UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF WISCONSIN
GREEN BAY DIVISION

UNITED STATES OF AMERICA and THE STATE OF WISCONSIN, Plaintiffs, v. NCR CORPORATION, *et al.*, Defendants.	)))))))))))	Civil Action No. 10-C-910 The Honorable William C. Griesbach

UNITED STATES' NOTICE OF LODGING OF PROPOSED CONSENT DECREE WITH NCR CORPORATION AND GEORGIA-PACIFIC CONSUMER PRODUCTS LP

The United States of America (the "United States") hereby lodges with the Court the proposed Consent Decree that is being filed herewith. The United States and the State of Wisconsin are co-plaintiffs in this action addressing polychlorinated biphenyl contamination at the Lower Fox River and Green Bay Superfund Site under the Comprehensive Environmental Response, Compensation, and Liability Act. The proposed Consent Decree memorializes an agreement by NCR Corporation and Georgia-Pacific Consumer Products LP to fund and perform an estimated $67 million in remediation work at the Site in 2015, as outlined in a 2015 Remedial Action Work Plan that EPA has approved in accordance with its 2007 Unilateral Administrative Order for remedial action at the Site.

This year's in-river remediation work at the Site began on March 30. In Paragraph 16 of the Consent Decree, the parties recite their understanding and expectation that remediation work under the 2015 Remedial Action Work Plan will need to continue at full pace and NCR and Georgia-Pacific stipulate and agree that they are bound to comply with their obligations under

the Consent Decree even before it is entered by the Court. The United States contends that the continuation of that work is not only required by the parties' agreement, but also by the UAO.

Pursuant to Department of Justice policy, the United States intends to publish notice of the lodging of this proposed Consent Decree in the Federal Register to commence a 30-day public comment period. The Court should not sign or enter the proposed Consent Decrees until the public has had an opportunity to comment and the United States has addressed those comments, if any.

The United States may withhold its consent to the proposed Consent Decree if comments disclose facts or considerations which indicate that the proposed Consent Decree is improper, inappropriate, inadequate, or not in the public interest. At the conclusion of the public comment period, the United States will: (1) file with the Court any written comments received pertaining to the proposed Consent Decree; and (2) either notify the Court of its withdrawal of the proposed Consent Decree, or respond to comments received and seek approval and entry of the Consent Decree.

Respectfully submitted,

For the United States of America

JOHN C. CRUDEN
Assistant Attorney General
Environment and Natural Resources Division

Dated: April 9, 2015

s/ *Randall M. Stone*

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that, on this day, the foregoing Notice of Lodging (together with the accompanying proposed Consent Decree and its Appendix) was filed electronically with the Clerk of the Court using the Court's Electronic Case Filing System, which sent notification of such filing to all counsel of record through the ECF notification system.

Dated: April 9, 2015 s/ *Randall M. Stone*

IN THE UNITED STATES DISTRICT
COURT FOR THE EASTERN DISTRICT OF WISCONSIN
GREEN BAY DIVISION

UNITED STATES OF AMERICA and the STATE OF WISCONSIN Plaintiffs, v. NCR CORPORATION, *et al*., Defendants.	Civil Action No. 10-C-910 The Honorable William C. Griesbach

CONSENT DECREE WITH
NCR CORPORATION AND GEORGIA-PACIFIC CONSUMER PRODUCTS LP
REGARDING PARTICULAR REMEDIAL ACTION WORK TO BE PERFORMED AT
THE LOWER FOX RIVER AND GREEN BAY SUPERFUND SITE IN 2015

CONSENT DECREE

A. By entry into this Consent Decree, Defendants NCR Corporation ("NCR") and Georgia-Pacific Consumer Products LP ("Georgia-Pacific") agree without admission of liability to perform or fund particular remedial action work at the Lower Fox River and Green Bay Superfund Site (the "Site") in 2015, as required by a November 2007 Unilateral Administrative Order ("UAO") that the U.S. Environmental Protection Agency ("EPA") issued under Section 106 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9606, and as described in Paragraph 1 below. This Consent Decree constitutes an agreement with potentially responsible parties under 42 U.S.C. § 9622(d) with respect to remedial action under 42 U.S.C. § 9606. This Consent Decree supplements and facilitates implementation of the UAO without superseding, replacing, or terminating the UAO.

B. The UAO requires specified environmental cleanup work in portions of the Site from the outlet of Little Lake Butte des Morts to the Bay of Green Bay – *i.e.*, Operable Units 2 through 5 at the Site ("OUs 2-5"). Among other things, the UAO requires remediation of sediment that is contaminated with polychlorinated biphenyls ("PCBs") in accordance with Records of Decision, Record of Decision Amendments, and an Explanation of Significant Differences issued by EPA and the Wisconsin Department of Natural Resources (collectively referred to herein as the "Agencies").

C. NCR and Georgia-Pacific are among the Respondents named in the UAO, along with P.H. Glatfelter Company ("Glatfelter") and certain other parties.

D. The UAO directs the Respondents to perform UAO work in accordance with a set of work plans and deliverables referenced in the UAO and its Statement of Work, including an annual Remedial Action Work Plan that must be approved by EPA.

E. EPA has approved a Remedial Action Work Plan for 2015 (the "2015 Work Plan"), which requires, *inter alia:* (i) that dredging and disposal of PCB-contaminated sediment from Operable Unit 4 proceed on a full-time basis during the 2015 dredging season; and (ii) that capping and covering of certain PCB-contaminated riverbed areas occur in Operable Unit 4 during 2015. The remediation work outlined in the 2015 Work Plan commenced on March 30, 2015, and is scheduled to finish on or about November 13, 2015. A copy of the main body of the 2015 Work Plan, along with Appendix E of the 2015 Work Plan, is attached hereto as Appendix 1 and is incorporated herein by reference.

F. Appendix E of the 2015 Work Plan identifies UAO work activities to be performed or funded by NCR and Georgia-Pacific during 2015 as described in Paragraph 1 below (the "NCR/GP Work") and UAO work activities to be performed or funded by Glatfelter during 2015 (the "Glatfelter Work"). By entry into this Consent Decree, NCR and Georgia-Pacific are agreeing to perform or fund only the NCR/GP Work as described in Paragraph 1 below, and do not have an obligation to perform or fund the Glatfelter Work in 2015. For the purpose of this Consent Decree, the "NCR/GP Work" and the "Glatfelter Work" do not include (and this Consent Decree does not address) response costs that the United States or the State incur in connection with that work, including oversight costs.

G. Cleanup work required by the UAO has been funded and performed over the last few years under a set of contracts and arrangements put in place by NCR and certain other parties, and through an entity that NCR helped form that is called the Lower Fox River Remediation LLC (the "LLC"). Georgia-Pacific has in the past provided funding for the LLC.

H. NCR has determined and hereby represents that the NCR/GP Work is expected to cost approximately twice as much as the Glatfelter Work if Glatfelter elects to utilize the LLC's contractors and subcontractors for performance of the Glatfelter Work.

I. The parties to this Consent Decree recognize, and the Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the parties in good faith and that implementation of this Consent Decree will expedite the cleanup of the Site and limit the issues to be litigated between the parties, and that this Consent Decree is fair, reasonable, and in the public interest.

THEREFORE, based on the foregoing and with the consent of the parties to this Consent Decree, it is ORDERED, ADJUDGED, and DECREED:

1. NCR and Georgia-Pacific shall perform or fund to completion all aspects of the NCR/GP Work in 2015 in accordance with the 2015 Work Plan as follows: (i) NCR will be the work party for the NCR/GP Work (*i.e.*, the party performing the NCR/GP Work) and will fund 50% of the NCR/GP Work; and (ii) Georgia-Pacific will fund a 50% share of the NCR/GP Work.

2. Georgia-Pacific will fund its 50% share of the NCR/GP Work by paying cash calls, without deduction or offset of any kind, as issued by the LLC to fund the NCR/GP Work either by the first business day of the following month or 14 days from Georgia-Pacific's electronic receipt of the LLC cash call, whichever is later (for example, a cash call sent electronically on November 14 shall be due on December 1; a cash call sent electronically on November 20 shall be due on December 4); notwithstanding the foregoing, Georgia-Pacific shall not be required in any instance to pay any cash call directed to it before NCR pays the corresponding cash call issued to NCR. The LLC will make available back-up information to support the cash call calculations on a monthly basis. NCR and Georgia-Pacific shall work together in good faith to resolve any questions or discrepancies relating to the funding of the NCR/GP Work, including issuing any necessary payments or credits to effectuate the intent of this agreement that each company shall pay equal shares of the cost of the NCR/GP Work. NCR shall prepare a true-up statement after the conclusion of the 2015 Work Plan for the purpose of establishing that NCR and Georgia-Pacific each pays 50% of the cost of the NCR/GP Work.

3. NCR and Georgia-Pacific consent to and shall not challenge the terms of this Consent Decree or this Court's authority to enter and enforce this Consent Decree.

4. All remedial action work required by this Consent Decree shall be subject to oversight by the Agencies, with supervision by the Court as to any party's claims or defenses under this Consent Decree and compliance with the specific terms of Appendix 1. NCR and Georgia-Pacific hereby agree that any performance or funding disputes between them in connection with the NCR/GP work specified in this Consent Decree shall be subject to the

exclusive jurisdiction of this Court utilizing this Court's expedited briefing procedures, and NCR and Georgia-Pacific hereby agree that (i) in connection with any such dispute resolution, both will respectfully request that the Court resolve the dispute as quickly as possible, (ii) the only issues to be determined shall be the legal question of whether a party complied with this Consent Decree and the resolution of any disputes arising under Paragraph 2 hereof, and (iii) a party shall comply with any performance or funding ordered by the Court within seven days of the Court's decision resolving the dispute.

5. As an exercise of its enforcement discretion, the United States will not take any enforcement action (including seeking penalties) against NCR or Georgia-Pacific for any failure to perform or fund any aspect of the Glatfelter Work during calendar year 2015. NCR commits to facilitate Glatfelter's ability to use the LLC's contractors and/or subcontractors for performance of the Glatfelter Work, including the provision of all necessary consents or change orders. Nothing in this Consent Decree or in the 2015 Work Plan should be construed as requiring Glatfelter's use of the LLC's contractors and/or subcontractors for performance of the Glatfelter Work.

6. Waiver of Claims by Georgia-Pacific. In Paragraph 20 of a prior Consent Decree entered in the case (Dkt. 2-1; Dkt. 130), Georgia-Pacific and certain affiliates have already covenanted not to sue, and agreed not to assert, any claims or causes of action against the United States or the State with respect to the Site, subject to limited reservations in Paragraph 21 of that Consent Decree. Nothing in this Consent Decree alters that covenant and the reservations in that prior Consent Decree.

7. Waiver of Claims by NCR. Subject to Paragraph 8, NCR hereby covenants not to sue and agrees not to assert any claims or causes of action against the United States or the State with respect to the NCR/GP Work or this Consent Decree, including, but not limited to:

a. any direct or indirect claim for reimbursement for the NCR/GP Work from the Hazardous Substance Superfund (established pursuant to the Internal Revenue Code, 26 U.S.C. § 507) through CERCLA Sections 106(b)(2), 107, 111, 112, 113 or any other provision of law;

b. any claims against the United States (including any department, agency or instrumentality of the United States) or the State (including any department, agency or instrumentality of the States) under CERCLA Sections 107, 112, or 113, 42 U.S.C. §§ 9607, 9612, or 9613, related to the NCR/GP Work; and

c. any claims against the United States (including any department, agency or instrumentality of the United States) or the State (including any department, agency or instrumentality of the State) under the United States Constitution, the Wisconsin Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law, related to the NCR/GP Work.

8. Reservations by NCR. NCR reserves, and this Consent Decree is without prejudice to, claims against the United States, subject to the provisions of Chapter 171 of Title 28 of the United States Code, and brought pursuant to any statute other than CERCLA or RCRA

and for which the waiver of sovereign immunity is found in a statute other than CERCLA or RCRA, for money damages for injury or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any employee of the United States, as that term is defined in 28 U.S.C. § 2671, while acting within the scope of his or her office or employment under circumstances where the United States, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred. However, the foregoing shall not include any claim based on EPA's selection of response actions, or the oversight or approval of response action plans, reports, other deliverables or activities.

9. Subject to Paragraphs 5-8 and 10-11, the United States, NCR, and Georgia-Pacific each reserve any and all rights (including, but not limited to, any right to contribution), defenses, claims, demands, and causes of action which each party may have with respect to any matter, transaction, or occurrence relating in any way to the Site. Among other things, the United States expressly reserves its right to require NCR and/or Georgia-Pacific to perform any uncompleted portion(s) of the Glatfelter Work after calendar year 2015.

10. The Parties agree, and by entering this Consent Decree this Court finds, that this Consent Decree constitutes a judicially-approved settlement pursuant to which NCR and Georgia-Pacific have, as of the Effective Date, resolved liability to the United States within the meaning of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and are entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Section 113(f)(2) of CERCLA, or as may be otherwise provided by law, for the "matters addressed" in this Consent Decree; provided that NCR and Georgia-Pacific agree that they will not assert the protection provided in this Paragraph 10 as a defense to any contribution claims as between each other or as a defense to any contributions claims by the United States or the State. The "matters addressed" in this Consent Decree are the performance and costs of the NCR/GP Work. The Parties further agree that all NCR/GP Work is necessary and consistent with the National Contingency Plan.

11. In any subsequent administrative or judicial proceeding initiated by the United States or the State for injunctive relief, recovery of response costs or natural resource damages, or other relief relating to the Site, NCR and Georgia-Pacific shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, *res judicata*, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised in the subsequent proceeding were or should have been brought in the instant action.

12. Except with respect to the waiver of claims against the State, nothing in this Consent Decree shall be construed to create any rights in, or grant any cause of action to, any person not a party to this Consent Decree.

13. This Consent Decree and its Appendix constitute the final, complete, and exclusive agreement and understanding among the parties with respect to the commitments made in this Consent Decree.

14. The terms of this Consent Decree may be modified only by a subsequent written agreement signed by the parties. Where the modification constitutes a material change to this Decree after its entry, the modification shall be effective only upon approval by the Court.

15. This Consent Decree shall be lodged with the Court for a period of not less than 30 days for public notice and comment. The United States shall file with the Court any written comments received and the United States' response thereto. The United States reserves the right to withdraw or withhold its consent if comments regarding the Consent Decree disclose facts or considerations which indicate that this Consent Decree is inappropriate, improper, or inadequate. NCR and Georgia-Pacific consent to entry of this Consent Decree without further notice and hereby agree not to oppose entry of this Consent Decree by this Court or to challenge any provision of this Consent Decree unless the United States has given notice in writing that it no longer supports entry of the Consent Decree.

16. The Effective Date of this Consent Decree shall be the date upon which it is entered by the Court; provided, however, that NCR and Georgia-Pacific hereby stipulate and agree that they shall be bound upon the date of lodging to comply with obligations of NCR and Georgia-Pacific specified in this Consent Decree that arise before the date upon which this Consent Decree is entered by the Court. The parties to this Consent Decree understand and expect that remediation work under the 2015 Work Plan – including the NCR/GP Work – needs to commence and continue before and through the Consent Decree's Effective Date. The United States contends that the continuation of that work is not only required by this agreement, but also by the UAO.

17. Each undersigned representative of the United States, NCR, and Georgia-Pacific certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Decree and to execute and legally bind such party to this document. This Consent Decree may be executed in multiple counterparts, each of which shall be deemed an original, but all of which, taken together, shall constitute one and the same instrument.

SO ORDERED.

THE COURT'S APPROVAL AND ENTRY OF THIS CONSENT DECREE SHALL BE SIGNIFIED BY ENTRY OF A SEPARATE ORDER IN ACCORDANCE WITH THE COURT'S ELECTRONIC CASE FILING POLICIES AND PROCEDURES MANUAL

_____

WILLIAM C. GRIESBACH, Chief Judge
United States District Court – WIED

Signature Page for Consent Decree with NCR Corporation and Georgia-Pacific Consumer Products in *United States, et al. v. NCR Corp., et al.*, No. 10-cv-910 (E.D. Wis.)

FOR THE UNITED STATES OF AMERICA

JOHN C. CRUDEN
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Date: 4/9/2015

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Date: 4/7/15

for RICHARD C. KARL
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Date: 4-2-15

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FOR NCR CORPORATION

Date: April 6, 2015

Signature

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Title: Acting General Counsel

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FOR GEORGIA-PACIFIC
CONSUMER PRODUCTS LP

Date: 4/2/15

Bryant T Champion
Signature

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Index to:

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1-1. EPA letter approving 2015 Remedial Work Plan with required modifications (without attachments)

1-2. Main body of the 2015 Work Plan (approved by EPA with required modifications)

1-3. Agencies/Oversight Team comments with required modifications to the main body of the 2015 Work Plan

1-4. Appendix E of the 2015 Work Plan (as approved by EPA)

Appendix 1 to Consent Decree with NCR Corporation and
Georgia-Pacific Consumer Products LP

1-1. EPA letter approving 2015 Remedial Work Plan with required modifications (without attachments)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

REPLY TO: SR-6J

April 9, 2015

VIA EMAIL

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Re: Notice of Approval with Modifications, 2015 Remedial Action Work Plan
Administrative Order for Remedial Action ("UAO"), Docket No. V-W-'08-C-885
Lower Fox River and Green Bay Superfund Site, WI

Dear Sirs and Madam:

Pursuant to paragraph 49 of the UAO, the 2015 Remedial Action Work Plan ("RAWP") is approved with modifications. Please incorporate the modifications specified in the following enclosures into the proposed final RAWP (the main body of which was identified as revision 3 and dated March 26, 2015): 1) A/OT Comments for the Text and Appendix D; 2) A/OT Comments for Appendices A, B and C; and 3) replacement Appendix E. The proposed final RAWP, as modified by this approval letter, shall serve as the Final 2015 RAWP. If you have any questions, please contact me at 312-353-4213.

Sincerely,

James Hahnenberg
Remedial Project Manager

Enclosures

cc (via electronic mail):
Tim Fischer, EPA
Thomas Short, EPA
Richard Murawski, EPA ORC
Randall Stone, DOJ
Cynthia Hirsch, WDOJ
Gary Kincaid, WDNR
Beth Olson, WDNR

Appendix 1 to Consent Decree with NCR Corporation and
Georgia-Pacific Consumer Products LP

1-2. Main body of the 2015 Work Plan (approved by EPA with required modifications)

FINAL PHASE 2B WORK PLAN FOR 2015 REMEDIAL ACTION OF OPERABLE UNITS 2 THROUGH 5

LOWER FOX RIVER AND GREEN BAY SITE BROWN AND OUTAGAMIE COUNTIES, WISCONSIN

Prepared by
Tetra Tech EC, Inc.
Anchor QEA, LLC
J. F. Brennan Company, Inc.
Stuyvesant Projects Realization, Inc.

Prepared for
Lower Fox River Remediation LLC

For Submittal to
Wisconsin Department of Natural Resources
U.S. Environmental Protection Agency

Document Control Number: LFRR-14-0444A-R3

March 2015

Revision	Prepared By	Reviewed By	Approved By	Date
0	Terri Blackmar	Richard Feeney	Bill Coleman	10/30/14
1	Terri Blackmar	Richard Feeney	Bill Coleman	1/30/15
2	Terri Blackmar	Richard Feeney	Bill Coleman	2/27/15
3	Terri Blackmar	Richard Feeney	George Willant	3/26/15

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ACRONYMS AND ABBREVIATIONS

AECOM	STS/AECOM
AM	adaptive management
AMVEP	Adaptive Management and Value Engineering Plan
ARAR	applicable or relevant and appropriate requirement
API	Appleton Papers Inc.
A/OT	Agencies/Oversight Team
BMP	best management practice
BOD	biochemical oxygen demand
BRM	beneficially reused material
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CQAPP	Construction Quality Assurance Project Plan
CNRR	Canadian National Railway Company
cy	cubic yard
DLR	dredge low risk
DMU	dredge management unit
DOC	depth of contamination
DOT	Department of Transportation
Design Team	Tetra Tech EC, Inc., Anchor QEA, and URS
EM	Engineering Manual
ESD	Explanation of Significant Differences
FIK	full indicator kriging
Foth	Foth Infrastructure & Environment, LLC
GAC	granular activated carbon
GOH	Gross Operating Hours
gpm	gallons per minute
GPS	global positioning system
H&S	health and safety
HASP	Health and Safety Plan
HDPE	high-density polyethylene

ACRONYMS AND ABBREVIATIONS
(Continued)

ICIAP	Institutional Control Implementation and Assurance Plan
J.F. Brennan	J.F. Brennan Co, Inc.
LFR	Lower Fox River
LHE	Low Hazard Waste Exemption
LLC	Lower Fox River Remediation LLC
LOS	level of significance
MOA	Memorandum of Agreement
NA-Confirm	No Action-Confirm
NCR	NCR Corporation
O&M	Operations and Maintenance
OU	Operable Unit
PCB	polychlorinated biphenyl
pcf	pounds per cubic foot
PLC	programmable logic controller
ppm	parts per million
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RA	remedial action
RA-Confirm	Remedial Action-Confirm
RAL	Remedial Action Level
RAWP	Remedial Action Work Plan
RD	remedial design
ROD	Record of Decision
RTK	Real Time Kinematic
SDDP	Sediment Desanding and Dewatering Plant
SDR	Standard Dimension Ratio
SHPO	State Historic Preservation Office
SHSP	Site Health and Safety Plan
SOP	Standard Operating Procedures
SOW	Statement of Work
SPRI	Stuyvesant Projects Realization, Inc.

ACRONYMS AND ABBREVIATIONS
(Continued)

SWAC	surface weighted average concentration
SWPPP	Stormwater Pollution Prevention Plan
Tetra Tech	Tetra Tech EC, Inc.
TSCA	Toxic Substances Control Act
TSS	total suspended solids
USACE	United States Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VE	value engineering
WisDOT	Wisconsin Department of Transportation
WTP	Water treatment plant
WDNR	Wisconsin Department of Natural Resources

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1. INTRODUCTION

This Phase 2B Remedial Action Work Plan (RAWP) describes implementation actions for the 2015 remediation of polychlorinated biphenyls (PCBs) in Operable Units (OUs) 2 through 5 of the Lower Fox River and Green Bay Site (referred to as the "Site"; see Figure 1-1).

The RAWP includes descriptions of the RA planned to be performed in 2015, which will include dredging, capping, and sand cover placement. An additional RAWP will be prepared for each subsequent year of Phase 2B construction. The design included in each subsequent RAWP will be refined based on data obtained from infill and additional sampling, and/or field investigations performed in the respective reach of river.

The overall remediation program for the Site is set forth in Records of Decision (RODs), the 2007 Record of Decision Amendment (United States Environmental Protection Agency [USEPA] and Wisconsin Department of Natural Resources [WDNR] 2002, 2003, and 2007), and the 2010 Explanation of Significant Differences (ESD; USEPA and WDNR 2010). As set forth in the 2007 Administrative Order for RA (the "Order") and Statement of Work (SOW) for completion of Phase 2A work elements (Phase 2A SOW) (USEPA 2007), certain remedial action (RA) tasks were expedited and completed in 2008 in order to commence full-scale sediment remediation in OUs 2 through 5 at the start of the 2009 construction season.

During 2009, construction of the Lower Fox River Processing Plant (LFR Processing Facility) was completed, as well as construction of a secondary support site in OU 3. During the 2009 and 2010 seasons, dredging was performed from April to mid-November, with project production estimates being exceeded. Sand covering and engineered capping operations also began in 2009, a season earlier than initially scheduled, but were not performed in 2010. During the 2011 season, dredging was performed from April to August, and sand covering and capping continued through October. All remediation work in OU 3 was completed by the end of the 2011 season. During the 2012 season, dredging was performed from May to mid-November, but no capping or sand covering was performed. During the 2013 and 2014 seasons, dredging was performed from April to mid-November, while capping and sand covering commenced in May or June and continued into November.

The Lower Fox River Remediation LLC (the "LLC"), an entity formed by Appleton Papers Inc. (API) and NCR Corporation (NCR), retained Tetra Tech, EC Inc. (Tetra Tech) as the prime contractor for Phase 2A and 2B. The Tetra Tech Team performing the Phase 2B RA includes J.F. Brennan Co, Inc. (J.F. Brennan) for dredging, debris removal, capping and sand cover placement; Stuyvesant Projects Realization Inc. (SPRI, a subsidiary of Boskalis Dolman Bv) for sediment desanding and dewatering; Anchor QEA, LLC (Anchor QEA) for design assistance; and other specialty subcontractors.

The Phase 1 area was the subject of a Consent Decree (CD) (USEPA 2006) executed by the Response Agencies, NCR, and U.S. Paper Mills Corporation (referred to as the "Phase 1 Project"). This area is located in southern OU 4. The Phase 1 area was dredged during the 2010 dredge season, and post-dredge confirmation sampling was performed. Additional sampling of accreted sediment was conducted in 2012 to determine the need for residuals management (e.g., residual dredging, sand cover, capping).

Figure 1-1. Lower Fox River Area Location Map

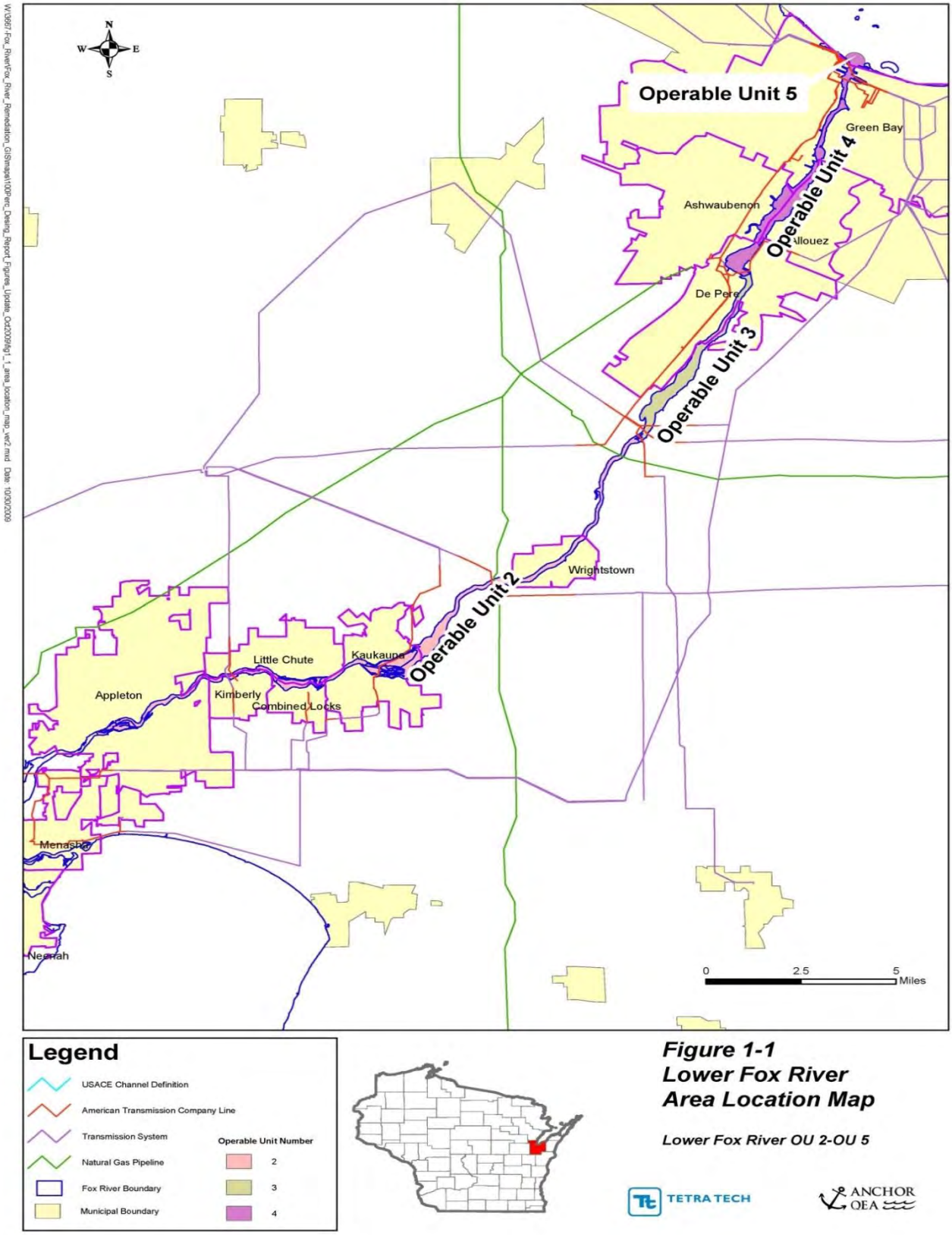

Table 1-1. Total Dredging, Capping and Covering Quantities Completed from 2009 through 2014

Remedial Activity	OU 2	OU 3	OU 4	Total
Dredging (in situ cubic yards)[1]	3,009	235,858	3,058,172	**3,297,039**
Remedy Caps (Types A, B or C) (acres)	6.98	26.75	62.66	**96.39**
Residual Caps (Types A, B or C) (acres)	0	0	5.81	**5.81**
Sand Cover as the Primary Remedy (acres)	0.29	61.87	14.31	**76.47**
Sand Cover over Dredge Residuals (acres)	0	52.15	216.77	**268.88**
Shoreline Caps (acres)	0	0	0	**0**

Notes: 1. Dredge volumes shown are total volume dredged, as reported in the Annual RA Summary Reports, which includes overcut volume and Phase 1 volumes removed as part of the Phase 2B work (i.e., excluding Phase 1 dredging performed in 2007).

2. Residual and remedy sand cover area includes sand cover placed in the Phase 1 area.

Additional detail regarding RA completed from 2009 through 2013 can be found in the annual RA Summary Reports (Tetra Tech et al. 2010b, 2011a, 2012b, 2013b, 2014b). The 2014 RA Summary Report will be submitted to the Response Agencies in 2015 describing all RA performed in 2014.

Final dredging in 2015 will follow the same general upstream-to-downstream approach to RA used in prior years and will begin on or about March 30. Production dredging will vary at locations in OU 4 and will be performed by the 12-inch dredge and up to two 8-inch dredges. Sand cover and engineered cap placement will resume in the 2015 construction season where final dredging has been completed ahead of this activity. In addition, residual dredging will be performed and residual sand covers and residual caps will be installed during 2015 to close out dredge management unit (DMUs) based on the results of post-dredge confirmation sampling in accordance with the Construction Quality Assurance Project Plan (CQAPP [Tetra Tech et al. 2014a]).

The active in-river RA is planned to start on or about March 30, 2015 and to end on approximately November 13, 2015, but actual dates are subject to weather and river conditions. The reach of the river where dredging will be performed is from approximately transect 4041, located south of the CNRR Bridge, Denmark Spur, to transect 4071. For this reach of the river, the Work Parties will perform final dredging and/or production dredging. Final dredging will follow the upstream-to-downstream approach used in prior years or as may be approved by the A/OT. (The "Work Parties" are identified in Appendix E. Appendix E also identifies the division of 2015 work among the Work Parties.) The RA will include dredging dewatering, trucking and disposal of sediment regulated under the Toxic Substances Control Act (TSCA).

Where final dredging has been completed upstream of all other required dredging, the following activities will be performed in accordance with the CQAPP:

- Each DMU's post-dredge bathymetric surface will be compared to the required dredge elevations to verify that at least 90 percent of the dredge area meets the target elevation.
- Each DMU's post-dredge confirmation sample results will be reviewed with the Agencies/Oversight Team (A/OT) to determine the appropriate residuals management for the area, if required.

During the 2015 RA season, residual sand covering and post-dredge capping, where applicable, will be completed in an upstream-to-downstream manner, similar to final dredging. The placement of engineered caps and remedy sand covers will also proceed in an upstream-to-downstream manner during 2015, proceeding after the completion and closeout (i.e., residuals management also completed and accepted by the A/OT, if required) of dredge areas.

1.2 Objectives for 2015 Remedial Actions

It is planned that the Phase 2B RA in 2015 will include primary and residual dredging (TSCA and non-TSCA); desanding and dewatering of sediment; transportation of filter cake, scalpings, and debris to appropriately permitted landfills; beneficial reuse of separated sand at approved project sites; placement of engineered caps, remedy and residual sand covers; and related design and construction work. The objectives for the 2015 RA are as follows:

1. Complete seasonal pre-operational testing and start-up of all sediment desanding and dewatering plant (SDDP) and water treatment plant (WTP) equipment prior to resuming dredging on approximately March 30, 2015.
2. Adjust locations of fused pipelines and booster pump stations to support planned 2015 OU 4 remedial activities. Prepare dredges and spreader systems for full-scale operation.
3. Obtain the sand, armor stone and quarry spall required for sand covers and engineered caps planned for 2015. These aggregates will be staged on the property at 2661 South Broadway, in Ashwaubenon, formerly occupied by Schneider Resources, Inc. (Schneider Property), at the LFR Processing Facility site and perhaps at an additional location that is yet to be determined, such as the RGL Real Estate, Inc. property.
4. Perform full-scale remediation in OU 4. This will include dredging, dewatering, and disposal of all dredged sediment; placement of type A, B and C engineered caps; and placement of remedy sand covers.
5. Perform residuals management, as required per the ROD Amendment, for dredge-only areas based on the results of confirmation sampling. This will include placement of residual sand covers and residual dredging. Alternative remedial action, such as engineered caps, may also be placed for residuals management purposes as approved by the Agencies.
6. Dispose of filter cake, scalpings, and debris derived from dredging in situ TSCA and non-TSCA sediment at appropriately permitted landfills.
7. Beneficially reuse sand generated from dredging of non-TSCA and TSCA sediment, as applicable, at approved off-site construction projects.
8. Remove, size and dispose of in-river debris, as required.
9. Comply with all Applicable, or Relevant and Appropriate Requirements (ARARs) identified for work in OUs 2 through 5 of the Lower Fox River as listed in Table 1-3.
10. Maintain continued communications with riparian property owners near RA areas. The LLC will communicate with the Brown County Port Authority and Municipalities regarding remedial action

planned near their properties in 2015 and beyond, as with other riparian property owners. In addition, the LLC will continue to dialogue with any other interested parties, including the Port Authority and municipalities, about general progress of the remediation.

11. Attend to worker safety in performing remedial action activities.
12. Prepare and submit the Draft 2016 RAWP as required per the Order schedule dated February 15, 2012.
13. Complete design refinements, as needed, for the reach of the river extending from approximately transect 4061 (Mason Street Bridge vicinity) to the mouth of the river in Green Bay. These design refinements will be an addendum to the 100 Percent Design Report Volume 2 of 2 (Tetra Tech et al 2012); however, this work will be part of remedial action, and not remedial design. These design refinements will be completed prior to startup of the dredge season in which the remedial action will occur.
14. Prepare the Draft 2014 Remedial Action Summary Report, summarizing the work completed during this season, and submit the report to the Agencies. Initiate preparation of the 2015 Remedial Action Summary Report at the end of the 2015 season.

The work to be performed to meet these objectives is described in detail in subsequent sections. Actual previous and estimated future annual volumes for dredging are shown in Table 1-2. This includes the volume associated with residual dredging.

Table 1-2. Annual Dredge Volumes

	Non-TSCA Quantity Including 6 Inch Overdredge (cy)				OU 4 TSCA Quantity (cy)	Total Quantity (cy)
	OU 2	OU 3	OU 4/5	Non-TSCA Total		
2009[1]	3,009	126,351	407,808	537,168	7,367	544,535
2010[1]	0	45,576	685,441	731,017	0	731,017
2011[1]	0	63,931	171,478	235,409	0	235,409
2012[1]	0	0	637,471	637,471	21,809	659,280
2013[1]	0	0	560,423	560,423	19,900	580,323
2014[1]	0	0	546,475	546,475	0	546,475
2015[2]	0	0	510,734	510,734	54,266	565,000
2016[2]	0	0	500,000	500,000	0	500,000
2017[2]	0	0	203,812	203,812	0	203,812
Total	3,009	235,858	4,223,642	4,462,509	103,342	4,565,851

Notes: 1. Dredge volumes for 2009, 2010, 2011, 2012, 2013, and 2014 reflect total volumes dredged as reported in the Annual RASummary Reports, which includes overcut volume and dredging of 67,157 cy from the Phase 1 area, conducted since 2010.

2. The dredge volumes shown for 2015, 2016, and 2017 are projected dredge volumes that include overdredge volume and assumed residual dredge volumes.

1.3 Applicable or Relevant and Appropriate Requirements

The 100 Percent Design Report for 2010 and Beyond RA Volume 2 (Tetra Tech et al. 2012a) lists location-specific ARARs for the remedy as identified in the ROD. The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) waives the administrative requirements of federal, state, and

local permits, and requires the remedy to comply with only those substantive technical requirements of ARARs. The ARARs identified for the Fox River RA are listed in Table 1-3, and include federal, state, and local requirements identified during the collaborative work group process.

The 100 Percent Design Report Volumes 1 and 2 (Tetra Tech et al. 2009a and 2012a) and other project documents submitted to the Response Agencies since 2009 for various site design and development activities incorporated and specifically addressed the substantive technical requirements of the ARARs by incorporating these requirements into technical specifications, standards, engineering designs, and work plans prepared for the remedial work. Additional details enabling project compliance with the ARARs are included in the annual RAWPs.

Table 1-3. Summary of Fox River ARARs

Act/Regulation	Citation	Description	Applicable Standards
Federal Chemical-specific ARARs			
TSCA	40 CFR 761.60(a)(5)-761.79 and USEPA Disposal Approval 40 CFR 125(a)(1) 40 CFR 761.65(c)(9)	TSCA disposal regulations including risk-based disposal approval and procedures and testing and decontamination methods for porous and nonporous debris. These are ARARs for the management of filter cake, debris, separated sand, and scalped material generated from sediment areas determined to be ≥50 ppm PCBs. Requirements for testing, decontamination, and disposal are addressed in the 100 Percent Design Report Volume 1 and associated documents (CQAPP, Transportation Plan, and Site-Wide O&M Plan). Criteria for on-site storage of bulk remediation PCB waste at a clean-up site.	Waste Disposal Criteria Waste shall not be stored longer than 180 days prior to disposal and shall be stored in a lined area such that no leachate is generated. Notification of PCB Waste Activity as a commercial PCB waste transporter required to be submitted to USEPA to obtain assigned USEPA ID number. Vehicles must meet specs for hauling PCB wastes and display proper placarding. Notify National Response Center for spills exceeding 1 pound PCBs by weight. Disposal in TSCA-permitted landfill: ≥ 50 ppm and < 500 ppm PCBs for in situ sediment based on 2.5-foot interval averaging, plus porous debris and sand from TSCA sediment areas, unless a risk-based exemption is approved by the USEPA for disposal in an NR 500 landfill. In addition, the waste must pass the Paint Filter Test. Uniform Hazardous Waste Manifest must accompany waste. Disposal in non-TSCA permitted landfill: < 50 ppm PCB for in situ sediment based on 2.5-foot interval averaging, plus porous debris from non-TSCA sediment areas. In addition, the waste must pass the Paint Filter Test. Special Waste Manifest must accompany waste. Non-porous metal surfaces must be decontaminated to ≤ 10 µg/100 cm^2. For unrestricted use as measured by a standard wipe test. For a spill exceeding 10 pounds PCBs by weight, notify the USEPA regional office within 24 hours of spill and decontaminate the area immediately.
Clean Water Act – Federal Water Quality Standards	40 CFR 131	Federal regulations establish approval standards for state water quality criteria. The Wisconsin water quality standards are ARARs for the WTP point source discharge and are addressed in the design and the WTP O&M Plan.	Water Treatment Plant Discharge Biochemical Oxygen Demand: 1,300 lbs/day and 10 mg/L Total Suspended Solids: 10 mg/L daily max/ 5 mg/L monthly average Ammonia: 8.41 mg/L multiplied by diffuser dilution ratio at pH of 8.0 Mercury: < LOD, with LOD = 0.2 ng/L pH: 6 – 9 Standard Units PCBs: < LOD, with LOD of 0.1 – 0.5 ug/L Total residual chlorine: <0.1 mg/L
Federal Action- and Location-specific ARARs			
Fish and Wildlife Coordination Act	16 USC 661 et seq	USEPA will consult with USFWS on habitat impacts from dredging, debris removal, and pipeline installation work. Coordination was started in 2008 and will continue over the course of the project. Fish and wildlife considerations for this work are addressed in the Habitat Replacement Plan and in the 100 Percent Design Report Volume 1 and Volume 2.	Whenever waters or channels are controlled or modified, adequate provision shall be made for the conservation, maintenance, and management of wildlife resources and habitat.
Endangered Species Act	16 USC 1531 et seq 50 CFR 200 50 CFR 402	Requirements to identify the presence of endangered species and manage any adverse impacts are ARARs for dredging activities. Endangered species considerations are addressed in the Former Shell Property Site Development Plan and in the 100 Percent Design Report Volume 1.	No endangered species have been identified for this project.
Rivers and Harbors Act	33 USC 403 33 CFR 322 – 323	Requirements for remedial activities to prevent obstructing or altering federal navigable waterways are ARARs for dredging work. Navigation considerations are addressed in the 100 Percent Design Report Volume 1 and the Phase 2B Work Plans for RA.	Navigation channel limits and required depth were provided by the U.S. Army Corps and are used as part of the basis for the design.

Act/Regulation	Citation	Description	Applicable Standards
NHPA	16 USC 470 et seq 30 CFR Part 800	USEPA will consult with the Wisconsin State Historic Preservation Office before affecting any cultural or historic sites. This requirement is an ARAR for upland site development and in-river work. Cultural resource assessments are completed prior to work, results, avoidance and mitigation actions as recommended are documented in the Former Shell Property Site Development Plan, the Underwater Cultural Resources Approach, and the annual Phase 2B Work Plans for RA.	Complete cultural resource assessments and identify any potential impact the work may have to items with historic significance. Applies to both in-river and upland areas. If items are found that may be eligible for listing in accordance with the NHPA, a mitigation plan or other plan to avoid the areas must be developed.
Floodplains and Wetlands Regulations and Executive Orders	40 CFR 264.18(b) and Executive Order 11988 40 CFR Section 401 and 404	Requirements to identify and delineate wetlands, and to manage impacts to wetlands regulated by the U.S. Army Corps of Engineers. These requirements are addressed in the Former Shell Property Site Development Plan, the 100 Percent Design Report, the Wetlands and River Habitat Replacement Work Plan, and the Phase 2B Work Plan for 2010 RA.	Conduct wetlands delineation during planning phases for site development and dredging work. Where wetlands are present, avoidance or mitigation actions must be addressed.
National Ambient Air Quality Standards for PM-10		Requirements are ARARs for air monitoring around the site perimeter. The requirements are addressed in the Final Phase 2B Air Monitoring Sampling and Analysis Plan	PM10 $\leq$ 150 µg/m^3 (acute action level)
OSHA	OSHA 1910.106	Requirements for proper use, handling, and storage of small quantities of petroleum products.	Ensure proper storage of mobile diesel storage tank. Inspect waste storage areas for structural integrity, clean up spills promptly, and dispose of materials properly.
State Chemical-specific ARARs			
Surface Water Quality Standards	NR 102, 105 (TBC) and 207 NR 722.091-2	Requirements for point source discharges to the river. The Wisconsin water quality standards are ARARs to the OU 4 WTP effluent discharge and are addressed in the WTP design and the WTP O&M Plan.	Water Treatment Plant Discharge Biochemical Oxygen Demand: 1,300 lbs/day and 10 mg/L Total Suspended Solids: 10 mg/L daily max/ 5 mg/L monthly average Ammonia: 8.41 mg/L multiplied by diffuser dilution ratio at pH of 8.0 Mercury: < LOD, with LOD = 0.2 ng/L pH: 6 – 9 Standard Units PCBs: < LOD, with LOD of 0.1 – 0.5 ug/L Total residual chlorine: <0.1 mg/L
Groundwater Quality Standards	NR 140	Requirements are ARARs for remedial activities involving discharges to groundwater.	No planned discharge to groundwater.
Soil Cleanup Standards	NR 720 and NR 722	Requirements include a process for establishing site-specific soil cleanup levels.	No soil remediation is planned as part of the RA.
Wisconsin Requirements for PCB Transportation and Disposal	NR 157 NR 660 – 665 NR 670	Requirements are ARARs for remedial activities involving the storage, transportation, and offsite disposal of PCB waste. Waste management requirements are addressed in the Site-Wide O&M Plan.	Transporters must be registered as a Hazardous Waste/PCB Waste Transporter. Notify division of emergency government if spillage occurs. Disposal facilities must be approved and permitted by WDNR.
WDNR Air Quality Regulations	NR 445.07	Requirements for monitoring of PCBs in air are addressed in the Community Health and Safety Plan (HASP).	PCBs < 12 µg/m^3 Project-specific Action Levels for PCBs based on Distance from the Source: At a distance of 0 ft: PCB $\leq$ 1.0 µg/m^3, total dust $\leq$ 2.0 mg/m^3 At a distance of 100 ft: PCB $\leq$ 1.2 µg/m^3, total dust $\leq$ 2.4 mg/m^3 At a distance of 500 ft: PCB $\leq$ 5.8 µg/m^3, total dust $\leq$ 12 mg/m^3

Act/Regulation	Citation	Description	Applicable Standards
State Action- and Location-specific ARARs			
Wisconsin Floodplain Management Program	NR 116	Requirements are ARARs for site development work involving the installation of structures/activities within the floodplain. Wisconsin Statues Chapter 30 requirements embody NR 116 and expand the requirement to minimize adverse effects to waterways. Chapter 30 requirements are addressed in the Former Shell Property Site Development Plan and Addendum pertaining to Chapter 30 permit requirements (Sept. 2008), and the 100 Percent Design Report.	
Navigable Waters, Harbors and Navigation	Chapter 30 Stats. NR 329 (Misc. Structures) NR 341 (Grading on Bank) NR 345 (Dredging) NR 343 (Ponds)	Technical guidelines for placement of structures or materials in state waters and below the ordinary high water mark are ARARs for the RA. Substantive requirements include control of erosion and turbidity. Design requirements for site development, dredging, and placement of caps and covers are described in the 100 Percent Design Report (Volumes 1 and 2).	Discharge of fill or dredged material into waters of the United States is prohibited without U.S. Army Corps of Engineers approval. Turbidity action levels during dredging, capping, and covering activities: Trigger Level - 40 mg/L TSS or 40 NTUs above background for four consecutive readings spaced at 1 hour each – exceeding this level triggers evaluation of BMPs by dredge operator and possible modification of operations. Action Level - 80 mg/L TSS or 80 NTUs above background for four consecutive readings spaced at 1 hour each – exceeding this level triggers suspension of RA activities and notification of the A/OT. If a clam shell or bucket is used for precision placement of armor stone it will be lowered to within 1 to 2 feet of the placement location and the material released slowly and evenly over the cell to reduce turbidity.
Solid Waste Management	NR 500-520 Wis. Stats. 289.43	Requirements for remedial activities involving the storage and disposal of solid waste - specifically filter cake, debris, and desanded material characterized as non-TSCA waste. Waste management requirements are addressed in the 2009 Site-Wide O&M Plan. Beneficial reuse of desanded material is addressed in the 100 Percent Design Report, the Phase 2B Work Plan for 2010 RA, and the LHE Request included in the Phase 2B Work Plan for 2009 RA. WDNR approval of the beneficial use of separated sand would be done under Wisconsin Statute 289.43 low hazard exemption. All beneficial reuse of sand would require case-by-case approval.	Waste Disposal Disposal in non-TSCA Solid Waste Landfill: < 50 ppm PCBs for in situ sediment, plus porous debris from non-TSCA Sediment areas Beneficial Reuse for Sand Relatively unrestricted use: PCB < 0.05 ppm Capping or covering, generally not required: PCB < 0.25 ppm Requires capping or covering: PCB > 0.25 ppm Eligible for beneficial reuse: PCB < 1 ppm Need to determine reuse potential: PCB > 1 ppm
Fish and Wildlife Habitat Structures in Navigable Waterways	NR 323	Requirements are ARARs for construction of habitat structures to replace habitat lost due to in-river installation of sediment transport pipelines, dredging, debris removal, and cap placement. Coordination started in 2008 and will continue over the course of the project. Wildlife considerations for this work are addressed in the Wetlands and River Habitat Replacement Work Plan, and the 100 Percent Design Report.	Construction of habitat replacement required to mitigate impacts – mitigation ratio to be approved by WDNR.
Stormwater Management	NR 216 Subchapter III NR 151 NR 341 WDNR Stormwater Management Technical Standards for Site Erosion and Sediment Control and for Post-Construction Stormwater Management	Requirements for the management of construction and post construction erosion control and stormwater management. Stormwater requirements are addressed in construction designs and plans, the Stormwater and Erosion Control Plan, and the Stormwater Pollution Prevention Plan.	Post-development discharge rates from 2-, 10-, and 100-year 24-hour storm events cannot exceed the pre-development rates. However, the City of Green Bay agreed that the post-developed discharge rate for the 10- and 100-year events could be exceeded and discharged to the Fox River through the detention pond. Removal of 80% of TSS is required. Infiltration of detained stormwater is prohibited. Detention pond design guidelines must be met. Inspect pond, swales, ditches, and erosion control features after all storms exceeding 0.5-inch over 24 hours and daily during prolonged rainfall events. Remove accumulated sediment every 5 years or when depth is reduced to 3 feet or less. Maintain erosion control features in good condition, free of erosion gullies and excess vegetation.

Acronyms and Abbreviations used in this Table:

A/OT – Agencies/Oversight Team
BMP – best management practice
cm^2 – square centimeter
CFR – Code of Federal Regulations
CQAPP – Construction Quality Assurance Project Plan
SHSP – Site Health and Safety Plan
LHE – Low Hazard Waste Exemption
LOD – limit of detection
mg/L – milligrams per liter
NHPA – National Historic Preservation Act
NTU – nephelometric turbidity unit
O&M – Operation & Maintenance
OSHA –Occupational Safety and Health Administration
PCB – polychlorinated biphenyl
ppm – parts per million
SWPPP – Stormwater Pollution Prevention Plan
TSCA – Toxic Substances Control Act
TSS – total suspended solids
µg – microgram
USC – United States Code
USEPA – U.S. Environmental Protection Agency
USFWS – U.S. Fish and Wildlife Service
WDNR – Wisconsin Department of Natural Resources
WTP – water treatment plant

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1.4 Adaptive Management and Value Engineering

As described in the Remedial Design (RD) Work Plan approved by the Response Agencies in June 2004 (Shaw and Anchor 2004), adaptive management (AM) and value engineering (VE) are integral elements of RD, and define the framework for modification of annual RA Work Plans as appropriate in response to new information and experience continually derived from the ongoing RA in OUs 2 through 5.

The Adaptive Management and Value Engineering Plan (AMVEP) includes a detailed description of VE opportunities that have been or will be evaluated and AM that will be utilized to modify methods, practices, or procedures related to the RA (Tetra Tech et al. 2012a). This plan was finalized in early 2009 and approved by the Response Agencies on April 23, 2009. The AMVEP requires an evaluation of lessons learned at the conclusion of each RA season, along with corresponding modifications to the RA to incorporate these lessons learned.

As has been stated in previous submittals, AM is management of a project that "adapts" over time to reflect the lessons learned from actual experience gained during the course of project implementation. The objective is to build on things that work in the early implementation process—and change the things that do not work, or are not fully efficient—with plans of achieving remedial objectives in the most efficient and cost-effective manner possible. AM involves a process to tailor technical approaches based on data and experience gained during the project. The process will focus on determining whether field experience has yielded information that differs significantly from assumptions when a particular course of action was initially chosen. AM requires flexibility so that a technical approach in general, and the specifics of implementation in particular, can be changed—when warranted—without cumbersome procedural hurdles. To ensure the success of this process, it is critical that the implementing parties and the Response Agencies share data, engineering evaluations, and other information early and throughout the process.

VE reflects a desire to design or engineer activities in the project in a manner that adds "value" to the project, meaning greater efficiency, reduced time to completion, more effective production and/or less cost. The objective is to implement work in the best way possible consistent with overall project (ROD) objectives and the contract requirements between the LLC and Tetra Tech.

The 2009 Annual Attachment to the AMVEP (Tetra Tech 2010c) documents AM or VE improvements made to the design and RA based on lessons learned and creative ideas discussed through the collaborative work group process during the 2009 RA. Many of these improvements were incorporated during the 2009 RA, and carried forward into 2010 and beyond, including the following:

A. Information received from various project stakeholders that had involvement with prior stages of remediation on the Fox River (e.g., OU 1, Phase 1)

B. Input provided by the Response Agencies and other parties at the weekly quality control (QC) meetings

C. Technical memoranda prepared, reviewed, approved, and implemented that were related to specific project issues

D. Various project technical, production, and operations meetings conducted frequently by the Response Agencies, including members of USEPA, the WDNR, industry experts, the LLC, and the Tetra Tech Team

E. Continuation of the Work Group process involving the designation of appropriate staff from the A/OT, the LLC, and the Tetra Tech Team to investigate and discuss specific project issues and make recommendations for use on the project

F. Continuous improvement in the implementation of health and safety, quality, and regulatory compliance in performing project activities

The Response Agencies requested that AM/VE activities taking place in 2010 and future years be described in the annual RAWP for the subsequent year. Therefore, AM/VE activities that occurred in 2014 are described in the following subsection of this 2015 RAWP. This means of tracking and reporting on AM/VE in the RA Work Plans for the subsequent year has replaced the Annual Attachment format, as represented by this document.

1.4.1 AM/VE for Remedial Action

The following modifications have been made to RA since the 2010 season, or will be recommended to be implemented in 2015, as a result of lessons learned during the 2014 RD and RA:

1. Case-by-case evaluations of appropriate utility or structure setbacks and commercial riparian property owner areas will continue, based on:

   - Safety
   - Contaminant levels in the area
   - Types of adjacent remedies
   - Reliable information on the location of the utility
   - Input received from the utility or structure owner
   - The type of utility and risk of damaging the utility or structure
   - Alternative remedial designs or alternative methods to implement the intended remedial design.

   Where appropriate, part or all of some areas may qualify as exceptional areas.

2. The Response Agencies, in the 2010/2011 RA for OU 3, allowed placement of a residual sand cover (minimum of 6 inches of sand) for DMUs that contained concentrations of PCBs between 1.0 and 10.0 ppm in more than one interval (an interval equals 6 inches). The sum of these intervals also had to be less than 10.0 ppm. The OU 3 post-dredge sample results, including the sums of the intervals that are greater than 1 ppm PCB (where applicable), and statistics on residuals management for OU 3 DMUs, were presented in tables in the 2013 RA Summary Report. These statistics indicate that applying the summation rule for these OU 3 DMUs increased the use of sand cover by 20.3 percentage points (equivalent to 10.2 acres) over the residuals management approach.

Likewise, the use of residual dredging was reduced by approximately the same percentage (equivalent to 10.2 acres) through use of the summation rule. These areas were "exceptional areas" because the residual sand covers for a DMU are typically allowed where just one interval is between 1.0 and 10.0 ppm and all other intervals are less than 1.0 ppm.

In OU 4, the LLC requests that, where a DMU has more than one interval between 1.0 and 10.0 ppm and the sum of these intervals is less than 10.0 ppm, the Response Agencies also allow placement of a residual sand cover. The LLC will provide a technical memorandum similar to the one provided for OU 3 as soon as practicable after the DMUs have been dredged and the LLC has received the confirmatory sample data for dredge areas completed through 2014.

Alternatively, the LLC understands that the Response Agencies will decide, on a case-by-case basis, if a DMU is eligible for residual sand covering when it has more than one interval between 1.0 and 10.0 ppm and the sum of these intervals is less than 10.0 ppm. The Response Agencies' decision will satisfy the ROD and will be based on engineering judgment for the specific site conditions of a DMU, such as geomorphology, hydrodynamic conditions, etc. The A/OT will review the technical memorandum when submitted and will continue to make decisions on a case-by-case basis.

3. The placement of remedy sand covers is allowed in areas where no more than two 6-inch intervals have PCB concentrations greater than 1.0 ppm, but less than 2.0 ppm (Response Agency Memorandum, USEPA 2012).

4. Use of type B2 (armor stone with a median stone size [D_{50}] of 1.5 inches) caps is allowed in the OU 4A navigation channel (south of the Fort Howard turning basin), which has been designated as "caretaker" status, instead of using type C caps (Response Agency Memorandum, USEPA 2012).

5. In addition to several other factors, i.e., riparian owner considerations, several potential shoreline caps in OU 4 have been eliminated in favor of dredging. This was done where stability of the bank was not adversely affected, as a result of additional sampling and poling and consideration of the break-even cost for dredging versus capping for selecting the most cost-effective, appropriate remedy in these locations.

6. Areas identified as "No Action/Confirm" in the 100 Percent Design Report Volume 2 (Tetra Tech et al. 2012a), will be sampled prior to dredging to determine if any targeted sediment exists with PCB concentrations exceeding the Remedial Action Level (RAL). If sampling indicates that no targeted sediment is present, no dredging will be performed.

7. Areas identified by the A/OT as "Dredge Low Risk" areas (DLR) in the June 14, 2012 memorandum (USEPA 2012) and additional areas that are determined to be eligible for DLR were evaluated. In these areas, the LLC was allowed to target dredging to an elevation that is 4 inches above the neat line. This was expected to result in the average overcut extending to the neat line when dredged. However, dredge volume was not always reduced using this strategy and, therefore, this approach was discontinued for the 2014 season. However, the Work Parties may consider using this approach again in subsequent years in sections of the river that are better suited to DLR.

8. Development of DMU configuration to account for river geomorphology or other features.
9. Design of dredging to a contoured neat line surface instead of a dredge prism approach in dredge-only areas. When applicable, and with Agencies' approval, prism dredging may be conducted.
10. The use of geostatistical modeling to develop the 0.5 LOS surface based on uncorrected DOC core depths, to minimize the removal of sediment that is less than the 1.0 ppm PCB RAL, and to maximize the removal of sediment that exceeds the 1.0 ppm PCB RAL with the first dredge event.

These changes in procedures are reflected in the 2015 design included in this RAWP and its attachments.

Initiatives to be considered or continued in 2015 that are expected to provide project benefits in 2015 and beyond include the following:

1. The disposal of dewatered dredged TSCA sediment with PCB concentrations less than 50 ppm—including filter cake, separated sand, scalpings, and spent equipment—at a local appropriately permitted landfill. This initiative was the result of Waste Management's request to USEPA for risk-based disposal. The request was submitted to Region 5 for Ridgeview Landfill in Whitelaw, Wisconsin, and was approved in September 2012. Disposal at Ridgeview Landfill began in 2013.
2. Beneficial reuse of sand separated from TSCA sediment, provided it meets the criteria for beneficial reuse, as approved by USEPA and WDNR.
3. Use of the dredge-versus-cap cost analysis for evaluation of remedial measures in cases where more than one option is viable. For example, where dredging of sediment below a cap would be more cost-effective or more appropriate for the location than placing the cap, the RA will be changed to dredging.
4. Evaluation of cap design and the potential to reduce the thickness of cap layers. If pursued, a Technical Memorandum and/or plan for a pilot study (if applicable) will be submitted to the Response Agencies for the alternative design.
5. Use of a minimum 9-inch thick residual sand cover, on a case-by-case exception basis, in lieu of residual dredging, for residuals management. Use of a minimum 9-inch thick sand cover as a primary remedy may also be approved by the A/OT in certain situations.
6. Incorporation of the results obtained from design refinement cores in the OU4-D38 and OU4-D141A dredge areas to refine the design of the RA for 2015 final dredging.
7. Localized re-modeling of DOC data using Surfer or a similar surface modeling program to refine the design dredge surface, as needed. The use of Surfer or another geostatistical modeling program for site-specific areas will be reviewed by the A/OT prior to being implemented.

Additional initiatives may be pursued in 2015 as opportunities for potential project improvements are identified, presented to, and approved by the Work Parties.

1.4.2 AM/VE Organizational Responsibilities

AM/VE will be led by the Remedial Design Manager (Fred Swed). He will work closely with the Project Manager, the Work Parties, the Design Team (Tetra Tech EC, Inc. and Anchor QEA), and the Response Agencies to track and report on lessons learned and the resulting AM, as well as all VE opportunities that are pursued. He will also be responsible for incorporation of the AM/VE into future RA Work Plans.

1.5 WDNR and Municipalities Memoranda of Agreement

The approved 100 Percent Design Report Volume 2 and the Institutional Control Implementation and Assurance Plan (ICIAP) describe the institutional controls required for the protection of engineered caps placed in the Lower Fox River. As described in the ICIAP, these controls are to be established in Memoranda of Agreement (MOAs) among the WDNR, the USACE, municipalities, and the respondents to the Order to achieve the following objectives:

- Ensure that USACE maintenance dredging in the navigation channel does not extend more than 2 feet below the federally-authorized channel depth, and that no other activity, such as dredging, impacts the integrity of the engineered caps.
- Ensure that no activity, such as dredging, affects engineered cap integrity for caps located outside the federal navigation channel.
- Ensure that no activities, particularly Chapter 30 Permit-exempt activities, impact the integrity of shoreline caps.
- Ensure that impacts to the caps are addressed as part of any future removal or modifications to the caps.

The ICIAP describes various controls that will be used to protect the engineered caps; as well as requirements for accurate maps showing the locations and elevations of caps. The maps are to be included in a comprehensive GIS database that can be accessed by all interested parties.

NCR, as the one party that is both a signatory to the remedial design AOC and a member of the LLC, has developed a draft MOA between the UAO respondents and WDNR and a draft MOA between the UAO respondents and the municipalities, both of which were reviewed and edited by the Agencies and NCR in 2013 and 2014. These drafts are under discussion with the Response Agencies.

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2. PROJECT ORGANIZATION

The organizational structure for the Phase 2B work includes the Work Parties, their RA Technical Team (including project manager, lead engineers, engineers, scientists, geologists, procurement and cost control personnel, operations managers, construction inspector(s), and other support personnel), remediation contractors, and the Response Agencies. The Phase 2B project organization chart is shown on Figure 2-1. Section 2.2 summarizes the qualifications of key personnel who will be performing the Phase 2B work.

The overall project organization is structured to provide the framework within which the specific roles and responsibilities of all project staff are clearly defined and communicated in relation to the technical requirements of the work. This structure is based upon simple and clear reporting lines among all levels of the project team, including subcontractors. In addition, this structure also establishes clear organizational interaction between the RA Technical Team and the Work Parties.

2.1 Core Project Management Team

The core project management team consists of the following individuals:

- Work Parties' Manager, to the extent that work is performed by the LLC: Jeffrey Lawson
- Project Manager: Bill Coleman
- Deputy Project Manager: George Willant
- Remedial Design Manager: Fred Swed, PE
- Construction Managers/Operations Managers: Jimmy Jenkins and Evan Borths
- Dredging Project Manager: Bill Hartman (J.F. Brennan)
- SDDP Project Manager: Rudy Driessen (SPRI)
- WTP Project Manager: Richard Feeney, PE
- WTP Operations Manager: Joseph Francis

The qualifications and responsibilities of the core management team and additional key project personnel are presented below.

2.2 Qualifications and Responsibilities of Key Personnel

Qualifications for the key RA Technical Team staff on the Phase 2B work are as follows:

Work Parties' Manager for GP/NCR Work (Jeffrey Lawson): Mr. Lawson has more than 34 years of experience in oversight and management of environmental projects. He will serve as the primary point of communication between the Work Parties and the core management team.

Tetra Tech Project Manager (Bill Coleman): Mr. Coleman has more than 20 years of experience as a project manager on large projects. He will serve as the primary point of communication with the core management team and stakeholders. Mr. Coleman has overall responsibility for all aspects of the project including staffing, subcontractors, procurement, scheduling, and performance.

Tetra Tech Deputy Project Manager (George Willant): Mr. Willant has more than 27 years of experience in managing large projects. He will serve as the designee for Project Manager, as required, and assist the Project Manager as needed.

Tetra Tech Remedial Design Manager (Fred Swed, PE): Mr. Swed has more than 26 years of experience in civil, remedial, and process design. He will be responsible for managing remedial design and computer aided design operations.

Tetra Tech Construction Manager/Operations Manager (Jimmy Jenkins and Evan Borths): Mr. Jenkins and Mr. Borths will serve as Operations Managers for the remedial action phase of the project. Their responsibilities will include reviewing subcontractor daily reports, tracking and scheduling of trucks for hauling of sand and filter cake, site maintenance activities, assisting quality assurance/quality control (QA/QC) and engineering functions, and managing day-to-day operations on the site.

The Work Parties' Representative (at least for GP/NCR work), Foth (Denis Roznowski, PE: Foth's general responsibility will be to monitor the performance of the Remediation Contractor (the Tetra Tech Team) for compliance with the contract between the LLC and the Tetra Tech. In addition, Foth will review and confirm cost and schedule matters to provide for accurate and appropriate approval of invoices and change orders, as directed by the LLC. Foth will also perform Third Party QA audits to monitor Tetra Tech's adherence to the procedures described in the approved project plans. Mr. Roznowski will act as the managing representative for Foth's efforts as the Work Parties' Representative and is a registered Professional Engineer in Wisconsin with more than 28 years of experience on remedial projects, including sediment remediation.

The Work Parties' On-Site Representative (at least for GP/NCR work), Foth (Troy Gawronski): Mr. Gawronski is currently expected to be the Work Parties' on-site representative and will be responsible for day-to-day interaction with the Tetra Tech Team. Mr. Gawronski has more 17 years of experience working on and managing environmental projects, including OU 1 of the Lower Fox River.

Phase 2B Project Coordinator (Terri Blackmar, PE): Ms. Blackmar is a registered Professional Engineer in Wisconsin, with more than 28 years of experience providing project coordination on large sediment remediation and other projects. Ms. Blackmar will serve as a primary point of communication with Tetra Tech's core management team, the Work Parties, and the Response Agencies. She will also be responsible for preparation and submittal of technical information and reports to the Response Agencies. Ms. Blackmar or her designee, Mr. Richard Feeney, will be based on site full time during the Phase 2B work. (If neither Ms. Blackmar nor Mr. Feeney are available, Mr. Coleman or Mr. Willant will serve as Ms. Blackmar's designee as the Phase 2B Project Coordinator.)

Certifying Engineers (Terri Blackmar, PE and Richard Feeney, PE): Mr. Feeney and Ms. Blackmar are Wisconsin-registered Engineers. All design drawings produced for the remedial design will be reviewed by Mr. Feeney and/or Ms. Blackmar. In addition, Mr. Feeney and Ms. Blackmar are the Wisconsin-registered professional engineers in responsible charge who will certify that the remediation has been performed in accordance with the design, once the project is completed.

Lead Engineers (Richard Feeney, Paul LaRosa [Anchor QEA]): Mr. LaRosa has over 15 years of experience in sediment remediation design and implementation. Mr. Feeney has over 31 years of

experience on Superfund and other remediation projects, as well as in general construction and wastewater treatment.

Construction QA/QC Manager (Robert Steele): Mr. Steele is a senior quality manager with more than 36 years of experience including construction oversight/inspection on remedial construction projects. Mr. Steele will be responsible for overall quality for the project. The quality functions performed by Mr. Steele are required to be performed as part of the project's quality assurance plans.

Site Health and Safety Supervisor (Cynthia Jones): Ms. Jones has over 31 years of experience providing health and safety (H&S) assistance and oversight for remediation and construction projects. She is responsible for all aspects of health and safety training and compliance, and for supervision of health and safety personnel.

SDDP Project Manager (Rudy Driessen – SPRI): Mr. Driessen is an engineer/operator with more than 19 years of experience managing major dewatering plant operations. He will be responsible for management of SDDP operations staff and communication with the Project Manager and Lead Engineers. Mr. Driessen will serve as the primary point of communication for SDDP-related information.

Dredging Project Manager (Bill Hartman – J.F. Brennan): Mr. Hartman is a scientist with more than 36 years of experience managing environmental operations and remediation projects. Mr. Hartman will serve as the primary line of communication for information related to dredging, capping, or sand cover placement.

WTP Project Manager (Richard Feeney): Mr. Feeney is a Professional Engineer in Wisconsin with more than 31 years of experience including management of major WTP operations. Mr. Feeney will serve as the primary line of communication for WTP-related operations.

WTP Operations Manager (Joseph Francis): Mr. Francis is a licensed water treatment operator in the State of Massachusetts, with more than 21 years of experience in managing, operating, and maintaining industrial and environmental water treatment plants in several states.

Identification of key personnel and their detailed roles and responsibilities are provided in the CQAPP (Tetra Tech et al. 2014a). The CQAPP also provides additional information regarding QA and QC roles and responsibilities for the project. The Third Party Quality Assurance Provisions Plan (Foth 2014) provides detail on the roles and responsibilities for implementing the Third Party QA program.

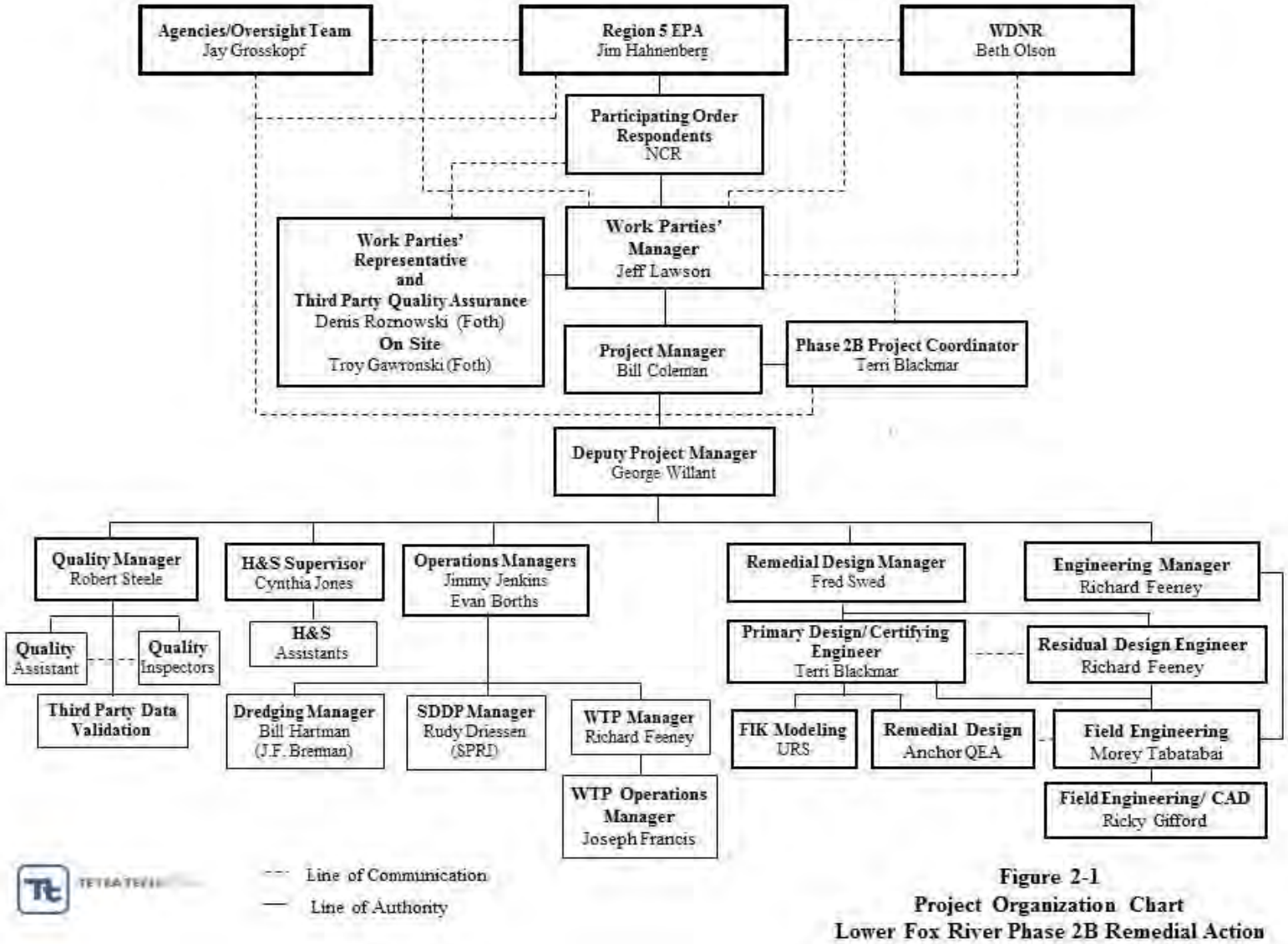
2.3 Schedules and Staffing for 2015 Site Operations

Beginning in late March 2015, the project will be scheduled to run on rotating labor shifts staffed as follows:

- 7:00 am to 5:00 pm shift
  - General management: Project Manager, project engineers, support staff
- 6:00 am to 6:00 pm shift
  - SDDP: Plant Manager
- 6:00 am to 6:00 pm and 6:00 pm to 6:00 am shifts
  - Tetra Tech Operations Supervision

- 7:00 am to 7:00 pm shift
  - Dredges: Foreman plus two operators on each dredge
  - Spreaders: Foreman plus four operators
- 7:00 pm to 7:00 am shift
  - Dredges: Foreman plus two operators on each dredge
  - Spreaders: Foreman plus four operators (once 24 hour capping and covering operations begin)
- 6:00 am to 2:00 pm, 2:00 pm to 10:00 pm, and 10:00 pm to 6:00 am shifts
  - Filter Cake Loading/Storage Area and Truck Scales: 2 operators (extended hours through 5:00 pm) and scale attendant
  - Sand Storage area: One operator
- 7:00 am to 3:00 pm, 3:00 pm to 11:00 pm, and 11:00 pm to 7:00 am shifts
  - SDDP plant operators and maintenance technicians (five each shift)
  - SDDP electrical technician (early shift only)
- 6:00 am to 4:00 pm shift
  - WTP: Plant Manager
- 6:00 am to 3:00 pm; 2:00 pm to 11:00 pm; and 10:00 pm to 7:00 am shifts (1 hour overlaps)
  - WTP: Plant Operators

Figure 2-1. Project Organization Chart



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3. PREPARATION FOR PHASE 2B REMEDIAL ACTION

Final and/or production dredging in 2015 will be conducted from approximately transect 4041 to transect 4071, located just north of the Main Street Bridge, in areas identified in Section 3.5. This dredging will involve the removal of non-TSCA and TSCA sediment. Engineered cap and sand cover placement is also planned for 2015, in areas described in Section 5. The dredge season is planned from March 30, 2015 to November 13, 2015 (weather and river conditions permitting), and is further described in Section 9 of this RAWP.

3.1 Sediment Desanding and Dewatering and Water Treatment Plants

SDDP and WTP equipment will be started up at the beginning of the 2015 dredge season in accordance with the procedures presented in the approved Operation and Maintenance (O&M) Plans (Tetra Tech et al. 2011b, 2011c, 2011d, 2012a, and 2013c) for these plants. Site H&S control zones were established prior to startup in 2009 and subsequently modified several times since then as part of the H&S protocol for the project. These zones are identified on Figure 3-1, and will continue to be observed during 2015.

3.2 Low Hazard Waste Exemption

Sand segregated from non-TSCA sediment during dredging operations in prior years was stockpiled at the LFR Processing Facility after chemical analyses indicated the sand met the requirements for beneficial reuse opportunities. A Conditional Grant of Low Hazard Exemption for the Beneficial Reuse of Separated Sand from the Fox River Remediation Project as Fill Material (the "LHE") was issued by the WDNR on October 18, 2010 for this purpose. Estimated maximum PCB and other constituent concentrations for off-site beneficial reuse opportunities of the sand are described in that document.

On August 27, 2012, the WDNR amended the LHE. This exemption approved the use of the sand in constructing drains or other uses within the landfill limits at licensed landfills that have a leachate collection system. Therefore, some separated sand may be beneficially reused in 2015 at licensed solid waste facilities having a leachate collection system, such as the Advanced Disposal Services (formerly Veolia) Hickory Meadows Landfill in Hilbert, Wisconsin.

On September 11, 2013, the WDNR modified the LHE again, allowing the beneficial reuse of sand separated from dredging in-situ TSCA sediment, provided it meets the same chemical and physical criteria previously established for sand separated from dredging non-TSCA sediment. Therefore, sand separated from dredging in-situ TSCA sediment in 2015 may be reused beneficially during the year, most likely at the same construction project noted above for sand separated from non-TSCA sediment.

A list of projects that could potentially use the separated sand beneficially was included in the LHE; however, many of those projects have been completed. During the 2014 season, approval was obtained for beneficial reuse of the sand at a new off-site WisDOT construction project, located at the intersection of Highways 41 and Interstate 43 (I-43). This project is expected to continue taking sand for beneficial reuse through approximately July 2015. A new project will be identified early in the season to receive the sand after the Highway 41/I-43 project no longer needs the sand.

Additional information regarding sand generated during the 2015 dredge season will be provided to the Response Agencies and the WDNR Waste and Materials Management Program Supervisor, Northeast Region, as required by the Conditional Grant, prior to transporting any sand off-site for beneficial reuse. A request for further amendment of the LHE will be submitted for any future beneficial reuse opportunities, if applicable. No off-site transportation of sand for beneficial reuse for future projects will occur until approval has been obtained from the WDNR.

3.3 Submerged Cultural Resources

Assessments have been performed throughout OU 4 RA areas to identify relevant magnetic and side-scan-sonar anomalies and determine if these anomalies suggest submerged cultural resources. These assessments were performed in accordance with the Underwater Cultural Resources Approach presented in Appendix C. Reports on these assessments were submitted to the Response Agencies and approved in advance of performing RA in specific areas. State Historic Preservation Office (SHPO) approval was received on April 6, 2011 and on May 12, 2011 for assessments covering all of OU 4. Additional assessments will only be performed and submitted if additional cultural resources are unexpectedly encountered in 2015 and subsequent years.

In 2012, the LLC performed additional sediment sampling around historical artifacts identified just off the LFR Processing Facility site, which were previously designated as Wisconsin Historical Site 47-BR-0305, to further define the area to be remedied. The LLC's Design Team received approval from the SHPO to remove the historical artifacts and structures. A Memorandum of Agreement (MOA) was developed and signed by the SHPO, USEPA, WDNR, the Neville Public Museum, and the LLC on September 25, 2013. The shipwreck debris removal was initiated during the 2013 season and completed on May 5, 2014. A photographic record was made of the removal, and copies were provided to all signatories to the MOA. An interpretative panel was developed to describe the importance of the ships to the development of commerce and industry to the Green Bay area. This display will reside in the Neville Public Museum after being accepted as final by the USEPA. Once the interpretative display has been delivered to the museum, all stipulations of the MOA will have been met, and the MOA will terminate.

3.4 Communication with Riparian Landowners

The LLC has discussed proposed remedial designs with riparian property owners such as commercial entities, Brown County Port Authority, and municipalities whose riparian property is located near RA planned for 2015, and these discussions continue. All of the proposed remedial designs are subject to refinement based on these discussions and on information from design refinement cores that may be added in these river reaches, some of which are planned after initial dredging. These efforts are ongoing but will be completed before RA is performed in areas of the river near affected riparian property owners.

Figure 3-1. Project Site Control Zones

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An initial notification letter will be sent to riparian landowners located near areas where remedial action (i.e., dredging, sand cover, capping, or debris removal) is planned to be performed in 2015, as described in the Technical Memorandum – Notification to Riparian Landowners near 2015 Dredge, Cap or Sand Cover Areas (Riparian Technical Memorandum) in Appendix B. The initial notification will inform riparian landowners that remedial activities are planned to recommence in 2015. They will be contacted again if remedial action is to take place near their shoreline.

Those riparian landowners with docks or other structures located in planned remedial action areas will also receive a riparian landowner agreement. These riparian landowners will be informed of the planned dredging, capping, or sand cover placement scheduled to take place in the vicinity of their docks, as well as potential impacts to the depth of the river in the immediate vicinity of their docks or other structures. The Riparian Technical Memorandum presented in Appendix B identifies the residential docks located within 2015 remedial action areas and describes the process used for evaluation of effects from remedial action on the depth of the river in the immediate vicinity of their docks, as well as the notification process. These remedial activities will be performed according to the approved design, or as close as practicable to the structures as determined by J.F. Brennan based on field conditions at the time of the remedial activities.

The notification and agreement (if applicable) that will be presented to the riparian landowners are presented in the Riparian Technical Memorandum in Appendix B, and are very similar to the documents used for riparian landowner communication performed during prior years of RA.

Any deviation from the remedial design that is proposed by the Work Parties, regardless of a riparian property owner's acceptance, must be reviewed and approved by the Agencies prior to being incorporated into the 2015 RA.

3.5 Design of Sediment Dredge Areas

Uncorrected depths of contamination (DOCs) were used in the FIK geostatistical model to calculate the 0.5 LOS neat line (referred to herein as the "uncorrected neat line") for final dredging in the OU 4 area between the De Pere Dam and the State Highway 172 Bridge, where dredging was performed from 2010 to 2014 and is now complete.

The area from the State Highway 172 Bridge to transect 4061 was also re-modeled (December 2010), as was the area from transect 4061 to the mouth of the river in Green Bay (August 2013), using the FIK geostatistical model and uncorrected DOC data. The uncorrected DOC was based on historic (2004 to 2008) core data and data from infill sampling and poling performed from 2009 to 2012. The modeling produced a refined neat line that was used to develop the design for remedial action for subsequent years, consistent with the delineation methods detailed in the 100 Percent Design Report Volume 2 (Tetra Tech et al. 2012). The design for RA in this reach of the river was further revised for 2012 RA, to include RA in utility setback and certain other areas previously identified as "TBD" (to be determined) areas, in response to comments on the Draft 100 Percent Design Volume 2 (April 2011) issued by the A/OT in June 2012. However, the design for these areas is still subject to refinement based on discussions with utility owners and/or commercial riparian land owners (e.g., owners of commercial terminals, boat slip, etc.) regarding the design. In addition, the design in several areas will be further refined based on information from design

refinement cores to be added in these areas, some of which are planned after initial dredging. These efforts are ongoing but will be completed before RA is performed in these areas.

Dredging to final elevations was completed in all areas from approximately transect 4012 to 4041, north of the State Highway 172 Bridge, by the end of the 2014 season. Post-dredge confirmation sampling and residuals management (as needed) was performed in each dredge area. Sand and armor stone thickness was verified for sand cover and cap areas, to document completion of these remedy areas, up to approximately transect 4035. The only exception to this is the placement of quarry spall, which remains to be completed in cap areas CC14 and the portion of CC2E located south of transect 4035. Therefore, all remedy areas south of transect 4035 have been verified as complete at this time, with the exception of quarry spall placement where noted.

A summary of the total non-TSCA volume for each area where 2015 dredging is planned, including the estimated volume exceeding the RAL that remains, overdredge volume, residual dredge volume, production dredge volume, and estimated volume planned for dredging, is presented in Table 3-1. A similar summary of the TSCA areas available to be dredged in 2015 is presented in Table 3-2. As in previous years, the actual sequence of dredging will depend on conditions in the river, and the total number of areas that will be dredged will depend on river conditions, weather, and other factors affecting productivity. The areas listed in Tables 3-1 and 3-2 are the areas located between transects 4041 and 4071, the reach of the river where dredging is available to be performed in 2015. These areas have refined final designs that incorporate all historical and infill sampling results performed to date. Dredge areas for the 12-inch dredge, in particular, in 2015 will be selected based on dredge-cut thickness and location of sediment subject to management in accordance with TSCA requirements, to the extent practicable, and are discussed further in Section 4.7.

The planned elevation for dredging in 2015 with the 12-inch and 8-inch dredges is either the 0.5 LOS neat line elevation or the dredge-and-cap prism elevation, with a 6-inch anticipated overdredge below the design elevation. In A or B cap areas, dredging will target removal of all intervals with 50 ppm PCB or higher, so that the dredge prism design elevation is at least 0.5 feet or more below the lowest elevation of the 50+ ppm intervals.

3.6 RA Design Overrides and Potential Field Refinement

The horizontal and vertical extent of dredging in dredge-only areas was determined based on FIK geostatistical modeling to the 0.5 LOS surface, using uncorrected core data, as described in the 100 Percent Design Report Volume 2 (Tetra Tech et al., 2012a). The remedial area footprint and remedial design are consistent with that presented in the Final 100 Percent Design Report, unless noted otherwise in Appendix D, which presents a summary of the differences between the 2015 RAWP design and the design in the 100 Percent Design Report Volume 2. These differences are largely in the stretch of river from transect 4049 to 5004, which was kriged and then refined after the Design Report was submitted. The kriging included the results of infill sampling, which increased the sample density, and uncorrected DOCs, the combination of which resulted in a revised FIK model surface that was used to refine the design and is included in this 2015 RAWP.

Table 3-1. Estimated Non-TSCA Dredge Volume by Area

OU/ Schedule Group[2]	Dredge Area for Production Dredging	RAL Volume (cy)	Overdredge Volume (cy)	Residual Dredge Volume (cy)	Estimated Total Dredge Volume[1] (cy)
OU 4B Group 1	Non-TSCA OB in D35A	2,755	NA	NA	2,755
	Non-TSCA OB in D35U[3]	3,000	NA	NA	3,000
	Non-TSCA OB in D35T	7,859	NA	NA	7,859
	Non-TSCA OB in D38	63,008	NA	NA	63,008
	Non-TSCA OB in D39	605	NA	NA	605
OU 4B Group 3	D35U[3]	13,000	TBD	-	13,000
	D35T	11,637	2,926	-	14,563
	D35Q	3,005	1,195	1,130	5,330
	D35S	600	600	0	1,200
	D37/D37B/D37C	9,147	3,009	3,290	15,446
	D78/D35B E/W	8,300	1,900	1,056	11,256
OU 4B Group 4	D141A-B	2,560	940	408	3,908
	D38/D58/DFIK-081/083	101,248	9,318	5,512	116,078
	D82	9,852	1,759	930	12,541
	D35CD/D67	25,800	12,000	5,019	42,819
OU 4A/B Group 5	D35EFG	100	5,330	2,810	8,240
	D39	13,600	3,400	3,011	20,011
	D40A	4,800	1,200	1,720	7,720
	D40B	79	385	139	603
	DFIK-090	37	18	5	60
	DFIK-091	170	74	16	260
	DFIK-093	465	125	45	635
OU 4B Group 6	D142-D68A	1,417	366	173	1,956
	D68B	17,966	8,092	1,745	27,803
	D79	455	210	195	860
	D35H	29,800	5,100	3,680	38,580
	D41	14,400	1,700	855	16,955
	D127	1,091	241	95	1,427
OU 4B Group 7	D165A/B	2,506	280	80	2,866
	D70	14,359	2,825	550	17,734
	D71	1,464	819	312	2,595
	D35K	653	381	130	1,164
	D35J	22,953	3,914	1,490	28,357
	D84	1,472	685	180	2,337
	D35M	24,386	4,981	1,900	31,267
	D35NOP	20,687	5,153	1,964	27,804
	Totals	**435,236**	**78,926**	**38,440**	**552,602**

Notes: 1) Estimated total dredge volume includes estimated primary dredge volume and overdredge, where applicable, but does not include accretion or scour except as indicated.
2) At the start of the season, production dredging will be performed in various dredge areas with approved designs. These areas are referred to as "Group 0" on the schedule in Section 9.
3) The volume shown for this area is a placeholder volume and subject to change.

Table 3-2. Estimated OU 4B TSCA Dredge Volume Summary

OU/Schedule Group	Dredge Area[1]	Estimated Total Dredge Volume (cy)
OU 4 – Group 2	D35A Lower TSCA	3,304
	D35U TSCA[2]	12,000
	D35T	6,283
	D38 TSCA 1-8	31,567
	D39 TSCA	1,112
Estimated TSCA Total Volume (cy)		**54,266**

Notes: 1) TSCA dredge area design is based on discrete sample-interval data and a dredge prism approach.
2) The volume shown for this area is a placeholder volume and subject to change.

After dredging is completed in a dredge-only area, post-dredge confirmation sampling will be performed to determine if the 1 ppm RAL has been achieved. If residual contamination remains, a decision process will be followed to determine if a design override is needed, or if the remaining contamination can be addressed through residuals management. If a design override is warranted based on cost and other considerations, the Design Team will revise the design to include additional dredging (e.g., dredge prism design), capping, or a combination of these remedies. The remedy selected will be based on several factors, including:

- PCB concentration remaining
- Thickness of contamination remaining
- Post-cap water depth if capping were performed
- Estimated cost of the remedy
- Remedies present in adjacent areas

If residuals management is warranted for the area, either residual dredging, residual capping, residual sand cover, or a combination of these options may be performed. The decision process will include:

- Consideration of the thickness and concentration of sediment remaining that is above the 1 ppm PCB RAL
- Geomorphology of the area
- Residuals management designed for adjacent areas
- Cost

Additional sampling may be performed to gain a better understanding of the residuals remaining.

Infill sample results, pre-cap sample delineation/verification results, and poling data were incorporated into the design in 2011, 2012, and 2013, which refined the LOS surface. Additional design refinements were completed in some areas during the 2014 dredge season, based on the results from design refinement cores

and pre-cap sampling. Production dredging was also performed in some limited areas prior to sampling. In some areas, the previous dredge area footprint was outside the current, refined dredge area footprint. Where this occurred, the areas were given designations as FIK-Confirm and numbered sequentially (e.g., FIK-001, FIK-002, etc.). FIK-Confirm areas were previously within the 2009 or 2010 FIK model footprint but are not within the updated 2011 to 2013 FIK model footprints, in which no remedial action has been performed. RA-Confirm areas are similar to FIK-Confirm areas, but production dredging has previously occurred in the area based on the 2009/2010 model footprint. All of the FIK-Confirm and some of the RA-Confirm areas were sampled during the 2013 and 2014 dredge seasons, in accordance with the CQAPP. When discrete samples were analyzed, the results were included in the Core Chemistry Database. Where analytical results have indicated that the area requires remediation, remedial plans have been developed and are included in the Engineered Plans in Appendix A. FIK- and RA-Confirm areas located between the De Pere Dam and transect 4035 were completed during the 2012 to 2014 dredge seasons if these areas required remedial action. Each FIK- and RA-Confirm areas located north of transect 4035 will be sampled shortly after dredging is completed in all areas upstream of each area, and remedial action will be designed for each area, if required.

The Engineered Plans (Appendix A) also identify areas of No Action-Confirm (NA-Confirm), which are areas to be evaluated for no action. NA-Confirm areas are within the FIK model footprint, but core data indicate that these areas meet the 1 ppm RAL without remediation. Sampling was also performed in these areas, as described in the CQAPP (Tetra Tech et al. 2014a), for all areas located south of transect 4035. For areas located between transect 4035 and 4061 (approximately the Mason Street Bridge), sampling will be performed during the 2015 dredge season after dredging upstream of each NA-Confirm area has been completed.

While developing the Final 100 Percent Design Report, it was observed that some dredge-only areas exhibited conditions that warranted application of AM in the form of engineering judgment to override the LOS neat line dredge surface. Areas with design overrides included in the Final 100 Percent Design and subsequent remedial designs are summarized in the table in Appendix D, along with the reason for each override.

Areas potentially eligible for DLR may continue to be evaluated during the 2015 season. In these areas, the Work Parties are allowed to target dredging to an elevation that is four inches above the neat line, which typically results in the average overcut extending to the neat line when dredged.

With the collaboration and approval of the Response Agencies, the Tetra Tech Team will use engineering judgment and/or AM when conditions observed in the field warrant a modification to the dredge plans. Examples of situations where engineering judgment may be used to modify the dredge plan in the field include, but are not limited to, the following:

- Soft sediment thickness is less than predicted by the geostatistical model due to the presence of rock, clay, or other natural deposits above the targeted dredge elevation that was previously unknown and was deposited before PCBs were released into the river. Procedures for delineating these areas are provided in the Standard Operating Procedures (SOPs) for High Subgrade Sampling, presented as an attachment to the CQAPP (Tetra Tech et al. 2014a).

- Slope geometry or dredge area must be modified to accommodate the presence of cultural resources, pipelines, or other structures in the river that were previously unidentified and/or require additional information before dredging can continue as planned in the area.
- Further investigation of a structure, utility, or pipeline indicates that dredging can be performed over or close to the utility or closer to the structure than originally planned.
- Post-dredge confirmation sampling with at least two or more intervals below the post-dredge mudline (i.e., the mudline measured immediately after completion of production dredging) shows that the 1.0 ppm RAL has been met with only production dredging, and further dredging to reach the design elevation is not required. Confirmation sampling after dredging for dredge/cap RA areas will be executed timely to allow sufficient time for residuals management, if needed, in the same construction season for the purpose of preventing over-winter exposure of concentrations of PCBs in sediment that are higher than were measured before dredging.
- Post-dredge confirmation sampling indicates that the 1.0 ppm RAL has not been achieved after final dredging as designed (e.g., to the neat line or prism elevation) in dredge-only areas. When this occurs, the results are discussed collaboratively with the Agencies and a recommendation is made regarding residuals management for the DMU. Residuals management may include residual dredging, residual sand covering, and/or residual capping. The Agencies will consider the recommendation, and issue a final decision shortly thereafter. Additional information regarding residuals management is presented in the CQAPP (Tetra Tech et al. 2014a).
- AM and/or VE evaluations indicate modification of the remedy should be considered.

Modifications will only be made to dredge plans in the field with the collaboration and approval of the Response Agencies.

4. SEDIMENT DREDGING AND PROCESSING

Remedial action for 2015 includes dredging sediment from dredge areas identified in Tables 3-1 and 3-2, in the reach of the river from approximately transect 4041 to transect 4071 (just north of the Main Street Bridge). Sediment dredging will be performed as shown on the Engineered Plan Drawings presented in Appendix A. The likely sequence of dredging in OU 4 is described in detail in Section 4.7.

Dredging of non-TSCA sediment that overlies TSCA sediment (non-TSCA overburden), followed by dredging of TSCA sediment, is planned for early in the season in 2015. Dredging in situ TSCA sediment will be performed separately from dredging non-TSCA sediment, so that the filter cake, scalpings, separated sand and debris derived from TSCA sediment can be managed separately from that derived from non-TSCA dredging.

OU 4 dredging will include dredging in both dredge-only and dredge-and-cap areas. In dredge-and-cap areas, some sediment exceeding the 1.0 ppm RAL will be dredged to a predetermined elevation. An engineered cap will be placed over the exposed dredge surface to complete the RA for the remaining sediments with concentrations above the RAL. Post-dredge sampling will be performed in these areas, as described in the CQAPP, and used to confirm that the planned cap type is appropriate, unless the cap type has been confirmed based on data from historic and infill sampling.

4.1 Dredging Equipment and Production Rates

Dredging will be accomplished with one to two 8-inch dredges and one to two 10-inch dredges. These dredges will be used unless conditions or circumstances warrant a change in configuration; for example, when the use of a second 8-inch dredge or either 8-inch dredge is not warranted. If this occurs, the Agencies will be notified of the proposed change in dredge configuration. The dredges will be configured, to the extent practicable, to balance flow rates to the desanding and dewatering systems at the LFR Processing Facility while accomplishing the remedial goals for 2015.

The average production rate for an 8-inch dredge is approximately 10 to 40 in situ cy per gross operating hour (cy/GOH); so one 8-inch dredge can remove approximately 1,800 in situ cy of sediment per week (cy/week), and two 8-inch dredges can remove approximately 3,600 cy/week, assuming operations running 24 hours per day, 5 days per week at an average combined dredge rate of 30 cy/GOH. This rate is influenced by the type of sediment being dredged and if the dredge is in swinging mode.

It is planned that the 10-inch dredge(s) will operate in several different configurations during the remedial season. The average production rate for this dredge is projected to be in the range of approximately 80 to 150 in situ cy/GOH, averaging approximately 120 in situ cy/GOH, so the 10-inch dredge can remove approximately 14,400 in situ cy of sediment per week (cy/week). This rate is influenced by numerous factors, but most significantly by the thickness of the sediment to be dredged where the work is being performed and whether it is operating in a production or final dredging mode.

As the remediation progresses downstream in 2015 and beyond, it will move into areas where the river narrows, interactions with commercial riparian property owners increase, and production interruptions due to ship traffic become more frequent. Maintaining efficiency and production to the fullest extent will therefore require maximum flexibility for the dredging configurations employed throughout the remainder

of the project. To offset the potential negative impacts of these occurrences, J.F. Brennan will continue to use the 10-inch and 8-inch dredges, as appropriate for the situation. This may include periods when only the 10-inch dredge is operating (or two 10-inch dredges), periods when only an 8-inch dredge is operating (or two 8-inch dredges) and periods when all dredges are operating. In addition, J.F. Brennan may convert the 10-inch dredge to a 12-inch dredge or employ the use of an independent 12-inch dredge, either separately or in combination with the other dredges on site.

In addition to the dredges, booster pump stations for the 8-inch and 10-inch dredges will be required as implemented in prior dredging seasons. The actual total production rate will vary throughout the year. During the season it is planned that operations will be 24 hours per day, 5 days per week. There are approximately 31.4 weeks planned for the 2015 RA season (March 30 – November 13, 2015) excluding time off for system flushing, Memorial Day, Labor Day, and the entire week surrounding Independence Day. The combined production rate for the 10-inch and 8-inch dredge(s) is planned to average approximately 150 in situ cy/GOH for the 31.4 weeks that non-TSCA and TSCA sediment will be dredged. As shown in the mass balance calculation presented in Table 4-1, this average rate of 18,000 in-situ cy per gross operating week for 31.4 weeks would yield a total of approximately 565,200 in situ cy of sediment removed.

Specifications, pump curves, and cut-sheets for the dredges and booster pumps are provided in the 100 Percent Design Report Volume 1 (Tetra Tech et al. 2009a). The design and layout of the booster pump system for the 8-inch dredge is presented in the 100 Percent Design Report Volume 1 (Tetra Tech et al. 2009a).

4.2 Removal and Transport of Debris

Debris will be removed from each dredge area prior to dredging, to the extent possible. Debris removal for the 2015 season will be performed after the commencement of dredging upstream of these areas and will continue as needed.

Potential cultural resources in OU 4, identified as described in Section 3.3, have been considered during the cultural resources assessment, and procedures to remove or avoid them during dredging are further described in the J.F. Brennan Operation Plan for Debris Removal (J.F. Brennan 2013) and in the Underwater Cultural Resources Approach in Appendix C. Additional debris removal may be performed, if necessary, if debris not identified during initial pre-dredge removal activities is encountered. If the dredge operators encounter areas of excessive debris that have not been identified during the pre-construction investigations, the Work Parties will inform the Response Agencies and present a plan for dealing with the newly encountered debris.

Transportation of debris to off-site landfills is described in detail in the revised Final Transportation Plan (Tetra Tech 2013d).

4.3 Dredge Pipeline Installation and Operation

Dredged sediment will be transported through pipelines installed by J.F. Brennan. A 10-inch dredge will begin operations in OU 4 in the Group 1 TSCA dredge areas removing non-TSCA overburden sediment, so the pipelines will initially be installed to reach these areas. The design and installation of the dredge

pipelines and booster pump stations is described in Section 3.2.8 of the 100 Percent Design Report Volume 1 (Tetra Tech et al. 2009a), and summarized herein.

The pipelines for both the 8-inch and 10-inch dredge systems run to the LFR Processing Facility, where the sediment is desanded and dewatered. The pipelines are routed onto shore along the northwest side of the CN Railroad Denmark Spur Bridge near transect 4049, immediately south of the LFR Processing Facility site. The pipelines lay mainly on the ground.

The 10-inch dredge will discharge slurry at a normal hydraulic flow rates less than 4,000 gallons per minute (gpm) through a 12-inch internal diameter high-density polyethylene (HDPE) Standard Dimension Ratio (SDR) 17 orange-colored safety pipe and through required booster stations to the SDDP.

During the initial installation in 2009, each of the dredge pipelines was submerged, weighted every 50 feet, and maintained in a filled (slurry or water) state to prevent the pipeline from becoming buoyant and rising to the surface. Where the two dredge pipelines cross the inlet to the Georgia Pacific coal-boat slip located at the west end of the Fort Howard turning basin, J.F. Brennan dredged to the design elevation and then weighted the pipeline to the bottom of the dredged area next to the coal slip. This provides a safe clearance of approximately 4.5 feet between the bottom of the ships and the top of the pipeline at the inlet to the slip.

The pipelines are configured with appropriate monitoring equipment to minimize the potential for plugging of the lines. The dredge levermen will monitor booster pump pressures and line velocities and make the necessary adjustments to maintain flows. In addition, the booster stations are outfitted with equipment that allows them to increase or decrease flow based on preset pressure and velocity parameters. Radio repeaters are installed along the line to ensure uninterrupted communication among the dredges, booster stations, and dewatering facility. The dredges and booster stations are also equipped with cleanout boxes and backflow valves so any sediment that becomes lodged in the pump can be easily removed. Another feature installed at each dredge is a Gatling head plate. This piece of equipment is located between the suction mouth and intake; its function is to limit the size of the materials (typically debris or rocks are caught and rerouted) that are allowed to pass through the pump.

With the measures described above in place, it is highly unlikely the slurry lines will plug. If a line does plug, it will most likely occur while pumping a large volume of coarse sand. If this occurs, clear water flushing of the line can be performed to dislodge the sand. Alternatively, a section of sand-choked line, identified through buoyancy checks, could be isolated with backflow valves shut, cut from the line, removed with a crane or backhoe, and then placed on a barge with containment. A new section of pipe could then be installed. The plugged section would be capped on both ends and delivered to the LFR Processing Facility, where the pipe would be cleaned out and the sediment processed as appropriate.

Additional information regarding the installation and maintenance of the dredge pipelines is presented in the Technical Memorandum – Pipeline Installation and Maintenance Procedures (J.F. Brennan 2009c).

4.3.1 Pipeline Marking System

The dredge pipeline marking system has been designed to allow for high visibility of dangerous areas on the river for the benefit of boaters operating at high speeds. The system will consist of a series of different waterway markers, installed as indicated in the Technical Memorandum – Pipeline Installation and

Maintenance Procedures (J.F. Brennan 2009c). Figure 4-1 outlines the pipeline marking system described in this Technical Memorandum. This system was used by J.F. Brennan at OU 1 and during 2009 in OU 2, OU 3, and OU 4, with additional marking and monitoring of the pipelines added in 2009 after two incidents involving boaters hitting pipelines. In addition, since 2010, Brennan has stationed personnel at common boat landings in the remediation area. These personnel provided real-time information to boaters regarding the location of pipelines in the river. The improved system was used from 2010 through 2014, with only one navigational incident in 2012. This practice will continue for 2015. Additional information regarding the installation and maintenance of the dredge pipelines is presented in the referenced Technical Memorandum.

4.4 OU 4 Production Dredging

Production dredging will be performed in OU 4 to remove targeted sediments with a minimum 1.0-foot thickness. The likely sequence of OU 4 production dredging is described in detail in Section 4.7. A bathymetric survey (single beam) will be performed prior to the start of the 2015 operations season and after completion of 2015 production dredging in these areas. The survey results will be used to determine the volume of sediment removed and whether the planned removal depth was achieved.

1.5 Cleanup Pass Dredging

Cleanup pass dredging (also referred to as final dredging) will be performed beginning at the southernmost point in OU 4 where work dredging was completed during the 2014 season, and progress in an upstream-to-downstream manner. This dredging will commence after TSCA sediment is removed. This dredging is typically performed in water with a depth of 3 feet or more, but may occasionally require shallow water dredging. During cleanup pass dredging, production is typically lower than the production achieved during production dredging.

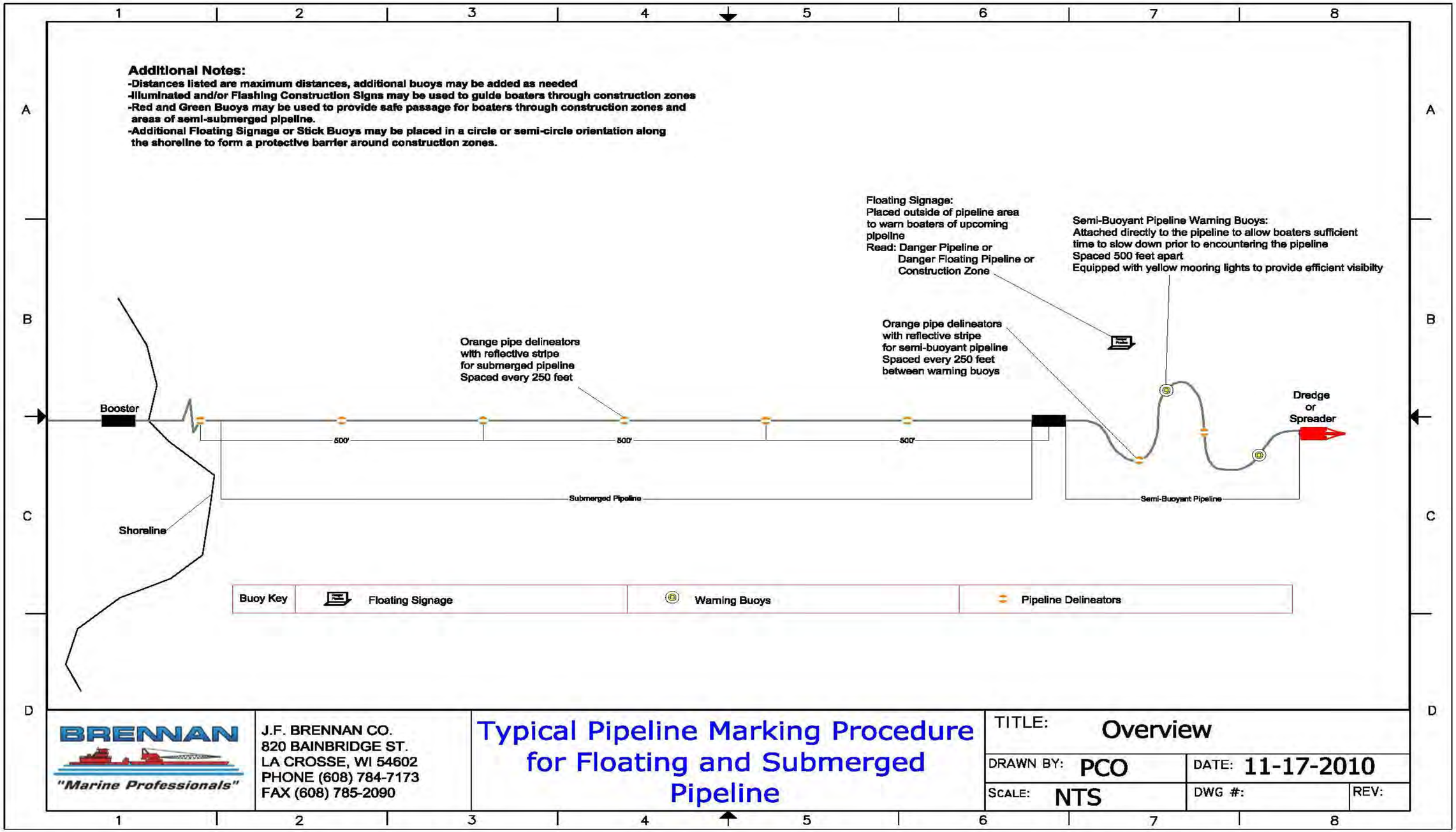
4.6 Shallow Water Dredging

In addition to cleanup pass dredging in deeper water, the 8-inch dredge will be used for removal of sediments in areas of OU 4 with water depths of less than 3 feet. Depending on fuel load, an 8-inch dredge drafts approximately 2 feet of water, which is suitable for operating in most shallow water environments. Shallow areas that cannot be dredged with the 8-inch dredge may meet the criteria for exceptional areas. In such cases, the Work Parties will submit their recommendation to the Response Agencies for consideration. When necessary, alternative methods such as mechanical excavation will be employed in shallow water areas that require dredging.

4.7 Sequence of Dredging Operations

Equipment startup will commence on the first day of dredging operations and will include startup of the dredges, pipeline and booster pump(s), and operation for an anticipated minimum of 16 hours per day. During this time, the entire system of dredges, slurry pipeline and booster stations, sediment desanding and dewatering, water treatment processes, and filter cake and scalpings load-out will be checked and adjusted as needed. Following confirmation that all systems and processes are functioning as planned, dredging and sediment dewatering operations will be expanded to a typical schedule of 24 hours per day and 5 days per week for the remainder of the 2015 season, except for the three noted holidays.

Figure 4-1. Typical Pipeline Marking Procedure for Floating and Submerged Pipeline



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During the 2015 season, the Tetra Tech Team plans to conduct the 8-inch hydraulic dredge and booster pump station operations as follows:

- Two 8-inch hydraulic dredges will begin production dredging in OU4 areas with approved dredge designs, including OU4-D38, OU4-D39, OU4-D78, OU4-D79, and OU4-D67 (Group 0 on Figure 9-1).
- The 8-inch dredges will then begin dredging non-TSCA overburden sediment in OU4-D35A TSCA, OU4-D35T TSCA, and OU4-D35U TSCA, south of the CNRR Bridge, Denmark Spur, in the Group 1 areas identified in Table 3-1 (see Section 3), while the 12-inch dredge is removing non-TSCA overburden sediment in dredge areas OU4-D38 TSCA and OU4-D39 TSCA (Group 1).
- The 8-inch dredges will then assist the 10-inch dredge with dredging of the TSCA sediment in the Group 2 areas shown on Table 3-2. At the completion of TSCA dredging, the entire slurry pipeline and SDDP will be flushed with river water, in accordance with the approved O&M Plans (J.F. Brennan 2011a; Tetra Tech et al. 2011b; Tetra Tech et al. 2011d).
- One or two 8-inch dredge(s) will then continue to areas south of the CNRR Bridge, Denmark Spur, to perform final dredging in the Group 3 areas listed on Table 3-1. For this reach of the river, final pass and residual dredging will commence in the southernmost area and will proceed generally in an upstream to downstream direction. The 8-inch dredge(s) will complete all dredging in dredge areas located south of the CN Railroad Bridge, Denmark Spur.
- One or two 8-inch dredge(s) will then continue to areas north of the CNRR Bridge, Denmark Spur, to perform final dredging in the Group 4, 5, and 6 areas listed on Table 3-1. For this reach of the river, final pass and residual dredging will commence in the southernmost area and will proceed generally in an upstream to downstream direction. The 8-inch dredge(s) will complete dredging in dredge areas located between the CNRR Bridge, Denmark Spur, and Transect 4071, as time permits.

During the 2015 season, the Tetra Tech Team plans to conduct the 10-inch hydraulic dredges and booster pump operations as follows:

- One 10-inch dredge will begin the season by production dredging in the following areas with approved dredge designs: OU4-D35Q, OU4-D35CD, OU4-D40A, OU4-D35EFG, OU4-D39, OU4-D35H, and OU4-D41 (Group 0 on Figure 9-1).
- The 10-inch dredge will then concentrate on production dredging of non-TSCA overburden sediment in OU4-D38 (Group 1), but may also assist the 8-inch dredges with dredging in other Group 1 areas (see Table 3-1) located near the CNRR Bridge, Denmark Spur.
- The 10-inch dredge will then commence dredging of in situ TSCA sediment in the OU4-D35A TSCA, OU4-D35T TSCA, OU4-D35U TSCA, OU4-D38 TSCA, and OU4-D39 TSCA dredge areas (Group 2), as shown in Table 3-2.

- After TSCA sediment is dredged, the entire slurry pipeline and SDDP will be flushed with river water, in accordance with the O&M Plans (J.F. Brennan 2011a; Tetra Tech et al. 2011b; Tetra Tech et al. 2011d).
- After flushing, the 10-inch dredge will work with the 8-inch dredges with final dredging in the Group 3 areas, dredging areas with the greatest thickness of non-TSCA sediment below the TSCA sediment.
- The 10-inch dredge will then move to the north and a second 10-inch dredge will be added. The 10-inch dredges will perform production and final dredging in areas that are located between the Mason Street Bridge and transect 4071 (just north of the Main Street Bridge) that have cuts of at least 1 foot of sediment exceeding the RAL.

The processing of sediment in the SDDP is described in Section 4.9.

4.8 Sediment Dredging Rates

The projected rates of sediment removal and slurry pumping (based on current design drawings) are as follows:

- Maximum flow of 6,000 gpm (combined from the dredges), with removal of up to 200 in situ cy/GOH.
- Average flow of approximately 4,500 to 5,500 gpm (combined from the dredges), with removal of approximately 130 to 190 in situ cy/GOH.
- Combined minimum flow of 3,125 gpm (combined from the dredges,) although each dredge configuration will have a different flow range. The combined minimum flow is the minimum flow rate required for flow through the WTP and diffuser pipeline.

During the previous dredge seasons, the average sediment removal rates achieved were approximately 150 to 180 cy/GOH. The assumed dredge season length for 2015 is from approximately March 30 to November 13, 2015— a total of approximately 31.4 weeks. This schedule assumes one day of scheduled down time for system flushing after dredging TSCA sediment, as well as down time for each of the three noted holidays. J.F. Brennan will monitor pipeline flow and make adjustments, as needed, to maintain the flow rates and production needed to meet the project requirements.

4.9 Mechanical Dewatering Operations

A brief description of the dewatering process and the procedures that are used to monitor its operation is presented in this section. Details of mechanical dewatering operations, including the SDDP, processing of hydraulically dredged sediment, segregation of sand, monitoring, best management practices (BMPs), and a description of physical characteristics of processed material are presented in Section 5.4 of the 100 Percent Design Report Volume 1 (Tetra Tech et al. 2009a).

The SDDP is designed to operate at flow rates ranging from 3,000 to 6,000 gpm, the same range of flow designed for dredge production. Process flow diagrams for the SDDP are presented on Figures 4-2 and 4-3. Flow entering the SDDP during dredging operations typically is expected to contain sediment in the range

of 5 to 15 percent solids (by weight), averaging approximately 8 percent, based on observations from previous dredge seasons. Following removal of particles larger than 3 to 6 mm by scalping, the slurry will be pumped through an initial thickening process that will increase the sand content to the desanding system. Residue from sand separation, defined as material smaller than 63 microns (U.S. No. 230 sieve), will be collected in slurry tanks and pumped to the residue tank. Sand in the desanding system will be separated into coarse sand (>150 microns to 3-6 mm) and fine sand (63 to 150 microns).

The fine residue in the residue tank will be dosed with coagulant and polymer as it is pumped to pre-thickeners, where it will be thickened to approximately 15 to 25 percent solids (by weight) and water will be decanted off the top and routed to water buffer tanks. Thickened slurry will be pumped to sludge holding tanks, which hold the sludge until it is pumped to the membrane filter presses. The presses will operate on an approximately 75 minute cycle time including filling, membrane inflation, and dropping of filter cake. Water squeezed from the sludge in the presses will also be piped to the water buffer tanks.

During operation of the SDDP, key aspects of the sand separation and dewatering operations will be monitored. The sand will be tested as described in the O&M Plan for the SDDP. The filter cake will also be tested for geotechnical strength properties as described in the O&M Plan for the SDDP (Tetra Tech et al. 2011c) and the Quality Assurance Project Plan (QAPP) (Tetra Tech et al. 2013e). Each individual component of the dewatering and water treatment processes will be monitored as described in the O&M Plans for the SDDP and the WTP (Tetra Tech et al. 2011b, 2013c), and as described in the CQAPP (Tetra Tech et al. 2014a).

All equipment monitoring information is linked to the SDDP Programmable Logic Control (PLC) system, which is the instrumentation system that controls flows, pressures, and volumes. This information will be continually monitored by the plant operator through the monitors in the SDDP control room. The operator will also monitor a series of cameras to check the status of operating equipment. Instrumentation and controls will be monitored and adjusted, as needed, to equalize sludge levels in the tanks. Physical properties (e.g., grain size distribution, organic matter content, and densities) of the sediment fines, sand and/or filter cake may also be tested using “wet screening” and other simplified test methods to verify process operations are within the expected range. Samples will be collected daily to check and monitor the mass balance over the system and control system efficiencies.

The tonnage of sand and filter cake estimated to be produced for the expected range of production rates for dredging, desanding, and dewatering is presented in Table 4-1, based on gross operating hours for operations. This analysis assumes an average sediment bulk density of 82.4 pounds per cubic foot (pcf), an average percent solids content of 42.9 percent by weight, a sand removal rate of approximately 25 percent by weight of the total dredge slurry, and a range of filter press uptime from 75 to 100 percent during the season. These estimated properties and the sand removal rate are based on actual production data from previous dredge seasons, with the exception of the sand removal rate. The sand removal rate averaged approximately 22% during the 2014 season, which is higher than the cumulative project average of 20.9 percent for all previous seasons. The estimated sand removal rate for the 2015 season was therefore assumed to be approximately 25 percent. Table 4-1 shows estimated 2015 values for these parameters.

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Table 4-1. Mass Balance for Dredging and Sediment Processing.

Mass Balance for 2009 - 2014 Dredge Seasons																			
In-Situ Flow Rate (cy/GOH)	In Situ Flow Rate (m3/GOH)	Dry Solids Flow Rate (mtds/GOH)	Sand Removal (% by weight)	Sand Removal Rate (mtds/GOH)	Solids to Residue Tank (mtds/GOH)	Filter Cake (mtons per GOH)	Filter Cake Produced (m3/GOH)	Flow Capacity per Press (m3/GOH)	No. of Presses @ 100% Uptime	No. of Presses @ 75% Uptime	Filter Cake (mtons per day)	Filter Cake (Short Tons per Day)	No. of Truck Loads per Day	Length of Dredge Season (days)	Filter Cake plus Scalpings (short tons)	Ratio of Tons of Filter Cake to In Situ CY	Sand Tonnage (wet short tons)*	Sand Volume (CY)	Total Dredge Volume (In-situ CY)
166.72	127	57	20.9	12	45	81	56	10.9	5.1	6.8	1,946.4	2,146	93	824	1,767,899	0.536	295,593	211,138	3,297,055
Actual Quantities for 2009 - 2014 Dredge Seasons															**1,767,914**		**295,000**		**3,297,039**

* includes sand that was disposed and sand that was used beneficially.

Notes:
1. Average percent solids for the filter cake is assumed to be 56% for the project to date; density is assumed to be 1.45 mtons/m^3.
2. The dry solids flow rate was calculated assuming 77 pcf density and percent solids of 36.5% for the in situ sediment for the average project to date.
3. Sand tonnage removed is estimated as slightly higher than actual reported sand removal, to account for sand used as fill on the site in 2009.

Mass Balance for 2014 Dredge Season																			
In-Situ Flow Rate (cy/GOH)	In Situ Flow Rate (m3/GOH)	Dry Solids Flow Rate (mtds/GOH)	Sand Removal (% by weight)	Sand Removal Rate (mtds/GOH)	Solids to Residue Tank (mtds/GOH)	Filter Cake (mtons per GOH)	Filter Cake Produced (m3/GOH)	Flow Capacity per Press (m3/GOH)	No. of Presses @ 100% Uptime	No. of Presses @ 75% Uptime	Filter Cake (mtons per day)	Filter Cake (Short Tons per Day)	No. of Truck Loads per Day	Length of Dredge Season (days)	Filter Cake plus Scalpings (short tons)	Ratio of Tons of Filter Cake to In Situ CY	Sand Tonnage (wet short tons)*	Sand Volume (CY)	Total Dredge Volume (In-situ CY)
149.9	115	65	22.2	14	50	83	57	10.9	5.2	7.0	1,989.7	2,193	95	152	333,378	0.610	65,465	46,760	546,835
Actual Quantities for 2014 Dredge Season															333,678		65,533		546,475

* Actual tonnage for 2014 includes sand that was disposed and sand that was used beneficially.

Mass Balance for 2015 Dredge Season (adjusted for slightly higher sand content)																			
In-Situ Flow Rate (cy/GOH)	In Situ Flow Rate (m3/GOH)	Dry Solids Flow Rate (mtds/GOH)	Sand Removal (% by weight)	Sand Removal Rate (mtds/GOH)	Solids to Residue Tank (mtds/GOH)	Filter Cake (mtons/GOH)	Filter Cake Produced (m3/GOH)	Flow Capacity per Press (m3/GOH)	No. of Presses @ 100% Uptime	No. of Presses @ 75% Uptime	Filter Cake (mtons per day)	Filter Cake (Short Tons per Day)	No. of Truck Loads per Day	Length of Dredge Season (days)	Filter Cake plus Scalpings (short tons)	Ratio of Tons of Filter Cake to In Situ CY	Sand Tonnage (wet short tons)	Sand Volume (CY)	Total Dredge Volume (In-situ CY)
150	115	65	25	16	49	80	55	10.9	5.1	6.7	1,919.4	2,116	92	157	332,173	0.588	76,197	54,427	565,200

Notes:
1) An average density of 82.4 pcf and percent solids of 42.9% were used for sediment in the analysis for dry solids flow rate, which were estimated based on 2014 production.
2) An average hourly production rate of 150 cy/GOH is assumed for the 10-inch dredge(s) and 8-inch dredge(s) combined for 2015.
3) Flow capacity per press is calculated based on a total capacity of 17.7 m3, divided by a compression factor of 1.3, divided by 1.25 (75 minute/60 minute cycle time).
4) Production is assumed to take place 24 hours/day for 157 days in 2015, with an estimated removal volume of approximately 565,000 cy.
5) This analysis assumes a moisture content of 13% and wet density of approximately 1.4 tons/cy for the sand removed from the sediment.
6) Filter cake density of 1.45 mtons/m3 and percent solids of 60.9% is used in this analysis, based on 2014 production.
7) This analysis includes tonnage of scalpings in the filter cake tonnage, but does not include tonnage of other miscellaneous waste that was disposed.
8) Number of truck loads per day is based on 23 tons per truck.
9) GOH = gross operating hour

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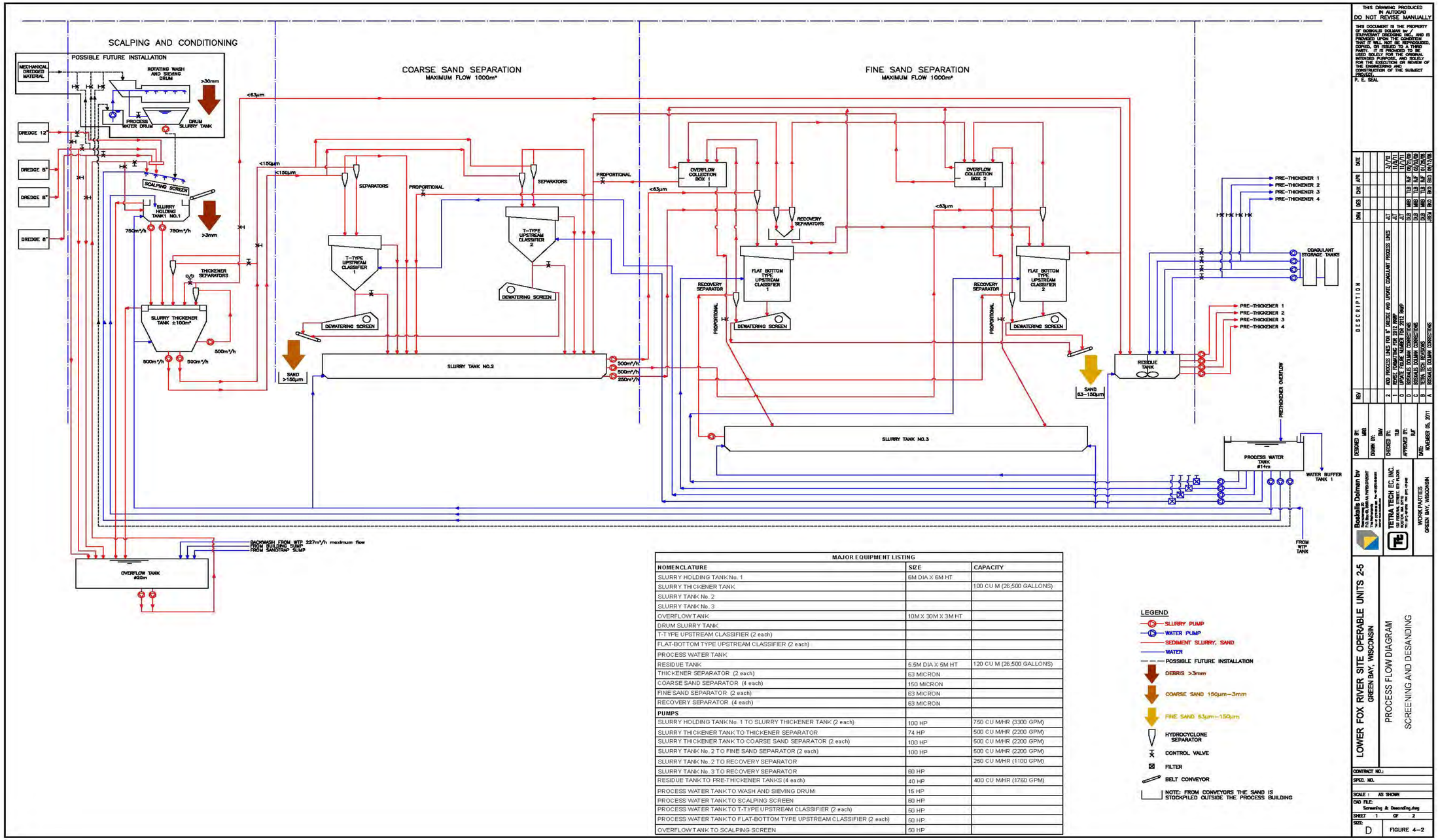
Figure 4-2. Process Flow Diagram - Screening and Desanding.



MAJOR EQUIPMENT LISTING

NOMENCLATURE	SIZE	CAPACITY
SLURRY HOLDING TANK No. 1	6M DIA X 6M HT	
SLURRY THICKENER TANK		100 CU M (26,500 GALLONS)
SLURRY TANK No. 2		
SLURRY TANK No. 3		
OVERFLOW TANK	10M X 30M X 3M HT	
DRUM SLURRY TANK		
T-TYPE UPSTREAM CLASSIFIER (2 each)		
FLAT-BOTTOM TYPE UPSTREAM CLASSIFIER (2 each)		
PROCESS WATER TANK		
RESIDUE TANK	5.5M DIA X 5M HT	120 CU M (26,500 GALLONS)
THICKENER SEPARATOR (2 each)	63 MICRON	
COARSE SAND SEPARATOR (4 each)	150 MICRON	
FINE SAND SEPARATOR (2 each)	63 MICRON	
RECOVERY SEPARATOR (4 each)	63 MICRON	
PUMPS		
SLURRY HOLDING TANK No. 1 TO SLURRY THICKENER TANK (2 each)	100 HP	750 CU M/HR (3300 GPM)
SLURRY THICKENER TANK TO THICKENER SEPARATOR	74 HP	500 CU M/HR (2200 GPM)
SLURRY THICKENER TANK TO COARSE SAND SEPARATOR (2 each)	100 HP	500 CU M/HR (2200 GPM)
SLURRY TANK No. 2 TO FINE SAND SEPARATOR (2 each)	100 HP	500 CU M/HR (2200 GPM)
SLURRY TANK No. 2 TO RECOVERY SEPARATOR		250 CU M/HR (1100 GPM)
SLURRY TANK No. 3 TO RECOVERY SEPARATOR	60 HP	
RESIDUE TANK TO PRE-THICKENER TANKS (4 each)	40 HP	400 CU M/HR (1760 GPM)
PROCESS WATER TANK TO WASH AND SIEVING DRUM	15 HP	
PROCESS WATER TANK TO SCALPING SCREEN	60 HP	
PROCESS WATER TANK TO T-TYPE UPSTREAM CLASSIFIER (2 each)	50 HP	
PROCESS WATER TANK TO FLAT-BOTTOM TYPE UPSTREAM CLASSIFIER (2 each)	50 HP	
OVERFLOW TANK TO SCALPING SCREEN	50 HP	

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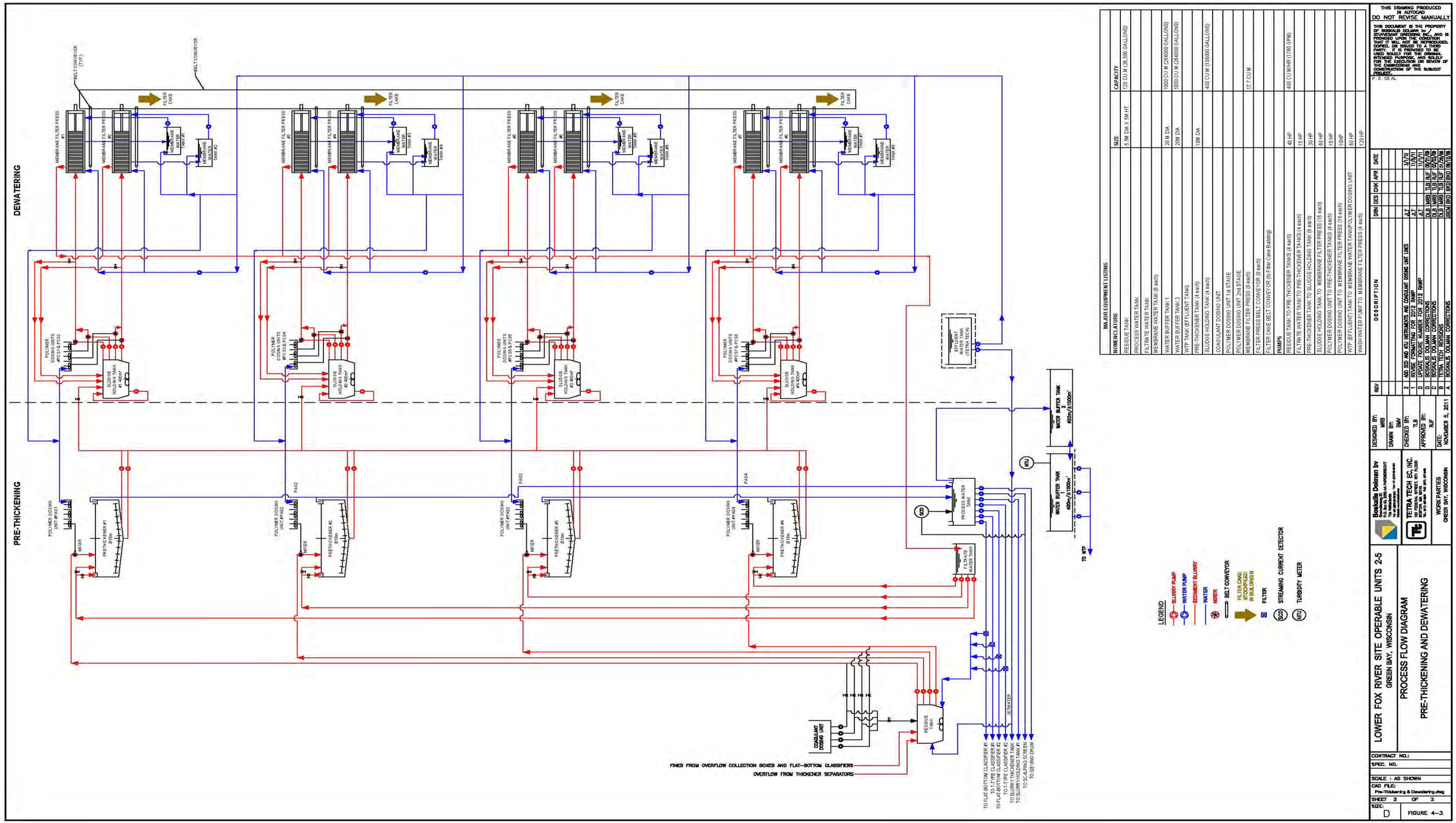
Figure 4-3. Process Flow Diagram - Pre-Thickening and Dewatering.



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4.10 Water Treatment Plant Operations

WTP operations started the 2014 production season after completion of significant maintenance activities during the winter shutdown. Maintenance completed during the 2013/2014 winter shutdown included:

- Replacement of 290,000 lbs. of new reactivated carbon (out of a total of 360,000 lbs.);
- Replacement of filter media in all 24 multi-media (sand) filter vessels;
- Redesign and replacement of the underdrain system in all 24 sand filters.

As experienced in previous years, operational challenges caused by the accumulated build-up of residual polymer and fine solids within the sand filters and granulated activated carbon (GAC) vessels continued during the 2014 season. These challenges were effectively addressed by implementing an aggressive maintenance program which included weekly air lancing of the sand filters and regular backwashing of the GAC vessels with hydrogen peroxide, as well as weekend treatment with caustic (NaOH). Upon completion of the 2014 production season, the media in the sand filters and GAC vessels was evaluated. Media in these vessels will be re-evaluated prior to the startup and during the 2015 season.

A new 25 horsepower air compressor was installed prior to the end of the 2014 production season to supply the additional air necessary to support the air lancing of the sand filters. The existing WTP air compressor was tested and determined to have an insufficient air capacity for the air lancing task.

Soon after start-up of the 2014 production season, two of the three process pumps were discovered to need new pump bearings. The pump heads were immediately replaced and a preventative maintenance program was implemented to rebuild the electrical motors of all the critical WTP pumps. A total of six pump motors were rebuilt off-site by a factory-authorized service center. The motors were rebuilt one at a time in order to keep the WTP at full operational capacity. After being rebuilt, the motors were re-installed, laser-aligned and balanced, and put back into service. All of the pump motor rebuilds were completed by August 27, 2014.

In addition to the above activities, a transition was made from using 10-micron bag filters to more efficient 5-micron bag filters while maintaining a reasonable change-out frequency. The intent of using the more efficient bag filters is to reduce the loading of fine solids to the GAC vessels. Efforts continue to optimize the bag filter performance, and a trial using 1-micron bag filters was performed prior to the end of the 2014 season.

Figure 4-4 presents a process flow diagram of the water treatment system, which identifies the individual processes. An O&M Plan for the WTP was initially submitted to the Response Agencies in 2009 and approved, and was most recently updated in 2013 (Tetra Tech 2013a). This O&M Plan will be updated again prior to the start of the 2015 dredge season. In addition, a description of the treatment process and the procedures that will be used to monitor its operation are presented in the 100 Percent Design Report Volume 1 (Tetra Tech et al. 2009a). Several process improvements to the original design of the WTP were made during the previous winter shutdown periods, which are summarized in Section 7 of the 2009 and 2011 RA Summary Reports (Tetra Tech, et al. 2010a and 2011a).

4.11 Water Treatment Plant Performance

The WTP process design includes multimedia sand filtration, bag filtration, cartridge filtration (though not used currently), and granular activated carbon (GAC) adsorption. The WTP was designed to reduce the level of suspended solids and dissolved organics, such as PCBs, in the effluent water. WTP discharge performance goals, established by WDNR, are presented in Table 4-2. Effluent discharge performance goals will remain as they were in 2013 and 2014, with the monitoring frequencies as shown. When sodium hypochlorite is used in the water treatment process, monitoring of effluent residual chlorine will be performed as indicated in Table 4-2. The initial monitoring frequency for total residual chlorine is twice per shift when sodium hypochlorite is used, subject to adjustment in consultation with the A/OT.

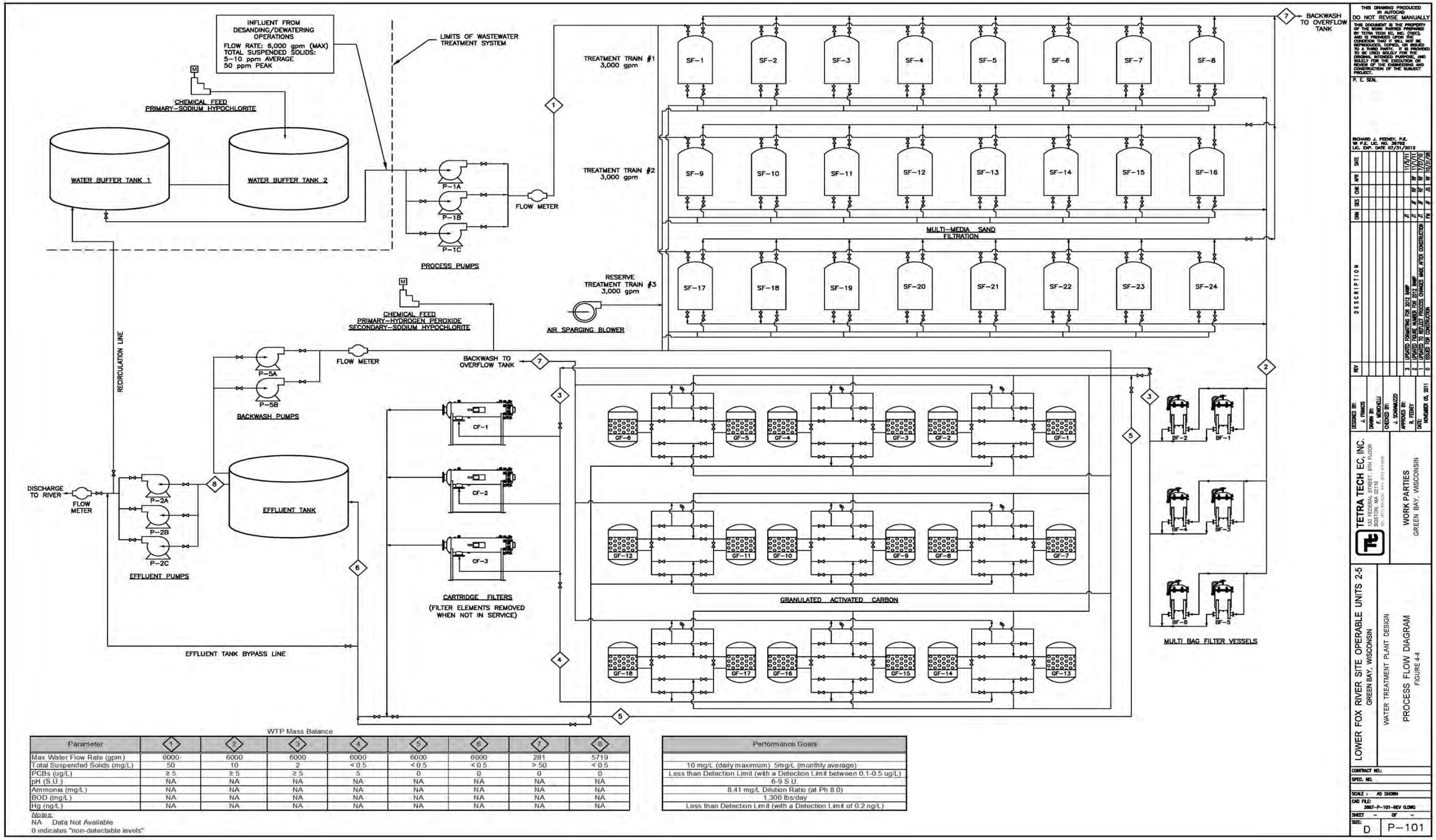
Table 4-2. Water Treatment Plant Effluent Discharge Performance Goals

Parameter	Monitoring Frequency	WDNR Performance Goal
TSS (mg/L)	Once/day for a 24 hr composite sample (or more frequent based on operating conditions)	5 (monthly average) 10 (daily maximum)
BOD (mg/L or lb/day)	Once/day for a 24 hr composite sample (or more frequent based on operating conditions)	<10 mg/L and 1,300 lb/day
PCB (µg/L)	Once/day for a 24 hr composite sample (or more frequent based on operating conditions)	<LOD (with a 0.1-0.5 ug/L LOD)
Minimum Flow (gpm)	Continuous	3,125 gpm
Ammonia (mg/L)	Once/day for a 24 hr composite sample (or more frequent based on operating conditions)	8.41 mg/L multiplied by diffuser dilution ratio (at a pH of 8.0) or approx. 202 mg/L
pH (S.U.)	Real time inline pH probe	6-9 Standard Units
Mercury (ng/L)	Weekly grab sample	<LOD (with a LOD of 0.2 ng/L)
Total residual chlorine	Twice per shift when NaOCl is used for the first month, then less frequently if agreed to by the A/OT	<0.1 mg/L daily maximum

4.12 Transport and Disposal of Dewatered Sediment and Debris

Transport and disposal of dewatered sediment and debris, general traffic controls, truck cleanliness and decontamination, and details of outbound waste and sand from the LFR Processing Facility are described in detail in the revised Final Transportation Plan (Tetra Tech 2013). The Transportation Plan also includes details regarding anticipated traffic volumes and truck routes to disposal facilities. On September 19, 2012, the USEPA approved risk-based disposal for Ridgeview Landfill in Whitelaw, Wisconsin, which allows disposal of filter cake and associated waste dredged from TSCA areas, provided the waste contains less than 50 ppm PCB. The Transportation Plan was revised in 2013 to reflect the use of this facility going forward.

Figure 4-4. Water Treatment Plant Process Flow Diagram



WTP Mass Balance

Parameter	1	2	3	4	5	6	7	8
Max Water Flow Rate (gpm)	6000	6000	6000	6000	6000	6000	281	5719
Total Suspended Solids (mg/L)	50	10	2	< 0.5	< 0.5	< 0.5	> 50	< 0.5
PCBs (ug/L)	≥ 5	≥ 5	≥ 5	5	0	0	0	0
pH (S.U.)	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia (mg/L)	NA	NA	NA	NA	NA	NA	NA	NA
BOD (mg/L)	NA	NA	NA	NA	NA	NA	NA	NA
Hg (ng/L)	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA Data Not Available
0 indicates "non-detectable levels"

Performance Goals
10 mg/L (daily maximum) 5mg/L (monthly average)
Less than Detection Limit (with a Detection Limit between 0.1-0.5 ug/L)
6-9 S.U.
8.41 mg/L Dilution Ratio (at Ph 8.0)
1,300 lbs/day
Less than Detection Limit (with a Detection Limit of 0.2 ng/L)

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4.12.1 Transport and Disposal of Non-TSCA Filter Cake and Debris

A licensed waste hauler will transport non-TSCA filter cake, debris, and scalpings from non-TSCA dredge areas to Advanced Disposal Service's Hickory Meadows Landfill near Hilbert, Wisconsin. This landfill is approximately 34 miles away from the LFR Processing Facility. The trucks will follow the hauling routes described in the Transportation Plan.

The estimated rates for filter cake production are shown in Table 4-1 for the planned dredge production rate, sediment properties, and estimated sand removal rate. Based on the average sediment properties and the average dredge production rate of 150 cy/GOH during most of the season, approximately 92 truckloads of filter cake and scalpings will be produced each day. Assuming truck loading will take place from 6:00 am to 3:30 pm daily (9 hours), approximately 10 trucks will be loaded each hour. This is equivalent to one truck every 6 minutes. The filter cake storage building can hold approximately 2 to 3 days of average production, which will help to even out increases and decreases in actual production.

4.12.2 Transport and Disposal of Filter Cake from TSCA-Designated Dredge Areas

Dewatered waste from areas of in situ TSCA sediment will be analyzed for PCBs. The filter cake, scalpings, and debris that have PCB concentrations less than 50 ppm will be disposed of at Waste Management's Ridgeview Landfill in Whitelaw, Wisconsin. This landfill is approximately 43 miles from the LFR Processing Facility. The trucks will follow the hauling routes described in the Transportation Plan. Waste (filter cake and scalpings) that have PCB concentrations equal to or greater than 50 ppm will be disposed of outside of the state of Wisconsin in an approved TSCA landfill. Transportation of all waste will be performed by a licensed hauler.

4.12.3 Transport and Disposal of Sand from Non-TSCA Dredge Areas

The estimated rates for sand production, which are based on variable dredge production rates, sediment properties and sand content, are presented on Table 4-1. Based on the sediment properties assumed for this analysis, coarse and fine sand are expected to be separated from the dredge slurry and stockpiled at an average rate of 485 wet tons per day (assuming 13 percent water content by weight). Following receipt of acceptable test results, the coarse and fine sand will be relocated to and combined in the bermed storage area just east of the haul road adjacent to the sand pad (see Figure 3-1) using a front end loader.

Sand from non-TSCA dredge areas will preferably be used beneficially for off-site construction projects, provided the sand meets all WDNR-approved beneficial reuse criteria. These criteria and a summary of the results for this sand from prior years will be presented in the 2015 RA Summary Report. Based on the analytical results for sand generated in prior years, the Tetra Tech Team is confident that all, or nearly all, of the recovered non-TSCA sand will have PCB concentrations averaging less than 0.49 ppm (based on a running average) and will therefore not require landfill disposal. The LHE approved by WDNR for beneficial reuse of non-TSCA sand requires the PCB concentration to be $\leq$ 0.49 ppm PCB to be considered for off-site beneficial reuse unless sent to a licensed landfill approved to receive it by WDNR. Testing requirements for the sand separated from the non-TSCA Sediment are included in the O&M Plan for the SDDP (Tetra Tech et al. 2011b). Potential beneficial reuse opportunities for the sand are discussed in detail in the Adaptive Management and Value Engineering Plan (included as part of the 100 Percent Design Report, Tetra Tech et al. 2012a) and in Section 1.4 of this RAWP. Following receipt of acceptable offsite

laboratory results, sand approved for beneficial reuse will be moved by a front end loader to a temporary stockpile in the sand storage area.

4.12.4 Sand Separated from TSCA Sediment

Sand will be separated from sediment with an in situ TSCA designation in the same manner as that used for non-TSCA sediment. Sand generation will occur at an estimated rate of 21 truckloads per day for the approximately 16 days when TSCA sediment is dredged and processed. Chemical and physical testing will be performed on this sand, along with any other testing that may be required by the landfill and testing that is required for potential beneficial reuse of this material.

Given the historically low PCB concentrations in the separated sand, the USEPA TSCA program and the WDNR approved the beneficial reuse of this sand provided that the analytical results for the sand meet the same requirements that were approved for the sand separated from the non-TSCA sediment.

Tetra Tech will determine whether the sand separated from TSCA sediment during 2015 is eligible for beneficial reuse based on analytical results. If the sand does not meet the requirements for beneficial reuse and contains less than 50 ppm PCBs, it will be disposed of as non-TSCA material at a Wisconsin-approved landfill. It may also be suitable for beneficial reuse at a Wisconsin landfill as approved by WDNR.

4.13 Sand Stockpile Management

Sand separated from the sediment during desanding operations will be transported via conveyor belt(s) to drain in temporary stockpiles that sit on a paved, sloped and contained sand pad located on the east side of the building (see Figure 3-1). The sand will then be relocated via a front end loader into sample stockpiles on the north end of the sand pad. These stockpiles will be sampled and analyzed for PCB levels and other parameters included in the Conditional Grant of Low Hazard Exemption to allow for its use as beneficially reused material (BRM), and held on the sand pad until results are received that indicate the sand is suitable as BRM and can be moved to the sand stockpile area. Storm water and water that drains from the sand on the sand pad will be collected in a sump along the north end of the sand pad and pumped to the SDDP overflow tank, then to the WTP for treatment prior to discharge.

The project operations staff will use a water sprinkler system for dust control for the sand stockpile. To assist in dust control, a commercially available soil fixating polymer (e.g., Dirt Glue®) will also be applied to sand located on the sand pad or in the stockpile area, as conditions warrant, according to the manufacturer's recommendations. Treated water from the WTP will supply the sprinkler, where an in-line port will allow the fixating polymer to be added as needed. The same water conveyance system will feed a fire hose connection that can be used manually on stockpiles located on the sand pad. The polymer has been shown to be effective on sand piles that are not disturbed. If the sand piles are disturbed, it will be necessary to reapply the fixating polymer to the working face in order to maintain reliable dust control.

Stormwater runoff from this storage pile will be contained within the bermed area, where it will be sampled and tested for PCBs. If the results meet the discharge goals, and WDNR authorizes the discharge, the stormwater will be allowed to drain to the on-site stormwater retention pond (see Figure 3-1). Water from the retention pond eventually flows into the river. If the stormwater does not meet the discharge goals, it will be pumped to the water treatment system by the sand trap pump and will be discharged after treatment.

5. CAP AND SAND COVER PLACEMENT

5.1 Sand Cover

Sand to be used for remedy sand cover, residual sand cover, and as the chemical isolation layer for engineered caps will be placed generally in an upstream-to-downstream manner as upstream dredge areas are confirmed to be completed. Additional details of placing sand for chemical isolation layers in caps are discussed in Section 5.2.

Sand placement will proceed ahead of armor stone placement for areas where Type A, B, or C caps will be installed. The rate of progress will depend on the amount of residual sand cover that must be placed, so an estimate of this acreage will also be considered in this section. Sand cover placement will begin in OU 4 with placement of remedy sand cover in OU4-SCFIK-063 and will extend to approximately halfway between the Denmark Spur and the Mason Street Bridge.

Residual sand cover will be placed over dredge areas from OU4-D30B to approximately OU4-D35EFG/D39/D40A, based on the results of 2014 and 2015 confirmation sampling performed after upstream-to-downstream dredging. Residuals management in this area will be determined on a case-by-case basis, in collaboration with the A/OT. In 2014, residual sand cover was placed over approximately 67.5 percent of the entire dredge-only area extending from OU4-D26A through OU4-D32.

Remedy and residual sand cover are planned in the areas shown in Tables 5-1 and 5-2. These are the areas located in the reach of river that extends from where sand placement was completed during the 2014 season (approximately transect 4035) to approximately transect 4061, between the Fort Howard Turning Basin and the Mason Street Bridge. As in previous years, the list of sand cover areas in Table 5-1 includes more areas than may be completed during the 2015 season. This is done so that additional areas are designed and available in the event that progress exceeds expectations.

Table 5-1. Potential Remedy Sand Cover Areas

OU 4 Remedy Sand Cover Areas	Area (Acres)
SC48	0.71
SCFIK-056-2	2.11
SC49	0.71
SC72A	1.54
SC72B	0.29
SCNA-018-1	0.24
SCFIK-063	0.24
SC50A	1.32
SC50B	0.19
SC111	0.22
SC146A	0.10
SCNA-007-1	1.59
SCNA-007-2	0.42
SC51	4.60
SCFIK089	0.63
SC53	0.88
SCFIK097	0.03
Total Remedy Sand Cover Area	**15.82**

The extent of sand placement will depend on productivity and the actual acreage requiring residual sand cover in the dredge areas extending from OU4-D30B/D32 to OU4-D35EFG/D39/D40A. The estimated areas shown in Table 5-2 are based on a historical average of 60 percent of dredge-only areas requiring residual sand cover in OU 3 and OU 4.

Table 5-2. Potential Residual Sand Cover Areas

OU 4 Residual Sand Cover Areas	Area (Acres)[1,2]
D30B	25.3
D32	22.07
D30B North	5.34
D32 North	5.55
D148	1.00
D149	0.17
D34	1.58
D144	0.40
D145	1.40
D150	0.29
D35Q	2.15
D35S	0.39
D35U	1.80
D35A	7.46
D37	6.17
D37B	0.86
D78	1.96
D141A	0.65
D141B	0.14
D38/D58	8.12
DFIK-081	0.02
DFIK-083	0.01
D35CD	8.37
DFIK-090, -091, -093	0.14
Utility Corridor #021	1.67
D67	1.55
D82	1.72
D40B	0.28
D40A	2.85
D35EFG	5.23
D39	4.55
DCA-36	0.54
Total OU 4 Residual Sand Cover	**119.73**

Notes:
1. Residual sand cover area presented above is estimated. Actual area of residual sand cover area placed will be determined based on the results of post-dredge confirmation sampling.
2. Residual sand cover is assumed to be required for 60 percent of the total dredge-only area, based on results previously experienced for completed dredge-only areas.

5.2 Cap Placement

Cap placement will begin in 2015 in OU 4 with installation of Type A, B, and C caps in the areas designated on the Engineered Plans in Appendix A, and as verified based on surface concentrations of the sediment (CQAPP [Tetra Tech et al. 2014a]).

The Type A caps will consist of a minimum 3-inch thick sand chemical isolation layer overlain by a gravel armor layer. Placement of Type A caps will be performed in the areas identified in Table 5-3. These are the cap areas located in the reach of river that extends from where cap installation was completed during the 2014 season to approximately transect 4061, between the Fort Howard Turning Basin and the Mason Street Bridge. As in previous years, the list of cap areas in Table 5-3 includes more areas than may be completed during the 2015 season. This is done so that additional areas are designed and available in the event that progress exceeds expectations.

Table 5-3. Potential Cap A Areas

OU 4 Cap A Areas	Area (Acres)
CA28C	2.08
CA30A	1.61
CA30B	0.25
CA30C	3.99
CA33A	0.77
CA33C	0.24
CA34	5.93
CA36	0.90
CA96	0.18
Total Cap A	**15.95**

The Type B caps will consist of a minimum 6-inch thick sand chemical isolation layer overlain by a gravel armor layer. The Type C caps will consist of a sand chemical isolation layer overlain by a gravel filter layer, which will in turn be overlain by quarry spall armor stone. Placement of Type B and C caps will occur in the areas identified on Table 5-4. As with sand cover and placement of Type A caps, Table 5-4 includes all Type B and C cap areas between the point at which capping was finished in 2014, at approximately transect 4035, and extends to approximately transect 4061, with the exception of quarry spall to be placed for Type C caps. This table includes more areas than may be completed during the 2015 season. This is done so that additional areas are designed and available in the event that progress exceeds expectations.

Cap C areas that will receive quarry spall during the 2015 season are listed in Table 5-5. Quarry spall is planned for placement in all C cap areas located in the active part of the navigation channel for which the sand and gravel filter layer are installed in 2015. This includes the C cap in the Fort Howard Turning Basin (Cap CC11) and all other C caps installed as far north as transect 4061.

Table 5-4. Potential Cap B and C Areas

OU 4 Cap B Areas	Area (Acres)
CB28A	0.99
CB46	0.37
CB47	0.41
CB54	0.15
CBD148	0.25
CB52	0.53
CBD144	0.63
CB50	3.50
CB20	4.66
CB58	0.63
CB35	0.30
Total Cap B	**12.42**

OU 4 Cap C Areas[1]	Area (Acres)
CC2E	17.41
SHC13A/B[2]	1.51
CC21	0.69
CC17	0.76
CC10	0.58
CC11	11.90
CC2FG-1	0.84
CC2FG-2	2.20
CC2FG-3	1.34
CC2H-1	0.44
CC2H-3	0.49
CC18	0.28
Total Cap C	**39.95**

Notes: 1. The above table for Cap C includes only areas that will have sand and gravel filter stone installed in 2015. Caps CC14 and CC2E-1A had sand and gravel filter stone installed in 2014, but require quarry spall placement in 2015 to be completed.
2. SHC13A/B may be dredged instead of capped. In this event, placement of buttressing sand and/or stone may be required.

Table 5-5. Potential Cap C Quarry Spall Areas

OU 4 Cap C Areas for Quarry Spall	Area (Acres)
CC14	0.62
CC2E[1]	23.33
CC10	0.58
CC17	0.76
SHC13A/B[2]	1.51
CC11	11.90
CC2FG-1	0.84
CC2FG-2	2.20
CC2FG-3	1.34
CC2H-1	0.44
CC2H-3	0.49
CC18	0.28
CC21	0.69
Total Cap C Quarry Spall	44.98

Notes: 1. Cap CC2E-1A may not have quarry spall placed, but is currently included in the acreage shown. Also, approximately 9.93 acres of quarry spall placement may remain after 2015 for CC2E, which will be placed during the 2016 season.

2. SHC13A/B may be dredged rather than capped. In this event, this area may require placement of stone for buttressing, so these areas are still included in the quantity.

5.3 Sand Cover and Cap Placement Methods

Sand used for sand cover and chemical isolation layer and gravel used for cap armor stone and/or gravel filter layer for Type C caps will be placed using J.F. Brennan's material spreader barge, which will distribute sand or gravel pumped via pipeline from the staging area located at the LFR Processing Facility site or a leased property located approximately 2 miles south of the site, at the corner of Broadway Street and Hansen Road. This site is also known as the Schneider Property. Two spreaders will be used in 2015. Sand cover and caps will be installed in accordance with the O&M Plan for Dredging, Sand Covering and Capping Activities (J.F. Brennan 2011) and as shown on the Engineered Plan Drawings in Appendix A. The minimum required thickness for the sand and gravel will depend on the type of cap to be installed and will be verified through the post-placement verification testing described in the CQAPP (Tetra Tech et al. 2014a).

The first spreader will begin operations at the beginning of May, working in areas confirmed to require residual sand cover during 2014, but not completed during that season. The spreader will begin operations running 12 to 16 hours per day, which will subsequently be increased to 24 hours a day, 5 days a week. The spreader schedule will then parallel the dredging schedule. The assumed spreader season length for 2015 is from approximately May 1 to November 13—a total of approximately 28 production weeks. The second spreader will begin operations in mid-May. However, this spreader will only operate 12 hours a day, 5 days a week. This spreader is expected to operate through November 13- a total of approximately 26 weeks.

Remedy sand cover and cap placement will begin in 2015 in OU4-SC48 and, based on production rate assumptions, will continue through the southernmost dredge-only areas and sand cover/cap areas and proceed northward. The targeted remedy sand cover areas for the 2015 season will include all sand cover and cap areas located south of approximately transect 4061 in OU 4, as shown on the Engineered Plans in Appendix A. In addition to the remedy sand cover and cap chemical isolation sand layer placement, residual sand cover will be placed over OU 4 dredge areas that were completed in 2014, as required, or will be completed in 2015. If the schedule allows and the spreading operations will not impede the dredging operations, the spreader will continue to work northward following the areas that the Response Agencies approve as complete for dredging. Coordination between the dredging and spreading activities will occur daily to provide that the spreading operations do not overtake the dredging operations.

Sand cover placement in areas that are inaccessible to the standard spreader barge configuration due to low water depths will be assessed on a case-by-case basis to determine the most appropriate method of sand placement. Additional installation methods may include, but are not be limited to, the "open-pipe" method (as demonstrated in 2013 in the southern shoreline area of OU4-D23, and again in 2014 in OU4-SCFIK-046/047 and SCNA-001), placement by an amphibious slurry plant and excavator, rain-bowing (i.e., pumping an arching sand slurry via a pressurized pipeline), or other methods deemed appropriate for the conditions present. Different methods may be needed within the same season due to the location and conditions present for specific areas. In most cases, the standard spreader barge configuration will cover all accessible areas first. The method used to complete the remaining inaccessible areas will be determined upon further analysis of the conditions present, as well as the presence of additional areas that may require similar methods in the general vicinity. In addition, the sequence of the areas to be remediated may be adjusted throughout the season to take advantage of water levels that allow the standard configuration of the spreader to access as many of the areas as possible.

Sand placed as the chemical isolation layer and gravel used as armor stone for caps (Type A and B) will begin in cap area OU4-CA28C and, based on production rate assumptions, will also continue to the north and include cap areas south of approximately transect 4061. If time allows, this work may proceed to the north beyond transect 4061. Sand placed as the chemical isolation layer and gravel used as filter stone for cap C will begin in cap area OU4-CC2E and, based on production rate assumptions, will also continue to the north and include cap areas south of approximately transect 4061. Quarry spall will be placed over the sand and gravel filter layer for the Type C caps installed in 2014, which includes cap OU4-CC14 and a portion of OU4-CC2E; as well as caps OU4-CC10, OU4-CC17 and OU4-CC11 to be installed in 2015. Based on current production rates, it is anticipated that the cap layers placed in the 2015 season may complete the capping in this part of OU 4 (i.e., south of transect 4049). The design drawings show the limits for these remedy sand cover and engineered cap areas.

During prior seasons of armor stone placement, floating fragments of the HDPE pipeline have been observed after placement of the stone. This is due to chipping of the pipeline while the stone is being pumped to the spreader barge. To maximize the efficiency of placing armor stone and to optimize the useful life of the pipeline, the transport pipeline will be routinely rotated in known high-wear areas. When the transport pipeline has been completely rotated it will be replaced with newer pipeline segments. To facilitate efficient replacement of work section of pipeline, the newer segments will be fused prior to the startup of operations for the season and staged along the river.

Pipeline fragments generated during the process of pumping armor stone will be minimized and contained, as practicable, through the following methods:

1. A woven mesh sock will be placed around the carriage water discharge pipe to contain pipeline fragments. The sock will be removed and cleaned at regular intervals, and replaced as needed.
2. Floating fragments that are not captured by the mesh sock will be removed by the spreader crew with tightly woven mesh long-handled nets. When these fragments are noticed outside of the moon pool, the crew will deploy a boat to collect these fragments.
3. A completely new pipeline will be used in 2015, and will include more gradual transition pieces in areas where the most pipeline wear has been observed previously.
4. A spray bar may be installed at the shaker screen to further wash fragments from the armor stone, prior to placement of the stone in the river.

A barge-mounted excavator will place quarry spall over an area of approximately 45.8 acres during the 2015 season, although spall placement in additional areas may be added if progress allows. Material barges will supply the spall to the placement barge. The excavator will be equipped with a global positioning system (GPS) system and computer with Hypack software, similar to what is used during dredging and spreading operations. Placement lanes for each area will be shown on the operator's computer screen, which will be located in the cab of the excavator. This is similar to the setup on the spreader system and will help to provide that adequate spall is placed over the area.

The quarry spall will be loaded onto the material barges at the LFR Processing Facility. Once loaded, a survey or barge displacement measurements will be performed of the spall placed on the barge to determine the volume of spall to be delivered to the placement barge. Staff will enter the following information into the computer to calculate the lane length to be covered (i.e., the distance the barge should travel while placing the determined volume of quarry spall within the lane) and inform the operator:

- Volume of spall
- Required placement
- Placement cell size within the grid

This information will be used for QC tracking, will be available to supplement QA measurements, and can be used in combination with the post placement surveys to provide an accurate and final QA assessment of having covered the required area.

Approximately 130 trucks of sand and 80 trucks of armor stone – a total of 210 truckloads each day - would be required when the spreader is operating, if these materials were delivered just prior to usage. To minimize truck traffic, the sand and armor stone will be delivered in advance and stockpiled to the extent possible. The areas planned for sand and armor stone stockpiles, as well as the truck traffic flow pattern through the site, are presented on Figure 5-1.

The sand and armor stone will meet the grain size requirements specified in the Project Plan (Appendix C, Attachment C-0 of the 100 Percent Design Report Volume 2), on a "rolling-average" basis. The rolling

average is the average of the most current grain size results and the results from the three previous tests, for aggregates obtained from the same quarry. The guidelines for aggregate acceptance are described in the A/OT approved Technical Memorandum – Sand Gradation Acceptance Criteria Guidelines Using a Four Test Rolling Average for 2014 and beyond, dated April 24, 2014. The average placement rate is expected to be approximately 25 acres/month for the spreader operating 24 hours/day. The second spreader is expected to complete approximately 12 acres/month operating 12 hours/day. These two spreaders should be sufficient to complete the sand and gravel placement planned for 2015.

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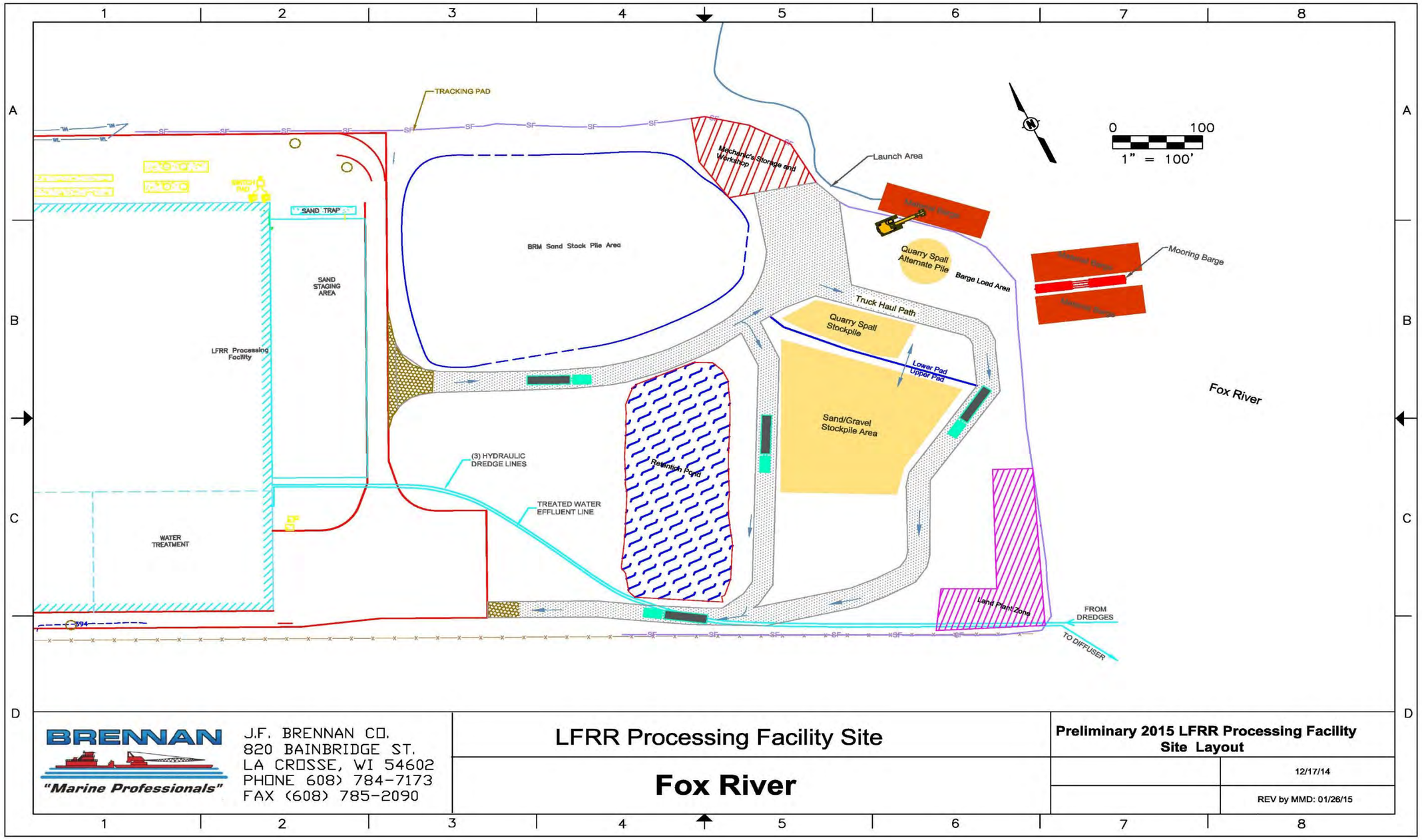
Figure 5-1. Preliminary 2015 LFRR Processing Facility - Site Layout



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6. MONITORING AND VERIFICATION ACTIVITIES DURING RA

Several activities will take place to verify that RA is being achieved as planned and that environmental controls are adequate. These activities include BMPs during dredging, bathymetric surveying, sampling and analysis of filter cake and sand produced during RA, and QA/QC activities that are specified in the CQAPP (Tetra Tech et al. 2014a) and in the QAPP (Tetra Tech et al. 2013b). These activities are described below.

6.1 Best Management Practices

J.F. Brennan will use several BMPs to minimize turbidity and other dredging-related impacts. It has been J.F. Brennan's experience with OU 1 (2004 to 2008), and dredging performed in the 2009 through 2014 seasons in OU 2, OU 3, and OU 4 of the Lower Fox River, that employing the BMPs described below has been effective in achieving turbidity control requirements without the need for engineered systems (e.g., silt curtains). The elimination of silt curtains during dredging operations also allows for greater use of the Lower Fox River by recreational and commercial vessels. However, silt curtains will be available as a contingent measure to control turbidity while dredging in localized areas, if necessary. The following BMPs will be employed during dredging operations:

- Debris will be removed prior to dredging (where debris is identifiable and can be removed in a manner that does not excessively suspend material) in accordance with the Debris Removal Work Plans (J.F. Brennan 2013).
- Biodegradable oil will be used to operate dredge hydraulics, as opposed to hydraulic oil.
- During startup, the dredge pump will be started prior to starting the cutterhead on the dredge.
- The cutterhead will be run in reverse in known areas of clay in an effort to minimize agitation energy, thereby limiting turbidity.
- The cutterhead speed will be maintained at the minimum level necessary to agitate the sediment in order to minimize the resuspension of sediment in previously dredged areas.
- Dredge movements (e.g., ladder swings) will be maintained at the minimum speed necessary to achieve target production and minimize turbidity.
- Dredging operations will be sequenced in an upstream to downstream order, to the extent practicable, with the exception of planned concurrent production dredging with the 12-inch dredge to maximize efficiency and reduce overall project schedule, or as otherwise approved by the Response Agencies.
- Dredge cuts will be overlapped to avoid leaving ridges or windrows of sediment between adjacent cuts.
- Where possible, large vessel tracking over completed dredge areas will be minimized.
- DREDGEPACK® software will be used to identify required dredge depths.

- During a period of temporary dredge shutdown, the dredge pump will be stopped after the cutterhead is turned off.
- Dredged areas will be surveyed daily (as the dredge pipeline location permits) to determine the effectiveness and demonstrate completion of the dredging operations.
- Hospital-grade mufflers will be used to limit engine noise.
- Dredge line blow back during non-operating periods will be prevented through the installation of a pneumatically-operated knife gate valve inserted behind the dredge. Manual verification of the knife valve position (i.e., open or closed) will be performed regularly.
- The dredge pipeline will be inspected daily for leaks and other problems, in accordance with the Technical Memorandum – Pipeline Installation and Maintenance Procedures. Observations will be logged on daily reports.
- In order to minimize resuspension of sediment during dredging, hydraulic thruster systems will not be utilized in areas where hydraulic thrusters cause visual resuspension of sediment during dredging. When thrusters are utilized, BMPs such as deflector plates or angles of the thrusters will be implemented to limit suspension of adjacent sediment.
- Clear direction regarding chain-of-command during emergencies will be provided to all employees.

6.2 Survey Methods and Equipment

Survey methods for multi-beam and single-beam acoustical systems will continue to follow the guidance set forth by the United States Army Corps of Engineers (USACE) Engineering Manual (EM) 1110-2-1003, Engineering and Design – Hydrographic Surveying (USACE 2004). These are the same guidelines used for hydrographic surveys performed during prior dredge seasons. Specifications for hydrographic surveys are provided in the Project Plan (Appendix C, Attachment C-0; Tetra Tech et al. 2012a). The equipment used for project surveying includes state-of-the-art hydrographic survey tools currently in use on the inland waterways.

6.2.1 Dredge and Survey Software

All equipment used for dredging and survey purposes on the Lower Fox River will employ HYPACK® software. HYPACK® is a hydrographic surveying, engineering, and equipment positioning software, which will be used in three modules:

- **HYPACK®** – HYPACK® is the original software form and is used to position survey vessels, record soundings, design dredge excavation cuts, and process single-beam survey and dredge data. HYPACK® software is the primary tool used for data analysis and recording.
- **HYSWEEP®** – HYSWEEP® is HYPACK®'s module for the recording and processing of multibeam survey data and will be used by the Tetra Tech Team throughout OU 2 through 5 RA.
- **DREDGEPACK®** – DREDGEPACK® is a HYPACK® module employed only on the dredge computers and equipment and is a module for dredge guidance and dredge data recording. In

addition, DREDGEPACK® would be used for mechanical dredging equipment should conditions be encountered that would necessitate use of such equipment.

Each dredge will be positioned through the use of Real Time Kinematic (RTK) GPS and a series of inclinometers and swing sensors. In a real-time environment, the position of the cutterhead will be tracked and recorded in relation to the dredge. DREDGEPACK® software employed on the dredge computer will use the input from the GPS and sensors to show the dredge operator the position of the cutterhead relative to the design removal line.

Additional details of the survey and position control equipment have been provided in the Project Plan in Appendix C of the 100 Percent Design Report Volume 2 (Tetra Tech et al. 2012a).

6.2.2 Dredging Data Management

Processing of data will commence after the single-beam or multi-beam survey vessel returns to its docking location. Data processing will include an analysis of all raw data and a compilation of edited recordings, which will exclude erroneously recorded points. The edited data will be assembled so it forms a surface that can be interpreted as a depth chart. Project engineers will then examine the processed data depth charts and calculate dredge productivity and accuracy. If project engineers find areas remaining above the dredge plan elevations, data can be inserted in the dredge computer to guide the dredge to specific locations requiring further excavation.

Each day, a second set of data will be recorded from the on-board dredge computers. The second set of data, recorded on a specified time interval, will detail the position of the dredge cutterhead. At the conclusion of a 24-hour period, dredge computer recordings will be downloaded and returned to the project office for analysis by project engineers. Furthermore, engineers will compare the data to project survey data and adjust removal strategies accordingly. On a daily basis, depth charts and dredge square foot coverage will be available for viewing in the project-specific office or submitted with daily reports.

Survey data used for determining attainment of target elevation in at least 90 percent completion of a DMU will be based on a single-beam survey. The data will be processed and interpreted in accordance with the Technical Memorandum – SOP for Final Dredge Surface Comparisons, dated July 27, 2009. Furthermore, after the data have been processed, all raw and edited x,y,z data will be cataloged by date and stored at the LFR Processing Facility and at the site of the Work Parties' Representative for future analysis. The raw and processed data used for development of the depth charts will be included in the reports submitted to the Work Parties. After the Work Parties have accepted each DMU dredge completion map, the maps will be submitted to the A/OT for review and acceptance. These DMU dredge completion maps will be included in the 2015 Annual Summary Report.

6.3 Third Party Auditing Activities

A representative of the Work Parties (Foth, at least with respect to the GP/NCR Work) will be on-site daily to monitor construction activities and will assess, on behalf of the Work Parties, the following field and data management activities during dredging and dewatering:

- Design refinement sampling, performed in limited areas in which previous data collection did not fully characterize the areas; this sampling is performed to verify that the design meets the requirements of the ROD Amendment
- Monitoring of pre- and post-dredge QA surveys
- Evaluation of surveys and post-dredge PCB residual concentration results for compliance with the approved plans and review of surface weighted average concentration (SWAC) calculations that may be provided by Tetra Tech
- Debris removal
- Post-dredge confirmation sampling
- High subgrade sampling
- Sand-cover and cap thickness monitoring
- Surface water turbidity monitoring
- WTP effluent sampling
- Sand sampling, analysis, and handling
- Filter cake sampling, analysis, and handling
- High volume air sampling for TSCA, as applicable

The Work Parties' Representative will provide written documentation to the Work Parties regarding the ongoing status and results of these activities. The Third Party Quality Assurance Provisions Plan (Foth 2014) provides detail on the roles and responsibilities for implementing the Third Party QA program.

6.4 Construction Quality Control/Quality Assurance

Construction QA/QC procedures are presented in the CQAPP (Tetra Tech et al. 2014a). This updated CQAPP includes the provisions associated with dredge, engineered capping, and sand covering in a single combined CQAPP.

6.4.1 Data Management

Management of data generated during remedial activities will be in accordance with the CQAPP.

6.5 Operation, Maintenance, and Monitoring

Four separate O&M Plans were prepared and implemented in 2009: the Site-Wide O&M Plan; the O&M Plan for Dredging, Sand Covering and Capping Activities; the SDDP O&M; and the WTP O&M Plan. These Plans were submitted to the Response Agencies and approved in 2009, and have been updated as necessary since then based on experience gained and changes implemented during past operating seasons. The updated O&M Plans were submitted to the Response Agencies for review in April 2011. The WTP O&M Plan was updated again in 2013, and approved by the Response Agencies in August 2013 and distributed as Revision 3, dated September 2013.

The Site-Wide O&M Plan addresses maintenance and monitoring requirements for infrastructure and cap and cover aggregate staging areas. This Plan also includes BMPs for managing stormwater pollution prevention and requirements for the management of wastes generated during operations.

The SDDP and WTP O&M Plans include detailed information regarding:

- Commissioning of equipment
- Equipment manufacturer information
- System startup testing
- Operation and troubleshooting
- System monitoring during operation
- Routine preventative maintenance
- Recommended spare parts lists
- System optimization
- Winterization

Sampling and analyses of filter cake and sand produced from sediment desanding and dewatering will be performed in accordance with the QAPP.

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7. PREPARATORY WORK FOR 2016 REMEDIAL ACTION

During the 2015 dredge season, additional activities will be performed as needed to prepare for the 2016 dredge season similar to those activities performed during 2014 in anticipation of the 2015 season. These activities will include, but may not be limited to, the review of data for utility/structure setback areas and for commercial riparian property owner areas subject to RA in 2016 and beyond, finalization of the design for these areas based on the refined 0.5 LOS surface, and discussions with the utility and commercial riparian property owners.

This work is described in the subsections below.

7.1 Design Refinement for the Remaining Stretch of River

In 2014, the Design Team refined the design for the remaining stretch of river. This design refinement is included in this 2015 RAWP; however, additional revisions may be needed in 2015 based on feedback from commercial riparian property owners.

7.2 Review of Data for Utility/Structure Setback Areas

Tetra Tech will continue discussions with utility owners and with those responsible for structures that cross the Fox River regarding the RA planned in utility/structure setback areas that are located north of transect 4061. Discussions will also continue with commercial and municipal riparian landowners regarding RA planned near their shoreline. This information will be used to revise the design, if warranted, from transect 4061 to the mouth of the river in Green Bay—areas to be remediated in 2016 and beyond.

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8. REPORTING AND DOCUMENTATION

8.1 Analytical Data from Pace

Pace will send its data simultaneously to the Design Team, the Work Parties, and the A/OT. Tetra Tech will provide other data from sampling activities and surveys to the Response Agencies within 5 business days of receipt. This information will be posted on the SharePoint Site managed by Tetra Tech.

8.2 Phase 2B Health and Safety Plan

The site-specific Health and Safety Plan (SHSP) submitted to the Response Agencies and accepted in June 2009 was updated early in 2013. It was reissued for use in February 2013, and is being updated for the 2015 season.

8.3 Community Outreach Support

If the USEPA implements any community relations program for this project, and requests the Work Parties' assistance, the Work Parties will participate in, for example, the preparation of appropriate information and public meetings to explain activities concerning the remediation.

The public relations firm of Leonard & Finco Public Relations, Inc. was retained by the LLC to assist with public awareness and involvement during previous work performed from 2009 through 2014. Leonard & Finco is expected to continue to assist the Work Parties and the Tetra Tech Team with community outreach during the Phase 2B work in 2015. These efforts will include the same activities performed during previous RA seasons.

8.4 Weekly Quality Control Reports and 4-Week Planning Schedule

During the RA season, weekly QC meetings will be held with the A/OT, the Work Parties, Foth, J.F. Brennan, SPRI, and Tetra Tech. These meetings will be held to discuss weekly progress of the RA, required submittals, QC sampling results, production for the week and year-to-date, and the 4-week look-ahead schedule. The schedule will include the status of design plans for areas planned for dredging during the upcoming 4-week period. Additional topics of interest related to the project may also be discussed during the QC meeting, or during work group meetings.

8.5 Progress Reports

The Work Parties will submit monthly progress reports to the Response Agencies, which will include the information required by the Order. This information includes the following:

- A description of the actions that have been taken to comply with the Order during the past month and work planned for the coming month.
- All results of sampling and tests, including raw data and validated data, and all other investigation results, which will be simultaneously released to the Work Parties and Response Agencies. Analytical results obtained from the laboratories will be sent directly to the Response Agencies from the laboratory. These results will also be posted on the project data sites in the format prescribed by the Response Agencies, including summaries of the following:
  - Pre- and post-dredge QA surveys

  - In situ volume of sediment dredged
  - Evaluation of PCB analytical results for post-dredge samples
  - Post-dredge confirmation sampling
  - High subgrade sampling
  - Turbidity monitoring
  - WTP effluent sampling
  - Sand sampling and analysis
  - Filter cake sampling and analysis
  - Volume/tonnage of sand separated and stockpiled or beneficially reused
  - Tonnage of TSCA and non-TSCA sediments sent to the landfill
  - Air monitoring
- Target and actual completion dates of each element of the RA, including project completion, with schedules relating the work to the overall project schedule for RA completion and an explanation of any deviation or anticipated deviation from the schedule approved by the Response Agencies, and proposed method of mitigating the deviation.
- A description of all Phase 2B work planned for the next 90 days, with schedules relating the work to the overall schedule for the RA completion.
- A description of any problems encountered and any anticipated problems during the reporting period, actual or anticipated delays, and solutions developed and implemented to address any actual or anticipated problems or delays.

The monthly progress reports will be submitted, as both electronic and hard copy files, to the Response Agencies by the tenth day of every month or subsequent business day if the tenth falls on the weekend or holiday.

8.6 Annual RA Summary Report

The Work Parties will submit an Annual RA Summary Report to the Response Agencies summarizing the 2014 work. The Annual RA Summary Report will include the following information:

- A description of the actions that have been taken to comply with the Order during 2014.
- Target and actual completion dates for each major element of the RA, including project completion, with schedules relating the work to the overall project schedule for RA completion and an explanation of any deviation or anticipated deviation from the schedule approved by the Response Agencies, and proposed method of mitigating such deviation.
- A description of all problems encountered, delays experienced, and solutions developed and implemented to address these problems or delays.
- Changes in key personnel that occurred during the year.

The Annual RA Summary Report will be submitted, as both electronic and hard copy files, to the Response Agencies by the date requested by the Response Agencies.

The Work Parties will submit an Annual RA Summary Report to the Response Agencies summarizing the 2015 work in 2016.

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9. 2015 PHASE 2B REMEDIAL ACTION PROJECT SCHEDULE

The construction activities and anticipated sequence of dredging operations planned for 2015 are described in detail in Section 4, and are shown on a revised Phase 2B RA Schedule, Figure 9-1. Dredging is scheduled to begin on approximately March 30 and will continue until approximately November 13, subject to weather and river conditions and unforeseen events. There will be no dredging and sediment dewatering on Memorial Day (May 25), during the week of the Independence Day holiday (June 27 – July 3), or on Labor Day (September 7). There is no dredging planned while river water is pumped through the SDDP following dredging of TSCA sediment, which is scheduled to occur early in the dredge season in 2015, directly following dredging of the non-TSCA overburden. This will result in approximately one day of dredging down time while the system is flushed and filter cake storage Building B is cleaned TSCA waste after handling and loading filter cake generated from in situ designated TSCA sediment.

To complete dredging of proposed dredge areas in 2015, an average dredge production rate of approximately 150 in situ cy/GOH or more will be maintained for up to three dredges combined during most of the season. This rate is indicative of the work being primarily final pass and residual dredging. Table 9-1 summarizes the individual and total dredge production target rates for 2015.

Table 9-1. Estimated Average Production Rates during the 2015 Season

Dredge	Average Hourly Rate (in situ cy/GOH)[1,2,3]	Average Daily Rate (in situ cy/day) [1,3]	Average Weekly Rate (in situ cy/week) [1,3]
8-inch	30	720	3,600
10-inch	120	2,880	14,400
Total	**150**	**3,600**	**18,000**

Notes:

1. These rates represent target average rates for each dredge during the season. Rates will vary depending on the type of dredging being performed and other factors. See Section 4.1 for derivation of assumed average production rates for one or two 8-inch dredges and one or two 10-inch dredges.
2. The average hourly production rate of 150 cy/GOH is a rounded number.
3. The production rates are estimated as an average for the approximately 31.4 weeks of the 2015 season.

The rates in Table 9-1 were used to calculate dredging duration for each dredge area presented on the Project Schedule (Figure 9-1). However, additional days are factored into the schedule for each area to allow time, if needed, for post-dredge residuals management.

9.1 Schedule Assumptions

The planned March 30 start date assumes weather and river conditions (e.g., the presence and location of ice) will allow work to begin at the dredge areas and according to the sequence indicated in Figure 9-1. The anticipated number of days from the planned startup date of approximately March 30 for other activities is also shown on the project schedule, including system flushing following TSCA sediment dredging. Actual dates for these activities may also vary.

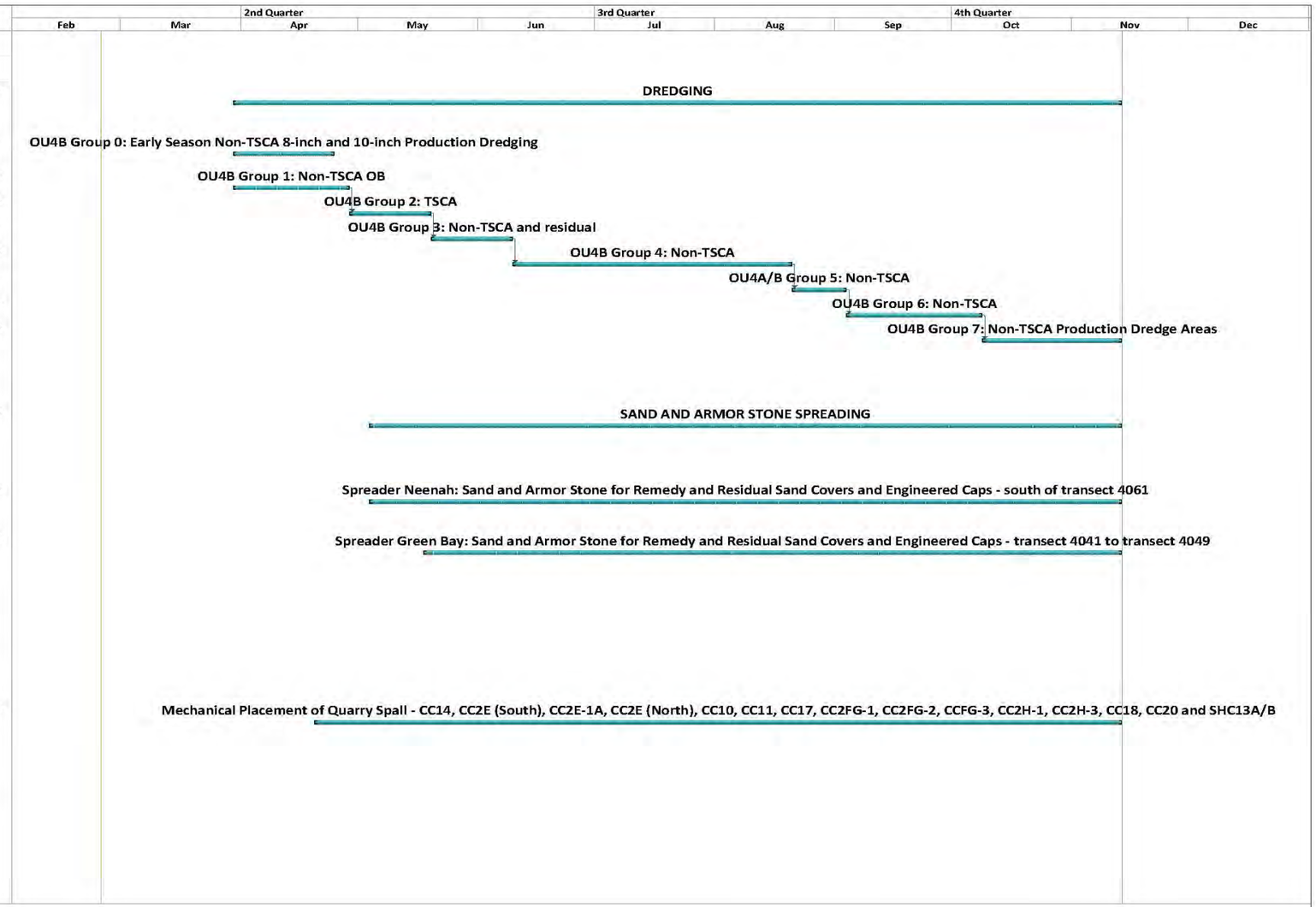
Pre-season bathymetric surveys are planned to begin in early to mid-March (depending on weather and river conditions) and will require approximately 3 to 4 weeks to complete for all areas to be dredged in 2015, except for several near shore areas that may require additional time due to ice conditions. The pre-season bathymetric survey work will be prioritized to begin as soon as practicable in early spring. Bathymetric surveys can overlap with dredging activities provided the completion of bathymetric surveys for individual areas and approval to commence dredging are obtained prior to the indicated dredge start date.

Additional assumptions used for development of the schedule shown on Figure 9-1 are as follows:

1. The actual residual dredge volume is not significantly greater than estimated in Table 3-1.
2. Dredging begins on March 30, as planned, and is not significantly impeded by weather or conditions in the river.
3. Water levels are sufficient to allow access to planned dredging and/or capping/covering areas.
4. Sediment concentrations in the upper surface interval(s) underlying caps are found to be consistent with the requirements of the ROD Amendment, so that capping can proceed as planned.
5. The Work Parties receive timely approval from the A/OT for capping of areas where dredging was completed, as applicable.
6. Final dredging in or near Georgia Pacific's boat slip (part of OU4-D35Q), if required, will not be delayed due to boat traffic or dredging by the USACE. This dredging will be coordinated with Georgia Pacific and the USACE (if applicable) to avoid delays in the schedule.
7. TSCA sediment will be dredged early in the 2015 season, followed by flushing of the pipelines and the sediment processing plant at the LFR Processing Facility.
8. Design x,y,z files will be prepared over the 2014/2015 winter season, and will only require adjustment at the start of the season for pre-season bathymetry. No additional review will be needed for this minor revision, which will only impact the dredge volume. This should allow for quick approval by the Response Agencies, since they will also be allowed to review and approve the detailed design for each area over the winter season.

Figure 9-1. Phase 2B Remedial Action Schedule for 2015

ID	Task Name	Duration	Start	Finish
1				
2				
3	**DREDGING**	158 days	Mon 3/30/15	Fri 11/13/15
4	OU4B Group 0: Early Season Non-TSCA 8-inch and 10-inch Production Dredging	20 days	Mon 3/30/15	Fri 4/24/15
5	OU4B Group 1: Non-TSCA OB	22 days	Mon 3/30/15	Tue 4/28/15
6	OU4B Group 2: TSCA	15 days	Wed 4/29/15	Tue 5/19/15
7	OU4B Group 3: Non-TSCA and residual	14 days	Wed 5/20/15	Tue 6/9/15
8	OU4B Group 4: Non-TSCA	47 days	Wed 6/10/15	Thu 8/20/15
9	OU4A/B Group 5: Non-TSCA	10 days	Fri 8/21/15	Thu 9/3/15
10	OU4B Group 6: Non-TSCA	24 days	Fri 9/4/15	Thu 10/8/15
11	OU4B Group 7: Non-TSCA Production Dredge Areas	26 days	Fri 10/9/15	Fri 11/13/15
12				
13				
14	**SAND AND ARMOR STONE SPREADING**	133 days	Mon 5/4/15	Fri 11/13/15
15	Spreader Neenah: Sand and Armor Stone for Remedy and Residual Sand Covers and Engineered Caps - south of transect 4061	133 days	Mon 5/4/15	Fri 11/13/15
16	Spreader Green Bay: Sand and Armor Stone for Remedy and Residual Sand Covers and Engineered Caps - transect 4041 to transect 4049	123 days	Mon 5/18/15	Fri 11/13/15
17				
18				
19	**QUARRY SPALL PLACEMENT**			
20	Mechanical Placement of Quarry Spall - CC14, CC2E (South), CC2E-1A, CC2E (North), CC10, CC11, CC17, CC2FG-1, CC2FG-2, CCFG-3, CC2H-1, CC2H-3, CC18, CC20 and SHC13A/B	143 days	Mon 4/20/15	Fri 11/13/15
21				
22				
23	**Refer to Tables 9-2 and 9-3 for remedy areas included in each Schedule Group**			



Project: Figure 9-1,
Date: Tue 2/24/15

Task | Split | Milestone | Summary | Project Summary | External Tasks | External Milestone | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | Deadline | Progress

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Table 9-2. Schedule Groupings for 2015 Dredge Areas

Schedule Group	Dredge Areas in Group	Approximate Volume (cy)
Group 0	Non-TSCA production dredging in D35Q, D35CD, D40A, D35EFG, D39, D35H, D41, D78, D38, D67, and D79	Volume from approved designs
Group 1	Non-TSCA OB in D35A, D35U, D35T, D38 and D39	77,227
Group 2	D35A Lower TSCA, D35U TSCA, D35T TSCA, D38 TSCA, D39 TSCA	54,266
Group 3	D35U, D35T, D35Q + residual, D35S + residual, D37 + residual, D78 residual	60,795
Group 4	D141A-B, D38, DFIK-081, DFIK-083, D58, D35CD, D67, D82	171,438
Group 5	D35EFG, D39, D40A, D40B, DFIK-090, DFIK-091, DFIK-093	37,529
Group 6	D142, D68A, D68B, D79, D35H, D41, D127	87,581
Group 7	D165A/B, D70, D71, D35K, D35J, D84, D35M, D35NOP	114,124

Table 9-3. Schedule Groupings for 2015 Sand Cover and Cap Areas

Schedule Group	Sand Cover and Cap Areas in Group	Approximate Area (acres)
Spreader Neenah, from completion in 2014 to approximately transect 4061	D30B and D32 residual sand; SC48; SCFIK-056-2; sand for CB28A, CB46, and CA28C; SCFIK-063; SC49; D30B North and D32 North residual sand; CC2E North sand; CB47 sand; SC72A; CB54 sand, D148 residual sand; SC72B; D34 and D149 residual sand; sand for CB52, and CA30B; D144 residual sand; SC50A, SC50B, CA30A; stone for CB28A, CB46, CA28C, CC2E filter layer; CB47, CB54, CB52, CB30B, and CB30A stone; D35Q, D35S, D35A, D78, D141A, D141B, D38, DFIK-081, DFIK-083 and D35CD residual sand; CC2FG-1, CC2FG-2, CC2FG-3, and CA36 sand; D67 and D82 residual sand; D39, D40A D40 B, and D35EFG residual sand; CB35, CC20, CC21, CB58;CA96; CC2H-1, CC2H-3, and CC18 sand; CC21, CC2FG-1, CC2FG-2, CC2FG-3 filter layer; CA36, CA96 stone; and CB35 stone; SCFIK-089; SCFIK-097, SC53; CC20 filter layer; CC2H-1, CC2H-3, and CC18 filter layer	185.11
Spreader Green Bay[1], from approximately transect 4041 to approximately transect 4061	D145, D35U, D37B, D58, DCA-36, DFIK-090 -091 -093, D142/D68A, utility 021 corridor residual sand; CBD148, CBD144, CB50 and CA30C sand; D150 residual sand; CA33A and CC17 sand; SCNA-007-2; CB20, CA33C, CC10, CA34, and CB58 sand; and CC11 sand; D37 residual sand; SCNA-018-1; SC111; SC146A; SCNA-007-1; SCH13A/B[1] sand; SCH13A/B[1] stone; CBD148, CB144, CB50, CA30C, and CA33A stone; CC17 filter layer; CB20, CA33C stone; CC10 filter layer; CA34, and CB58 stone; CC11 filter layer	92.03
Mechanical placement of spall[2]	CC14, CC2E South, CC2E-1A, CC2E North[2], CC10, CC11, CC17, CC2FG-1, CC2FG-2, CC2FG-3, CC2H-1, CC2H-3, CC-18, CC-21 and SHC13A/B[1]	44.98

Notes: 1. SHC13A and SHC13B areas may be dredged, but in this event the time allowed for the installation of these caps may alternatively be needed for placement of buttressing stone.

2. Cap CC2E-1A may not have quarry spall placed, but is currently included in the acreage shown. Also, approximately

9.93 acres of quarry spall placement may remain after 2015 for CC2E, which will be placed during the 2016 season.

10. REFERENCES

J.F. Brennan. 2013. Fox River Operating Units 2-5 Operation Work Plan; Debris Removal. October 2013.

J.F. Brennan. 2009c. Technical Memorandum – Pipeline Installation and Maintenance Procedures. November 2009.

J.F. Brennan. 2011c. Operations and Maintenance Plan for Dredging, Sand Covering and Capping Activities. March 2011.

Foth Infrastructure and Environment, LLC (Foth). 2014. Third Party Quality Assurance Provisions Plan for Operable Units 2 - 5. Prepared for Appleton Papers Inc., Georgia-Pacific Consumer Products, LP and NCR Corporation. 2014.

Shaw and Anchor. 2004. Work Plan for Remedial Design of Operable Units 2, 3, 4 and 5 Lower Fox River And Green Bay Site; Brown, Outagamie, and Winnebago Counties, Wisconsin. Prepared for Fort James Operating Company, Inc. and NCR Corporation by Shaw Environmental and Infrastructure, Inc. and Anchor Environmental, LLC. 2004

Tetra Tech EC, Inc., Anchor Environmental, L.L.C., J. F. Brennan Co, Inc., and Boskalis Dolman (Tetra Tech et al.). 2008a. Lower Fox River Operable Units 2 through 5 Phase 2A Work Plan Addendum Upland Archeology and Historic Architecture Final Work Plan. Prepared for Appleton Papers Inc., Georgia-Pacific Consumer Products, LP, NCR Corporation, and U.S. Paper Mills Corporation. May 30, 2008.

Tetra Tech et al. 2008b. Lower Fox River; Phase 2A Remedial Action Site Survey Report. Prepared for Appleton Papers Inc., Georgia-Pacific Consumer Products, LP, NCR Corporation, and U.S. Paper Mills Corporation. November 5, 2008.

Tetra Tech et al. 2009a. Lower Fox River Remedial Design; 100 Percent Design Report Volume 1. Prepared Appleton Papers Inc., Georgia-Pacific Consumer Products LP, and NCR Corporation. April 2009. Attachment A-12 updated July 2009.

Tetra Tech et al. 2009b. Lower Fox River; Phase 2A Remedial Action Site Survey Report Addendum. Prepared for Appleton Papers Inc., Georgia-Pacific Consumer Products, LP, NCR Corporation, and U.S. Paper Mills Corporation. March 2009.

Tetra Tech et al. 2009c. Lower Fox River Remedial Design; Phase 2B Work Plan for 2009 Remedial Actions. Prepared Appleton Papers Inc., Georgia-Pacific Consumer Products LP, and NCR Corporation. September 2009.

Tetra Tech et al. 2010a. Lower Fox River; Phase 2A Remedial Action Site Survey Report Addendum for 2009. Prepared for Appleton Papers Inc., Georgia-Pacific Consumer Products, LP, NCR Corporation, and U.S. Paper Mills Corporation. June 2010.

Tetra Tech et al. 2010b. 2009 Annual Summary Report, Remedial Action of Operable Units 2, 3, 4 and 5, Lower Fox River and Green Bay Site; Brown, Outagamie, and Winnebago Counties, Wisconsin. Prepared for Appleton Papers Inc., Georgia-Pacific Consumer Products, LP, and NCR Corporation. 2010.

Tetra Tech et al. 2010c. 2009 Annual Attachment to the Adaptive Management and Value Engineering Plan, Remedial Action of Operable Units 2, 3, 4 and 5, Lower Fox River and Green Bay Site; Brown, Outagamie, and Winnebago Counties, Wisconsin. Prepared for Appleton Papers Inc., Georgia-Pacific Consumer Products, LP, and NCR Corporation. February 2010.

Tetra Tech et al. 2011a. 2010 Annual Summary Report, Remedial Action of Operable Units 2, 3,4 and 5, Lower Fox River and Green Bay Site; Brown, Outagamie and Winnebago Counties, Wisconsin, Prepared Appleton Papers Inc., Georgia-Pacific Consumer Products LP, and NCR Corporation. April 2011.

Tetra Tech et al 2011b. Lower Fox River Site Operation & Maintenance Plan for the Sediment Desanding and Dewatering Plant. Prepared for Appleton Papers Inc., Georgia-Pacific Consumer Products, LP, and NCR Corporation. April 2011.

Tetra Tech EC, Inc., Anchor Environmental, L.L.C., J. F. Brennan Co., Boskalis Dolman, and AECOM 2011. 2011c. Site-Wide Operation and Maintenance Plan; Former Shell Property Staging and Material Processing Facility. Operable Units 2 – 5 Remedial Action; Lower Fox River and Green Bay Site; Green Bay, Wisconsin. Prepared for Appleton Papers Inc., Georgia-Pacific Consumer Products, LP, and NCR Corporation. April 2011.

Tetra Tech et al. 2011e. Lower Fox River; Phase 2A Remedial Action Site Survey Report Addendum for 2010. Prepared for Appleton Papers Inc., Georgia-Pacific Consumer Products, LP, NCR Corporation, and U.S. Paper Mills Corporation. July 2011.

Tetra Tech EC, Inc., Anchor QEA, L.L.C., J. F. Brennan Co, Inc., and Stuyvesant Projects Realization, Inc. (Tetra Tech et al.). 2012a. Lower Fox River Remedial Design; 100 Percent Design Report Volume 2. Prepared for Lower Fox River Remediation. October 2012.

Tetra Tech et al. 2012b. 2011 Annual Summary Report, Remedial Action of Operable Units 2, 3,4 and 5, Lower Fox River and Green Bay Site; Brown, Outagamie and Winnebago Counties, Wisconsin, Prepared for Appleton Papers Inc., Georgia-Pacific Consumer Products LP, and NCR Corporation. 2012.

Tetra Tech et al. 2013a. Lower Fox River; Phase 2B Remedial Action Site Survey Report Addendum for 2012. Prepared for Lower Fox River Remediation LLC. July 2013.

Tetra Tech et al. 2013b. 2012 Annual Summary Report, Remedial Action of Operable Units 2, 3,4 and 5, Lower Fox River and Green Bay Site; Brown, Outagamie and Winnebago Counties, Wisconsin, Prepared for Lower Fox River Remediation LLC. May 2013.

Tetra Tech EC, Inc. 2013c. Operation & Maintenance Plan for the Water Treatment Plant Material Processing and Staging Facility Lower Fox River and Green Bay Site. Prepared for Lower Fox River Remediation LLC. October 2013.

Tetra Tech et al. 2013d. Quality Assurance Project Plan For Remedial Action of Operable Units 2, 3, 4 and 5, Lower Fox River and Green Bay Site; Brown, Outagamie, and Winnebago Counties, Wisconsin. Revision 1. Prepared for Lower Fox River Remediation LLC. May 2013.

Tetra Tech et al. 2014a. Construction Quality Assurance Project Plan For Remedial Action of Operable Units 4 and 5 in 2014 and Beyond, Lower Fox River and Green Bay Site; Brown County, Wisconsin. Prepared for Lower Fox River Remediation LLC. April 2014.

Tetra Tech et al. 2014b. Draft 2013 Annual Summary Report, Remedial Action of Operable Units 2, 3,4 and 5, Lower Fox River and Green Bay Site; Brown, Outagamie and Winnebago Counties, Wisconsin, Prepared for Lower Fox River Remediation LLC. June 2014.

U.S. Environmental Protection Agency (USEPA). 2004. Administrative Order on Consent, In the Matter of Lower Fox River and Green Bay Site. Respondents for Operable Units 2, 3, 4, and 5: Fort James Operating Company, Inc. and NCR Corporation. March 2004.

USEPA. 2006. Consent Decree for Performance of Phase 1 of the Remedial Action in Operable Units 2 through 5 of the Lower Fox River and Green Bay Site. 2006.

USEPA. 2007. Administrative Order for Remedial Action and associated Statements of Work for Phase 2A and Phase 2B, respectively, In the Matter of Lower Fox River and Green Bay Superfund Site; Green Bay, WI; Operable Units 2 through 5. 2007.

USEPA. 2012. Memorandum: Minor Change to Selected Remedy – Lower Fox River and Green Bay Superfund Site, WI. Memorandum to File from Thomas R. Short. June 14, 2012.

USEPA and Wisconsin Department of Natural Resources (WDNR). 2002. Record of Decision, Record of Decision, Operable Unit 1 and Operable Unit 2. Lower Fox River and Green Bay, Wisconsin. December 2002.

USEPA and WDNR. 2003. Record of Decision, Operable Units 3, 4, and 5. Lower Fox River and Green Bay Wisconsin. June 2003.

USEPA and WDNR. 2007. Record of Decision Amendment: Operable Unit 2 (Deposit DD), Operable Unit 3, Operable Unit 4, and Operable Unit 5 (River Mouth). Lower Fox River and Green Bay Superfund Site. June 2007.

USEPA and WDNR. 2010. Explanation of Significant Differences; Operable Unit 2, Operable Unit 3, Operable Unit 4, and Operable Unit 5 (River Mouth); Lower Fox River and Green Bay Superfund Site. February 2010.

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APPENDIX A

ENGINEERED PLAN DRAWINGS

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APPENDIX B

TECHNICAL MEMORANDUM – NOTIFICATION TO RIPARIAN LANDOWNERS NEAR 2015 REMEDIAL ACTION AREAS

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APPENDIX C

UNDERWATER CULTURAL RESOURCES APPROACH

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APPENDIX D

TABLE SUMMARIZING DESIGN REVISIONS FROM THE 100 PERCENT DESIGN TO THE 2015 RAWP

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APPENDIX E

DIVISION OF WORK

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1-3. Agencies/Oversight Team comments with required modifications to the main body of the 2015 Work Plan

Agencies/Oversight Team Follow up Comments to Text and Appendix 'D' of Final Draft Phase 2B Work Plan for 2015 Remedial Action of Operable Units 2 through 5 dated March 26, 2015

1. A/OT Comment 2015-02-05: Correct the section numbers starting at section 5.

   LLC Response 2015-02-27: The section numbers have been corrected.

   A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

2. A/OT Comment 2014-12-10: Typical for the entire document, confirm/update all transect numbers and supply a map showing the transect numbers in order for the reader to understand where in the river the discussion is referencing.

   LLC Response 2015-01-30: The transect numbers in the document have been updated to reflect that dredging was completed up through transect 4041 in 2014, and that in 2015 dredging may be performed to approximately transect 4071.

   A/OT Follow up Comment 2015-02-05: The response is acceptable and has been adequately implemented.

   LLC Response 2015-02-27: Comment noted. These redline revisions have been accepted.

3. A/OT Comment 2014-12-10: The approved 2014 RAWP used the term "LLC" which has been replaced with "Work Parties" in this 2015 RAWP draft. The A/OT questions whether the term "Work Parties" is appropriate and is following up with the Agencies' legal team(s) regarding what term is most appropriate. However, typical for the entire document and until further notice, in place of the term "Work Parties" use the term "Respondents". The reasoning being that "Respondents" is consistent with the UAO and also recognizes that the work plans are a UAO submittal.

   LLC Response 2015-01-30: The LLC anticipates that the final, approved version of the document will either use the term "Respondents" or another, more specific term to describe the parties that will perform the work. The LLC's review of the appropriate term to use is continuing; as a result, for this draft, the LLC has continued to use the term "Work Parties" as a placeholder.

   A/OT Follow up Comment 2015-02-05: In collaboration with the Agencies and before the final draft of the "2015 RAWP" is submitted, resolve which term will be replacing "Work Parties".

   LLC Response 2015-02-27: The LLC expects to have resolution on this term by mid-March, and will inform the Agencies as to the term to be used in the final 2015 RAWP before it is distributed.

   LLC Supplemental Response 2015-03-26: The LLC has made revisions in the work plan to refer the reader to Appendix E for identification of the Work Parties and for the division of work between GP/NCR and Glatfelter. In addition, the LLC has changed a few references to "Work Parties" to "the LLC," where the relevant sentence describes work that relates to 2014 work or otherwise is appropriate for the LLC.

   A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

4. A/OT Comment 2014-12-10: Typical for the entire document, update quantities with actuals completed through 2014.

   LLC Response 2015-01-30: Quantities have been updated throughout the 2015 RAWP to reflect the actual dredge volume and cap and sand cover acreage completed in 2014, as well as the quantities completed for the project to date.

   A/OT Follow up Comment 2015-02-05: The response is acceptable and has been adequately implemented.

   LLC Response 2015-02-27: Comment noted. These redline revisions have been accepted.

5. A/OT Comment 2014-12-10: Section 1 **Introduction,** 6th paragraph: Include a brief discussion regarding the remedial action completed in 2008 under the Phase 1 Consent Decree and what was completed in 2013 under Phase 2.

   LLC Response 2015-01-30: The requested discussion has been added to Section 1.

   A/OT Follow up Comment 2015-02-05: The response is acceptable and has been adequately implemented.

   LLC Response 2015-02-27: Comment noted. These redline revisions have been accepted.

6. A/OT Comment 2014-12-10: Section 1.2 **Objectives for 2015 Remedial Action,** item #10: Modify as follows;

   "Maintain continued communications with riparian property owners near 2015 RA areas, and also engage the Riparians near the 2016 planned RA work, as well as other interested parties such as Brown County Port Authority and Municipalities."

   LLC Response 2015-01-30: Section 1.2 has been revised, with some modification. The LLC will communicate with the Brown County Port Authority and Municipalities regarding remedial action planned near their properties in 2015 and beyond, as with other riparian property owners. In addition, the LLC plans to continue to talk with any other interested parties, including the Port Authority and municipalities, about general progress of the remediation.

   A/OT Follow up Comment 2015-02-05: In addition to the acceptable modifications already made, add the following sentence "The LLC will communicate with the Brown County Port Authority and Municipalities regarding remedial action planned near their properties in 2015 and beyond, as with other riparian property owners. In addition, the LLC will continue to dialogue with any other interested parties, including the Port Authority and municipalities, about general progress of the remediation."

   LLC Response 2015-02-27: Section 1.2 has been revised as requested.

   A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

7. A/OT Comment 2014-12-10: Section 1.4.1 **AM/VE for Remedial Action,** under "Initiatives to be considered or continued in 2015…": Add two items:

   Design of dredging to a contoured neat line surface instead of a dredge prism approach in dredge-only areas. When applicable, and with Agencies' approval, prism dredging may be conducted.

   The use of geostatistical modeling to develop the 0.5 LOS surface based on uncorrected DOC core depths, to minimize the removal of sediment that is less than the 1.0 ppm PCB RAL, and to maximize the removal of sediment that exceeds the 1.0 ppm PCB RAL with the first dredge event.

   LLC Response 2015-01-30: Section 1.4.1 has been modified as requested; however, it should be noted that no further geostatistical modeling is planned using the FIK model. As discussed with the A/OT localized remodeling may be performed using Surfer®.

   A/OT Follow up Comment 2015-02-05: The response is acceptable and has been adequately implemented.

   LLC Response 2015-02-27: Comment noted. These redline revisions have been accepted.

8. A/OT Comment 2014-12-10: Section 1.4.1 **AM/VE for Remedial Action,** for Item #6: "Incorporation of the results obtained from design refinement cores in the OU4-D38 and OU4-D141A dredge areas to refine the design of the RA for 2015 final dredging."

   Explain why the remedial design refinement only lists these two areas when there are many more that could be listed, and state where the list of refinements is located.

   LLC Response 2015-01-30: At the time, OU4-D38 and OU4-D141A were the only areas where design refinement cores were planned during the 2015 season, and these cores were to be obtained after dredging TSCA. The LLC may also obtain cores in OU4-D35T after TSCA dredging to better define areas that may be capped or to define the extent of final dredging. The Design Team plans to refine the design in other areas, such as those areas where localized remodeling may be performed, but plans to have this work completed prior to the start of the 2015 season.

   A/OT Follow up Comment 2015-02-05: The response is acceptable.

   LLC Response 2015-02-27: Comment noted.

9. A/OT Comment 2014-12-10: Section 1.4.1 **AM/VE for Remedial Action,** for Item #7: "Localized re-modeling of DOC data using Surfer or a similar surface modeling program to refine the design dredge surface, as needed."

   Clarify in this paragraph that using Surfer or another geostatistical modeling program for site specific areas will be reviewed by the A/OT before implementing.

   LLC Response 2015-01-30: This section has been revised as requested.

A/OT Follow up Comment 2015-02-05: The response is acceptable and has been adequately implemented.

LLC Response 2015-02-27: Comment noted. This redline revision has been accepted.

10. A/OT Comment 2014-12-10: Section 1.4.2 **AM/VE Organizational Responsibilities:** Because URS is no longer on the Respondents' project team, list a replacement source for the type of tasks that were performed by URS and/or explain how these type of tasks will be accomplished in the future.

    LLC Response 2015-01-30: URS was previously included on the project team to perform the task of geostatistical modeling using the FIK model. That work was completed in 2013, and the Agencies' accepted the 0.5 LOS surface for the final reach of river on August 28, 2014. The LLC doesn't believe there is a need for further geostatistical modeling for URS to perform, given the option to use Surfer® or to design dredging using dredge prisms, but has added URS back to the Project Organizational Chart in the event they need to be consulted.

    A/OT Follow up Comment 2015-02-05: The response is acceptable and has been adequately implemented.

    LLC Response 2015-02-27: Comment noted. This redline revision has been accepted.

11. A/OT Comment 2014-12-10: Section 2.2 **Qualifications and Responsibilities of Key Personnel,** for the 6th & 7th paragraphs: Clarify that the current representatives in these two paragraphs could be replaced if additional or different Respondents are to implement the 2015 RAWP.

    LLC Response 2015-01-30: The LLC respectfully disagrees that the requested clarification is needed, so this revision has not been made.

    A/OT Follow up Comment 2015-02-05: The response is acceptable.

    LLC Response 2015-02-27: Comment noted.

12. A/OT Comment 2014-12-10: Section 3.2 **Low Hazard Waste Exemption,** 4th paragraph: Clarify if the 2015 sand will go to a "new off-site WisDOT construction project, located at the intersection of Highways 41 and Interstate 43", or if an additional or new site will be identified.

    LLC Response 2015-01-30: The requested clarification has been added. The Highway 41/Interstate 43 project is expected to continue taking beneficial reuse sand through approximately July 2015. A new project will be identified early in the season to receive the sand after the Highway 41/I-43 project no longer needs the sand.

    A/OT Follow up Comment 2015-02-05: The response is acceptable and has been adequately implemented.

    LLC Response 2015-02-27: Comment noted. This redline revision has been accepted.

13. A/OT Comment 2014-12-10: Section 3.4 **Communication with Riparian Landowners,** insert the following paragraph at the beginning of this section:

    Prior to submitting the final 2015 RAWP to the A/OT, discussions will be held with utility owners and/or commercial riparian land owners (e.g., owners of commercial terminals, boat slip, etc.) regarding the proposed remedial design in the riparian's reach of the river. All of the proposed remedial designs are subject to refinement based on riparian discussions and on information from design refinement cores that may be added in these river reaches, some of which are planned after initial dredging. These efforts are ongoing but will be completed before RA is performed in the riparian reach of the river.

    LLC Response 2015-01-30: The requested paragraph has been added to this section, with some modification.

    A/OT Follow up Comment 2015-02-05: The response is acceptable and has been adequately implemented.

    LLC Response 2015-02-27: Comment noted. This redline revision has been accepted.

14. A/OT Comment 2014-12-10: Section 4 **Sediment Dredging and Processing,** 1st paragraph: Change text as follows: "Remedial action planned for 2015 ~~likely~~ includes…"

    LLC Response 2015-01-30: The requested revision has been made.

    A/OT Follow up Comment 2015-02-05: The response is acceptable and has been adequately implemented.

    LLC Response 2015-02-27: Comment noted. This redline revision has been accepted.

15. A/OT Comment 2015-02-05: Section 4.1 **Dredging Equipment and Production Rates**: Update the RAWP with the actual planned dredges for 2015 including modifications to lengths of ladders for the various dredges.

    LLC Response 2015-02-27: The previous RAWP text revisions were accepted, but have been revised in redline to reflect the currently-planned dredges for 2015. Recently, J.F. Brennan revised their plans for 2015 to include the use of two 8-inch dredges and one 10-inch dredge at the start of the season, then converting to two 10-inch dredges and one 8-inch dredge in June 2015. The 2015 RAWP has been revised to reflect this change in plans.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

16. A/OT Comment 2014-12-10: Section 4.10 **Water Treatment Plant Operations,** 6th paragraph: Update the WTP O&M Plan. It needs to reflect current operation and lessons learned from this and previous seasons. In particular, address how the loss of sand filter media will be monitored and addressed in order to prevent a recurrence of what occurred at the end of the 2014 construction season.

    LLC Response 2015-01-30: The WTP O&M Plan will be updated to include current operation and lessons learned from the 2014 and previous seasons. This document is a separate, stand-alone plan, so may be submitted on a different schedule than the 2015 RAWP. However, a revised O&M Plan will be submitted to the Agencies at least 30 days prior to the planned start of the 2015 dredge season. A statement regarding this update to the O&M Plan has been added to Section 4.10 of the 2015 RAWP.

    A/OT Follow up Comment 2015-02-05: The response is acceptable.

    LLC Response 2015-02-27: Comment noted. This redline revision has been accepted.

17. A/OT Comment 2015-02-05: Include the following Remedy Sand Covers in Table 5-1:
    SCNA-018
    SCNA-007-1
    SC111
    SC146A
    SC51
    SCFIK089
    SC53
    SCFIK-097
    SCFIK-098

    LLC Response 2015-02-27: These sand cover areas have been added to Table 5-1, as requested, along with the acreages associated with these areas.

    LLC Supplemental Response 2015-03-26: Since the previous submittal of this response to comments, remedy sand cover area SCFIK-098 has been revised to an NA-confirm area, so it no longer appears on Table 5-1.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

18. A/OT Comment 2015-02-05: Include the following in TABLE 5-4:

    CC14
    CC2E-1A

    LLC Response 2015-02-27: Table 5-4 includes only cap areas requiring sand and/or gravel armor/filter stone placement, which is why cap CC14 is not included. Table 5-5 has been added to list areas where quarry spall will be placed in 2015. CC2E-1A is included in the cap CC2E acreage for 2015 on Table 5-5, and CC14 is also listed in this table.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

19. A/OT Comment 2015-02-05: Arrange a work group to review Figure 5-1 in order to discuss how this area is operated.

    In particular, address how the LAND PLANT ZONE, at the Water's Edge, is operated.

    LLC Response 2015-02-27: J. F. Brennan will schedule an over-the-shoulder work group meeting in March 2015, prior to the start of the season, to review how this area will be operated.

    A/OT Comment 2015-04-08: The response is acceptable but the over-the-shoulder work group meeting still needs to be held. Conduct the OTS and resubmit an updated Figure 5-1.

20. A/OT Comment 2015-02-05: Section 5.2 Cap Placement – Table 5-4 lists total 'C' Cap area at 37.40 acres, text for quarry spall placement on page 5-6 lists 33.53 acres to be covered. Review and revise as needed.

    LLC Response 2015-02-27: Table 5-4 has been updated to match the Appendix D table for cap C to be placed during the 2015 season.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

21. A/OT Comment 2014-12-10: Section 5.3 **Sand Cover and Cap Placement Methods,** in paragraph 11: "Approximately 130 trucks…"

    Add a reference to a new figure that shows on a project site map where capping materials will be stock piled and handled (e.g., equipment placement, truck and equipment patterns, etc.)

    LLC Response 2015-01-30: The requested map and explanatory text have been added.

    A/OT Follow up Comment 2015-02-05: The response is acceptable and has been adequately implemented.

    LLC Response 2015-02-27: This redline revision has been accepted.

22. A/OT Comment 2014-12-10: Section 6.1 **Best Management Practices,** second to last bullet: Change to read;

    - In order to minimize resuspension of sediment during dredging, hydraulic thruster systems will not be utilized in areas where hydraulic thrusters cause visual resuspension of sediment during dredging. When thrusters are utilized, BMPs such as deflector plates or angles of the thrusters will be implemented to limit suspension of adjacent sediment. Also, clarify if hydraulic thrusters will be installed or used on the eight (8) inch dredges.

    LLC Response 2015-01-30: The requested revision has been made to the text, with some modification. The last sentence, which appears to be a comment, has also been omitted. With regard to this comment, the 8-inch dredges do not have hydraulic thrusters, and installation of hydraulic thrusters is not planned for those dredges.

A/OT Follow up Comment 2015-02-05: The response is acceptable and has been adequately implemented.

LLC Response 2015-02-27: This redline revision has been accepted.

23. A/OT Comment 2015-02-05: Section 9, Figure 9-1 Schedule – Previous schedule figure included monthly time columns, this version only shows quarters. Please restore the monthly columns.

    LLC Response 2015-02-27: Figure 9-1 has been revised to include months along the time scale.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

24. A/OT Comment 2015-02-05: Section 9, Table 9-1 – Update the table to reflect the proposed dredges that will be utilized this year with the appropriate production rates.

    LLC Response 2015-02-27: During 2015 plans are to utilize one 10-inch dredge (either the retrofitted Mark Anthony or the Victor Buhr) and two 8-inch dredges (the Ashtabula and the Ottawa River) during the early part of the season, then switch over to two 10-inch dredges and one 8-inch dredge sometime in June for the remainder of the season. This plan is considered flexible based on what is most efficient at a particular time. The typical combined dredge rate is 150 cy/hr which has been used to estimate durations for the dredge groups indicated on the schedule.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

25. A/OT Comment 2015-02-05: Section 9, Figure 9-1 Schedule – Previous Schedule has a footnote on the bottom of the page referencing page 9-5 for area groupings. This is now missing. Please insert reference for the schedule groupings. (i.e.: page 9-6)

    LLC Response 2015-02-27: Figure 9-1 has been revised to add a footnote referencing Tables 9-2 and 9-3 for the area groupings.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

26. A/OT Comment 2015-02-05: **Quarry Spall Placement for Engineered Caps**

    "Spreader Green Bay, from CC14 to approximately transect 4049: CC14, CC2E, CC10, CC11, and CC17"

    Confirm the name of the spreader for Quarry Spall. Is it "Green Bay"?

    LLC Response 2015-02-27: Quarry spall will be mechanically placed, so the "Spreader Green Bay" will not be used for this activity. A placement machine working from a barge will be used for this purpose.

A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

27. A/OT Comment 2014-12-10: Section 9.1 **Schedule Assumptions,** Sand and Armor Stone Spreading … section; Spreader Green Bay, CC20:

    Include mechanical placement areas for quarry spall materials.

    LLC Response 2015-01-30: Section 9.1 has been revised to include the areas where quarry spall placement is planned in 2015.

    A/OT Follow up Comment 2015-02-05: The response is acceptable and has been implemented.

    LLC Response 2015-02-27: Quarry spall placement plans for the 2015 season have been updated on Figure 9-1.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

28. A/OT Comment 2015-02-05: Section 9, Figure 9-1 Schedule – Line 21, Quarry Spall Placement: The areas listed do not include all the areas listed in Table 5-4, delete the areas listed and list similarly to the description on page 9-6.

    LLC Response 2015-02-27: The areas listed for quarry spall placement planned in 2015 have been revised in Table 5-4. Figure 9-1 has also been revised to include all the areas listed in Table 5-4 and shown in the quarry spall grouping in Table 9-3 on page 9-6.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

29. A/OT Comment 2015-02-05: Section 9 Page 9-6: Make these groupings a table to allow referencing. Also, match up the tables from Section 5 for capping and spreading with the listing on page 9-6 for all caps.

    LLC Response 2015-02-27: Dredge and cap/cover groups have been organized into Tables 9-2 and 9-3 for more ready reference as requested. Information for sand cover and caps in Table 9-3 corresponds to those included in the capping and sand cover tables in Section 5.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

Appendix 'D'

Dredge Spreadsheet: (Fox River-100PD_vs_Draft 2015 RAWP-DREDGE VOLS-Rev015-01262015_AOT_Explanations.xlsx)

30. A/OT Comment 2015-02-05: Cell B64: DFIK-033 should read DFIK-003 "This dredged area is located near southern end of D24. Also, DFIK-003 is not listed in this spreadsheet and needs to be listed in the spreadsheet."

    LLC Response 2015-02-27: The Appendix D Dredge Spreadsheet has been revised to include both DFIK-003 and DFIK-033.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

31. A/OT Comment 2015-02-05: Cell K64: DFIK-033 should read DFIK-003

    LLC Response 2015-02-27: The Appendix D Dredge Spreadsheet has been revised to include both DFIK-003 and DFIK-033.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

32. A/OT Comment 2015-02-05: Row 83: Above the existing row 83, insert a new row stating new area for 2014 RAWP (DFIK-033) and then in this new row at column 'K' should read "Completed in 2014 (Ashwaubenon Creek)."

    LLC Response 2015-02-27: The Appendix D Dredge Spreadsheet has been revised to include DFIK-033 as an area completed in 2014.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

33. A/OT Comment 2015-02-05: Row 89: Above the existing row 89, insert a new row stating new area for 2014 RAWP (D27G) and then in this new row at column 'K' should read "Completed in 2014."

    LLC Response 2015-02-27: The Appendix D Dredge Spreadsheet has been revised to include D27~~B~~G as an area completed in 2014.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

34. A/OT Comment 2015-02-05: Add the following columns to TABLE: "Total Project Volume (Jan. 2015) versus 100 Percent Design Volume" (Reference Preliminary Submittal for Details)

    a. Surface Area Delta
    b. Dredge and Cap Prism Area
    c. Neatline Area
    d. Total Area

    LLC Response 2015-02-27: The Appendix D Dredge Spreadsheet has been revised to include the additional columns requested.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

Cap/Cover Spreadsheet: (Copy of Fox River-100PD_vs_Draft 2015 RAWP-CAP-ACREAGES-Rev007-01262015_AOT_Explanations (2).xlsx)

35. A/OT Comment 2015-02-05: Cells R121 and R122 were not completed in 2014.

    LLC Response 2015-02-27: The Appendix D Cap/Cover Spreadsheet has been revised to state that these areas will be completed in 2015.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

36. A/OT Comment 2015-02-05: Cells R255 and R256 were not completed in 2014.

    LLC Response 2015-02-27: The Appendix D Cap/Cover Spreadsheet has been revised to state that these areas will be completed in 2015.

    A/OT Comment 2015-04-08: The response is acceptable and has been adequately implemented.

37. New A/OT Comment 2015-04-08: Release formal submittal of Appendix 'D' that Clarifies CB46, CB47 and CB28A.

38. New A/OT Comment 2015-04-08: Clarify why the quantities changed in file:

    (*Copy of Fox River-100PD_vs_Draft 2015 RAWP-CAP-ACREAGES-Rev009-02262015_AOT_Explanations (2).xlsx*)

    Reference Cells: F309, F311, F314, F319, F321, F324, F330, F332, F333, F335, K311, K312, K314, K319, K321, K322, K324, Q352, Q354, Q359, Q361, Q364

39. New A/OT Comment 2015-04-08: Resubmit Appendix 'D' with corrections based on Appendix 'E'.

40. NEW A/OT Comment 2015-04-08: Table 3-1, does not include any dredge volumes for CA36 and the RA corridor for **Utility #20**. Include applicable dredge volumes in Table 3-1 for these areas.

41. NEW A/OT Comment 2015-04-08: Table 5-2, does not include potential sand cover area D142-D68A. These areas are listed in appendix E as potential sand cover areas. Change Table 5-2 to conform to Appendix 'E'.

42. NEW A/OT Comment 2015-04-08: Table 5-3, Area CA36 is still listed as a cap area. Remove CA36 from this table.

43. NEW A/OT Comment 2015-04-08: Table 5-4, the total volume for the C cap table should be 38.44 acres instead of 39.95 acres. The area was reduced for SHC-13A/B by 1.51 acres.

44. NEW A/OT Comment 2015-04-08: Update all Tables to match the attached Appendix 'E'. (File: *2015 RAWP Appendix E RLSO 2015-04-08A.docx*)

45. NEW A/OT Comment 2015-04-08: Modify footnote number 1 of Table 1-1 to read:

    "*Dredge volumes shown are total volume dredged, as reported in the Annual RA Summary Reports, which includes overcut volume and Phase 1 volumes removed as part of the Phase 2B work (i.e., excluding Phase 1 dredging performed in 2007) for OU2-5.*"

46. NEW A/OT Comment 2015-04-08: Throughout the entire document (including appendices), change references from one 12-inch dredge and two 8-inch dredges to two 10-inch dredges and one 8-inch dredge.

1-4. Appendix E of the 2015 Work Plan (as approved by EPA)

APPENDIX E – DIVISION OF WORK

The Work Plan generally describes the work to be conducted during the 2015 construction season. In many places, the text of the Work Plan states that work will be conducted by the "Work Parties." This appendix describes how the 2015 work will be divided among Georgia-Pacific Consumer Products LP ("Georgia-Pacific"), NCR Corporation ("NCR"), and P.H. Glatfelter Company ("Glatfelter").

Some of the 2015 work will be funded by Georgia-Pacific and NCR together. This work is known as the "GP/NCR Work." NCR will perform the GP/NCR Work and fund 50 percent of the GP/NCR Work. Georgia-Pacific will fund 50 percent of the GP/NCR Work.

Glatfelter will be the Work Party for the remainder of the 2015 work. This work is known as the "Glatfelter Work." Glatfelter will fund and perform the Glatfelter Work.

The GP/NCR Work

The "GP/NCR Work" includes performance of dredging, capping, and covering work in the following specific areas of Operable Unit 4:

TSCA Dredging

Area	2015 Work to Be Performed	Expected Volume/Area
D35A Lower TSCA	Complete TSCA dredging, to the design elevation	3,304
D35U TSCA	Complete TSCA dredging, to the design elevation	12,000
D35T	Complete TSCA dredging, to the design elevation	6,283
D38 TSCA, Dredge Management Units ("DMUs") 1-8	Complete TSCA dredging, to the design elevation	31,567
D39 TSCA	Complete TSCA dredging, to the design elevation	1,112

Non-TSCA Dredging

Area	2015 Work to Be Performed	Expected Volume/Area
Non-TSCA Overburden in D35A	Complete non-TSCA dredging to an elevation that is six-inches above the top of the TSCA interval	2,755
Non-TSCA Overburden in D35U	Complete non-TSCA dredging to an elevation that is six-inches above the top of the TSCA interval	3,000

Non-TSCA Overbuden in D35T	Complete non-TSCA dredging to an elevation that is six-inches above the top of the TSCA interval	7,859
Non-TSCA Overburden in D38	Complete non-TSCA dredging to an elevation that is six-inches above the top of the TSCA interval	63,008
Non-TSCA Overburden in D39	Complete non-TSCA dredging to an elevation that is six-inches above the top of the TSCA interval	605
D35U (Below TSCA Layer)	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	13,000
D35T (Below TSCA Layer)	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is not scheduled for 2015 and is not part of the GP/NCR Work.)	14,563
D35Q	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	5,330
D35S	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	1,200

D37/D37B/D37C	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	15,446
D78/D35B E/W	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed for D78 is part of the Glatfelter Work. Any other residual sand cover needed is not scheduled for 2015 and is not part of the GP/NCR Work.)	11,256
D141A-B	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	3,908
D38/D58/DFIK-081/083	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	116,078
D82	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	12,541
D35CD/D67	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	42,819

D35EF	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	8,240
D39	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	20,011
D40A	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	7,720
D40B	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	603
DFIK-090	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	60
DFIK-091	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	260

DFIK-093	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	635
D142-D68A	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.)	1,956
D79	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is not scheduled for 2015 and is not part of the GP/NCR Work.)	860
D35H	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is not scheduled for 2015 and is not part of the GP/NCR Work.)	38,580
D127	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is not scheduled for 2015 and is not part of the GP/NCR Work.)	1,427

D165A/B	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is not scheduled for 2015 and is not part of the GP/NCR Work.)	2,866
D71	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is not scheduled for 2015 and is not part of the GP/NCR Work.)	2,595
Former CA36	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.) (Although listed in the work plan drawings as a Cap A area, the Response Agencies have determined that CA36 will be remediated as a non-TSCA dredge area.)	14,650
Utility #20 Corridor	Complete dredging to the neat line or to such horizontal and vertical limits as are determined to be safe, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.) (Proposed caps in CA81A, CA81B, CB35, CC20, and CCFG-3 would be eliminated or reduced to the extent of dredging in this corridor.)	(Dredge volume has not yet been calculated.)

Cap A

Area	**2015 Work to Be Performed**	**Expected Volume/Area**
CA28C	Install a minimum three-inch sand layer, per the ROD Amendment. (Installation of the armor layer for this cap is part of the Glatfelter Work.)	2.08
CA30A	Install a minimum three-inch sand layer, per the ROD Amendment. (Installation of the armor layer for this cap is part of the Glatfelter Work.)	1.61
CA30B	Install a minimum three-inch sand layer, per the ROD Amendment. (Installation of the armor layer for this cap is part of the Glatfelter Work.)	0.25
CA30C	Install a minimum three-inch sand layer, per the ROD Amendment. (Installation of the armor layer for this cap is part of the Glatfelter Work.)	3.99
CA33A	Install a minimum three-inch sand layer, per the ROD Amendment. (Installation of the armor layer for this cap is part of the Glatfelter Work.)	0.77
CA33C	Install a minimum three-inch sand layer, per the ROD Amendment. (Installation of the armor layer for this cap is part of the Glatfelter Work.)	0.24

Cap B

Area	**2015 Work to Be Performed**	**Expected Volume/Area**
CB28A	Complete installation of engineered Cap B, with sand and armor layer thicknesses per the ROD Amendment	0.99
CB46	Complete installation of engineered Cap B, with sand and armor layer thicknesses per the ROD Amendment	0.37
CB47	Complete installation of engineered Cap B, with sand and armor layer thicknesses per the ROD Amendment	0.41
CB54	Complete installation of engineered Cap B, with sand and armor layer thicknesses per the ROD Amendment	0.15
CBD148	Complete installation of engineered Cap B, with sand and armor layer thicknesses per the ROD Amendment	0.25
CB52	Complete installation of engineered Cap B, with sand and armor layer thicknesses per the ROD Amendment	0.53
CBD144	Complete installation of engineered Cap B, with sand and armor layer thicknesses per the ROD Amendment	0.63
CB50	Complete installation of engineered Cap B, with sand and armor layer thicknesses per the ROD Amendment	3.50
CB20	Complete installation of engineered Cap B, with sand and armor layer thicknesses per the ROD Amendment	4.66

Cap C and Shoreline Cap
(Not Including Quarry Spall)

Area	**2015 Work to Be Performed**	**Expected Volume/Area**
CC2E	Complete installation of the sand and armor layers of engineered Cap C, with sand and armor layer thicknesses per the ROD Amendment. (Installation of the quarry spall layer is part of the Glatfelter Work.)	17.41
SHC13A/B	Complete installation of the sand and armor layers of engineered shoreline cap (or other cap or cover as may be approved), with sand and armor layer thicknesses per the design to be approved. (Installation of the quarry spall layer is part of the Glatfelter Work.)	1.51
CC17	Complete installation of the sand and armor layers of engineered Cap C, with sand and armor layer thicknesses per the ROD Amendment. (Installation of the quarry spall layer is part of the Glatfelter Work.)	0.76
CC10	Complete installation of the sand and armor layers of engineered Cap C, with sand and armor layer thicknesses per the ROD Amendment. (Installation of the quarry spall layer is part of the Glatfelter Work.)	0.58

In all of the above tables, the expected volume and area column shows the dredge volume or cap/cover area that is currently expected as of the date of this appendix. However, the GP/NCR Work is defined by completing the work described in the "2015 Work to Be Performed" column of the table, not by the volume or area currently expected. For example, the GP/NCR Work includes completion of dredging to the neat line and any residual dredging needed in dredge area D37, and the relevant table indicates that this is expected to involve 7,339 cubic yards. GP and NCR are in compliance with the Work Plan if D37 is dredged to the neat line and any residual dredging needed is conducted, even if that is accomplished with fewer than 7,339 cubic yards.

In addition, the GP/NCR Work requires finishing dredging D37 to the neat line, along with any residual dredging needed, even if accomplishing that requires more than 7,339 cubic yards.

In all cases, when dredging is required, the GP/NCR Work includes dredging, dewatering, water treatment, and transportation and disposal of dredge spoils. When sand covering or capping is required, the GP/NCR Work includes both installation of the cap or cover layers and purchase of the materials required for the cap or cover layers.

Neither the listing of a dredge, cap, or cover area in the tables above, nor the listing of an expected volume/area figure, constitutes approval of the Response Agencies for a particular design. The Response Agencies will continue to use the existing design approval process, which may cause dredge, cap, or cover areas to expand or contract, thus changing the actual volume/area to be dredged, capped, or covered.

In addition to the work described in the tables above, the GP/NCR Work includes the work for 2015 that is within the scope of the Lump Sum Price items identified in the Schedule of Values in the Agreement for Environmental Remediation Services, between Lower Fox River Remediation LLC and Tetra Tech EC Inc., dated April 27, 2009. These items include agency coordination, public involvement, mobilization/demobilization, submittals, bathymetric surveying, construction monitoring, and site support. The GP/NCR Work also includes any remedial design and associated engineering work, as well as debris removal and sheet pile wall installation in the RGL slip area.

The Glatfelter Work

The "GlatfelterWork" includes performance of dredging, capping, and covering work in the following specific areas of Operable Unit 4:

Remedy Sand Cover

Area	2015 Work to Be Performed	Expected Volume/Area
SC48	Complete application of minimum six-inch sand cover, per the ROD Amendment	0.71
SCFIK-056-2	Complete application of minimum six-inch sand cover, per the ROD Amendment	2.11
SC49	Complete application of minimum six-inch sand cover, per the ROD Amendment	0.71
SC72A	Complete application of minimum six-inch sand cover, per the ROD Amendment	1.54
SC72B	Complete application of minimum six-inch sand cover, per the ROD Amendment	0.29
SCNA-018-1	Complete application of minimum six-inch sand cover, per the ROD Amendment	0.24
SCFIK-063	Complete application of minimum six-inch sand cover, per the ROD Amendment	0.24
SC50A	Complete application of minimum six-inch sand cover, per the ROD Amendment	1.32
SC50B	Complete application of minimum six-inch sand cover, per the ROD Amendment	0.19
SC111	Complete application of minimum six-inch sand cover, per the ROD Amendment	0.22
SC146A	Complete application of minimum six-inch sand cover, per the ROD Amendment	0.10
SCNA-007-1	Complete application of minimum six-inch sand cover, per the ROD Amendment	1.59
SCNA-007-2	Complete application of minimum six-inch sand cover, per the ROD Amendment	0.42

SC51	Complete application of minimum six-inch sand cover, per the ROD Amendment	4.60
SCFIK089	Complete application of minimum six-inch sand cover, per the ROD Amendment	0.63
SC53	Complete application of minimum six-inch sand cover, per the ROD Amendment	0.88
SCFIK097	Complete application of minimum six-inch sand cover, per the ROD Amendment	0.03

Residual Sand Cover

Area	**2015 Work to Be Performed**	**Expected Volume/Area**
D30B	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	25.30 (approximately 4.00 acres are south of the Georgia-Pacific consent decree line, and approximately 21.30 acres are north of that line)
D32	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	22.07 (approximately 6.00 acres are south of the Georgia-Pacific consent decree line, and approximately 16.07 acres are north of that line)
D30B-North	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	5.34
D32-North	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	5.55
D148	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	1.00

D149	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.17
D34	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	1.58
D144	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.40
D145	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	1.40
D150	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.29
D35Q	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	2.15
D35S	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.39
D35A	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	7.46

D37	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	6.17
D37B	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.86
D78	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	1.96
D141A	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.65
D141B	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.14
D38	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	8.05
DFIK-081	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.02
DFIK-083	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.01

D35CD	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	8.37
D67	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	1.55
D82	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	1.72
D40B	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.28
D40A	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	2.85
D35EF	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	5.23
D39	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	4.55
D35U	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	1.80

D58	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.07
Former CA36 Area	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.54
DFIK-090	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.01
DFIK-091	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.10
DFIK-093	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.03
D142-D68A	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	0.32
Utility #20 Corridor	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	1.67

Former CA96	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	(Residual Sand Cover area has not yet been calculated.)
Former CB58	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	(Residual Sand Cover area has not yet been calculated.)
Former CC2FG-1	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	(Residual Sand Cover area has not yet been calculated.)
Former CC2H-3	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	(Residual Sand Cover area has not yet been calculated.)
Former CC18	Complete application of minimum six-inch sand cover, per the ROD Amendment, to the extent determined after post-dredge confirmation sampling	(Residual Sand Cover area has not yet been calculated.)

Non-TSCA Dredging

Area	2015 Work to Be Performed	Expected Volume/Area
D68B	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is not scheduled for 2015 and is not part of the GP/NCR Work or Glatfelter Work in 2015.)	27,803
D41	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is not scheduled for 2015 and is not part of the GP/NCR Work or Glatfelter Work in 2015.)	16,955
D35K	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is not scheduled for 2015 and is not part of the GP/NCR Work or Glatfelter Work in 2015.)	1,164
D35J	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is not scheduled for 2015 and is not part of the GP/NCR Work or Glatfelter Work in 2015.)	28,357
D84	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is not scheduled for 2015 and is not part of the GP/NCR Work or Glatfelter Work in 2015.)	2,337

D35M	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is not scheduled for 2015 and is not part of the GP/NCR Work or Glatfelter Work in 2015.)	20,287
Former CA96	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.) (Although listed in the work plan drawings as a Cap A area, the Response Agencies have determined that CA96 will be remediated as a non-TSCA dredge area.)	(Dredge volume has not yet been calculated.)
Former CB58	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.) (Although listed in the work plan drawings as a Cap B area, the Response Agencies have determined that CB58 will be remediated as a non-TSCA dredge area.)	(Dredge volume has not yet been calculated.)
Former CC2FG-1	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.) (Although listed in the work plan drawings as a Cap C area, the Response Agencies have determined that CC2FG-1 will be remediated as a non-TSCA dredge area.)	(Dredge volume has not yet been calculated.)

Former CC2H-3	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.) (Although listed in the work plan drawings as a Cap C area, the Response Agencies have determined that CC2H-3 will be remediated as a non-TSCA dredge area.)	(Dredge volume has not yet been calculated.)
Former CC18	Complete dredging to the neat line, conduct post-dredge confirmation sampling, and complete any residual dredging needed. (Any residual sand cover needed is part of the Glatfelter Work.) (Although listed in the work plan drawings as a Cap C area, the Response Agencies have determined that CC18 will be remediated as a non-TSCA dredge area.)	(Dredge volume has not yet been calculated.)

Cap A

Area	**2015 Work to Be Performed**	**Expected Volume/Area**
CA28C	Install a minimum four-inch armor layer, per the ROD Amendment. (Installation of the sand layer for this cap is part of the GP/NCR Work.)	2.08
CA30A	Install a minimum four-inch armor layer, per the ROD Amendment. (Installation of the sand layer for this cap is part of the GP/NCR Work.)	1.61
CA30B	Install a minimum four-inch armor layer, per the ROD Amendment. (Installation of the sand layer for this cap is part of the GP/NCR Work.)	0.25
CA30C	Install a minimum four-inch armor layer, per the ROD Amendment. (Installation of the sand layer for this cap is part of the GP/NCR Work.)	3.99
CA33A	Install a minimum four-inch armor layer, per the ROD Amendment. (Installation of the sand layer for this cap is part of the GP/NCR Work.)	0.77
CA33C	Install a minimum four-inch armor layer, per the ROD Amendment. (Installation of the sand layer for this cap is part of the GP/NCR Work.)	0.24
CA34	Complete installation of engineered Cap A, with sand and armor layer thicknesses per the ROD Amendment	5.93

Cap B

Area	**2015 Work to Be Performed**	**Expected Volume/Area**
CB35	Complete installation of engineered Cap B, with sand and armor layer thicknesses per the ROD Amendment	0.30

Cap C (Not Including Quarry Spall)

Area	**2015 Work to Be Performed**	**Expected Volume/Area**
CC11	Complete installation of the sand and armor layers of engineered Cap C, with sand and armor layer thicknesses per the ROD Amendment. (Installation of the quarry spall layer is reflected on the next table below.)	11.90
CC2FG-2	Complete installation of the sand and armor layers of engineered Cap C, with sand and armor layer thicknesses per the ROD Amendment. (Installation of the quarry spall layer is reflected on the next table below.)	2.20
CC2FG-3	Complete installation of the sand and armor layers of engineered Cap C, with sand and armor layer thicknesses per the ROD Amendment. (Installation of the quarry spall layer is reflected on the next table below.)	1.34
CC2H-1	Complete installation of the sand and armor layers of engineered Cap C, with sand and armor layer thicknesses per the ROD Amendment. (Installation of the quarry spall layer is reflected on the next table below.)	0.44

CC21	Complete installation of the sand and armor layers of engineered Cap C, with sand and armor layer thicknesses per the ROD Amendment. (Installation of the quarry spall layer is reflected on the next table below.)	0.69

Cap C (Including Quarry Spall)

Area	**2015 Work to Be Performed**	**Expected Volume/Area**
CC14	Complete installation of the quarry spall layer of Engineered Cap C, with thickness per the ROD Amendment	0.62
CC2E	Complete installation of the quarry spall layer of Engineered Cap C, with thickness per the ROD Amendment. Area CC2E-1A may receive a smaller stone size if the Response Agencies determine that a quarry spall layer is not necessary. Although this area contains an estimated 33.26 acres, up to 9.93 acres of quarry spall placement may be omitted from the Glatfelter Work and left for placement in 2016.	23.33 (approximately 15.85 acres are south of the Georgia-Pacific consent decree line, and approximately 7.48 acres are north of that line that will be placed in 2015. Up to 9.93 acres of CC2E are not part of the Glatfelter Work and may be placed in 2016.)
CC10	Complete installation of the quarry spall layer of Engineered Cap C, with thickness per the ROD Amendment	0.58
CC17	Complete installation of the quarry spall layer of Engineered Cap C, with thickness per the ROD Amendment	0.76

SHC13A/B	Complete installation of the quarry spall layer, if necessary, of engineered shoreline cap (or other cap or cover as may be approved), with thickness per the ROD Amendment	1.51
CC11	Complete installation of the quarry spall layer of Engineered Cap C, with thickness per the ROD Amendment	11.90
CC2FG-2	Complete installation of the quarry spall layer of Engineered Cap C, with thickness per the ROD Amendment	2.20
CC2FG-3	Complete installation of the quarry spall layer of Engineered Cap C, with thickness per the ROD Amendment	1.34
CC2H-1	Complete installation of the quarry spall layer of Engineered Cap C, with thickness per the ROD Amendment	0.44
CC21	Complete installation of the quarry spall layer of Engineered Cap C, with thickness per the ROD Amendment	0.69

In all of the above tables, the expected volume and area column shows the dredge volume or cap/cover area that is currently expected as of the date of this appendix. However, the Glatfelter Work is defined by completing the work described in the "2015 Work to Be Performed" column of the table, not by the volume or area currently expected. For example, the Glatfelter Work includes completion of dredging to the neat line and any residual dredging needed in dredge area D68B, and the relevant table indicates that this is expected to involve 27,192 cubic yards. Glatfelter is in compliance with the Work Plan if D68B is dredged to the neat line and any residual dredging needed is conducted, even if that is accomplished with fewer than 27,192 cubic yards. In addition, the Glatfelter Work requires finishing dredging D68B to the neat line, along with any residual dredging needed, even if accomplishing that requires more than 27,192 cubic yards.

In all cases, when dredging is required, the Glatfelter Work includes dredging, dewatering, water treatment, and transportation and disposal of dredge spoils. When sand covering or capping is

required, the Glatfelter Work includes both installation of the cap or cover layers and purchase of the materials required for the cap or cover layers.

Neither the listing of a dredge, cap, or cover area in the tables above, nor the listing of an expected volume/area figure, constitutes approval of the Response Agencies for a particular design. The Response Agencies will continue to use the existing design approval process, which may cause dredge, cap, or cover areas to expand or contract, thus changing the actual volume/area to be dredged, capped, or covered.