)+(50*1)]/3 =	72.7	=Step out core composite result (0.5-1 ft)*Number of samples+Original result (0.5-1 ft)*Number of Samples/Total Samples

Small Area Average		
33.4*5 =	167	=0-0.5 ft layer average*Number of Samples
72.7*3 =	218.1	=0.5-1 ft layer average*Number of Samples
Sum of layer averages	385.1	
Number of Samples	8	
385.1/8 =	48.1	=Sum of layer averages/Number of Samples

Model Data for Area 6B (10 ppm PCB region)

Volume	Area	Mass
90 cubic yards	0.14 acres	1.4 Kg

Notes:

ft = feet

PCB = Polychlorinated biphenyl

TSCA = Toxic Substances Control Act

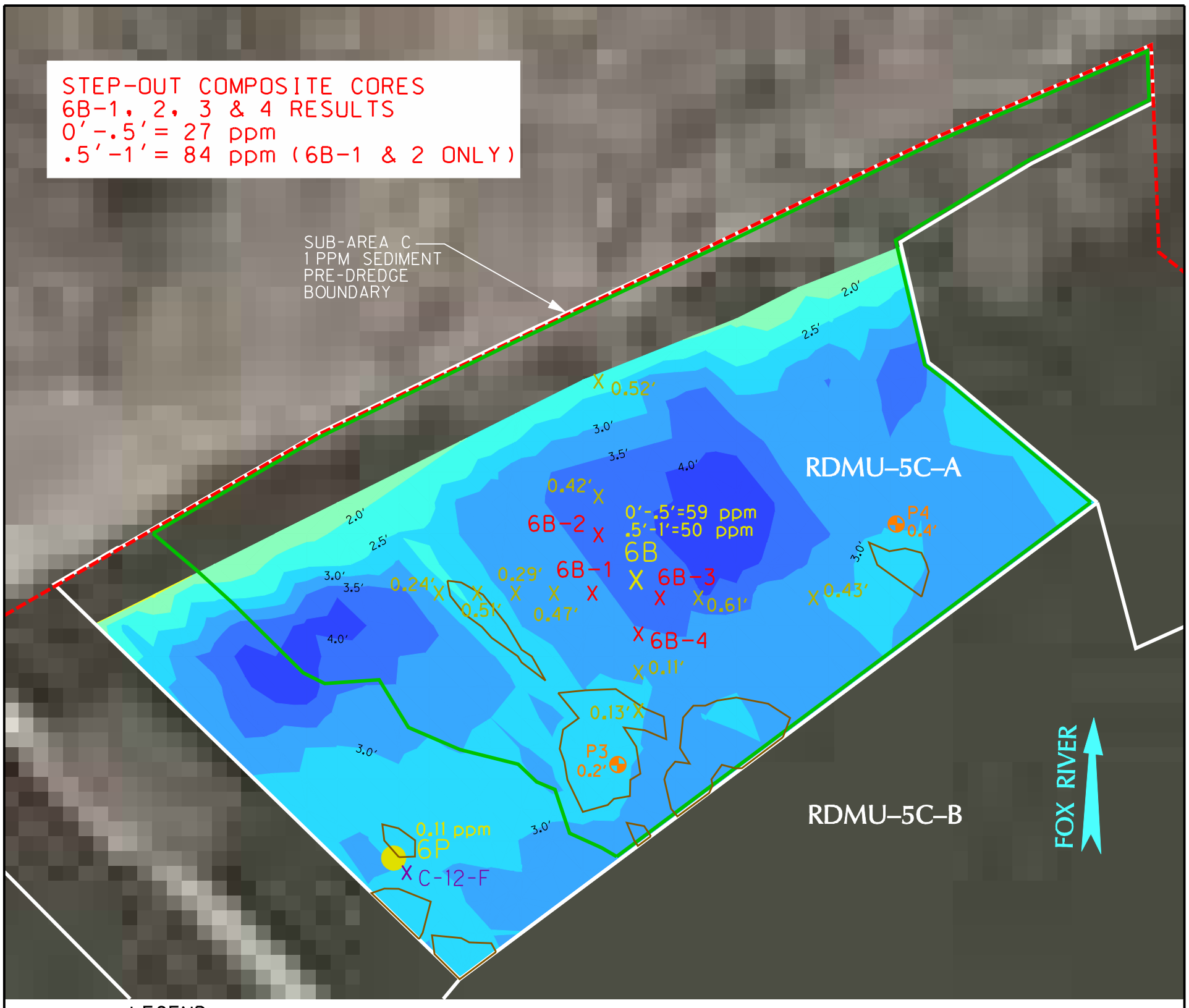
RDMU = Redredge Management Unit

NSS = No Sample ≥ 3" recovered

0.0168 = PCB Value (1 ppm) assigned to NSS samples (does not apply to step-out cores)

Kg = Kilogram

Prepared by: SVF
Checked by: GRE



LEGEND

- PRE-DREDGE 1 PPM SEDIMENT BOUNDARY
- 10 ppm CONTOUR
- C-12-F — PRE-DESIGN CORING SAMPLE LOCATIONS
- 6P 0.11 ppm — POST-DREDGE PRIMARY SAMPLE LOCATION WITH PCB RESULTS
- 6B — POST-DREDGE-SECONDARY SAMPLE LOCATION
- 6B-2 — STEP-OUT CORE LOCATION
- 0.11' — MINI CORE LOCATION WITH SOFT SEDIMENT THICKNESS
- P3 0.2' — HIGH SUB-GRADE POLING TEST LOCATION WITH SEDIMENT THICKNESS
- AREAS OF POST-DREDGE TOP OF SEDIMENT ELEVATION ABOVE DESIGN 1 PPM ELEVATION

0 10' 20'
BAR SCALE

NOTE:

1. THE HORIZONTAL CONTROL IS REFERENCED TO THE NAD83 WISCONSIN STATE PLANE COORDINATE SYSTEM (WISCONSIN SOUTHERN ZONE). THE VERTICAL CONTROL IS REFERENCED TO NAVD 88.

WATER DEPTHS

WATER DEPTHS BASED ON LOW WATER DATUM ELEVATION OF 736.23 AND POST DREDGE TOP OF SEDIMENT ELEVATIONS

- 1.5' - 2.0' WATER DEPTH
- 2.0' - 2.5' WATER DEPTH
- 2.5' - 3.0' WATER DEPTH
- 3.0' - 3.5' WATER DEPTH
- 3.5' - 4.0' WATER DEPTH
- 4.0' - 4.5' WATER DEPTH

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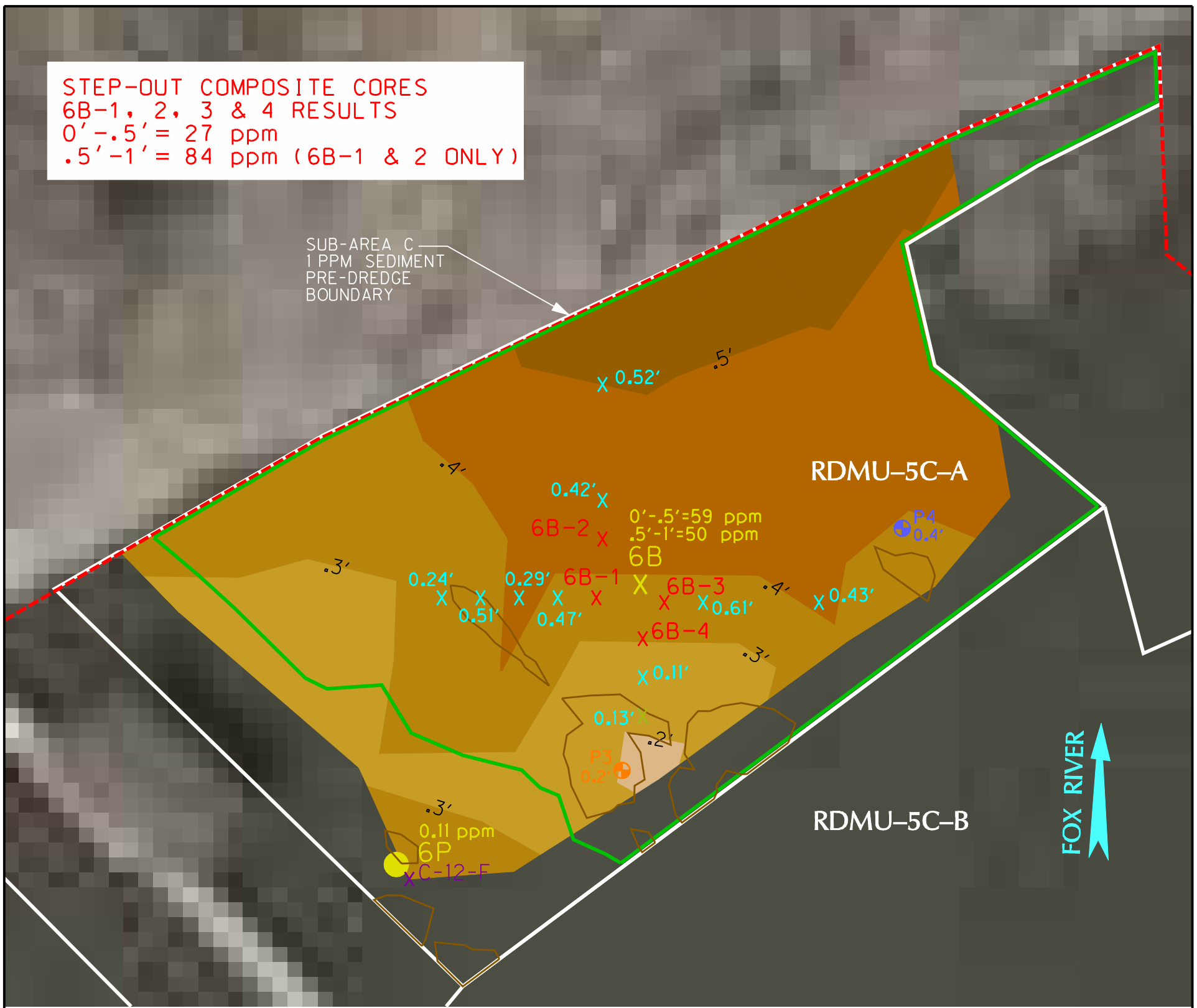
FIGURE 1

LOWER FOX RIVER - OU1 - SUB-AREA C
RDMU-5C-A AREA 6B STEP-OUT CORE
POST-DREDGE SAMPLING RESULTS

Date: JULY, 2007	Revision Date: APRIL, 2008	
Drawn By: JRB2	Checked By: DMR	Scope: 07G007

X:\GB\IE\2007\07G007\CAD\C-D2S\plotting\RDMU-5C-A-Step-out.3d
4/15/2008 bjw1



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WATER DEPTHS

WATER DEPTHS BASED ON LOW WATER DATUM ELEVATION OF 736.23 AND POST DREDGE TOP OF SEDIMENT ELEVATIONS

- 0.1' - 0.2' SEDIMENT THICKNESS
- 0.2' - 0.3' SEDIMENT THICKNESS
- 0.3' - 0.4' SEDIMENT THICKNESS
- 0.4' - 0.5' SEDIMENT THICKNESS
- 0.5' - 0.6' SEDIMENT THICKNESS

0 10' 20'
BAR SCALE

NOTE:

1. THE HORIZONTAL CONTROL IS REFERENCED TO THE NAD83 WISCONSIN STATE PLANE COORDINATE SYSTEM (WISCONSIN SOUTHERN ZONE). THE VERTICAL CONTROL IS REFERENCED TO NAVD 88.

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FIGURE 2

LOWER FOX RIVER - OU1 - SUB-AREA C
RDMU-5C-A AREA 6B STEP-OUT CORE
POST-DREDGE SAMPLING RESULTS

Date: JULY, 2007	Revision Date: APRIL, 2008	
Drawn By: JRB2	Checked By: DMR	Scope: 07G007

X:\GB\IE\2007\07G007\CAD\C-D2S\plotting\RDMU-5C-A-Step-out-2.3d
4/15/2008 bjw1

"Hartman, William A." <WAH@glatfelter.com>

08/09/2007 02:40 PM

To: <george.berken@boldt.com>
cc: <nkp@quarles.com>, <phz@muslaw.com>, "Missimer, Skip" <CLM@glatfelter.com>, <slaszewski@foth.com>, <Mjury@ch2m.com>, <DRoznowski@foth.com>
Subject: Fw: 87500 OU1 - Sub-area C Step-out Core Results

Will do. Thanks.

Sent from my BlackBerry Wireless Handheld

----- Original Message -----
From: George.Berken@boldt.com <George.Berken@boldt.com>
To: Hartman, William A.
Cc: LFR.OverSightTeam@boldt.com <LFR.OverSightTeam@boldt.com>; Tom Vik <tvik@mcmgrp.com>; Mike Palermo <mike@mikepalermo.com>; John Kern <jkern@kernstat.com>; AgenciesLFRTeam@boldt.com <AgenciesLFRTeam@boldt.com>
Sent: Thu Aug 09 12:43:12 2007
Subject: 87500 OU1 - Sub-area C Step-out Core Results

Bill, the Agencies and Oversight Team has have reviewed the "Sub-Area 'C' Step-Out Core Results".

Please include this information/data in your "2007 Summary Report".

It is acceptable to the Agencies that the final proposed remediation action for this small area will be included in the "2008 RAWP" and that this area will receive its final remediated next year (2008).

Thanks,
George...

George A. Berken, PE
Engineering Project Manager

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08/03/2007 02:08 PM

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Fax to

Subject
Sub-area C Step-out Core Results

Greg and Jim,

Attached please find a memo that provides information related to Sub-area C, RDMU5C-A, area 6B. Please let me know if you have any questions. Thanks,

<<M- Hartman OU1 2007 Sub-Area C RDMU -5C-A Core Ave-remodel.pdf>>

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