

Foth & Van Dyke
Draft Technical Memorandum

September 22, 2005

TO: Greg Hill, WDNR
Jim Hahnenberg, USEPA
Rich Johnson, Boldt

CC: Bill Hartman, GW Partners
Skip Missimer, Glatfelter
Pat Zaepfel, Glatfelter
John Blind, Glatfelter
Nancy Peterson, Q&B
Tony Vogel, Q&B
JP Causey, WTM I
Jeanne Tarvin, STS
John Trast, STS
Mike Jury, CH2MHill
Tara Konkle, Foth & Van Dyke
Jerry Eykholt, Foth & Van Dyke

FR: Steve Laszewski, Foth & Van Dyke
Denis Roznowski, Foth & Van Dyke

RE: Additional Characteristics East-Central Region for Sub-Area A

A September 7, 2005 draft technical memorandum presented Pre-design information for a select portion of Sub-area A, referred to as the “east-central” portion of Sub-area A. This location of interest in Sub-area A is delineated on the attached figure. This memorandum summarizes the previous information and responds to a request from USEPA for additional information for this area of interest.

Summary of September 7, 2005 Memorandum

Data used from this east-central location to develop the BODR Sub-area A dredge prism consisted of five samples all of which have PCB concentrations less than 2.0 ppm. In addition, this east-central location of Sub-area A is characterized by high in-situ percent solids (indicating sand/gravel material) with current planned dredge cuts to elevation of only 0.5 feet or less. Additionally overcut dredging would be necessary here, with the overcut clearly operating in the sand/gravel material.

A summary of the current data from this east-central location in Sub-area A includes:

Location	PCB Concentration	In-Situ Percent Solids
DAO1S	1.4 ppm	64%
A-02	1.2 ppm	67%
DAO1S	1.4 ppm	74%
A-18	1.9 ppm	54%
LLBM-A-71	1.6 ppm	NA

Additional requested Information for East-Central Region

The east-central region as delineated on the attached figure is approximately 4 acres in size. In addition to an average PCB concentration of less than 2 ppm the PCB mass within this east-central-region is low in comparison to the entire Sub-area A. Sediment PCB concentrations in the adjacent area to the west of this east-central region range between 2 and 6 ppm. A summary of PCB mass metrics for this region includes:

Location of Interest	PCB Mass in 1 ppm Isopach
Sub-area A Total	281 kg
East-Central Region	2 kg

The influence or percentage of the estimated PCB mass from the east-central region is a little less than 0.7% of the total estimated PCB mass within the 1.0 ppm PCB isopach of Sub-area A.

Removal of some or this entire east-central portion from the dredge prism would appreciably reduce the overall amount of planned material to be dredged, dewatered and disposed and would thus have a positive affect on the OU1 project.

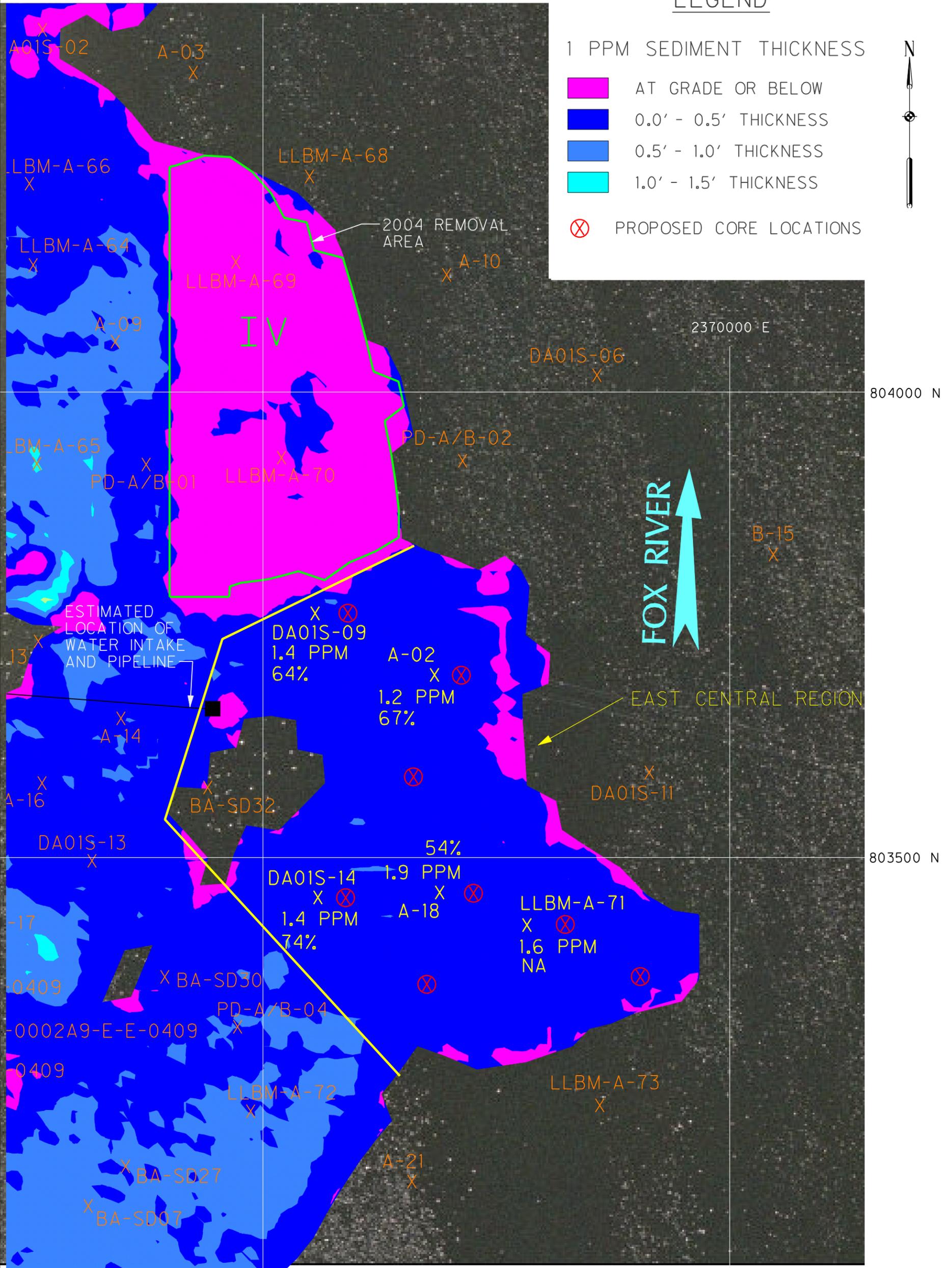
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LEGEND

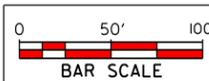
1 PPM SEDIMENT THICKNESS

- AT GRADE OR BELOW
- 0.0' - 0.5' THICKNESS
- 0.5' - 1.0' THICKNESS
- 1.0' - 1.5' THICKNESS

⊗ PROPOSED CORE LOCATIONS



LOCATION	PCB CONCENTRATION	IN-SITU % SOLIDS
DA01S-09	1.4 PPM	64%
A-02	1.2 PPM	67%
DA01S-14	1.4 PPM	74%
A-18	1.9 PPM	54%
LLBM-A-71	1.6 PPM	NA



GW PARTNERS

REVISED FIGURE 1

LOWER FOX RIVER - SUB-AREA A
REFINEMENT OF "EAST-CENTRAL" SUB-AREA A

Date: SEPT. 2005 REVISION DATE:
 Drawn By: JRB2 Checked By: DMR Scope: 04G007

SR-6J

October 4,, 2005

William Hartman
225 W. Wisconsin Ave.
P.O. Box 488
Neenah, WI 54957

Dear Mr. Hartman:

Regarding possible dredging of “East-Central” area of Sub-Area A, representing approximately 2.5-acres: the agencies have no objection if the area shown in Figure 1 in the Memorandum regarding *Additional Characteristics East-Central Region for Sub-Area A*, by Foth and Van Dyke, dated September 22, 2005, is not dredged at this time. The reasons for not dredging this area, as we have discussed, are as follows:

1. All samples in this area have PCB concentrations less than 2 parts per million (ppm), just above the Action Level of 1 ppm, with an average concentration of 1.5 ppm. The total PCB mass for this area (the “east-central region of Sub-Area A”) is 2 kilograms, or 0.1 % of 281 kilograms PCBs within Sub-Area A.
 2. The contaminated sediment deposit is relatively thin (0.5-feet or less) with underlying sand and gravel. Thus dredging this area would be inefficient.
 3. Not dredging this 2.5-acre area would have a positive effect on the project schedule, increasing the likelihood of completion of removal of Sub-Area A this construction season.
- and
4. Dredging this area provides a relatively small environmental benefit relative to the effort required.

Please feel free to call me at 312-353-4213 if you have any questions or concerns.

Sincerely yours,

James J. Hahnenberg, Remedial Project Manager
Superfund

cc: Mike Jury, CH2M Hill
Patrick H. Zaepfel, Glatfelter
J.P. Causey Jr., WTM I
Nancy Peterson, Quarles & Brady
Greg Hill, WDNR
Rich Murawski, EPA ORC

GW PARTNERS, LLC

Please Reply to:
William A. Hartman
Little Lake Cleanup Team
P.O. BOX 97
Neenah, WI 54956-0097

November 1, 2005

Mr. Greg Hill
WI-DNR Project Coordinator, LFR OU1
WI-DNR
P.O. Box 7921
Madison, WI 53707-7921

Mr. James Hahnenberg
US-EPA Project Coordinator, LFR OU1
US-EPA Region 5
77 West Jackson Boulevard
SR-6J
Chicago, IL 60604-3507

Dear Greg & Jim,

Per the enclosed memo, GW Partners would like to propose the removal of certain portions of Sub-Area A and Sub-Area CD2S from the dredge prism. These regions are similar to the east-central lobe of Sub-Area A, which are characterized by PCB concentrations at or below 2.0 ppm and high in-situ percent solids.

I appreciate your attention to this matter and await a formal response. Please contact me if you have any questions.

Sincerely,



William A. Hartman
Project Coordinator – GW Partners

Enclosure

Cc: Rich Johnson, Boldt
Skip Missimer, Glatfelter
Pat Zaepfel, Glatfelter
John Blind, Glatfelter
Nancy Peterson, Quarles & Brady
Tony Vogel, Quarles & Brady

JP Causey, WTM 1
Jeanne Tarvin, STS
John Trast, STS
Mike Jury, CH2MHill
Steve Laszewski, Foth & Van Dyke

Foth & Van Dyke

Technical Memorandum

November 1, 2005

TO: Greg Hill, WDNR
Jim Hahnenberg, USEPA
Rich Johnson, Boldt

<p>CC: Bill Hartman, GW Partners Skip Missimer, Glatfelter Pat Zaepfel, Glatfelter John Blind, Glatfelter Nancy Peterson, Q&B Tony Vogel, Q&B</p>	<p>JP Causey, WTM I Jeanne Tarvin, STS John Trast, STS Mike Jury, CH2MHill Steve Lehrke, Foth & Van Dyke Denis Roznowski, Foth & Van Dyke</p>
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FR: Steve Laszewski, Foth & Van Dyke

RE: Proposal for Sub-area A and Sub-area C/D2S Dredge Prism Refinement

This memorandum outlines a proposal to remove portions of Sub-area A and of Sub-area C/D2S from the current dredge prisms. The portion of interest for Sub-area A is referred to as the Northern Region and is shown on Figure 1. For Sub-area C/D2S two portions are proposed for removal, namely the Southern Region of D2S and a Northern Region of C, with both regions shown on Figure 2.

Similar to the East-central portion of Sub-area A these regions are characterized as having PCB concentrations at or less than 2.0 ppm PCBs, high in-situ percent solids (indicating sand/gravel material) with current planned dredge cuts need to reach elevation of only 0.5 feet or less.

Specific characteristics of the regions, with the associated Pre-Design sample location from within that region, include:

Region and Sample ID	PCB Concentration	Region Area	In-Situ Percent Solids
Sub-area A: Northern Region (A-36)	2.0 ppm	59,400 sq.ft.	66%
Sub-area C: Northern Region (C-16)	1.2 ppm	39,800 sq.ft.	79%
Sub-area D2S: Southern Region (D2-19)	1.1 ppm	69,887 sq.ft.	76%

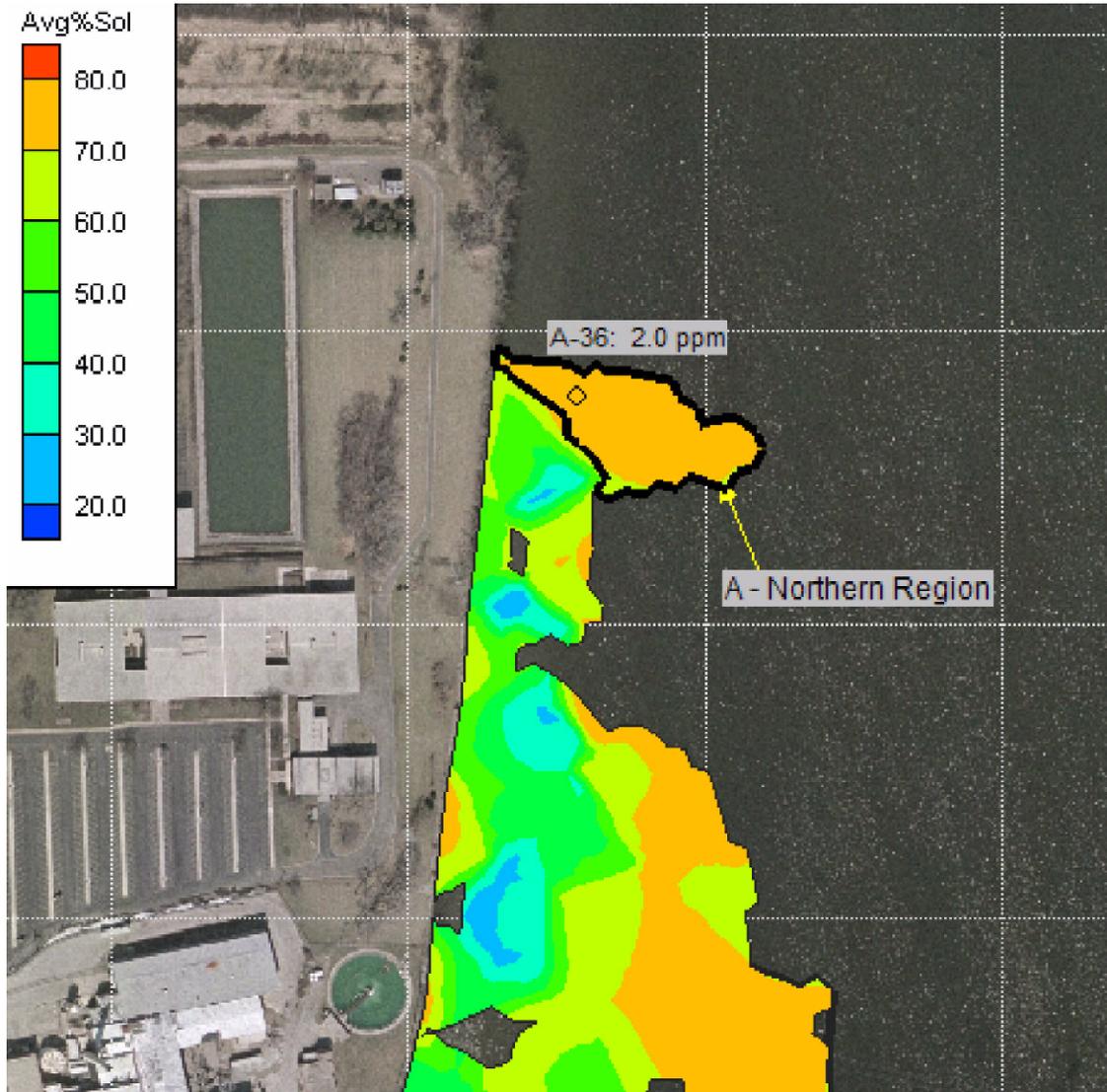
Given the considerable effort demonstrated this year to remove this type of material and the relatively low PCB mass contained in a location where a thin layer of sediment rests upon sand and gravel, it appears reasonable to remove these regions from the dredge prisms. A reduction in the dredging effort required over this combined 170,000 sq. ft. is significant to the project schedule, given the daily target dredge rate of approximately 30,000 square feet per day.

A summary of the PCB mass contained in these regions includes:

Location of Interest	PCB Mass in 1 ppm Isopach
Sub-area A Total	281 kg
Northern Region	0.5 kg
Sub-area C Total	34 kg
Northern Region	0.5 kg
Sub-area D2S Total	4 kg
Southern Region	0.7 kg

As can be seen, the influence or percentage of the estimated PCB mass from the respective regions is small when compared to the total mass in a sub-area or to the total PCB mass in OU1.

Removal of these three Regions from the dredge prisms would reduce the overall amount of planned material to be dredged, dewatered and disposed and would thus have a positive affect on the project schedule.



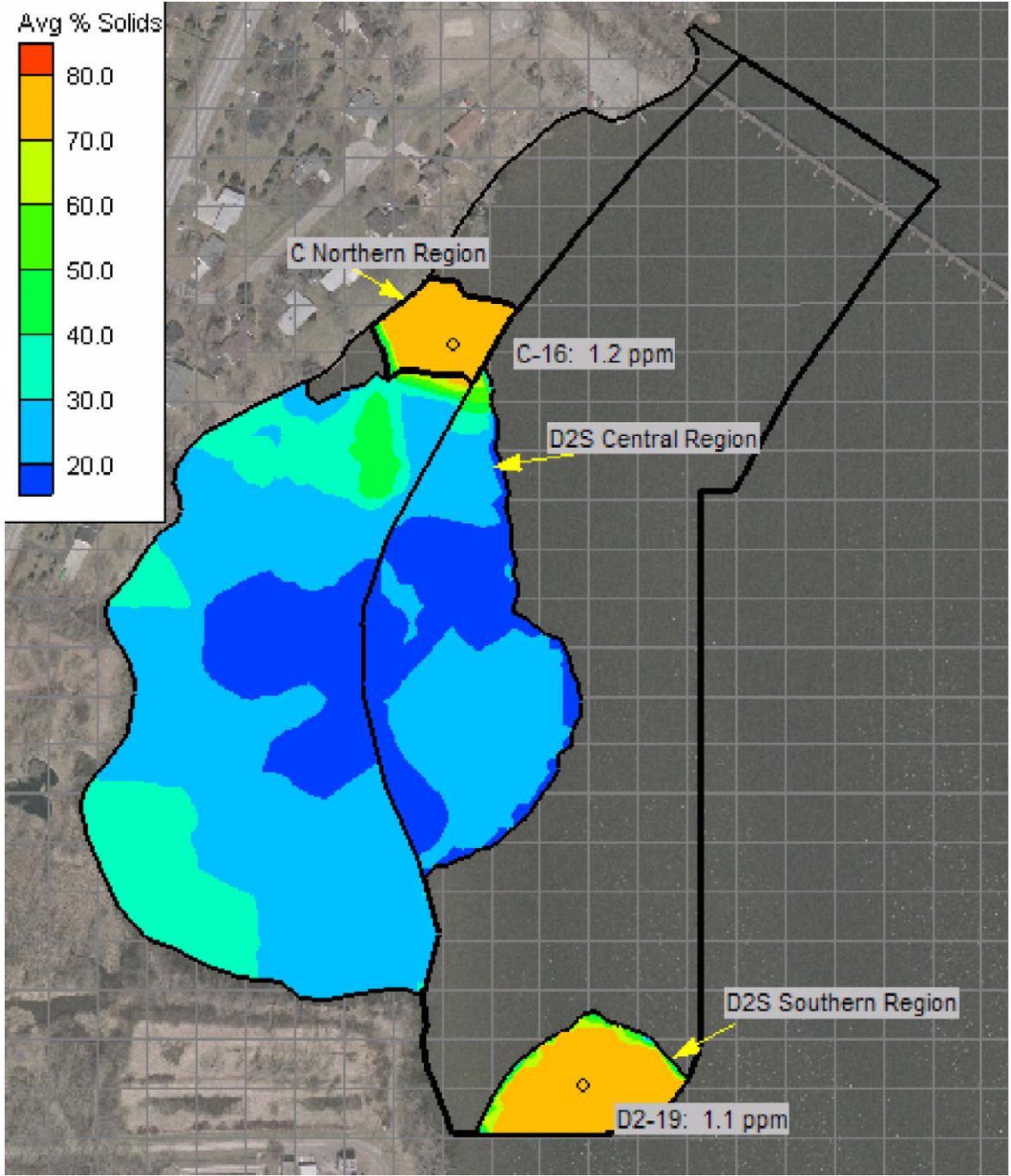
This drawing is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only.



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Foth & Van Dyke		
FIGURE 1		
Subarea A - Northern Region		
Scale:	AS SHOWN	Date: October 2005
Drawn By:	SGL	Checked By: PEP1
		Scope: 04G007



This drawing is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only.



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Foth & Van Dyke		
FIGURE 2		
C Northern Region - D2S Southern Region		
Scale: 100' grid	Date: November 2005	
Drawn By: SGL	Checked By: PEP1	Scope: 04G007



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGIONS 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SR-6J

November 1, 2005

William Hartman
225 W. Wisconsin Ave.
P.O. Box 488
Neenah, WI 54957

Dear Mr. Hartman:

Regarding possible dredging of "Northern Region" of Sub-Area A (or A-36), "Northern Region" of Sub-area C (or C-16), and "Southern Region" of Sub-area D2S (or D2-19): the agencies have no objection if these areas are not dredged at this time. These areas are shown in Figures 1 and 2 in the Draft Technical Memorandum regarding *Proposal for Sub-area A and Sub-area C/D2S Dredge Prism Refinement*, by Foth and Van Dyke dated October 19, 2005, representing a total of 179,500 square feet. The reasons for not dredging this area as we have discussed, are similar to those discussed in my letter to you dated October 4, 2005, and described in the Memorandum referenced above.

Please feel free to call me at 312-353-4213 if you have any questions or concerns.

Sincerely yours,

A handwritten signature in black ink, appearing to read "James J. Hahnenberg".

James J. Hahnenberg, Remedial Project Manager
Superfund

cc: Mike Jury, CH2M Hill
Patrick H. Zaepfel, Glatfelter
J.P. Causey Jr., WTM I
Nancy Peterson, Quarles & Brady
Greg Hill, WDNR
Rich Murawski, EPA ORC



MEMORANDUM

August 16, 2006

To: Bill Hartman, GW Partners

From: Rick Fox, NRT, Boldt Oversight Team
George Berken, Boldt, Boldt Oversight Team
Denis Roznowski, GW Partners, Foth & Van Dyke

Reference: LFR OU1 - POG Clarification on Defining Dredge Neat Line Using GMS

During recent conversations with the OU1 Design Team, a misunderstanding regarding the nature/characteristic of the input data collected on the OU1 project, and how this input data is utilized by the GMS-SED Model was clarified. In particular, the OU1 Design Team clarified that the GMS-SED Model, coupled with the input data collected, provides a higher level of conservatism to the design than the Oversight Team (OT) understood. This conservatism occasionally results in defining the neat line elevation below the interface elevation between the soft sediment and the clay. This conservatism results in the dredge encountering relatively frequent "high-sub-grade" elevations without there being a proportionate number of "low-sub-grade" elevations. This conservatism was designed to attain a higher probability of achieving the RAL.

The input data that is used by the GMS-SED Model to determine the bottom surface of the soft sediments (called the mesh by the model) comes from results of poling. Poling was conducted by setting the pole on the bottom and advancing it until it stops (i.e., refusal). Care was taken so poling was conducted consistently throughout the project. This poling can distinguish between soft sediment and hard clay, gravel, dense sand, or rock, but it is unable to distinguish between soft sediment and soft clay. When soft sediment is underlain by soft clay, refusal generally occurs in the soft clay layer or at the bottom of the soft clay layer. The OT originally believed that the neat line was biased high. After discussing the use of the poling data as described above, the OT's understanding of the design of the neat line has now changed to an understanding of the conservative nature of the neat line elevation.

GW Partners and the agencies established a "high sub-grade" protocol in 2005 to minimize the amount of clay dredged in areas where the clay bottom was encountered above the neat line elevation. This protocol was instituted because the dredging of clay wastes resources and adds undesired difficulties to the project. It was hoped that the 2006 poling activities would reduce the frequency and extent of high and low sub-grade areas.

The nature/characteristics of the input data, supplemented by the 2006 poling data, generally serve to minimize low sub-grade areas. In practice, the modeling procedures have the opposite effect of increasing the frequency of high sub-grade areas encountered through dredging,

especially if those high sub-grade areas are comprised of soft clays. In Sub-area POG3, a thin zone of organic, contaminated sediment is commonly underlain with a soft, clay layer. A photograph of a typical set of high subgrade verification cores is shown in Figure 1.

Figure 2 illustrates how the soft clay can affect the neat line (Errors associated with the survey elevation, sample recovery, and analytical errors are ignored for this illustration). Poling is used to define the zone of soft sediment and sampling results are interpolated within the model to prescribe the cut at the poling location. When there is a thin zone of contamination not fully extending through the sample interval, the model overestimates the depth of PCB contamination. Similarly, overestimating the thickness of the extent of soft sediment tends to drive the modeled neat line down into the soft clay layer. These two occurrences result in a conservative approach to RAL elevation establishment.



Figure 1. Sample cores used to define remaining sediment in high sub-grade areas (Foth & Van Dyke and Associates, MVC-020F).

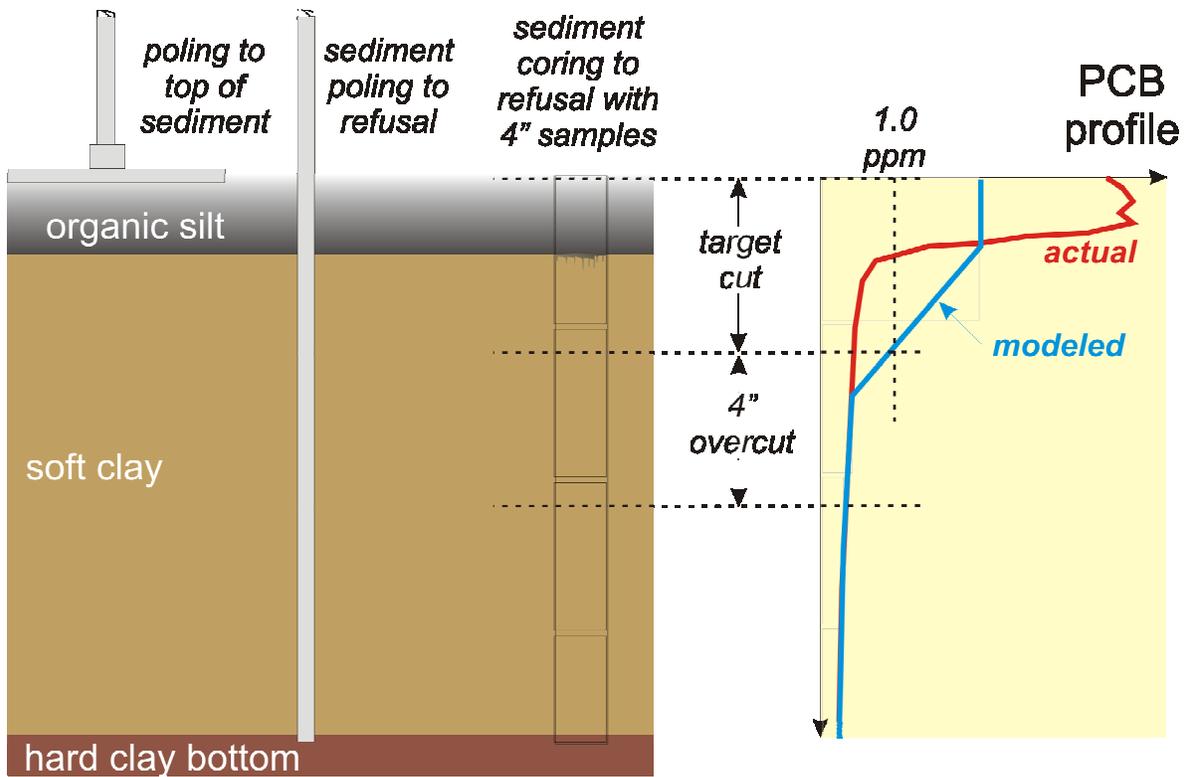


Figure 2. Schematic of sediment profile, showing extent of sampling, poling, and GMS-SED modeling results for a thin zone of organic silt underlain by a soft clay layer (Foth & Van Dyke and Associates).

CC: Jim Hahnenberg, USEPA
 Greg Hill, Steve Jaeger, Jim Killian, Gary Kincaid, WDNR
 Rich Johnson, Tim Harrington, John Kern, Mike Palermo, Tom Vik, Rich Weber, Boldt Oversight Team