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May 2, 2014

Mr. Gary Kincaid
Wisconsin Department of Natural Resources
625 East County Road Y, Suite 700
Oshkosh, WI 54901

Subject: Cap Monitoring and Repair Plan and Special Provisions
STH 441 – Little Lake Butte des Morts Bridge (B-07-403 & B-70-61)
Winnebego County, WI
WisDOT Project ID# 1517-07-00/04

Dear Mr. Kincaid:

On behalf of the Wisconsin Department of Transportation (WisDOT), we have enclosed the following five documents associated with future construction activities for the STH 441 Bridge over Little Lake Butte des Morts (LLBDM) scheduled to begin construction in August 2014:

Sediment Excavation Management:

1. Special Provision for Excavation, Hauling, and Disposal of Contaminated Sediment
2. Special Provision for Excavation, Hauling, and Disposal of Superfund-Criteria Regulated Waste
3. Special Provision for Reuse of Dredged Material

Cap Monitoring, Protection, and Repair

4. Cap Monitoring and Repair Plan (Plan)
5. Special Provisions for Protection and Repair of Engineered Sediment Cap (Attachment B to Plan)

The enclosed documents incorporate the concepts discussed in our September 16, 2013, and WDNR's comments to previous drafts that were received via email on January 9, 2014 and April 30, 2014.

Please review and provide final concurrence to the enclosed documents. You can reach me at 608-826-3658 if you have any questions.

Sincerely,

TRC Environmental Corporation

Alyssa Sellwood, P.E.
Project Engineer

Daniel Haak, P.E.
Project Manager

Enclosures:

cc: Kathie VanPrice, Scot Ebel, Sharlene TeBeest – WisDOT (hard copy and pdf on CD)
Liz Victor, Greg Tilkens, Jim Doperalski – WDNR (hard copy and pdf on CD)
Jay Schiefelbein – WDNR (pdf via e-mail)
Mike Arnold – URS (pdf via e-mail)
Jim Morse – TRC

Sediment Excavation Management

May 1, 2014

Special Provisions for the Excavation, Hauling, and Disposal of Contaminated Sediment

Project ID #1517-07-00/04
STH 441 – Little Lake Butte des Morts Bridge
Winnebago County, Wisconsin

Prepared by
TRC
Madison, Wisconsin

Excavation, Hauling, and Disposal of Contaminated Sediment, Item _____

A. Description

A.1 General

This special provision describes excavating, dewatering, temporary storage, loading, hauling, and disposal of contaminated sediment excavated for this project and designated by the Environmental Consultant as contaminated sediment to be disposed as solid waste at a Wisconsin Department of Natural Resources (WDNR)-licensed solid waste facility approved to accept dredged sediment.

Perform this work in accordance to section 205 of the standard specifications and with pertinent parts of Chapters NR 700-754 of the Wisconsin Administrative Code, as supplemented herein. Per NR 718.07, a solid waste collection and transportation service-operating license is required under NR 502.06 for each vehicle used to transport contaminated sediment.

A.2 Notice to the Contractor

The contractor is advised that excavations within Little Lake Butte des Morts (LLBDM) for this project will occur within the United States Environmental Protection Agency (USEPA) Lower Fox River PCB Remediation Site following Superfund criteria, where soft sediment have the potential to be contaminated with PCBs. Others previously dredged PCB-impacted sediment from LLBDM and constructed a protective sand/armor cap over areas where low-level PCBs remain in the sediment.

The department completed testing of the sediment from the non-capped areas where excavation is required for this project. PCBs were not detected in any of the samples. However, because there is the potential for PCBs to be present in the surface sediment, the top two feet of material has been classified as contaminated sediment to be managed as solid waste.

Dredged material that is removed from below the depth of contaminated sediment shall be reused within the project. Management of this material is defined under Reuse of Dredged Material.

Sediment under the protective sand/armor cap may require excavation during construction. Management of this sediment is defined under Excavation, Hauling, and Disposal of Superfund-Criteria Regulated Waste.

For further information regarding the investigations contact the Environmental Consultant listed below.

A.3 Coordination With The Environmental Consultant

The Contractor shall coordinate work under this contract with the environmental consultant retained by the Department:

Consultant:	TRC Environmental Corporation
Address:	708 Heartland Trail, Suite 3000, Madison, WI, 53717-1934
Contact:	Alyssa Sellwood or Dan Haak
Phone:	(608) 826-3658 or (608) 826-3628
Fax:	(608) 826-3941
e-mail:	asellwood@trcsolutions.com or dhaak@trcscolutions.com

The role of the Environmental Consultant will be limited to:

- Characterizing contaminated sediment for disposal approval;

- Documenting that activities associated with management of contaminated sediment are in conformance with the contaminated sediment management methods for this project as specified herein; and

- Obtaining the necessary approvals for disposal of contaminated sediment from the landfill.

Provide at least a 14-calendar day notice of the preconstruction conference date to the Environmental Consultant. At the preconstruction conference, provide a schedule for all excavation activities at each of the pier locations. Also notify the Environmental Consultant at least three calendar days prior to commencement of excavation activities at each of the pier locations.

Select a WDNR-licensed facility that is approved to accept sediment which will be used for disposal, and provide this information to the Environmental Consultant no later than 30 calendar days prior to commencement of excavation activities in the pier areas or at the preconstruction conference, whichever comes first.

The Environmental Consultant will be responsible for obtaining the necessary approvals for disposal of contaminated sediment from the selected facility. Do not transport contaminated sediment offsite without approval from the Environmental Consultant.

A.4 Health and Safety Requirements
Supplement subsection 107.1 of the standard specifications with the following:

Soft sediments encountered on this project may be contaminated with PCBs. Site workers taking part in activities that will result in the reasonable probability of exposure to safety and health hazards associated with hazardous materials shall have completed health and safety training that meets the Occupational Safety and Health Administration (OSHA) requirements for Hazardous Waste Operations and Emergency Response (HAZWOPER), as provided in 29 CFR 1910.120.

Prepare a site-specific Health and Safety Plan, and develop, delineate and enforce the health and safety exclusion zones for each contaminated site location as required by 29 CFR 1910.120. Submit the site-specific health and safety plan and written documentation of up-to-date OSHA training to the Engineer prior to the start of work.

A.5 Erosion Control
Supplement subsection 107.20 of the standard specifications with the following:

Include as part of the Erosion Control Implementation Plan (ECIP), as required under Subsection 107.20 of the Standard Specifications, the construction methods for sediment removal, the proposed location for staging and dewatering activities for removed sediment, and the means and methods for containment and dewatering.

All work involving excavation and dredging for removal of existing structures and construction of temporary or permanent structures in the Fox River shall be performed in a manner and by methods or techniques that will minimize the turbidity increases and sediment resuspension. Erosion and sediment control devices such as silt curtains or turbidity barriers shall be used to prevent migration of resuspended sediment beyond the construction limits. Upon completion of construction, the silt curtain or turbidity barrier shall be removed.

B (Vacant)

C Construction Methods

Subsection 205.3 of the Standard Specifications is supplemented with the following:

Contractor is responsible for excavating, dewatering, temporarily storing, loading, hauling, and disposing of contaminated sediment. Excavations shall not extend beyond the construction limits unless directed by Engineer.

Contaminated sediment is the upper two feet of sediment removed for construction of the bridge piers in areas that do not contain the protective sand/armor cap.

Load, haul, and prepare contaminated sediment for disposal at WDNR-licensed disposal facility. Use loading and hauling practices that prevent any spills or releases of contaminated sediment or residues from point of generation to the disposal site. Satisfy water quality monitoring requirements established for project during dredging and loading of contaminated sediment.

Dewater sediment to meet requirements for transport and disposal. Dewatering approach to be defined in the ECIP. Dewatering shall be accomplished without the addition of drying materials to the sediment, unless approved by the Engineer. Dewatering work will not proceed until necessary permits are in place.

Handle, treat, and monitor water generated during storage and dewatering of sediment to satisfy waste water discharge and handling requirements within the Wisconsin Administrative Code, Chapters NR 100-299, and the WDNR General Permit to Discharge under the Wisconsin Pollutant Discharge Elimination System (WPDES) for Carriage and/or Interstitial Water Resulting from Dredging Operations (WI-0046558-05-0). Water handling and discharge approach to be defined in the ECIP. Sediment removed during dewatering of contaminated sediment will be managed and handled as contaminated sediment.

Select WDNR-approved disposal from the options listed below. The Department's Environmental Consultant is responsible for obtaining the necessary approvals from the selected disposal facility.

Haul and dispose contaminated sediment at selected WDNR-licensed disposal facility approved to accept sediment. Do not transport sediment off-site without approval of the Engineer and the disposal facility. Use loading and hauling practices that prevent any spills or releases of contaminated sediment or residues from point of generation to the disposal site. Verify that vehicles used to transport contaminated sediment are licensed for such activity in accordance with applicable state and federal regulations. All vehicles transporting contaminated sediment shall have sealed and covered containers.

Pay all fees for the disposal of non-hazardous contaminated sediment. WDNR-licensed solid waste facilities approved to accept contaminated sediment for this contract include:

Port of Green Bay
Bay Port Dredge Material Rehandling Facility (DMRF)
Brown County Solid Waste Department
2561 S. Broadway Street
Green Bay, WI 54304
(920) 492-4950

Waste Management – Ridgeview RDF
6207 Hempton Lake Road
Whitelaw, Wisconsin 54247
(920) 732-4473 Ext. 228

Advanced Waste – Hickory Meadows Landfill
W3105 Schneider Road
Hilbert, Wisconsin 54129
(920) 853-8553

D Measurement
Management of contaminated sediment shall be measured by the cubic yard of material accepted by the disposal facility. (If Hickory Meadows or Ridgeview are selected as the disposal facility, a conversion of 1.5 TON per CY will be used).

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
_____	Handling and Disposal of Contaminated Sediment	CY

The price shall be payment in full for the payment of all disposal tipping fees and taxes and the furnishing of all labor, tools, equipment, and incidentals necessary to complete the work for the excavating, segregating, dewatering, temporary storing, hauling, and disposing of the solid waste in accordance with the contract.

May 1, 2014

Special Provisions for the Excavation, Hauling, and Disposal of Superfund-Criteria Regulated Waste

Project ID #1517-07-00/04
STH 441 – Little Lake Butte des Morts Bridge
Winnebago County, Wisconsin

Prepared by
TRC
Madison, Wisconsin

Excavation, Hauling, and Disposal of Superfund-Criteria Regulated Waste, Item _____

A. Description

A.1 General

This special provision describes excavating, dewatering, temporary storage, loading, hauling, and disposal of contaminated sediment classified as Superfund-Criteria Regulated Waste that is excavated for this project and designated by the Environmental Consultant to be disposed as solid waste at a Wisconsin Department of Natural Resources (WDNR)-licensed solid waste facility approved to accept the material based on results of characterization.

Perform this work in accordance to section 205 of the standard specifications and with pertinent parts of Chapters NR 700-754 of the Wisconsin Administrative Code, as supplemented herein. Per NR 718.07, a solid waste collection and transportation service-operating license is required under NR 502.06 for each vehicle used to transport contaminated sediment.

A.2 Notice to the Contractor

The contractor is advised that excavations within Little Lake Butte des Morts (LLBDM) for this project will occur within the United States Environmental Protection Agency (USEPA) Lower Fox River PCB Remediation Site following Superfund criteria, where soft sediment have the potential to be contaminated with PCBs. Others previously dredged PCB-impacted sediment from LLBDM and constructed a protective sand/armor cap over areas where low-level PCBs remain in the sediment.

Sediment under the protective sand/armor cap may require excavation during construction. Removal of the cap and underlying sediment is anticipated for construction of Piers 9, 10, and 12. PCB-impacted sediment from below the cap is regulated as Superfund-Criteria Regulated Waste.

For this project Superfund-Criteria Regulated Waste is the top four feet of sediment removed from below the sand/armor cap. Segregate Superfund-Criteria Regulated Waste from other materials and temporarily store prior to disposal. The Environmental Consultant will collect a sample of the Superfund-criteria regulated Waste for landfill waste characterization, and will coordinate landfill disposal approval.

Dredged material that is removed from below the depth of contaminated sediment shall be reused within the project. Management of this material is defined under Reuse of Dredged Material.

For further information regarding the investigations contact the Environmental Consultant listed below.

A.3 Coordination With The Environmental Consultant

Coordinate work under this contract with the Environmental Consultant retained by the Department:

Consultant:	TRC Environmental Corporation
Address:	708 Heartland Trail, Suite 3000, Madison, WI, 53717-1934
Contact:	Alyssa Sellwood or Dan Haak
Phone:	(608) 826-3658 or (608) 826-3628
Fax:	(608) 826-3941
e-mail:	asellwood@trcsolutions.com or dhaak@trcscolutions.com

The role of the Environmental Consultant will be limited to:

- Characterizing Superfund-Criteria Regulated Waste for disposal approval;
- Documenting that activities associated with management of Superfund-Criteria Regulated Waste are in conformance with the management methods for this project as specified herein; and
- Obtaining the necessary approvals for disposal of Superfund-Criteria Regulated Waste from the landfill.

Provide at least a 14-calendar day notice of the preconstruction conference date to the environmental consultant. At the preconstruction conference, provide a schedule for all excavation activities at each of the pier locations.

Notify the Environmental Consultant at least three calendar days prior to commencement of excavation activities for Piers 9, 10, and 12, so that Environmental Consultant can be onsite to oversee excavation and management of Superfund Waste. Assist Environmental Consultant with collection of sample of Superfund-Criteria Regulated Waste for waste characterization.

Select a WDNR-licensed facility that is approved to accept sediment which will be used for disposal, and provide this information to the Environmental Consultant no later than 30 calendar days prior to commencement of excavation activities in the pier areas or at the preconstruction conference, whichever comes first.

The Environmental Consultant will be responsible for obtaining the necessary approvals for disposal from the selected facility. Do not transport Superfund-Criteria Regulated Waste offsite without approval from the Environmental Consultant.

A.4 Health and Safety Requirements
Supplement subsection 107.1 of the standard specifications with the following:

Soft sediments encountered on this project may be contaminated with PCBs. Site workers taking part in activities that will result in the reasonable probability of exposure to safety and health hazards associated with hazardous materials shall have completed health and safety training that meets the Occupational Safety and Health Administration (OSHA) requirements for Hazardous Waste Operations and Emergency Response (HAZWOPER), as provided in 29 CFR 1910.120.

Prepare a site-specific Health and Safety Plan, and develop, delineate and enforce the health and safety exclusion zones for each contaminated site location as required by 29 CFR 1910.120. Submit the site-specific health and safety plan and written documentation of up-to-date OSHA training to the Engineer prior to the start of work.

A.5 Erosion Control
Supplement subsection 107.20 of the standard specifications with the following:

Include the construction methods for sediment removal, the proposed location for staging and dewatering activities for removed sediment, and the means and methods for containment and dewatering, as part of the Erosion Control Implementation Plan (ECIP), as required under Subsection 107.20 of the Standard Specifications.

All work involving excavation and dredging for removal of existing structures and construction of temporary or permanent structures in the Fox River shall be performed in a manner and by methods or techniques that will minimize the turbidity increases and sediment resuspension. Erosion and sediment control devices such as silt curtains or turbidity barriers shall be used to prevent migration of resuspended sediment beyond the construction limits. Upon completion of construction, the silt curtain or turbidity barrier shall be removed.

B (Vacant)

C Construction Methods
Subsection 205.3 of the Standard Specifications is supplemented with the following:

Contractor is responsible for excavating, temporarily storing, dewatering loading, hauling, and disposing of Superfund-Criteria Regulated Waste. Excavations shall not extend beyond the construction limits unless directed by Engineer.

Superfund-Criteria Regulated Waste is the top four feet of sediment removed from below the sand/armor cap. Removal of Superfund-Criteria Regulated Waste is anticipated for construction of Piers 9, 10, and 12.

Load and temporarily store Superfund-Criteria Regulated Waste in covered and lined container or staging area approved by Engineer, for a maximum of 60 days from the date of sample collection. Staging area to be defined in the ECIP. Use loading and hauling practices that prevent any spills or releases of contaminated sediment or residues from point of generation (piers) to the disposal

site. Satisfy water quality monitoring requirements established for project during dredging and loading of contaminated sediment.

Assist the Environmental Consultant in collection of sample of the Superfund-Criteria Regulated Waste, using excavation equipment, if necessary. Environmental Consultant to submit sample of Superfund-Criteria Regulated Waste to laboratory for waste characterization.

Dewater sediment to meet requirements for transport and disposal of the sediment. Dewatering approach to be defined in the ECIP. Dewatering shall be accomplished without the addition of drying materials to the sediment, unless approved by the Engineer. Dewatering work will not proceed until necessary permits are in place.

Handle, treat, and monitor water generated during storage and dewatering of sediment to satisfy waste water discharge and handling requirements within the Wisconsin Administrative Code, Chapters NR 100-299, the WDNR General Permit to Discharge under the Wisconsin Pollutant Discharge Elimination System (WPDES) for Carriage and/or Interstitial Water Resulting from Dredging Operations (WI-0046558-05-0), and the discharge criteria for PCBs for this project (PCB concentrations less than a limit of detection of 0.2 to 0.5 micrograms per liter). Water discharge handling approach to be defined in the ECIP. Sediment removed during dewatering of Superfund-Criteria Regulated Waste will be managed and handled as Superfund-Criteria Regulated Waste.

Select WDNR-approved disposal facility approved to accept sediment from the options listed below. The Department's Environmental Consultant is responsible for obtaining the necessary approvals from the selected disposal facility based on the waste characterization results.

Load, haul, and dispose of the Superfund-Criteria Regulated Waste at the selected WDNR-licensed disposal facility, after landfill approval obtained by Environmental Consultant. Do not transport Superfund-Criteria Regulated Waste without approval from the Engineer and disposal facility. Use loading and hauling practices that prevent any spills or releases of contaminated sediment or residues from point of generation to the disposal site. Verify that vehicles used to transport contaminated sediment are licensed for such activity in accordance with applicable state and federal regulations. All vehicles transporting contaminated sediment shall have sealed and covered containers in accordance with the handling instruction defined above.

Note, if the Superfund-Criteria Regulated Waste is classified as hazardous based on laboratory analysis results of sample collected by Environmental Consultant, the Superfund-Criteria Regulated Waste will not be transported and disposed by Contractor. If material is found to be hazardous, it is mandatory that Veolia Environmental Services transport and dispose of the waste under their hazardous waste contract with the State.

Pay all fees for the disposal of non-hazardous Superfund-Criteria Regulated Waste. WDNR-licensed solid waste facilities that can accept non-hazardous sediment include:

Port of Green Bay
Bay Port Dredge Material Rehandling Facility (DMRF)
Brown County Solid Waste Department

2561 S. Broadway Street
Green Bay, WI 54304
(920) 492-4950

Waste Management – Ridgeview RDF
6207 Hempton Lake Road
Whitelaw, Wisconsin 54247
(920) 732-4473 Ext. 228

Advanced Waste – Hickory Meadows Landfill
W3105 Schneider Road
Hilbert, Wisconsin 54129
(920) 853-8553

D Measurement
Management of contaminated sediment shall be measured by the cubic yard of material accepted by the disposal facility. (If Hickory Meadows or Ridgeview are selected as the disposal facility a conversion of 1.5 TON per CY will be used).

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
_____	Handling and Disposal of Superfund-Criteria Waste	CY

The price shall be payment in full for the payment of all disposal tipping fees and taxes and the furnishing of all labor, tools, equipment, and incidentals necessary to complete the work for the excavating, segregating, dewatering, temporary storing, hauling, and disposing of the Superfund-Criteria Regulated Waste in accordance with the contract.

May 1, 2014

Special Provisions for the Reuse of Dredged Material

Project ID #1517-07-00/04
STH 441 – Little Lake Butte des Morts Bridge
Winnebago County, Wisconsin

Prepared by
TRC
Madison, Wisconsin

1. Reuse of Dredged Material, Item SPV.0035.XX.

A Description

A.1 General

This special provision describes excavating, dewatering, temporary storing, and reuse of dredged material for this project. Reuse of dredged material excludes contaminated sediment and Superfund-Criteria Regulated Waste, which are defined under Items ___ and ___.

Perform this work in accordance with Section 205 of the standard specifications, the plans, including as supplemented herein. The reuse of dredged material shall be completed in accordance with NR 500.08(3) and NR504.04(4).

A.2 Notice to the Contractor

The department completed environmental testing of the materials where excavation is required for this project. Dredged material that is removed from below the depth of Contaminated Sediment (below 2-feet in non-capped areas), and below the Superfund-Criteria Regulated Waste (below 4-feet in the capped areas) was approved for reuse on the project based on the results of the testing.

Management of Contaminated Sediment and Superfund-Criteria Regulated Waste are defined under Items ___ and ___.

This dredged material shall be reused within the project within the areas designated on the plans.

A.3 Coordination with the Environmental Consultant

The Contractor shall coordinate work under this contract with the Environmental Consultant retained by the Department:

Consultant:	TRC Environmental Corporation
Address:	708 Heartland Trail, Suite 3000, Madison, WI, 53717-1934
Contact:	Alyssa Sellwood or Dan Haak
Phone:	(608) 826-3658 or (608) 826-3628
Fax:	(608) 826-3941
e-mail:	asellwood@trcsolutions.com or dhaak@trcscolutions.com

The role of the environmental consultant will be limited to:

- Documenting that activities associated with management of dredged material are in conformance with the management methods for this project as specified herein,

- Documenting the reuse location of the dredged material.

Provide at least a 14-calendar day notice of the preconstruction conference date to the environmental consultant. At the preconstruction conference, provide a schedule for all excavation and placement activities for the dredged material. Also notify the environmental

consultant at least three calendar days prior to commencement of any excavation and placement activities for the dredged material.

A.4 Health and Safety Requirements
Supplement subsection 107.1 of the standard specifications with the following:

Soft sediments encountered on this project may be contaminated with PCBs. Site workers taking part in activities that will result in the reasonable probability of exposure to safety and health hazards associated with hazardous materials shall have completed health and safety training that meets the Occupational Safety and Health Administration (OSHA) requirements for Hazardous Waste Operations and Emergency Response (HAZWOPER), as provided in 29 CFR 1910.120.

Prepare a site-specific Health and Safety Plan, and develop, delineate and enforce the health and safety exclusion zones for each contaminated site location as required by 29 CFR 1910.120. Submit the site-specific health and safety plan and written documentation of up-to-date OSHA training to the Engineer prior to the start of work.

A.5 Erosion Control
Supplement subsection 107.20 of the standard specifications with the following:

Include as part of the Erosion Control Implementation Plan (ECIP), as required under Subsection 107.20 of the Standard Specifications, the construction methods for sediment removal, the proposed location for staging and dewatering activities for removed sediment, and the means and methods for containment and dewatering.

All work involving excavation and dredging for removal of existing structures and construction of temporary or permanent structures in the Fox River shall be performed in a manner and by methods or techniques that will minimize the turbidity increases and sediment resuspension. Erosion and sediment control devices such as silt curtains or turbidity barriers shall be used to prevent migration of resuspended sediment beyond the construction limits. Upon completion of construction, the silt curtain or turbidity barrier shall be removed.

B (Vacant)

C Construction Methods
Subsection 205.3 of the Standard Specifications is supplemented with the following:

Contractor is responsible for excavating, segregating, dewatering, temporarily storing, loading, hauling, and placing the dredged material within the designated reuse areas for the project.

Dredged material is defined as material removed from the bed of the waterway that is below the depth of Contaminated Sediment (below 2-feet in non-capped areas), and below the depth of the Superfund-Criteria Regulated Waste (below 4-feet in the capped areas)

Load, haul, and prepare dredged sediment for reuse. Satisfy water quality monitoring requirements established for project during dredging and loading of contaminated sediment.

Segregate dredged material from Contaminated Sediment and Superfund-Criteria Regulated Material.

Temporarily store dredged material in lined and covered container, staging area, or stockpile in accordance with NR 718.05(3), as needed. Staging approach to be defined in the ECIP. Construction and maintenance of stockpiled material includes, but is not limited to, placement of the material on an impervious surface, utilizing appropriate erosion control measures, and covering the stockpile with material to prevent infiltration of precipitation (such as 10 mil plastic sheeting and ballast of tires, sandbags, or similar material) on a daily basis. The stockpile location shall be approved by the Construction Engineer.

Dewater sediment to meet requirements for transport of the sediment prior to reuse. Dewatering approach to be defined in the ECIP. Dewatering shall be accomplished without the addition of drying materials to the sediment, unless approved by the Engineer. Dewatering work will not proceed until necessary permits are in place.

Handle, treat, and monitor water generated during storage and dewatering of sediment to satisfy waste water discharge and handling requirements within the Wisconsin Administrative Code, Chapters NR 100-299, and the WDNR General Permit to Discharge under the Wisconsin Pollutant Discharge Elimination System (WPDES) for Carriage and/or Interstitial Water Resulting from Dredging Operations (WI-0046558-05-0). Water discharge handling approach to be defined in the ECIP

Load and haul place the dewatered dredged material at the reuse areas designated on the plans for the project.

Cover dredged material placed in approved reuse area with a minimum of 1-foot of clean material. For areas not covered by the roadway, the reuse area to be covered with topsoil and seeded at a minimum.

D Measurement

Reuse of dredged material shall be measured by the cubic yard of excavated material in accordance with Subsection 205.4.1 of the Standard Specifications, except that Subsection 205.4.1 shall be modified to read that the quantity will be as set forth in the contract plans without measurement thereof. Any modifications to the contract quantity caused by corrections or revisions of the original contract plan, which have been approved by the engineer, will be measured in accordance with the applicable section of the standard specifications, and the contract quantity will be adjusted accordingly to determine the final pay quantity.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.xx	Reuse of Dredged Material	CY

The price shall be payment in full for the payment of all labor, tools, equipment, and incidentals necessary to complete the work for the excavating, segregating, dewatering, temporary storing, hauling, and reusing of the dredged material.

Cap Monitoring and Repair Plan

STH 441 – Little Lake Butte des Morts Bridge (B-07-403 & B-07-61)
Winnebago County, Wisconsin

WisDOT Project ID #1517-07-00/04

November 2013
Revised May 2014

Cap Monitoring and Repair Plan

STH 441 – Little Lake Butte des Morts Bridge (B-07-403 & B-07-61)
Winnebago County, Wisconsin

WisDOT Project ID #1517-07-00/04

November 2013
Revised May 2014

Alyssa Sellwood, P.E.
Project Engineer

Daniel Haak, P.E.
Project Manager

James E. Morse
Senior Client Service Manager

Table of Contents

List of Figures

List of Appendices

Commonly Used Abbreviations and Acronyms

AST	aboveground storage tank
bgs	below ground surface
BRRTS	Bureau for Remediation and Redevelopment Tracking System
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CTH	County Trunk Highway
CY	cubic yards
DATCP	Department of Agriculture, Trade and Consumer Protection
DRO	diesel range organics
FDM	Facilities Development Manual
EMP	Excavation Management Plan
ERP	Environmental Repair Program
ES	Enforcement Standards
ESA	Environmental Site Assessment
FINDS	Facility Index System/Facility Identification Initiative Program Summary Report
GIS Registry	WDNR Geographic Information System (GIS) Registry of Closed Remediation Sites
GRO	gasoline range organics
HAZWOPER	Code of Federal Registry Chapter 29 (29 CFR) Part 1910.120 Hazardous Waste Operations and Emergency Response
HMA	Hazardous Materials Assessment
IH	Interstate Highway
LQG	large quantity generator
LUST	leaking underground storage tank
NPL	National Priorities List
NR ###	Wisconsin Administrative Code (WAC) Natural Resources (NR) Chapter ###
PAHs	polynuclear aromatic hydrocarbons
PAL	Preventive Action Limits
PCBs	polychlorinated biphenyls
PCE	perchloroethylene/tetrachloroethylene
PID	photoionization detector
PVOCs	petroleum volatile organic compounds
RCLs	Residual Contaminant Levels in NR 720
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
R/W or ROW	right-of-way
sf	square feet
STH	State Trunk Highway
TCE	trichloroethylene
TRIS	Toxic Chemical Release Inventory System
USGS	United States Geological Survey
USH	United States Highway
UST	underground storage tank
VOCs	volatile organic compounds
WDNR	Wisconsin Department of Natural Resources
WisDOT	Wisconsin Department of Transportation
WGNHS	Wisconsin Geological and Natural History Survey
WI ERP	Wisconsin Environmental Repair Program database

Section 1
Introduction

1.1 Background

As part of the reconstruction and expansion of USH 10/STH 441 between Cold Spring Road and Oneida Street, in Winnebago County, Wisconsin, the Wisconsin Department of Transportation (WisDOT) is proposing to construct a new bridge over Little Lake Butte des Morts (LLBDM), as well as rehabbing and re-decking the existing Roland Kampo Bridge (Figure 1). When complete, both bridges will carry 4 lanes of traffic. A total of 21 new piers are required for construction of the new bridge at the proposed locations shown on Figure 2. Construction is anticipated to begin in September 2014.

LLBDM is part of the Lower Fox River Remediation Site following Superfund criteria for contamination of polychlorinated biphenyls (PCBs). Remediation of LLBDM was completed in 2009, and the remedy included removal of approximately 370,000 cy of sediment impacted with PCB's, and placing a sand cover or engineered cap over approximately 260 acres of the lake bottom that contained low-concentrations of PCBs. The engineered cap consists of sand and armor stone, with a nominal design thickness of 13 inches.

The approximate extents of the dredging and sediment cap in proximity to the bridge are shown on Figure 2. The PCB-impacted sediment within the footprint of the new bridge was dredged during the remediation in anticipation of future construction of the bridge. However, the protective sand/armor cap that covers low-level PCB-impacted sediment is present below the existing bridge, and adjacent to the new bridge, between piers P-8 and P-13. The protective cap is composed of approximately 6-inches of sand overlain with approximately 7-inches of armor. A photograph of a profile of a typical core of the cap is shown in Figure 3.

The construction of the new bridge and re-decking of the existing bridge will require removal of sediment, and has the potential to impact the existing sand/armor cap. Therefore, the WisDOT has developed a sediment excavation management plan, and a cap monitoring and repair plan for the project.

- The excavation management plan was provided under separate cover (see Section 1.2)
- The cap monitoring and repair plan is summarized herein.

1.2 Sediment Investigation and Excavation Management Plan

In July 2012, TRC Environmental Corporation (TRC), on behalf of the WisDOT, completed an investigation of the sediment proposed for excavation during construction of the bridge. The results of the investigation and Special Provisions defining the excavation management plan for the sediment to be removed during construction were provided to the WDNR in a report dated January 2013. The WDNR provided concurrence to the Special Provision in March 2013.

The final construction plans for the project have been modified since the WDNR's concurrence to the original plan. Therefore, revised Special Provisions for management of sediment have been prepared. The excavation management plan for the project now includes the following Special Provisions for the three categories of material that will be removed during construction of the bridge:

- Excavation, Hauling, and Disposal of Contaminated Sediment:
  Sediment in upper 2-feet in non-capped areas and sediment contained during dewatering: Approximately 1,500 cy
- Excavation, Hauling, and Disposal of Superfund-criteria Regulate Waste:
  Sediment in upper 4-feet in capped areas along with sediment collected during dewatering: Approximately 440 cy
- Reuse of Dredged Material:
  All other sediment excavated for piers: Approximately 6,000 cy

The Special Provisions for the management of excavated sediment are submitted under separate cover for final concurrence.

1.3 Purpose

The purpose of this report is to present the WisDOT's plan for the monitoring and repair of the sand/armor cap in LLBDM during construction of the new bridge and re-decking of the existing bridge for WDNR's review and concurrence. Repair to the cap may be needed for areas where direct excavation into the capped area occurs or from indirect impacts resulting from construction activities. The contractor will be responsible for protection and repair to the cap during construction, and draft Special Provisions for the Protection and Repair the Engineered Sediment Cap are included in Appendix B for WDNR review and concurrence.

Section 2
Plan Objectives and Criteria

2.1 Plan Objectives

The objective of this Cap Monitoring and Repair Plan (Plan) is to establish means to maintain a cap/barrier within the limits of construction for the bridge that provides equal, or greater, protection (as compared to the existing cap) against mobilization or contact with the PCB-impacted sediment in LLBDM.

2.2 Pre-Plan Meeting

Currently, the caps in LLBDM are the responsibility of GW Partners, in accordance with the applicable PCB remedial action project requirements/documents (e.g. LTMP, ICIAP, COMMP, etc.). On September 16, 2013 representatives from the GW Partners, Boldt, WDNR, WisDOT, URS, and TRC met in Green Bay, Wisconsin to discuss the conceptual approach and objectives for monitoring and repair of the cap during future construction of the bridge. The objective from the meeting was to reach agreement, in concept, on the measures to limit and repair potential damage to the sand/armor cap. The main outcomes from the meeting with respect to the cap include the following:

- The construction of Piers 9, 10, and 12 will potentially remove some cap material and underlying sediment. In each case, a concrete footing for the new piers will replace the cap and underlying sediment, but backfilling may be needed to fill gap between cap and top of the perimeter seal for the piers.
- Spudding of barge(s) used in construction, or other construction activities, have the potential to impact the cap in areas outside the pier locations. Monitoring will be needed to evaluate potential impacts to the cap within the limits of construction.
- Bathymetric surveys, within the limits of construction, were recommended to monitor the cap for damage. A pre-construction survey was recommended to establish baseline elevations, and periodic bathymetric surveys were recommended during construction and after completion of the bridge work to track potential damage to cap. The bathymetric survey method has noted to have a tolerance of 3-inches.
- If damage to the cap occurs during construction of the bridge (within the extent of operations of construction), as measured by comparison of the bathymetric surveys, then the WisDOT will be responsible for repairing the cap within the affected areas, and demonstrating that the repair is complete.

- GW Partners may also complete a post-construction bathymetric survey to confirm final conditions. This bathymetric survey would be done by JF Brennan Co., Inc..
- Additional measures, such as surface marking at edges of the cap, were discussed to raise awareness to cap location and to limit activities within extent of cap during construction.

2.3 Design Criteria

At the September 2013 meeting, the WDNR recommended that WisDOT's Plan include GW Partner's cap design criteria from the original design specifications for the cap, and their long-term monitoring and repair requirements for the cap. Bill Hartman of GW Partners provided the requested specifications and criteria to TRC. Copies are included in Appendix A, and include the following:

- Sand specification (layer thickness and grain size distribution)
- Armor stone specification (layer thickness and grain size distribution)
- Bathymetric survey specification
- Cap repair criteria

Section 3
Construction at New Piers 9, 10, and 12

The cap and underlying PCB-impacted sediment may be removed during construction of new Piers 9, 10, and 12. Management of the material removed from below the cap is defined in Special Provision for Superfund-Criteria Regulated Waste submitted under separate cover. If the cap is removed, it will be replaced with the concrete footing for the pier at each location. (It is possible that the excavation for one or more of these piers will not penetrate the cap, in which case replacement of the cap will not be needed). The following approach will be completed to document that the cap is effectively replaced at each location.

3.1 Elevation Surveying and Probing

The elevation of the top of the cap at the locations of new Piers 9, 10, and 12 will be measured by representative of WisDOT prior to the start of excavations for these piers. The elevations will be measured by determining the elevation of the water level at the location of the bridge, and then probing the depth to top of cap at each pier location. A total of six probes will be made at each pier to define the cap elevation at each specific location.

3.2 Cap Replacement

The elevation of the concrete footings are designed to be higher than the elevation of the cap for Piers 9, 10, and 12, and thus each footing will effectively replace the cap within each pier excavation area. However, the seal surrounding the perimeter of each pier may be up to 2 feet lower than the elevation of top of the surrounding cap material. Prior to removing the coffer dam that will enclose each pier during construction, armor stone will be added to the interior perimeter of the coffer dam to bring the elevation to match the grade of the surrounding cap. The armor stone will match the design criteria for the existing armor layer as defined in Appendix B.

3.3 Reporting

The elevation of the top of concrete footing and top of the surrounding armor stone for Piers 9, 10, and 12 will be recorded following construction via the probing method described above. Armor stone can be added if needed to bring the elevation of the cap to the elevation recorded prior to construction. The final elevations of the concrete footing and surrounding armor stone layer will be provided to WDNR and GW Partners to document that the piers replace the cap at each location.

Section 4
Cap Monitoring and Repair Plan

The cap near the limits of construction has the potential to be damaged during construction. In order to minimize damage to the cap, and repair damage, should it occur, the following plan is proposed.

The plan can be broken into two categories with regard to roles and responsibilities:

- **Best Construction Practices and Repair of Cap**: ***WisDOT's Construction Contractor***
  Responsibility of contractor selected for the construction, and included as Special Provisions for the construction project. Draft Special Provisions for management practices and repair of the cap are included in Appendix B. (The Special Provisions follow the plan described below in Sections 4.1 and 4.3).
- **Monitoring and Repair Planning/Evaluation**: ***WisDOT's Environmental Representative***
  Responsibility of environmental oversight representative for the project. Environmental Representative will follow the plan defined herein (i.e. no Special Provisions are needed for this category).

4.1 Construction - Best Practices

The items described below are intended to raise construction contractors' awareness to the cap's location and function, and to ultimately limit construction activities that may impact the cap (to the extent practicable to complete the construction of the bridge).

4.1.1 Pre-Construction Meeting

The cap location, function, survey requirements, and repair criteria will be discussed in the pre-construction meeting for the project. This discussion will highlight the best management practices specified below.

4.1.2 Surface Buoys

Surface water buoys are proposed to define the corners of the cap during the in-water construction to raise contractor's awareness to the cap, and ultimately limit activity within the extent of the cap. The buoys will be set to float on the water approximately 10 feet outside the corners of the cap (Figure 2), and at a spacing of approximately 50 feet. Deployment location and signage will be subject to regulatory permit approval.

The coordinates for where the buoys will be placed will be approved by GW Partners, and the final coordinates of the buoy locations will be documented by the Environmental Representative following deployment.

The location of the buoys may be adjusted, if needed, to accommodate construction. Any adjustments will be at the request of the contractor, and will require approval by the Engineer. The new location of any buoy(s) will also be documented by the Environmental Representative.

4.1.3 Barge Spudding and Boat Traffic Limitation

The spudding of the barge(s) during construction is the most likely action to result in potential impact to the cap. The construction contractor will be required to "minimize" the number of times barge(s) spud within the capped area (to the extent practicable to complete the construction). In addition, the construction contractor will be required to avoid use of tug boats within the extent of the capped areas.

These requirements to minimize/avoid activities in the capped area will be accomplished more readily when used in conjunction with the surface buoys indicators described above. A specific metric is not proposed to define "minimize". However, this language, and the surface buoys, are intended to create heightened awareness to the caps location during construction.

In the event that spudding or tug boat traffic cannot be avoided in the capped area during construction, the contractor will notify the Environmental Representative if spudding of barges or use of tug boats in the capped area occurs, and will provide documentation to the Environmental Consultant of these specific location(s) of these activities.

4.2 Environmental Oversight - Cap Monitoring and Repair Planning

The WisDOT's Environmental Representative will provide periodic oversight during construction, will be responsible for the monitoring, and will work with WDNR to establish Cap Repair Plan(s), as needed during construction.

4.2.1 Environmental Oversight

Environmental oversight to occur when the construction activities will potentially penetrate or damage the cap (e.g., tug boat traffic or barge spudding), and during excavations for construction of new Piers 9, 10, and 12 (see Section 2). If other construction-related activities penetrate the cap, environmental oversight will be

provided during these activities as well. (Oversight for the management of contaminated sediment or Superfund criteria regulated waste are defined in Special Provisions provided to WDNR under separate cover).

4.2.2 Monitoring – Bathymetric Surveys

WisDOT's Environmental Representative will coordinate and work with a qualified subcontractor to complete the bathymetric surveys. The bathymetric surveys will be completed throughout the construction process to evaluate the condition of the cap within, and near the limits of construction, in order to determine if damage occurred to the cap as a result of construction activities. The bathymetric surveys will be completed in accordance with the survey specification included in Appendix A.

Survey Specification

The bathymetric surveys will be completed in accordance with the survey specification included in Appendix A.

Survey Extent

Each survey will cover, at a minimum, the extent of the areas defined on Figure 2. The survey area will include the full extent the cap within 200 feet of the northern and southern edges of the bridge decks, and will extend at least 50 feet to the east and west of the edge of the capped areas. The survey will also include other capped areas that may be affected by the construction activities.

Pre-Construction Survey

A survey will be completed within four months prior to the start of in-water work for construction of the bridge. This survey will be used to establish the baseline elevations of the river bottom prior to the start of construction activities.

Interim Surveys

Interim surveys will be completed during construction years that include in-water work, at least once per year. These surveys will be used to determine if the in-water construction activities caused damage to the cap that requires repair (see Section 4.3 for Repair).

Post Repair Surveys

If repair is required for the cap, a post-capping survey will be completed within one month after completion of the repair activities to document that the repair to the cap was effective, and to establish new baseline elevations from which to compare future survey data.

Post-Construction Survey

A final survey will be completed either at the end of the final construction season, or after final repair of the cap. The results of this final survey will establish the final conditions for the cap post-construction. The WisDOT will not be responsible for any surveys following the post-construction survey.

4.2.3 Data Sharing and Cap Repair Plan

All bathymetric survey data collected on behalf of the WisDOT will be provided to WDNR (Agencies' Oversight Team) and G.W. Partners for independent review. *(In the event that G.W. Partners completes an additional survey, the results of their survey will likewise be provided to the WisDOT for independent review.)*

Concurrent with the WDNR and G.W. Partners review, the WisDOT's Environmental Representative will evaluate/compare bathymetric survey data sets to determine if damage occurred to the cap during construction. Evaluations will be completed following each interim survey during construction, and following the final post-construction survey.

It is expected that WDNR/G.W. Partners and the WisDOT's Environmental Representative will discuss their respective interpretation of the bathymetric survey results and reach agreement on the areas requiring repair, if any, following each interim survey and the final post-construction survey.

If the WDNR/G.W. Partners and the WisDOT's Environmental Representative find measurable damage to the cap, the Environmental Representative will develop a Cap Repair Plan. The Cap Repair Plan will define the area(s) requiring repair, schedule to complete the repair, and criteria to evaluate if the repair is complete. The Cap Repair Plan will be provided to WDNR and G.W. Partners for review and concurrence.

4.3 Construction - Cap Repair

Cap repair, if needed, will be completed by the contractor in accordance with the general requirements defined below, the Draft Special Provisions in Appendix B, and additional details specified in Cap Repair Plan(s), as prepared by the Environmental Representative and approved by WDNR.

4.3.1 Schedule

Cap repair will be initiated following approval from the WDNR, in accordance with the schedule in the approved Cap Repair Plan.

4.3.2 Cap Materials

It is likely that only the armor stone will need to be replaced during repair. The specification for the stone will match the original design specification. A copy of the specification for the armor stone is included in Appendix A.

In the event that the sand layer requires replacement during the repair, the specification for the sand will match the original design specification. A copy of the specification for the sand is included in Appendix A.

4.3.3 Cap Repair

Armor stone (and sand if needed) will be placed over the area requiring repair as defined by the bathymetric survey. The means and methods selected by the contractor to place the stone will be included in a Cap Repair Plan for WDNR's approval. The final elevation of the cap will be required to achieve, at a minimum, the baseline elevations defined in the bathymetric survey, but not to exceed 6-inches over the baseline elevation. The final condition of the cap will be recorded in a bathymetric survey, as defined under Section 4.2.2.

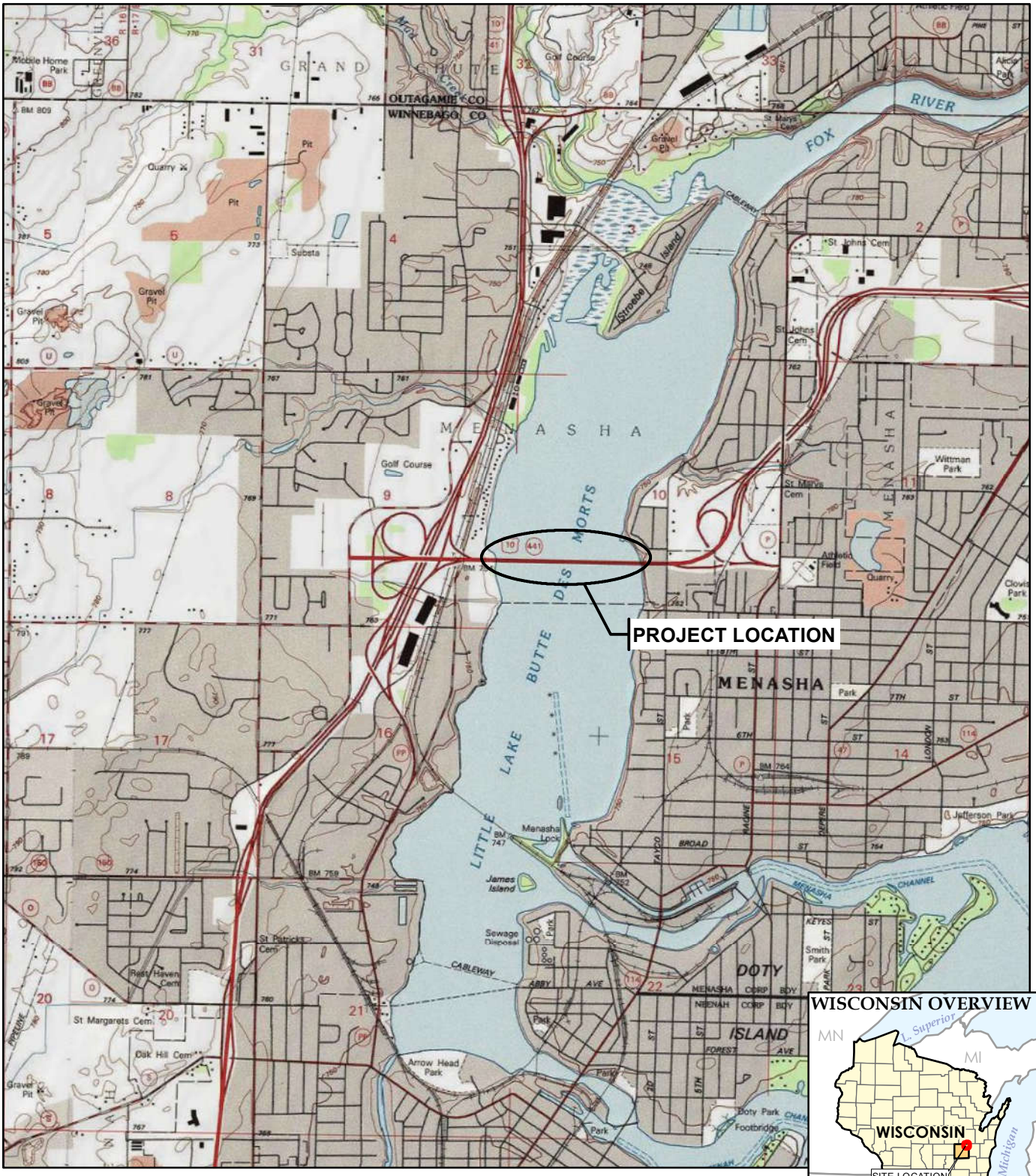
Section 5
Conclusions

Construction for the new bridge over LLBDM is anticipated to begin in September 2014. The Plan defined herein is intended to minimize potential damage to the existing sediment cap, and provides provisions to monitor and repair the cap during construction, while allowing the construction of the bridge and re-decking of the old bridge to proceed effectively.

In addition to these measures, the WDNR and G.W. Partners will be provided a copy of the construction schedule and notified at least one week prior to start of in-water construction activities near the capped areas. WDNR and G.W. Partners may choose to visit the site to observe the construction activities.

The WisDOT requests the WDNR's review and concurrence of this Cap Monitoring and Repair Plan, and the associated draft Special Provisions for Protection and Repair of Engineered Sediment Cap found in Appendix B.

TRC - GIS



BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

1 " = 3,000 '
1:36,000

0 3,000 6,000
FEET

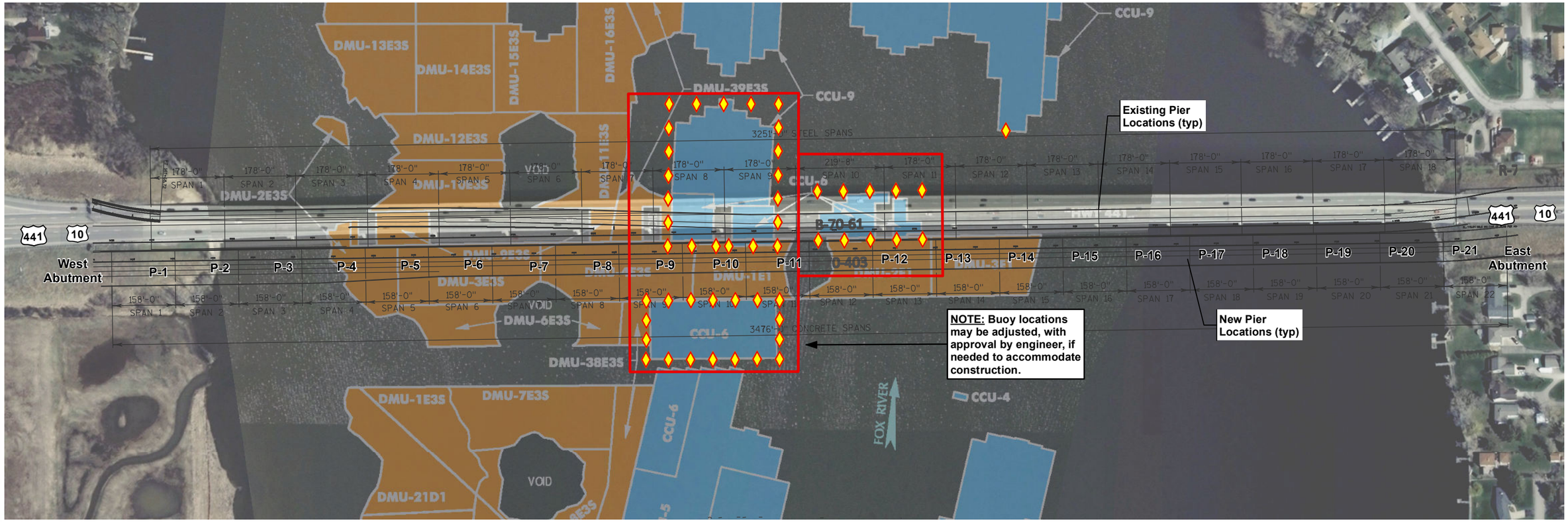
TRC
708 Heartland Trail
Suite 3000
Madison, WI 53717
Phone: 608.826.3600

WISDOT ID#1517-07-00/04
STH 441 - LITTLE LAKE BUTTE DES MORTS
NEENAH, WISCONSIN

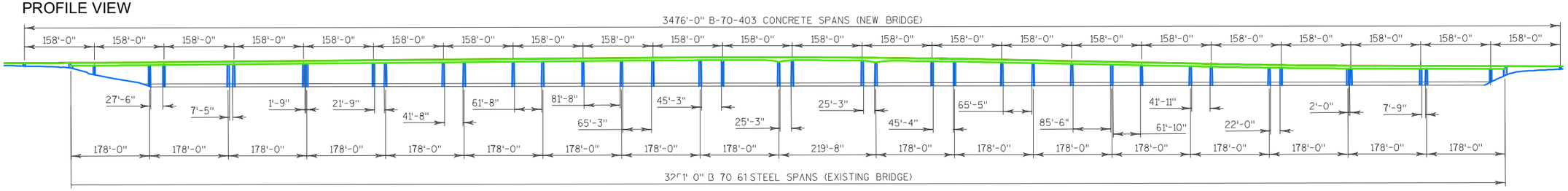
SITE LOCATION MAP

DRAWN BY:	PAPEZ J
APPROVED BY:	SELLWOOD A
PROJECT NO:	191949
FILE NO.	191949.002.slm.mxd
DATE:	NOVEMBER 2013

FIGURE 1



PROFILE VIEW



LEGEND

- APPROXIMATE ENGINEERED CAP AREA
- APPROXIMATE DREDGING AREA
- APPROXIMATE LOCATION OF MARKER BUOY FOR CAP (SEE NOTE 4)
- APPROXIMATE EXTENT OF MINIMUM COVEREAGE FOR BATHYMETRIC SURVEY

0 250 Feet

1 " = 250 '

1:3,000

NOTES

1. BASE MAP IMAGERY FROM WISCONSIN REGIONAL ORTHOPHOTOGRAPHY CONSORTIUM, SPRING 2010 .
2. DREDGED AND CAPPED AREAS FROM “FIGURE 1, LOWER FOX RIVER – OU1 DREDGE AND CAP UNITS”, FOTH, MAY, 2012.
3. BRIDGE DESIGN PLAN AND PROFILE LINEWORK FROM FIGURE “LLBDM BRIDGES, B-70-61 (EXISTING_ AND B-70-403 (PROPOSED) SPAN LAYOUTS”, WisDOT, MARCH 20, 2012, AND “EXHIBIT 4.1 0-LLBDM TEMPORARY CAUSEWAY”, OCTOBER 2012.
4. MARKER BUOYS WILL BE SPACED APPROXIMATELY 50 FEET APART ALONG PERIMETER OF CAP WITHIN 300 FT OF THE EXISTING BRIDGE, OR AS ALLOWED BY NAVIGATION PERMIT ISSUED FOR CONSTRUCTION.

PROJECT: **WISDOT ID#1517-07-00/04**
STH 441 - LITTLE LAKE BUTTE DES MORTS
NEENAH, WISCONSIN

SHEET TITLE: **SITE PLAN**

DRAWN BY:	RHODE B	SCALE: 1: 3,000	PROJ. NO. 191949
CHECKED BY:	SELLWOOD A		FILE NO. 191949-003.mxd
APPROVED BY:	HAAK D	DATE PRINTED:	**FIGURE 2**
DATE:	MAY 2014		

TRC
708 Heartland Trail, Suite 3000
Madison, WI 53717
Phone: 608.826.3600
www.trcsolutions.com

Coordinate System: NAD 1983 StatePlane Wisconsin Central FIPS 4802 Feet (Foot US)
Map Rotation: -0.75
Printed By: JPAPEZ on 6/28/2012, 04:20:01 PM
Path: E:\WI_DOT\2012_191949\191949-003.mxd

Client Name:	Site Location:	Project No.:
Wisconsin Department of Transportation (WisDOT)	Little Lake Butte des Morts Outagamie County, WI	TRC: 191949.0000.0000 WisDOT: 1517-07-00/04

Description

Sediment cap conceptual core profile. Photo provided to TRC in email dated October 9, 2013.

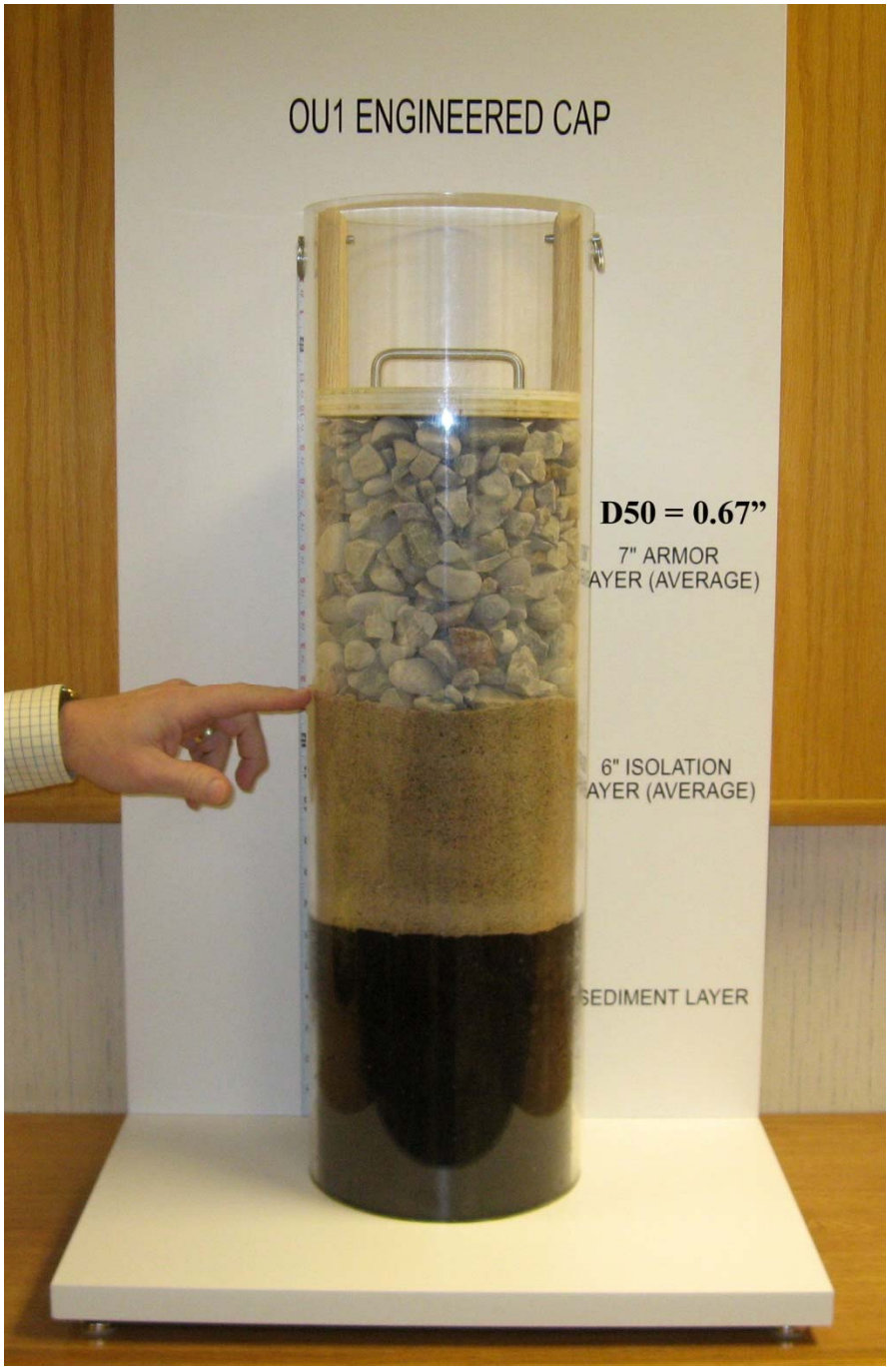


Figure 3. Sediment Cap Profile

Appendix A
Cap Specifications

6.1.2 Sand Cover Design

The OU1 *2008-2009 RA Work Plan* proposed placing sand cover over select undredged, dredged, and re-dredged areas. In 2009, sand cover was only placed over select undredged areas. The design thickness specification was 3 or 6 inches of applied sand. The specification for the sand is listed below in Table 6-2. GW Partners selected a sand material which generally met the American Society of Testing Materials (ASTM) C33 gradation for fine aggregates but voluntarily elected to tighten the specifications at the #200 sieve to 0-1% passing. The reasons for this material selection were:

1. It was readily available (concrete sand);

2. Its coarse nature allowed it to be readily cast by the Brennan spreading equipment; and

3. The low percent fines minimized suspended solid plumes during placement, as well as minimizing material loss during placement activities.

The unified soil classification for ASTM C33 fine aggregate is "poorly graded sand." ASTM D2487 defines poorly graded sand as follows:

- Cu (Coefficient of Uniformity) < 6 (Cu = 2.29 to 3.6)
- Cc (Coefficient of Curvature) between 1 and 3 (Cc = 1.0 to 1.1)

Table 6-2

Sand Specification
(ASTM C33 fine aggregate)

Sieve Size	% Passing
3/8 inches	100
#4	95-100
#8	80-100
#16	50-85
#30	25-60
#50	10-30
#100	2-10
#200	0-3[1]

1. GW Partners elected to tighten specification to 0-1% passing #200 sieve as explained in Section 6.1.2.

Prepared by: GRE
Checked by: TAG

Table 7-1

Summary of 2009 Engineered Cap Placement

Sub-Area	2008-2009 RA Work Plan (acres)	2009 Total Coverage (acres)
E2	29.7	30.6
E3 North	0.04	0.04
E5	1.6	1.6
Total	**31.3**	**32.2**

Prepared by: GRE
Checked by: NRA

7.1.2 Engineered Cap Placement Design

The 2009 engineered cap consisted of a minimum of 3 inches of sand (specifications in Section 6.1.2) overlain with a minimum of 4 inches of armor stone, as detailed in the *Final OU1 Cap Design* report. With a 3-inch overplacement allowance for each of the cap layers, the nominal design cap thickness is 13 inches. Photographs of 2009 armor placement activities are provided in Appendix A, Photographs 18 through 24.

The armor stone specification requires the material to be hard and durable having not more than 40% by weight loss upon abrasion (ASTM C535). The maximum design armor stone size is 1¼ inch, as this stone size is at or near the limit of the transport and placement technologies utilized by Brennan in 2009. The armor material is specified to be angular to sub-rounded material meeting the modified ASTM C33 No. 467 (*Final OU1 Cap Design*) which is defined in Table 7-2.

Table 7-2

Armor Stone Specification
(ASTM C33 No. 467)

Sieve Size	% Passing
1 1/4 inch	100
3/4 inch	30-70
3/8 inch	10-30
#4	0-5

Prepared by: GRE
Checked by: TAG

7.1.3 Sand Layer Source Quality Control and Quality Assurance

Source QC and QA requirements for the sand layer of the engineered cap are provided in Section 6.1.3 of this report.

One cap monitoring "trigger" is cap erosion, which is defined as a significant (i.e., detectable within the sensitivity of the hydrographic survey) differential between the previous hydrographic surveys of cap elevation and the most recent hydrographic survey of cap elevation. In other words, erosion is a significant decrease in the cap surface elevation over time. Note, it is important to differentiate between cap erosion and cap consolidation (see Section 3.1 for discussion on cap consolidation).

If a bathymetric survey indicates erosion of the armor layer over more than 5% of a cap certification unit (CCU), the affected cap areas will be assessed by poling and/or diver inspection. The main objective of the poling and diver inspection is to determine if the armor stone layer is intact and, if practical, whether the armor stone layer meets the minimum design thickness. If physical poling and/or diver inspection confirms the armor stone remains intact, it will be determined that the sediment substrate has settled rather than the cap has eroded. Poling will be completed with a standard poling rod (3/4 inch diameter) with gradations of 0.1 feet, used previously on the OU1 project to estimate sediment thickness. Through experience, it has been noted that the poling operator is able to distinguish sediment from gravel/stone by the feel of refusal. It is intended that poling will be completed in suspect areas to determine if gravel/stone is still present, based on pole refusal and measurements to the top of armor layer.

As stated in Section 5.1.1.3 of *Lower Fox River Operable Unit 1, 2007 Cap Placement Test Summary* (Foth, 2008), the accuracy of each hydrographic survey (based on product literature and field testing) is typically within 5 centimeter (cm) (2 inches). Errors are less for quiescent water and hard bottom conditions. For instance, OU1 hydrographic surveys are conducted with a minimum of three poling readings per survey, typically confirming that the spot readings are within 0.1 foot (3 cm or 1.2 inches). Assuming equal errors for each event (UA = UB = 5 cm), the propagation of errors formula (UD = sqrt(UA^2 + UB^2)) would predict that the differential survey accuracy for a point would be within 7.1 cm (3 inches).

The cap monitoring results will be summarized in technical memoranda to be submitted to the Response Agencies following each monitoring event.

Table 1

Bathymetric Survey Requirements

Survey Classification	Special Order
Survey Equipment	♦ Real-Time Kinematic Global Positioning System (RTK-GPS). ♦ 200 kHZ multi-beam transducer (unless otherwise approved by GW Partners). ♦ For multi-beam, motion control unit to compensate for heave, pitch and roll. Heave 5cm or 5%, Roll & pitch 0.2 degrees. ♦ Laptop computer with sounding and navigation software. ♦ Survey boat with maximum 24-inch draft.
Survey Coverage	♦ Full coverage, entire length and width of each cap area. ♦ Minimum overlap at least 95% of cap areas.
Equivalent Target Map Scale	1 in. = 50 ft. (Note: The mapping may also be used at various smaller scales for different purposes on the project, but the accuracy of the bathymetric survey shall be based on the map scale no smaller than 1 in. = 50 ft.).
Resultant Horizontal Accuracy	+/- 10% of water column depth.
Resultant Elevation/Depth Accuracy	0.25 ft.
Map Contour Interval	0.5 ft.
Horizontal Datum	Wisconsin State Plane South NAD 83
Vertical Datum	NAVD 88
Unit of Measure	U.S. survey ft.
Output Electronic Format	Compatible with ArcGIS and Microstation
Output Hard Copy Format	ANSI D-size sheets (22 x 34 in.; to allow half-scale plotting directly to 11 x 17 in. when needed).

Prepared by: REM
Checked by: DMR

Table 1 (continued)

Quality Control Checks:

- Project control point and water surface elevation will be measured at the beginning and end of each survey.
- Sound speed recorded before, during, and after each survey.
- Patch test performed before data collection to confirm misalignment values of sensors.
- Manual polings of top of cap depth below water surface will be taken at a rate of one poling per hour of survey distributed evenly throughout the surveyed area. Compare against transducer reading and record both readings.
- Interact as needed with Foth or another third party serving in a QA role as requested by GW Partners.

Deliverables:

- Top-of-sediment bathymetric charts in elevations & depths, and cross-sections of the same area.
- Hypack® project(s) established on the survey vessel.
- Hypack RAW data, Sound Speed files.
- Copy of field notes including, control checks, water surface elevations, etc.
- Hypack HS2 data edited by survey contractor
- Hypack XYZ data output on a 2' x 2' grid using average elevations per grid cell.
- Other bathymetric charts of specific areas within the survey limits, as requested

Appendix B
Draft Special Provision – Protection & Repair to Engineered Sediment Cap

May 1, 2014

Special Provisions for
Protection and Repair of Engineered Sediment Cap

Project ID #1517-07-00/04
STH 441 – Little Lake Butte des Morts Bridge
Winnebago County, Wisconsin

Prepared by
TRC
Madison, Wisconsin

1. Protection of Engineered Sediment Cap, Item _____. Repair of Engineered Sediment Cap, Item SPV.0035.XX.

A Description

A.1 General

This special provision describes measures to prevent damage to the engineered sediment cap in place in Little Lake Butte des Morts, and the requirements for repair of the cap if damaged during construction.

A.2 Notice to the Contractor

The contractor is advised Little Lake Butte des Morts (LLBDM) is within the United States Environmental Protection Agency (USEPA) Lower Fox River PCB Remediation Site following Superfund criteria, where soft sediment have the potential to be contaminated with PCBs. Others previously dredged PCB-impacted sediment from LLBDM and constructed a protective sand/armor cap over areas where low-level PCBs remain in the sediment.

The extent of the engineered cap is as shown on the plans. The cap has a nominal thickness of 13 inches, and consists of 3 to 6 inches of sand overlain with 4 to 7 inches of armor stone. The sand meets the ASTM C33 gradation for fine aggregate, and armor stone is angular to sub-rounded material meeting ASTM C33 No 467.

The engineered cap that covers PCB-impacted sediment is near or within the limits of construction. The contractor is advised to use best practices to avoid damage to the cap (e.g. avoid spudding and tug boat prop-wash disturbance in the capped areas). The Wisconsin Department of Natural Resources may observe construction practices for in-water work that occurs near the cap. The Environmental Consultant will monitor the cap for damage, and will direct contractor to repair damage to the cap, as needed.

For further information on the engineered sediment cap contact the Environmental Consultant listed below.

A.3 Coordination with the Environmental Consultant

Coordinate work under this contract with the Environmental Consultant retained by the Department:

Consultant:	TRC Environmental Corporation
Address:	708 Heartland Trail, Suite 3000, Madison, WI, 53717-1934
Contact:	Alyssa Sellwood or Dan Haak
Phone:	(608) 826-3658 or (608) 826-3628
Fax:	(608) 826-3941
e-mail:	asellwood@trcsolutions.com or dhaak@trcscolutions.com

The role of the Environmental Consultant will be limited to:

- Oversee and document in-water construction activities occurring near the cap

- Document that buoys defining the edge of cap are set and maintained at the approved locations.

- Coordinate bathymetric surveys of the engineered sediment cap. (Surveys to be completed include: pre-construction, interim [end of each construction season], post-repair [if needed], and post-construction [final]).

- Evaluate bathymetric survey data for damage to the cap.

- Prepare and obtain WDNR approval for Cap Repair Plan(s) if cap damage is detected.

- Direct and oversee that repair of the cap is completed in accordance with the approved Cap Repair Plan.

Provide at least a 14-calendar day notice of the preconstruction conference date to the environmental consultant. At the preconstruction conference, provide a schedule for all in-water activities anticipated to occur near or within the capped areas. Notify the Environmental Consultant at least five calendar days prior to commencement of any in-water construction activities occurring near the cap.

B (Vacant)

C Construction Methods
Subsection 205.3 of the Standard Specifications is supplemented with the following:

Protect engineered cap to minimize damage to the cap during construction:

- Set and maintain buoys around the boundaries of the cap at locations specified by the Environmental Consultant or Engineer. Buoys will provide visual reminder of the location of the engineered cap to which damage must be avoided and repaired.

- Minimize in-water activity within the capped areas and use best practices to avoid damage to the cap (e.g. avoid/minimize spudding of barges and prop-wash from tug boats in or near capped areas as defined by the buoys).

- Notify the Environmental Consultant if spudding of barges or use of tug boats in the capped area will occur, and provide documentation of location(s) of these activities.

- Request adjustment of buoy location(s), if needed to accommodate construction. Do not move buoy(s) until request has been approved by Engineer.

- Coordinate with Environmental Consultant to allow bathymetric surveys to be completed as needed to evaluate condition of the cap. Bathymetric surveys to be completed by others.

- Provide Environmental Consultant with preferred means and methods for repair of cap, if needed, such that Environmental Consultant can include method in Cap Repair Plan for WDNR approval.

Repair damage to the cap, as needed, and as directed by the Environmental Consultant in accordance with WDNR- approved Cap Repair Plan. Repair, if needed, is anticipated to be as follows:

- Supply armor stone (and sand if needed) that meet design specifications for the engineered cap that is currently in place.

- **Armor Stone** to be hard and durable not having more than 40 percent by with loss upon abrasion (ASTM C535), angular to sub-rounded material meeting modified ASTM C33 No 467, which is defined below:

Armor Stone Specification ASTM C33 No. 467	
Sieve Size	**% Passing**
1 ¼ - inch	100
3/4 – inch	30-70
3/8 – inch	10-30
#4	0-5

- **Sand cover** to be poorly graded sand that generally meets ASTM C33 gradation for fine aggregates, which is defined below:

Sand Specification ASTM C33 fine aggregate	
Sieve Size	**% Passing**
3/8 – inch	100
#4	95-100
#8	80-100
#16	50-85
#30	25-60
#50	10-30
#100	2-10
#200	0-3[(1)]

[(1)] Note that the current cap used sand with specifications that tightened the percent passing the #200 sieve to 0-1 percent.)

- Place armor stone (and sand if needed) over the area(s) with construction-related damage in accordance with approved Plan and schedule.

- Fill damaged area(s) to achieve elevation(s) of the top of cap measured pre-construction, but not to exceed 6-inches over the pre-construction elevation(s).

D Measurement
Protection of engineered cap shall be measured as lump sum. Repair of engineered cap shall be measured by the cubic yard of material placed to repair the cap.

E Payment

The department shall pay for protection of engineered cap as a lump sum and measured quantities to repair the cap at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
	Protection of Engineered Cap	LS
SPV.0035.xx	Repair of Engineered Cap	CY

The price shall be payment in full for the payment of all labor, tools, equipment, materials, and incidentals necessary to complete the work for protecting and repairing the cap.