State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

Form 4400-237 (R 9/15)

Notice: Use this form to request **a written response (on agency letterhead)** from the Department of Natural Resources (DNR) regarding technical assistance, a post-closure change to a site, a specialized agreement or liability clarification for Property with known or suspected environmental contamination. A fee will be required as is authorized by s. 292.55, Wis. Stats., and NR 749, Wis. Adm. Code., unless noted in the instructions below. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records law [ss. 19.31 - 19.39, Wis. Stats.].

Definitions

"Property" refers to the subject Property that is perceived to have been or has been impacted by the discharge of hazardous substances.

"Liability Clarification" refers to a written determination by the Department provided in response to a request made on this form. The response clarifies whether a person is or may become liable for the environmental contamination of a Property, as provided in s. 292.55, Wis. Stats.

"Technical Assistance" refers to the Department's assistance or comments on the planning and implementation of an environmental investigation or environmental cleanup on a Property in response to a request made on this form as provided in s. 292.55, Wis. Stats.

"Post-closure modification" refers to changes to Property boundaries and/or continuing obligations for Properties or sites that received closure letters for which continuing obligations have been applied or where contamination remains. Many, but not all, of these sites are included on the GIS Registry layer of RR Sites Map to provide public notice of residual contamination and continuing obligations.

Select the Correct Form

This from should be used to request the following from the DNR:

- Technical Assistance
- Liability Clarification
- Post-Closure Modifications
- Specialized Agreements (tax cancellation, negotiated agreements, etc.)

Do not use this form if one of the following applies:

- Request for an **off-site liability exemption or clarification** for Property that has been or is perceived to be contaminated by one or more hazardous substances that originated on another Property containing the source of the contamination. Use DNR's Off-Site Liability Exemption and Liability Clarification Application Form 4400-201.
- Submittal of an Environmental Assessment for the **Lender Liability Exemption**, s 292.21, Wis. Stats., **if no response or review by DNR is requested**. Use the Lender Liability Exemption Environmental Assessment Tracking Form 4400-196.
- Request for an **exemption to develop on a historic fill site** or licensed landfill. Use DNR's Form 4400-226 or 4400-226A.
- **Request for closure** for Property where the investigation and cleanup actions are completed. Use DNR's Case Closure - GIS Registry Form 4400-202.

All forms, publications and additional information are available on the internet at: dnr.wi.gov/topic/Brownfields/Pubs.html.

Instructions

1. Complete sections 1, 2, 6 and 7 for all requests. Be sure to provide adequate and complete information.
2. Select the type of assistance requested: Section 3 for technical assistance or post-closure modifications, Section 4 for a written determination or clarification of environmental liabilities; or Section 5 for a specialized agreement.
3. Include the fee payment that is listed in Section 3, 4, or 5, unless you are a "Voluntary Party" enrolled in the Voluntary Party Liability Exemption Program **and** the questions in Section 2 direct otherwise. Information on to whom and where to send the fee is found in Section 8 of this form.
4. Send the completed request, supporting materials and the fee to the appropriate DNR regional office where the Property is located. See the map on the last page of this form. A paper copy of the signed form and all reports and supporting materials shall be sent with an electronic copy of the form and supporting materials on a compact disk. For electronic document submittal requirements see: http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf"

The time required for DNR's determination varies depending on the complexity of the site, and the clarity and completeness of the request and supporting documentation.

Section 1. Contact and Recipient Information

Requester Information

This is the person requesting technical assistance or a post-closure modification review, that his or her liability be clarified or a specialized agreement and is identified as the requester in Section 7. DNR will address its response letter to this person.

Last Name	First	MI	Organization/ Business Name
Tucker-Billingslea	Kim	D	General Motors LLC - Global Real Estate HQ

Mailing Address	City	State	ZIP Code
30400 Van Dyke, 5th Floor	Warren	MI	48093

Phone # (include area code)	Fax # (include area code)	Email
(248) 255-2797		kim.tucker-billingslea@gm.com

The requester listed above: (select all that apply)

- ☒ Is currently the owner
- ☒ Is considering selling the Property
- ☐ Is renting or leasing the Property
- ☐ Is considering acquiring the Property
- ☐ Is a lender with a mortgagee interest in the Property
- ☐ Other. Explain the status of the Property with respect to the applicant:

Contact Information (to be contacted with questions about this request)

☒ Select if same as requester

Contact Last Name	First	MI	Organization/ Business Name
Tucker-Billingslea	Kim	D	General Motors LLC - Global Real Estate HQ

Mailing Address	City	State	ZIP Code
30400 Van Dyke, 5th Floor	Warren	MI	48093

Phone # (include area code)	Fax # (include area code)	Email
(248) 255-2797		kim.tucker-billingslea@gm.com

Environmental Consultant (if applicable)

Contact Last Name	First	MI	Organization/ Business Name
Barrera	Mauricio		GHD Services Inc.

Mailing Address	City	State	ZIP Code
26850 Haggerty Road	Farmington Hills	MI	48331

Phone # (include area code)	Fax # (include area code)	Email
(519) 884-0510		Mauricio.Barrera@ghd.com

Section 2. Property Information

Property Name	FID No. (if known)
General Motors LLC (GM) Former GM LLC Janesville Assembly Plant	

BRRTS No. (if known)	Parcel Identification Number
BRRTS # 02-54-577951	

Street Address	City	State	ZIP Code
1000 General Motors Drive	Janesville	WI	53546

County	Municipality where the Property is located	Property is composed of:	Property Size Acres
Rock	◉ City ○ Town ○ Village of Janesville	○ Single tax parcel ○ Multiple tax parcels	145

1. Is a response needed by a specific date? (e.g., Property closing date) Note: Most requests are completed within 60 days. Please plan accordingly.

◉ No ○ Yes

Date requested by: _____

Reason:

_____

2. Is the "Requester" enrolled as a Voluntary Party in the Voluntary Party Liability Exemption (VPLE) program?

◉ No. **Include the fee that is required for your request in Section 3, 4 or 5.**

○ Yes. **Do not include a separate fee.** This request will be billed separately through the VPLE Program.

Fill out the information in Section 3, 4 or 5 which corresponds with the type of request:
Section 3. Technical Assistance or Post-Closure Modifications;
Section 4. Liability Clarification; or Section 5. Specialized Agreement.

Section 3. Request for Technical Assistance or Post-Closure Modification

Select the type of technical assistance requested: [**Numbers in brackets are for WI DNR Use]**

☐ No Further Action Letter (NFA) (Immediate Actions) - NR 708.09, [183] - **Include a fee of $350.** Use for a written response to an immediate action after a discharge of a hazardous substance occurs. Generally, these are for a one-time spill event.

☐ Review of Site Investigation Work Plan - NR 716.09, [135] - **Include a fee of $700.**

☐ Review of Site Investigation Report - NR 716.15, [137] - **Include a fee of $1050.**

☐ Approval of a Site-Specific Soil Cleanup Standard - NR 720.10 or 12, [67] - **Include a fee of $1050.**

☒ Review of a Remedial Action Options Report - NR 722.13, [143] - **Include a fee of $1050.**

☐ Review of a Remedial Action Design Report - NR 724.09, [148] - **Include a fee of $1050.**

☐ Review of a Remedial Action Documentation Report - NR 724.15, [152] - **Include a fee of $350**

☐ Review of a Long-term Monitoring Plan - NR 724.17, [25] - **Include a fee of $425.**

☐ Review of an Operation and Maintenance Plan - NR 724.13, [192] - **Include a fee of $425.**

Other Technical Assistance - s. 292.55, Wis. Stats. [97] (For request to build on an abandoned landfill use Form 4400-226)

☐ Schedule a Technical Assistance Meeting - **Include a fee of $700.**

☐ Hazardous Waste Determination - **Include a fee of $700.**

☐ Other Technical Assistance - **Include a fee of $700.** Explain your request in an attachment.

Post-Closure Modifications - NR 727, [181]

☐ Post-Closure Modifications: Modification to Property boundaries and/or continuing obligations of a closed site or Property; sites may be on the GIS Registry. This also includes removal of a site or Property from the GIS Registry. **Include a fee of $1050, and:**

☐ Include a fee of $300 for sites with residual soil contamination; and

☐ Include a fee of $350 for sites with residual groundwater contamination, monitoring wells or for vapor intrusion continuing obligations.

Attach a description of the changes you are proposing, and documentation as to why the changes are needed (if the change to a Property, site or continuing obligation will result in revised maps, maintenance plans or photographs, those documents may be submitted later in the approval process, on a case-by-case basis).

Skip Sections 4 and 5 if the technical assistance you are requesting is listed above and complete Sections 6 and 7 of this form.

Section 4. Request for Liability Clarification

Select the type of liability clarification requested. Use the available space given or attach information, explanations, or specific questions that you need answered in DNR's reply. Complete Sections 6 and 7 of this form. **[Numbers in brackets are for DNR Use]**

☐ "Lender" liability exemption clarification - s. 292.21, Wis. Stats. [686]

❖ **Include a fee of $700.**

Provide the following documentation:

(1) ownership status of the real Property, and/or the personal Property and fixtures;

(2) an environmental assessment, in accordance with s. 292.21, Wis. Stats.;

(3) the date the environmental assessment was conducted by the lender;

(4) the date of the Property acquisition; for foreclosure actions, include a copy of the signed and dated court order confirming the sheriff's sale.

(5) documentation showing how the Property was acquired and the steps followed under the appropriate state statutes.

(6) a copy of the Property deed with the correct legal description; and,

(7) the Lender Liability Exemption Environmental Assessment Tracking Form (Form 4400-196).

(8) If no sampling was done, please provide reasoning as to why it was **not** conducted. Include this either in the accompanying environmental assessment or as an attachment to this form, and cite language in s. 292. 21(1)(c)2.,h.-i., Wis. Stats.:

h. The collection and analysis of representative samples of soil or other materials in the ground that are suspected of being contaminated based on observations made during a visual inspection of the real Property or based on aerial photographs, or other information available to the lender, including stained or discolored soil or other materials in the ground and including soil or materials in the ground in areas with dead or distressed vegetation. The collection and analysis shall identify contaminants in the soil or other materials in the ground and shall quantify concentrations.

i. The collection and analysis of representative samples of unknown wastes or potentially hazardous substances found on the real Property and the determination of concentrations of hazardous waste and hazardous substances found in tanks, drums or other containers or in piles or lagoons on the real Property.

☐ "Representative" liability exemption clarification (e.g. trustees, receivers, etc.) - s. 292.21, Wis. Stats. [686]

❖ **Include a fee of $700.**

Provide the following documentation:

(1) ownership status of the Property;

(2) the date of Property acquisition by the representative;

(3) the means by which the Property was acquired;

(4) documentation that the representative has no beneficial interest in any entity that owns, possesses, or controls the Property;

(5) documentation that the representative has not caused any discharge of a hazardous substance on the Property; and

(6) a copy of the Property deed with the correct legal description.

☐ Clarification of local governmental unit (LGU) liability exemption at sites with: (select all that apply)

☐ hazardous substances spills - s. 292.11(9)(e), Wis. Stats. [649];

☐ Perceived environmental contamination - [649];

☐ hazardous waste - s. 292.24 (2), Wis. Stats. [649]; and/or

☐ solid waste - s. 292.23 (2), Wis. Stats. [649].

❖ **Include a fee of $700, a summary of the environmental liability clarification being requested, and the following:**

(1) clear supporting documentation showing the acquisition method used, and the steps followed under the appropriate state statute(s).

(2) current and proposed ownership status of the Property;

(3) date and means by which the Property was acquired by the LGU, where applicable;

(4) a map and the ¼, ¼ section location of the Property;

(5) summary of current uses of the Property;

(6) intended or potential use(s) of the Property;

(7) descriptions of other investigations that have taken place on the Property; and

(8) (for solid waste clarifications) a summary of the license history of the facility.

Section 4. Request for Liability Clarification (cont.)

☐ Lease liability clarification - s. 292.55, Wis. Stats. [646]

- ❖ **Include a fee of $700 for a single Property, or $1400 for multiple Properties and the information listed below:**

(1) a copy of the proposed lease;

(2) the name of the current owner of the Property and the person who will lease the Property;

(3) a description of the lease holder's association with any persons who have possession, control, or caused a discharge of a hazardous substance on the Property;

(4) map(s) showing the Property location and any suspected or known sources of contamination detected on the Property;

(5) a description of the intended use of the Property by the lease holder, with reference to the maps to indicate which areas will be used. Explain how the use will not interfere with any future investigation or cleanup at the Property; and

(6) all reports or investigations (e.g. Phase I and Phase II Environmental Assessments and/or Site Investigation Reports conducted under s. NR 716, Wis. Adm. Code) that identify areas of the Property where a discharge has occurred.

General or other environmental liability clarification - s. 292.55, Wis. Stats. [682] - Explain your request below.

- ❖ **Include a fee of $700 and an adequate summary of relevant environmental work to date.**

☐ No Action Required (NAR) - NR 716.05, [682]

- ❖ **Include a fee of $700.**

Use where an environmental discharge has or has not occurred, and applicant wants a DNR determination that no further assessment or clean-up work is required. Usually this is requested after a Phase I and Phase II environmental assessment has been conducted; the assessment reports should be submitted with this form. This is not a closure letter.

☐ Clarify the liability associated with a "closed" Property - s. 292.55, Wis. Stats. [682]

- ❖ **Include a fee of $700.**

- Include a copy of any closure documents if a state agency other than DNR approved the closure.

Use this space or attach additional sheets to provide necessary information, explanations or specific questions to be answered by the DNR.

Section 5. Request for a Specialized Agreement

Select the type of agreement needed. Include the appropriate draft agreements and supporting materials. Complete Sections 6 and 7 of this form. More information and model draft agreements are available at: dnr.wi.gov/topic/Brownfields/lgu.html#tabx4.

☐ Tax cancellation agreement - s. 75.105(2)(d), Wis. Stats. [654]

- **Include a fee of $700, and the information listed below:**

(1) Phase I and II Environmental Site Assessment Reports,
(2) a copy of the Property deed with the correct legal description; and,
(3) a draft 75.105 agreement based on the DNR's model (dnr.wi.gov/topic/brownfields/documents/mod75-105agrmt.pdf).

☐ Agreement for assignment of tax foreclosure judgement - s.75.106, Wis. Stats. [666]

- **Include a fee of $700, and the information listed below:**

(1) Phase I and II Environmental Site Assessment Reports,
(2) a copy of the Property deed with the correct legal description; and,
(3) a draft 75.105 agreement based on the DNR's model (dnr.wi.gov/topic/brownfields/documents/mod75-106agrmt.pdf).

☐ Negotiated agreement - Enforceable contract for non-emergency remediation - s. 292.11(7)(d) and (e), Wis. Stats. [630]

- **Include a fee of $1400, and the information listed below:**

(1) a draft schedule for remediation; and,
(2) the name, mailing address, phone and email for each party to the agreement.

Section 6. Other Information Submitted

Identify all materials that are included with this request.

Include one copy of any document from any state agency files that you want the Department to review as part of this request. The person submitting this request is responsible for contacting other state agencies to obtain appropriate reports or information.

☐ Phase I Environmental Site Assessment Report - Date: _____

☐ Phase II Environmental Site Assessment Report - Date: _____

☐ Legal Description of Property (required for all liability requests and specialized agreements)

☐ Map of the Property (required for all liability requests and specialized agreements)

Analytical results of the following sampled media: Select all that apply and include date of collection.

☐ Groundwater ☐ Soil ☐ Sediment ☐ Other medium - Describe: _____

Date of Collection: _____

☐ A copy of the closure letter and submittal materials

☐ Draft tax cancellation agreement

☐ Draft agreement for assignment of tax foreclosure judgment

☐ Other report(s) or information - Describe: _____

For Property with newly identified discharges of hazardous substances only: Has a notification of a discharge of a hazardous substance been sent to the DNR as required by s. NR 706.05(1)(b), Wis. Adm. Code?

◯ Yes - Date (if known): _____

◯ No

Note: The Notification for Hazardous Substance Discharge (non-emergency) form is available at: dnr.wi.gov/files/PDF/forms/4400/4400-225.pdf.

Section 7. Certification by the Person who completed this form

☐ I am the person submitting this request (requester)

☒ I prepared this request for: Kim D. Tucker-Billingslea

Requester Name

I certify that I am familiar with the information submitted on this request, and that the information on and included with this request is true, accurate and complete to the best of my knowledge. I also certify I have the legal authority and the applicant's permission to make this request.

Signature

Mauricio Barrera

Date Signed

September 28, 2017

Environmental Consultant Representative

Title

519-884-0510

Telephone Number (include area code)

Section 8. DNR Contacts and Addresses for Request Submittals

Send or deliver one paper copy and one electronic copy on a compact disk of the completed request, supporting materials, and fee to the region where the property is located to the address below. Contact a DNR regional brownfields specialist with any questions about this form or a specific situation involving a contaminated property. For electronic document submittal requirements see: http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf.

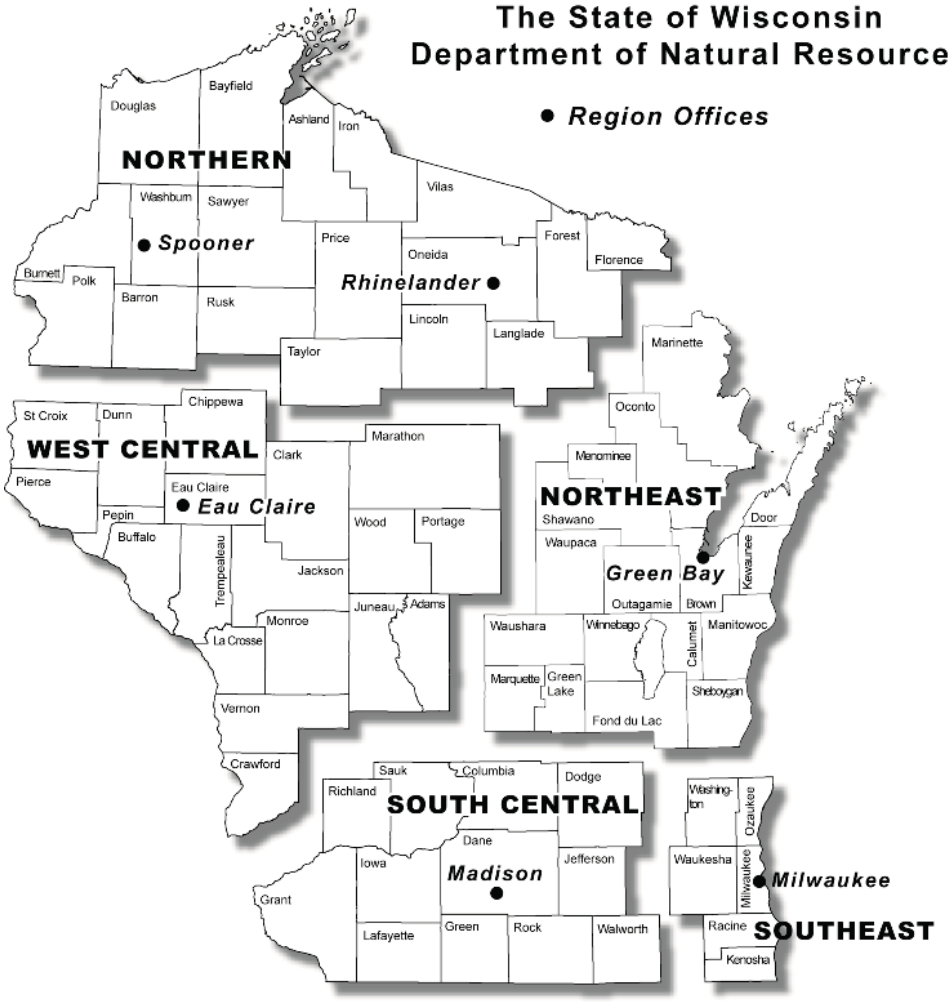
DNR NORTHERN REGION
Attn: RR Program Assistant
Department of Natural Resources
223 E Steinfest Rd Antigo, WI 54409

DNR NORTHEAST REGION
Attn: RR Program Assistant
Department of Natural Resources
2984 Shawano Avenue
Green Bay WI 54313

DNR SOUTH CENTRAL REGION
Attn: RR Program Assistant
Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg WI 53711

DNR SOUTHEAST REGION
Attn: RR Program Assistant
Department of Natural Resources
2300 North Martin Luther King Drive
Milwaukee WI 53212

DNR WEST CENTRAL REGION
Attn: RR Program Assistant
Department of Natural Resources
1300 Clairemont Ave.
Eau Claire WI 54702



Note: These are the Remediation and Redevelopment Program's designated regions. Other DNR program regional boundaries may be different.

DNR Use Only			
Date Received	Date Assigned	BRRTS Activity Code	BRRTS No. (if used)
DNR Reviewer	Comments		
Fee Enclosed? ◯ Yes ◯ No	Fee Amount $	Date Additional Information Requested	Date Requested for DNR Response Letter
Date Approved	Final Determination		

September 28, 2017 Reference No. 058505

Mr. Jason Lowery
Project Manager
Wisconsin Department of Natural Resources (WDNR)
Site Assessment Team Leader – Remediation & Redevelopment Bureau
101 S. Webster St., P.O. Box 7921
Madison, Wisconsin 53707-7921

Dear Mr. Lowery:

Re: Remedial Action Options Report Rock River (RM 178.5 to 180.5) - ch. NR 722
Reported contamination in the Rock River outflow of the storm water sewer pipe located north of the former General Motors LLC Assembly Facility, and north of the electrical substation WTM Coordinates: X: 600,046/Y: 244,398
BRRTS # 02-54-577951
Janesville, Wisconsin

Please find enclosed for your review the Remedial Action Options Report Rock River (RM 178.5 to 180.5) - ch. NR 722 (Report) prepared on behalf of General Motors LLC (GM LLC) for the reported contamination in the Rock River at the outflow of the storm water sewer pipe located north of the former General Motors Assembly Facility, and north of the electrical substation in Janesville, Rock County, Wisconsin (Site) under Wisconsin Department of Natural Resources (WDNR) Bureau for Remediation and Redevelopment Tracking System (BRRTS) Number (#) 02-54-577951.

The WDNR formally accepted the Site Investigation Report in a letter dated July 12, 2017 with comments pending on the risk assessments. In an email dated August 1, 2017, the WDNR stated *"The Department is in general agreement with the remedial action area shown in the SI report Figure 6.1".* This Report documents the evaluation and selection of remedial action options feasible for the Site and was prepared in accordance with chapter NR 722, Wisconsin Administrative Code (Wis. Admin. Code) and is consistent with WDNR statement on the general strategy based on the email dated August 1, 2017.

Sincerely,

GHD SERVICES INC.

Mauricio Barrera, MASc

MB/jh/2

Encl.

cc: Kim Tucker-Billingslea, GM
Steve Song, Ramboll Environ
Mark Nielsen, Ramboll Environ
Renee Sandvig, Ramboll Environ
Phyllis Fuchsman, Ramboll Environ
Meg McArdle, Exponent
Scott Shock, Exponent
Glenn Turchan, GHD
Ryan Bayne, GHD
Tom Kinney, GHD
Daniela Araujo, GHD

GHD Services Inc.
5325 Wall Street Suite 2305 Madison Wisconsin 53718 USA
T 608 249 4545 **F** 608 249 4402 **W** www.ghd.com

Remedial Action Options Report

Rock River (RM 178.5 to 180.5) - ch. NR 722

GM LLC Janesville Assembly Plant
1000 General Motors Drive
Janesville, Wisconsin 53546
DNR BRRTS Activity # 02-54-577951

General Motors LLC

GHD | 5325 Wall Street Suite 2305 Madison Wisconsin 53718 United States

058505 | 01 | Report No 32 | September 28 2017

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List of Acronyms

ATSDR	Agency for Toxic Substances and Disease Registry
BRRTS	Bureau for Remediation and Redevelopment Tracking System
CDF	confined disposal facility
COPC	Chemical of Potential Concern
COPEC	Chemical of Potential Ecological Concern
CPT	Cone Penetration Testing
CY	cubic yard
EMNR	Enhanced Monitored Natural Recovery
ERA	Ecological Risk Assessment
ft	feet
GHD	GHD Services Inc.
GM LLC	General Motors LLC
HHRA	Human Health Risk Assessment
MLC	Motors Liquidation Company
MNR	Monitored Natural Recovery
NPDES	National Pollutant Discharge Elimination System
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
Plant Building	Main Assembly Building
Property	Former GM LLC Janesville Assembly Plant located at 1000 General Motors Drive in Janesville, Rock County, Wisconsin
RAOs	Remedial Action Objectives
RAOR	Remedial Action Options Report
Revised Work Plan	Revised Supplemental Rock River Investigation (Mile 178.5 to 180.5) Work Plan
RP	Responsible Party
Site	Vicinity of Adjacent Outfall
Site Investigation Report	Rock River (Mile 178.5 to 180.5) Site Investigation Report
USACE	United States Army Corps Engineers
U.S. EPA	United States Environmental Protection Agency
WDNR	Wisconsin Department of Natural Resources
Wis. Adm. Code	Wisconsin Administrative Code
WPDES	Wisconsin Pollutant Discharge Elimination System
WWTP	Wastewater Treatment Plant

1. Introduction

This Remedial Action Options Report (RAOR or Report) was prepared by GHD Services Inc. (GHD) (with input from Ramboll Environ and Exponent) on behalf of General Motors LLC (GM LLC) for certain discharges to the Rock River in the vicinity of Outfall 010 of the Former GM LLC Janesville Assembly Plant located at 1000 General Motors Drive in Janesville, Rock County, Wisconsin (Site) under Wisconsin Department of Natural Resources (WDNR) Bureau for Remediation and Redevelopment Tracking System (BRRTS) Number (#) 02-54-577951. This Report documents the evaluation and selection of remedial action options feasible for the Site and was prepared in accordance with chapter NR 722, Wisconsin Administrative Code (Wis. Admin. Code) and is consistent with WDNR statement on the general strategy based on the email dated August 1, 2017.

1.1 Contacts

The contact information for the person(s) responsible for completing this evaluation (Responsible Party [RP]), and the environmental consultant preparing this Report on behalf of the RP are provided below.

- **RP Contact**

  Ms. Kim Tucker-Billingslea, Project Manager
  General Motors, LLC
  Global Environmental Compliance & Sustainability - Remediation Team
  VEC East – 5th Floor
  30400 Van Dyke Avenue
  Warren, Michigan 48092
  Telephone: (248) 255-2797
  Email: kim.tucker-billingslea@gm.com

- **Environmental Consultant**

  Mr. James Ryan Bayne, Project Advisor/Project Engineer, PE 141944
  Mr. Thomas Kinney, Project Advisor/Project Geologist, PG #636
  Mr. Mauricio Barrera, Project Manager
  GHD Services Inc.
  26850 Haggerty Road
  Farmington Hills MI 48331
  Telephone: (248) 893-3400
  Email: Ryan.Bayne@ghd.com; Tom.Kinney@ghd.com; Mauricio.Barrera@ghd.com

1.2 Background

The Former GM LLC Janesville Assembly Plant located at 1000 General Motors Drive in Janesville (Property) is currently owned by GM LLC and comprises approximately 145 acres of land, including approximately 4.8 million square feet (ft) of floor space located in the Main Assembly Building (Plant Building), as well as several ancillary structures. The Property Wastewater Treatment Plant (WWTP) is located approximately 1/4 mile to the west of the main plant property. The Property location is presented on Figure 1.1.

The Property had been used by General Motors Corporation beginning in 1918. Prior to 1918, the Property consisted of vacant land or residential properties. Approximately 55 acres of the main plant property were purchased by General Motors Corporation to produce Samson Tractors in 1918. Since the original property acquisition in 1918, the Property has undergone numerous additions and renovations, both in the acreage included in the properties comprising the Property and various structures. The Plant was "idled" on April 24, 2009 and General Motors Corporation declared bankruptcy on June 10, 2009. General Motors Corporation changed its name to Motors Liquidation Company (MLC) during the bankruptcy proceeding. Effective July 10, 2009, as a result of the General Motors Corporation bankruptcy, the Property was sold to General Motors Company. On October 16, 2009, General Motors Company changed its name to General Motors LLC. The GM LLC Janesville Assembly plant was officially "closed" in November 2015.

General Motors Corporation and GM LLC have completed a series of environmental investigations and some remedial actions at the Property in conjunction with changes in land use and/or plant expansions during the past 30 to 40 years. Decommissioning programs have been underway since the plant closed in November 2015. GM LLC conducted a major cleaning of the of the storm water sewer system to mitigate the potential for any chemical releases to the Rock River.

Storm water collected from the Property's main assembly plant property discharges to the Rock River via a permitted outfall (Outfall 010) (Wisconsin Pollutant Discharge Elimination System [WPDES] – Tier 2 General Permit No. WI-S067857-4) located north of the former GM LLC Assembly Facility, and south of the electrical substation. In addition, GM LLC maintains a Pit/Trench Dewatering General Permit (WI-0049344-4) to discharge groundwater to the storm water system via Outfall 010. Discharge from Outfall 010 combines with storm water from other properties in the vicinity of the Property and discharges to the Rock River via an outfall referred to in this Report as the Adjacent Outfall (Figure 1.2). Storm water runoff from other parts of the Property and the Property's WWTP combine with runoff from other properties in the vicinity of the Property and discharge to the Rock River via outfalls located east (City Northeast Outfall 1) and west (City West Outfall) of the Property (see Figure 1.2).

The Rock River is part of the Lower Rock River drainage basin, covering over 3,700 square miles (WDNR, 2016a). The segment of the Rock River near the Property flows from east to west and is approximately 400 ft to 800 ft wide. The Monterey Dam, constructed in 1846, is located approximately 1/4 mile downstream of the Property, and consists of two spillways. The City of Janesville approved the removal of the Monterey Dam on March 27, 2017 but the demolition schedule is uncertain. In support of the City's evaluation of these options, a study of sediment quality upstream of the Monterey Dam was performed by Inter-Fluve, Inc. in 2015 (Inter-Fluve, Inc., 2015).

After Inter-Fluve, Inc. identified the presence of sediment impact near the Adjacent Outfall (see Figure 1.2) as part of a study for the City of Janesville to support decisions on whether to repair the Monterey Dam or remove it, GM LLC performed an investigation and developed a report of the sediment conditions around the Adjacent Outfall in the Spring of 2016. GM LLC has been proactively working with the WDNR and the City of Janesville, meeting with them both via conference calls and in-person to present work plans and present the results of the investigations. Based on the results from the Spring 2016 investigation, GM LLC performed an expanded

investigation in the Fall of 2016, proposed in the GM LLC Revised Supplemental Rock River Investigation (Mile 178.5 to 180.5) Work Plan (Revised Work Plan) (GHD, 2016c). The Revised Work Plan includes revisions to the September 2016 draft that addressed WDNR's comments.

The primary objective of the Revised Work Plan was to: (1) augment the previously completed Sediment Investigation (GHD, 2016b) and fill data gaps necessary to complete quantitative human health and ecological risk assessments for potential exposures to sediment in the vicinity of the Adjacent Outfall and other outfalls that collect storm water runoff from the former GM LLC Janesville Assembly Plant in Janesville, Wisconsin; and (2) evaluate potential sediment remediation options, should the risk assessment determine that remediation is warranted. It should be noted that GM LLC investigated three outfalls to the Rock River (issues were only identified in the vicinity of the Adjacent Outfall).

A Site investigation was completed in Fall 2016, consistent with the Revised Work Plan (Site Investigation). The Rock River (Mile 178.5 to 180.5) Site Investigation Report (Site Investigation Report) (GHD, 2017) was completed in May 2017. The Site Investigation Report documents the analytical results of the Site Investigation to assess the extent of sediment impact due to historical discharges from storm water outfalls in the vicinity of the Site, and the potential significance of potential human and ecological exposures under current and future river conditions.

GM LCC has implemented decommissioning activities at the Property (e.g., cleaned sumps/pits and cleaned the storm water sewer system) mitigating potential future chemical releases to the Rock River, and has proactively completed a series of investigations within the Rock River (RM 178.5 to 180.5) as documented in the Site Investigation Report (May 2017). The August 1, 2017 WDNR email stated that the WDNR was in general agreement with the remedial action area presented on Figure 6.1 of the Site Investigation Report (May 2017). As a result, the Rock River project can enter the design and remediation phase consistent with chapter NR 724, Wis. Adm. Code (Remedial and Interim Action Design, Implementation, Operation, Maintenance and Monitoring requirements).

1.3 Nature and Extent of Contamination and Risk Assessment Summary

During the Site Investigation, surface water and sediment data were collected to determine whether discharges to the Rock River from the three storm water outfalls in the Adjacent Area have affected surface water and/or sediment quality, and if so, to define the nature and extent of the impact, as necessary, to support human health and ecological risk assessment. The results from the Site Investigation show that sediment impact is localized near the Adjacent Outfall. The highest sediment concentrations of polycyclic aromatic hydrocarbons (PAHs), metals (e.g., lead), and polychlorinated biphenyls (PCBs) are focused within an approximately 1.7-acre area around the Adjacent Outfall (as presented on Figure 6.1 of the Site Investigation Report). Beyond this area, the concentrations of chemicals of potential concern (COPCs)/chemicals of potential ecological concern (COPECs) in sediment are generally similar to concentrations found in the upstream sediment data collected during the field investigation. These results indicate that the extent of the COPCs/COPECs have been adequately characterized to support the human health and ecological risk assessments. The Rock River (Mile 178.5 to 180.5) Site Investigation Report was completed in May 2017.

A Human Health Risk Assessment (HHRA) was completed to determine if the reasonable maximum exposures to surface water, sediment, and game fish data would pose an unacceptable health risk. The HHRA considered potential sediment exposures under current conditions and a scenario in which the Monterey Dam is removed and sediment outside the main channel becomes soil and is used for park recreation. The potential health risks associated with reasonable maximum exposures under these scenarios were characterized using methods and assumptions based on WDNR and United States Environmental Protection Agency (U.S. EPA) risk assessment guidance, along with Site-specific considerations and professional judgment.

An Ecological Risk Assessment (ERA) was completed to evaluate the risks to ecological receptors from exposure to the COPECs under scenarios similar to those used in the HHRA: current conditions; and a scenario in which the Monterey Dam is removed, sediment outside the main channel becomes soil, and the area is left as a natural space. The potential for unacceptable ecological risk under each scenario was assessed using methods and assumptions based on U.S. EPA ecological risk assessment guidance, incorporating Site-specific data from the field investigation and professional judgment.

Based on the findings from the HHRA and ERA, human health risks from exposures to COPCs/COPECs in the Rock River near the Adjacent Outfall are expected to be within acceptable WDNR limits, whether the Monterey Dam remains or is removed. The only ecological risks that could not be ruled out in the ERA are impact to benthic organisms within a 1.7-acre area around the Adjacent Outfall, for current conditions, and possible impacts to terrestrial organisms within the same area in the future scenario. This area is presented on Figure 1.3. The ecological risk analysis considered sediments within the biologically active zone under current and future scenarios. Concentrations of COPCs/COPECs in deeper sediments were considered subsequently for the purpose of defining the sediment management area (see Section 2.2).

1.4 Environmental Setting

The Rock River is part of the Lower Rock River drainage basin, covering over 3,700 square miles (WDNR, 2016a). The Rock River is approximately 299 miles long and empties into the Mississippi River (USGS, 1980). The Rock River is listed as a scenic urban waterway by the WDNR, which is a waterway that provides opportunity to enjoy water-based recreational activities including fishing close to urban areas. The WDNR has not issued a fish consumption advisory for the Rock River (WDNR, 2015).

The segment of the Rock River near the Site flows from east to west and is approximately 400 to 800 ft wide (Figure 1.2). The Monterey Dam is located approximately 1/4 mile downstream of the Site and consists of two spillways, each approximately 185 to 190 ft long. One spillway is perpendicular to the flow of the river, while the other spillway is parallel to the flow. In general, dams act as sediment traps, limiting the transport of coarse sediment and creating areas where fine material can fall out of suspension resulting in the accumulation of sediment. Sediment has been impounded upstream of the Monterey Dam, most notably in a relatively large embayment area located on the north side of the Rock River, just upstream of the Monterey Dam, as well as in the area where the Rock River turns to the west just upstream of the Site. If the Monterey Dam is

removed, the water level in the Rock River is expected to drop and some areas of sediment may no longer be under water (i.e., such sediment may become soil).

Upstream of the Site, the Rock River flows through a mix of towns and agricultural areas, including the City of Janesville. Potential sources of pollutants to the Rock River and its sediment include agricultural runoff, storm water discharges, treated municipal and industrial wastewater discharges, and legacy contamination (Inter-Fluve, Inc., 2015). Fine sediment, consisting of muck, silt, and sand have deposited in several lower energy areas in the margins outside of the main river channel, which generally is located along the center line of the existing river. Potential sources of contamination such as PAHs, mercury, and PCBs to surface water and sediment include: airborne deposition, municipal and industrial wastewaters, urban storm water runoff, runoff from coal storage areas, and, road runoff (Agency for Toxic Substances and Disease Registry [ATSDR] 1995, 1999, 2000).

The sediment thickness and type within the Rock River between Mile 178.5 and 180.5 were initially characterized by Inter-Fluve, Inc. (2015). The thickness of sediment in the area investigated by GM LLC (further discussed in Section 2.2) was evaluated using cone penetration testing (CPT) data from explorations conducted in 2016 supplemented with selected sediment thickness values reported by Inter-Fluve (2015) (GHD, 2017). Sediment thickness was typically measured in the range of 5 to 6 ft in the central and eastern portion of this area, with thinning out to 0 to 1 ft toward the main channel and the western end of the remedial action area (GHD, 2017).

Surface water samples were collected by GHD in the vicinity of the Adjacent Outfall, downstream main channel (close to the Monterey Dam), and upstream of the GM LLC Janesville Assembly Site. Field observations from the second phase of the Site Investigation found a surface water depth from 2.6 to 13.3 ft (GHD, 2017).

2. Remedial Action Options

2.1 Remedial Action Objectives

Remedial Action Objectives (RAOs) were developed based on the determination that there are currently no risks to human health or to fish and wildlife receptors and that the risks to be addressed are the risks to benthic invertebrates within a 1.7-acre area around the Adjacent Outfall for current conditions, and possible impacts to terrestrial organisms within the same area in the future scenario (Figure 1.3). The RAOs are stated so as to address both current and future scenarios for sediment, which could become wetland soils if the Monterey Dam is removed and water levels lowered by as much as potentially 4 ft according to officials reviewing the impact of future actions. The RAOs are also stated to address the potential for mobilization of COPCs/COPECs in surface water and sediment either during or after a potential remedial action. Specific preliminary RAOs for the impacted sediments in Rock River are as follows:

- **RAO1**—Reduce risks to acceptable levels for environmental receptors (e.g., benthic invertebrates) from exposure to COPECs in sediments or soils in the proposed remedial action area.

- **RAO2**— Minimize the potential for COPECs in sediments to migrate from the proposed remedial action area to areas where potential unacceptable ecological exposures may occur.

The HHRA found that there are no risks to human health from exposure to COPCs in sediments, surface water, soil or fish, under current or future scenarios, therefore it was considered unnecessary to identify a human health related RAO.

2.2 Remedial Action Area

The proposed remedial action area is approximately 2.1-acres (Figure 2.1). The remedial action area was determined based on a review of the concentrations of COPECs and potential for benthic invertebrate community risk at multiple depths as presented on Figures 6.1 and 6.2 in the Site Investigation Report (GHD, 2017). This area is slightly expanded compared to the 1.7-acre area identified in the ecological risk analysis, due to incorporating two additional sample locations in the remediation area. One of these locations was added based on consideration of chemical concentrations in subsurface sediment, and the other was added for practical purposes because it was in close proximity to other locations characterized as having "likely" risk to benthic invertebrates. The estimated total volume of impacted sediments within the remedial action area is approximately 16,000 cubic yards (CY). The volume estimate was determined based on the remedial action area, the bathymetric surface, and the estimate sediment thickness (based on depth of refusal at approximately 5 to 6 ft) as presented in the Site Investigation Report (GHD, 2017).

2.3 Initial Screening of Remedial Action Options

General response actions and remedial technologies potentially suitable for addressing contaminated river sediments in the Rock River under high and low water levels include (see Tables 2.1 and 2.2):

- No Action
- Institutional Controls
- Containment (capping)
- In situ treatment (monitored natural recovery [MNR], and enhanced monitored natural recovery [EMNR])
- Removal (dredging and excavation)
- Ex situ treatment (e.g., dewatering, physical separation, chemical extraction, etc.)
- Disposal (confined disposal facility [CDF], nearshore bio filtration cell, onshore/upland disposal, or commercial disposal)

The above remedial technologies and their process options were evaluated based on effectiveness, implementability, and relative cost. The technology screening for Rock River sediments is presented in Table 2.1 and 2.2. The retained technologies are highlighted in boldface, and for technologies that were screened out, the rationale for not retaining them is provided.

2.4 Identification of Remedial Action Options

The retained technologies were assembled into a set of remedial action options that are intended to achieve the RAOs for the Site, independent of the status of the Monterey Dam and Rock River water level. The remedial action options considered suitable for high (i.e., dam is retained) and low (i.e., dam is removed) water level conditions include:

- Option 1 - No action (included for comparison only)
- Option 2 - Sediment removal and disposal
- Option 3 - Engineered isolation cap
- Option 4 - Engineered isolation cap with partial removal and disposal

2.4.1 Option 1 – No Action

The No Action option consists of no active remediation efforts, no engineering or institutional controls, and no long-term monitoring. Administrative activities may be required as part of the WDNR and U.S. EPA's long-term oversight responsibilities for the Site. This option serves as a baseline for comparison with other options and involves taking no action towards a remedy, implying no active management or expectation that the RAOs will be achieved over time. The No Action option would not be protective of the environment and would not comply with environmental laws and standards under NR 722.09(2), Wis. Admin. Code.

2.4.2 Option 2 – Sediment Removal and Disposal

Option 2 consists of the removal of sediments within the remedial action area through either dredging (mechanical or hydraulic) or excavation and dewatering of removed sediments with mechanical dewatering. The dredged or excavated sediments would either be disposed to an on-Site/on-Property approved landfill or off-Site commercial non-hazardous and/or hazardous landfill. To minimize mobilization of sediments outside the removal area either a silt curtain, cofferdam, or silt fence will be employed surrounding the removal activities. After dredging or excavation, a 12-inch layer of habitat-suitable media (e.g., sand) will be placed in the Rock River. A conceptual cross section of the completed sediment removal and disposal remedy is shown on Figure 2.2. Option 2 consists of six sub-options (2a, 2a-S, 2b, 2c, 2d, and 2e):

- Option 2a: Mechanical Dredging with Silt Curtains (high water level) and Filter Press Dewatering
- Option 2a-S: Mechanical Dredging with Silt Curtains (high water level) and Stabilization Amendment
- Option 2b: Hydraulic Dredging with Silt Curtains (high water level)
- Option 2c: Hydraulic Dredging within Cofferdam (high water level)
- Option 2d: Excavation within Cofferdam (high or low water level)
- Option 2e: Excavation with Silt Fence (low water level)

Dredging and excavation operations will be controlled by either using a silt curtain (Option 2a, Option 2a-S, and Option 2b), a cofferdam (Option 2c and Option 2d), or a silt fence (Option 2e) to minimize transport of sediments and/or water outside the removal area. Mechanical dredging (through use of barge-based excavator) is used in Option 2a and 2a-S, and hydraulic dredging (through the use of hydraulic dredger and floating pipeline) is used in Options 2b and 2c. Both mechanical and hydraulic dredging with silt curtains are suitable for a high Rock River water level when the Monterey Dam is in-place or not yet removed. Hydraulic dredging within a cofferdam is suitable under a high water level only (Option 2c) and excavation within a cofferdam is suitable for a high or low water level (Option 2d). Excavating with a silt fence (Option 2e) would only be conducted under a low water level, when the Monterey Dam has been removed. Under a high water level, excavation would be conducted after installation of the cofferdam and pumping of overlying water within the cofferdam before excavating sediments with wheeled and/or tracked land-based equipment. All sub-options of Option 2 would be protective of the environment and would comply with environmental laws and standards under section NR 722.09(2), Wis. Admin. Code.

Conceptual layouts of all Option 2 sub-options are shown on Figures 2.3 to 2.8.

2.4.3 Option 3 – Engineered Isolation Cap

Option 3 consists of capping of sediments with stone mattresses and sand to contain the impacted area and remove exposure pathways from the sediments. Capping the sediments will reduce sediment transport from the impacted area through erosion or scour and prevent resuspension of sediments within the impacted area. Stone mattresses will be placed directly on top of the existing sediment surface, and six inches of clean sand will then be placed on top of the stone mattress to provide infill in the stone layer and additional capping on top of the stone. Option 3 would be protective of the environment and would comply with environmental laws and standards under section NR 722.09(2), Wis. Admin. Code.

A conceptual cross-section of Option 3 is shown on Figure 2.9. A conceptual layout Option 3 is shown on Figure 2.10.

2.4.4 Option 4 – Engineered Isolation Cap with Partial Removal and Disposal

Option 4 consists of a blended approach that combines partial removal with capping. Partial removal before capping will reduce the volume of impacted sediments, as well as reducing exposure pathways to the impacted sediments. Option 4a utilizes a 6-inch stone mattress with a 6-inch cap, requiring removal of 1 foot of impacted sediments to bring the overall cap to the original sediment surface profile. Option 4b utilizes 6-inches of sand and/or a geotextile as a bottom layer, 12-inches of rock as an intermediate layer, and 6-inches of sand as a top layer, requiring removal of 3 ft of impacted sediments to bring the overall cap to the original sediment surface profile. In high water level conditions, removal will be accomplished through mechanical dredging with a silt curtain, and in low water level conditions, removal will be accomplished by excavation with a silt curtain. Option 4a and Option 4b would be protective of the environment and would comply with environmental laws and standards under section NR 722.09(2), Wis. Admin. Code.

Conceptual cross-sections of Option 4a and Option 4b are shown on Figures 2.11 and 2.12, respectively. Conceptual layouts of Option 4a and 4b are shown on Figures 2.13 and 2.14, respectively.

2.5 Evaluation Criteria

The remedial action options described in Section 2.4 were evaluated using the following criteria in compliance with section NR 722.07 and section NR 722.09. Wis. Admin. Code.

2.5.1 Technical Feasibility

The technical feasibility of each remedial action option was evaluated using the following criteria: long-term effectiveness, short-term effectiveness, implementability, and remediation time frame. The definition of each criterion is provided below.

Long-term Effectiveness

This criterion evaluates the level of risk remaining after the remedial action is completed, and considers the degree to which the toxicity, mobility, and volume of contamination is expected to be reduced as well as the degree to which the remedial action option, if implemented, will protect public health, safety, and welfare of the environment over time.

Short-term Effectiveness

This criterion evaluates the level of risk associated with the construction and implementation period of a remedial action option, until case closure under chapter NR 726, Wis. Admin. Code.

Implementability

This criterion evaluates the feasibility of implementing a remedial action option, with consideration to the type of contaminants and water flow conditions present at the site, the availability of materials, equipment, technologies and services, monitoring requirements, and the activities and time needed to obtain any necessary licenses, permits or approvals.

Remediation Time Frame

This criterion evaluates the expected time needed to complete remediation, with consideration to the proximity of contamination to receptors, presence of sensitive receptors, presence of threatened or endangered species, current and potential use of the aquifer, the magnitude, mobility and toxicity of the contamination, geologic and hydrogeologic conditions, and the effectiveness, reliability and enforceability of continuing obligations.

2.5.2 Economic Feasibility

The economic feasibility of each remedial action option was evaluated in consideration of capital costs, initial costs (e.g., pre-design, design, and oversight), operation and maintenance costs, total present worth of the costs, and the costs associated with potential future liability.

2.6 Evaluation of Remedial Action Options

The following tables show the expected performance of each remedial action option in relation to the technical and economic feasibility criteria defined in Section 2.5.

Remedial Action Option	Technical Feasibility Criteria			
	Long-Term Effectiveness	Short-Term Effectiveness	Implementability	Remediation Time Frame
Option 1 – No Action	None	None	None	None
Option 2 – Sediment Removal and Disposal	High	High	High	Short
Option 3 – Engineered Isolation Cap	Moderate	High	Moderate	Short
Option 4 – Engineered Isolation Cap with Partial Removal and Disposal	Moderate	High	Moderate	Short

Remedial Action Option	Economic Feasibility Criteria				
	Capital Costs	Initial Costs	Annual Operation and Maintenance Costs	Total Present Worth of Costs	Costs Associated with Potential Future Liability
Option 1 – No Action	None	None	None	None	High
Option 2 – Sediment Removal and Disposal	Moderate-High	High	Low	Moderate	Low
Option 3 – Engineered Isolation Cap	Moderate	Moderate	High	Moderate-High	Moderate
Option 4 – Engineered Isolation Cap with Partial Removal and Disposal	Moderate-High	Moderate-High	Moderate	Moderate-High	Low-Moderate

3. Selected Remedial Action

Based on the evaluation presented in Section 2.6, Option 2, "Sediment Removal and Disposal", is the proposed remedy for the remedial action area sediments. Removal and disposal is anticipated to be the most effective and permanent remedy that can best meet the RAOs. It is also expected to be the most acceptable remedy to the Janesville community. This proposed remedy is based on the estimated volume of sediments in the remedial action area (i.e. 16,000 CY). Increases in volumes could change the recommended option (e.g., capping).

The exact sediment removal option (Options 2a, 2a-S, 2b, 2c, 2d, and 2e) will be determined dependent on the Monterey Dam removal schedule and during the detailed design. Dewatered solids from the sediment removal will be loaded on trucks for transport and off-Site landfill disposal. Solid characterization and monitoring will be conducted to ensure compliance with applicable landfill disposal requirements. For further details on the conceptual design and implementation details for all Option 2 sub-options, see Appendix A.

3.1 Proposed Schedule

The design and construction of the remedy is expected to take approximately 12 to 18 months as follows:

	Estimated Duration
Conceptual (30%) Design Report(1)	1.5 months
Pre-Final (95%) Design Report(1)	3 months
Final (100%) Design Report(1)	1.5 months
Construction(2)(3)(4)	6 to 12 months
Total	12 to 18 months

Notes:

(1) Design Report will include detailed design discussion, plans, specifications, treatability studies, and engineering calculations. The various design reports are subject to Agency permits (including United States Army Corps of Engineers [USACE]) and approvals, as necessary.

(2) Mobilization in May, removal of sediments in June, demobilization in October (Spring, Summer, and Fall project [construction season]).

(3) Dependent on weather, permit requirements, and WDNR approvals, as necessary.

(4) Construction Certification Report would require 3 months from the substantial completion of the remedy.

3.2 Cost Estimation

An estimate of the approximate total cost of implementing Option 2 is shown in the table below (provided as an estimate, costs will be re-assessed during the design).

	Estimated Cost (Millions, 2017 dollars)
Capital Costs	$2.9 to $5.0
Initial Costs (pre-design, design, oversight)	$0.5
Total Present Worth of Costs	$3.4 to $5.5

3.3 Sustainable Remedial Action

In accordance with section NR 722.09(2m), Wis. Admin. Code, the selected remedial action option was evaluated based on sustainable remediation action criteria as follows:

Total energy use and the potential to use renewable energy

As indicated in Section 3.1, the project schedule for implementing Option 2 has been set as to occur during the summer months (e.g., construction season). This will result in energy savings due to

reduced electricity requirements for lighting and heating at the remediation site. In addition, if possible, the closest acceptable off-Site landfill (subject to future environmental liability considerations) will be selected in order to reduce diesel fuel consumption associated with transporting the resulting sediments.

Generation of air pollutants, including particulate matter and greenhouse gas emissions

As the sediments will be excavated under wet conditions, the generation of particulate matter will be minimal. During the transportation of resulting solids to the off-Site landfill, the use of covered hauling trucks will be used to reduce fugitive dust emissions.

In order to reduce greenhouse gas emissions, construction equipment and vehicles will be turned off when not in use, as required. In addition, during the transportation of resulting sediments to the off-Site landfill, a transportation route will be selected to minimize the distance travelled (subject to safety concerns).

Water use and impacts to water resources

The excavated sediments will be dewatered and all resulting filtrate will be treated in the temporary construction on-Site wastewater treatment plant prior to being released to the municipal sanitary sewer, or to the Rock River under a National Pollutant Discharge Elimination System (NPDES) permit.

The future land use and enhancement of ecosystems, including minimizing unnecessary soil and habitat disturbance and destruction

The incorporation of a silt curtain, cofferdam or silt fence will capture sediment runoff from the remedial action area, preventing sediment runoff within the Rock River.

Reducing, reusing and recycling materials and wastes, including investigative or sampling wastes

The excavated sediments will be dewatered and the dewatering method will be optimized to reduce the total volume of resulting solids for disposal (minimizing depletion of approved landfill capacity).

In addition, a recycling program will be implemented during construction.

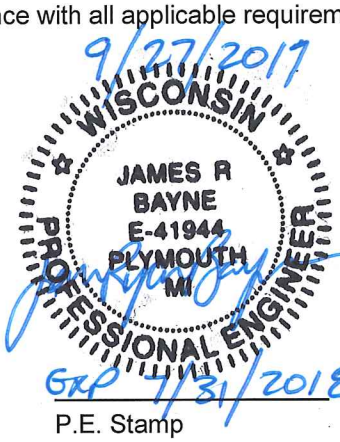
Optimizing sustainable management practices during long-term care and stewardship

The selected remedy has a short remediation time frame and is anticipated to be the most acceptable remedy to the Janesville, Wisconsin community.

4. Certifications

"I, James Ryan Bayne, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."

9/27/2017



Project Advisor, PE 141944
Signature, Title, and P.E. Number

EXP 7/31/2018
P.E. Stamp

"I, Thomas Kinney, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, and that, to the best of my knowledge, all information contained in this document is correct and the documentation was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."

Thomas Kinney

Senior Geologist, PG #636
Signature and Title

9/28/2017
Date

5. References

ATSDR, 1995. Toxicological Profile for Polycyclic Aromatic Hydrocarbons. August.

ATSDR, 1999. Toxicological Profile for Mercury. March.

ATSDR, 2000. Toxicological Profile for Polychlorinated Biphenyls (PCBs). November.

GHD, 2016a. Phase II Environmental Site Assessment (ESA) Work Plan, GM Janesville Assembly Plant, 1000 General Motors Drive, Janesville, Wisconsin. Memorandum to Kim Tucker-Billingslea, GM. January 4.

GHD, 2016b. Draft Sediment Investigation and Data Evaluation Report, GM Janesville Assembly Plant, 1000 General Motors Drive, Janesville. May 30, 2016.

GHD, 2016c. Revised Supplemental Rock River (Mile 178.5 to 180.5) Investigation (Work Plan), GM Janesville Assembly Plant, 1000 General Motors Drive, Janesville. November 18, 2016.

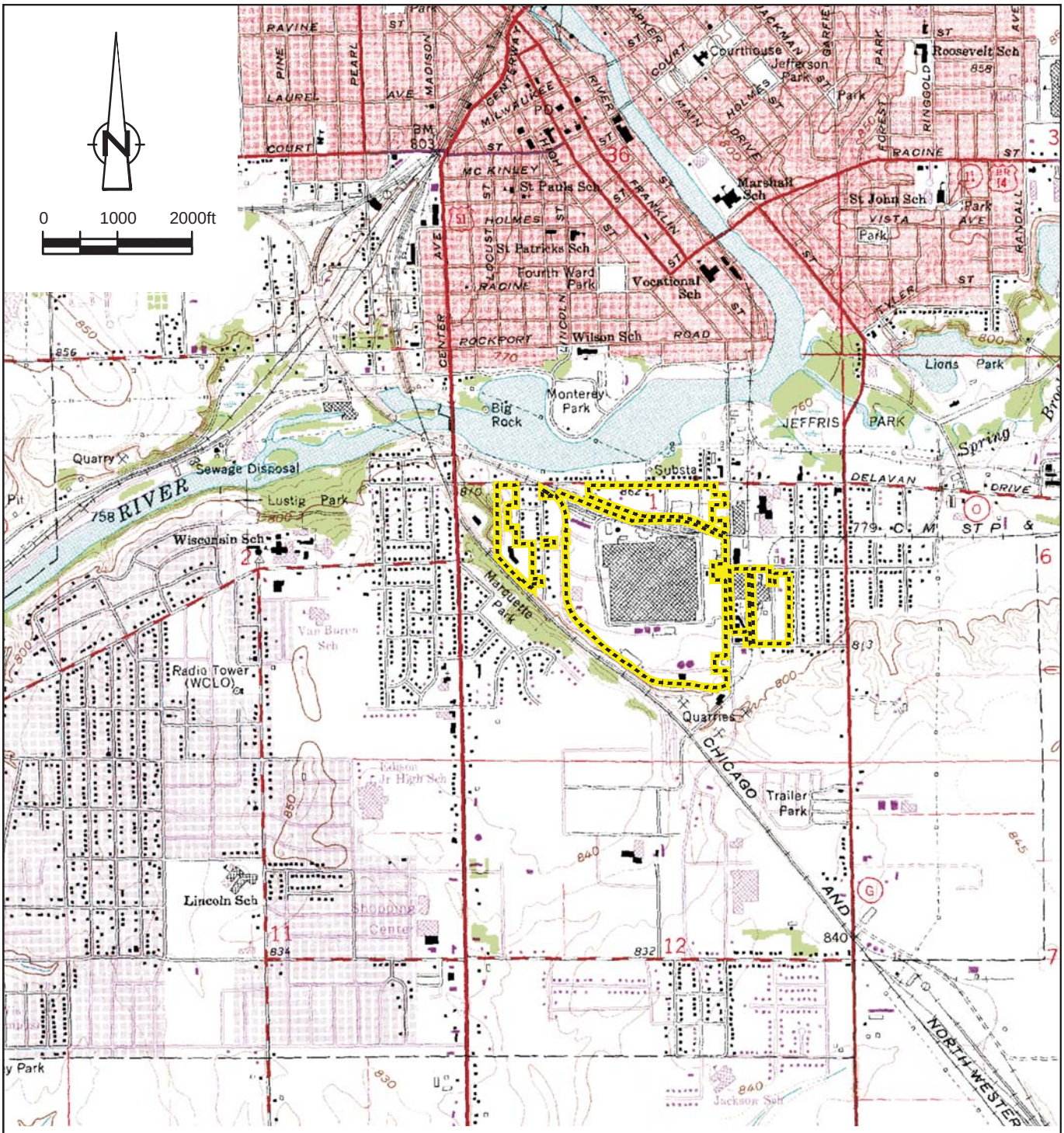
GHD, 2017. Rock River (RM 178.5 to 180.5) Site Investigation Report, GM Janesville Assembly Plant, 1000 General Motors Drive, Janesville. May 31, 2017.

Inter-Fluve, Inc., 2015. Monterey Dam Impoundment Sediment Report. December 22, 2015.

USGS, 1980. Feature Detail Report for: Rock River. https://geonames.usgs.gov/apex/f?p=gnispq:3:::NO::P3_FID:416824. Accessed August 28, 2017.

Wisconsin Department Natural Resources (WDNR), 2015. Choose Wisely – 2015: A Healthy Guide for Eating Fish in Wisconsin. PUB-FH-824-2015.

Wisconsin Department Natural Resources (WDNR), 2016a. Lower Rock River Basin. http://dnr.wi.gov/water/basin/lowerrock/. Accessed April 21, 2016.



SOURCE: USGS QUADRANGLE MAP;
JANESVILLE WEST , WISCONSIN,
PHOTOREVISED 1971 AND 1976

LEGEND

GM JANESVILLE ASSEMBLY PLANT
PROPERTY BOUNDARY

JANESVILLE
WISCONSIN

figure 1.1

PROPERTY LOCATION
ROCK RIVER (RM 178.5 TO 180.5)
REMEDIAL ACTION OPTIONS REPORT
Janesville, Wisconsin

GHD

LEGEND

- PROPERTY BOUNDARY
- MAIN CHANNEL
- MAJOR OUTFALL

SOURCES:

- IMAGERY PROVIDED BY NAIP IMAGERY OF WISCONSIN, 2015 – U.S. DEPARTMENT OF AGRICULTURE (USDA) FARM SERVICE AGENCY, AERIAL PHOTOGRAPHY FIELD OFFICE (WISCRS-ROCK COUNTY FEET).
- SEDIMENT SAMPLE LOCATIONS FROM MONTEREY DAM SEDIMENT ANALYSIS SEDIMENT ANALYSIS EXHIBIT , INTER-FLUVE, INC, DECEMBER 9, 2015.
- MAJOR OUTFALL LOCATIONS FROM CITY OF JANESVILLE STORM SEWER SYSTEM PERMIT MAP - 2016.
- OTHER STORMWATER OUTFALL LOCATIONS FROM CITY OF JANESVILLE WEB MAPPING APPLICATION, GEOCORTEX VIEWER FOR HTML5, AVAILABLE AT: HTTP:GIS.CI.JANESVILLE.WI.US/HTML5VIEWER/INDEX.HTML?VIEWER=JANESVILLE

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

ROCK RIVER (RM 178.5 TO 180.5)
JANESVILLE, WISCONSIN

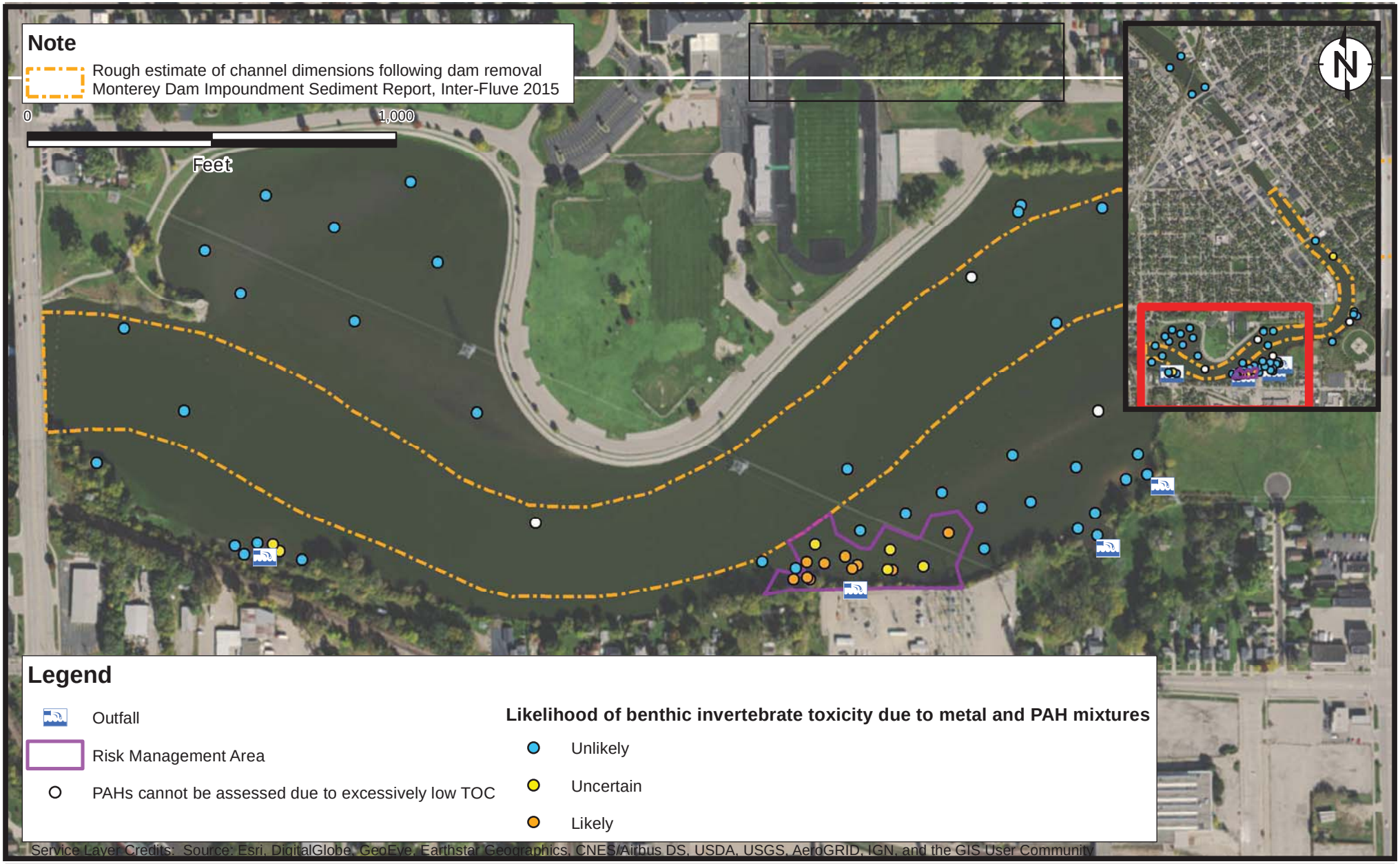
REMEDIAL ACTION OPTIONS REPORT

SITE PLAN - ROCK RIVER
(RM 178.5 TO 180.5)

GHD

Source Reference:			
Project Manager: M.B.	Reviewed By: D.A.	Date: AUGUST 2017	
Scale: AS SHOWN	Project NR: 58505-01	Report NR: 032	Drawing NR: figure 1.2

58505-01(032)GN-WA002 AUG 21, 2017



RAMBOLL ENVIRON

DRAFTED BY: RD | DATE: 4/24/2017

Spatial Distribution of Metal-PAH Mixtures and Toxicity Predictions for Surface Sediments

ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE,WISCONSIN

REMEDIAL ACTION OPTIONS REPORT

FIGURE

1.3

PROJECT: 0227748A

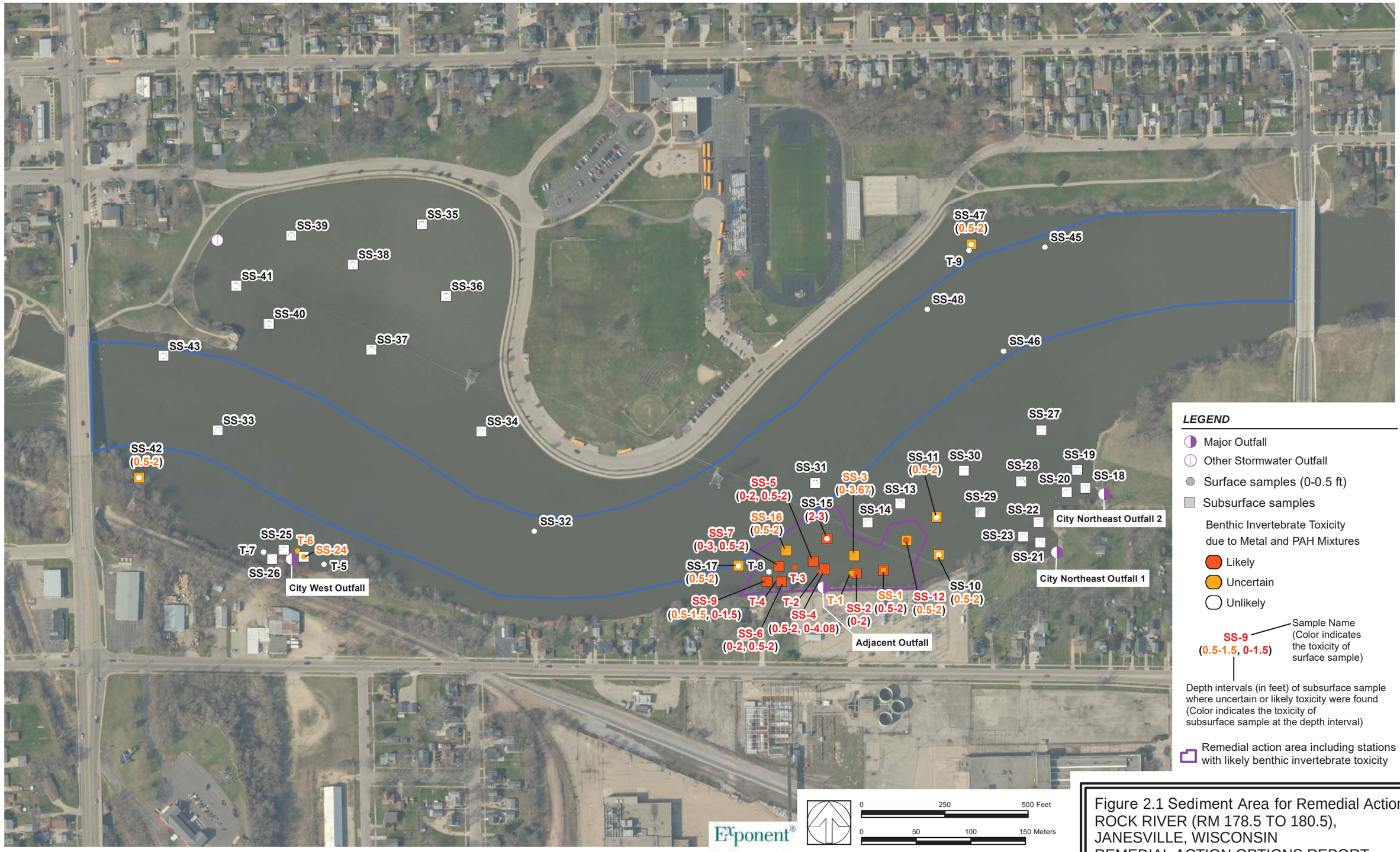


Figure 2.1 Sediment Area for Remedial Action
ROCK RIVER (RM 178.5 TO 180.5),
JANESVILLE, WISCONSIN
REMEDIAL ACTION OPTIONS REPORT

May 9, 2017 / P:\16\1601395_GM_Janesville\GIS\projects\Janesville sedt toxicity.mxd

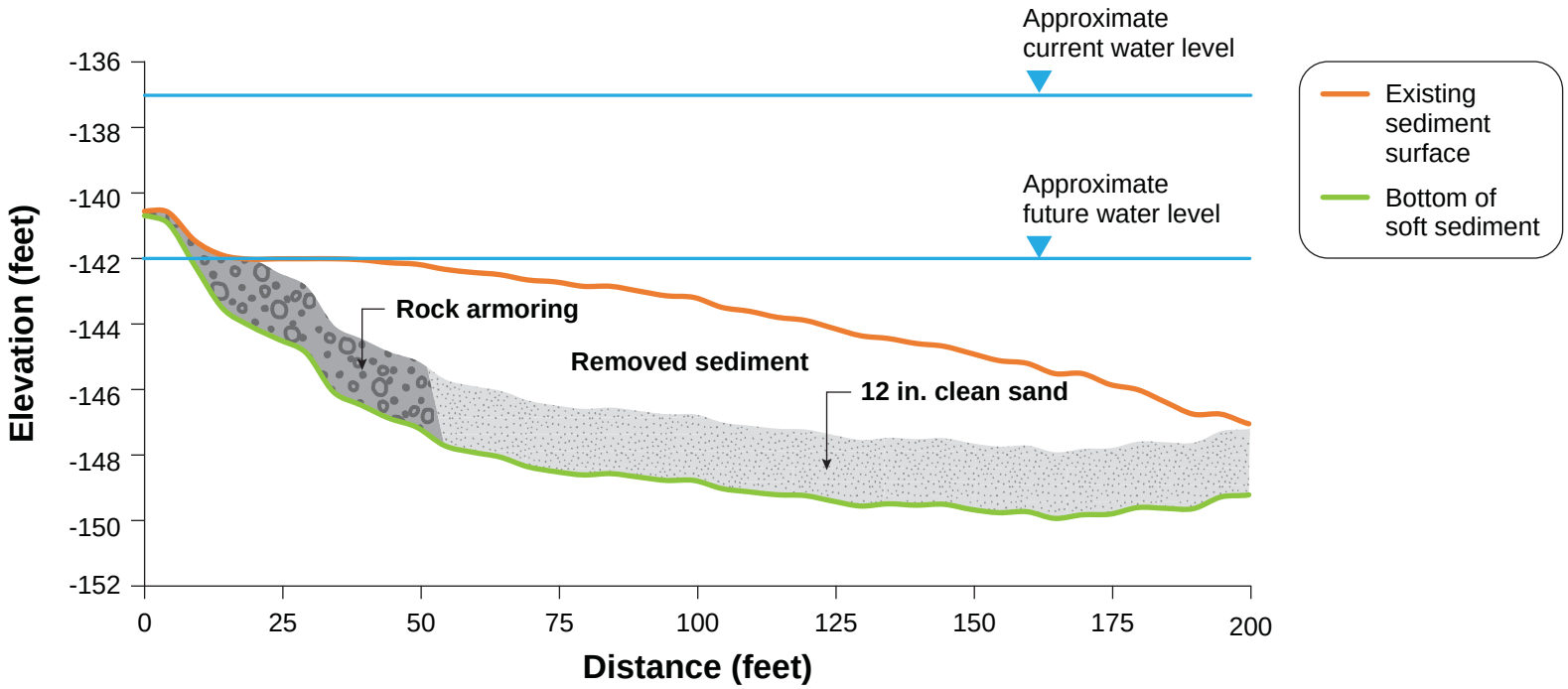


Figure 2.2 Conceptual Cross Section for Option 2: Removal and Disposal
ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE, WISCONSIN
REMEDIAL ACTION OPTIONS REPORT

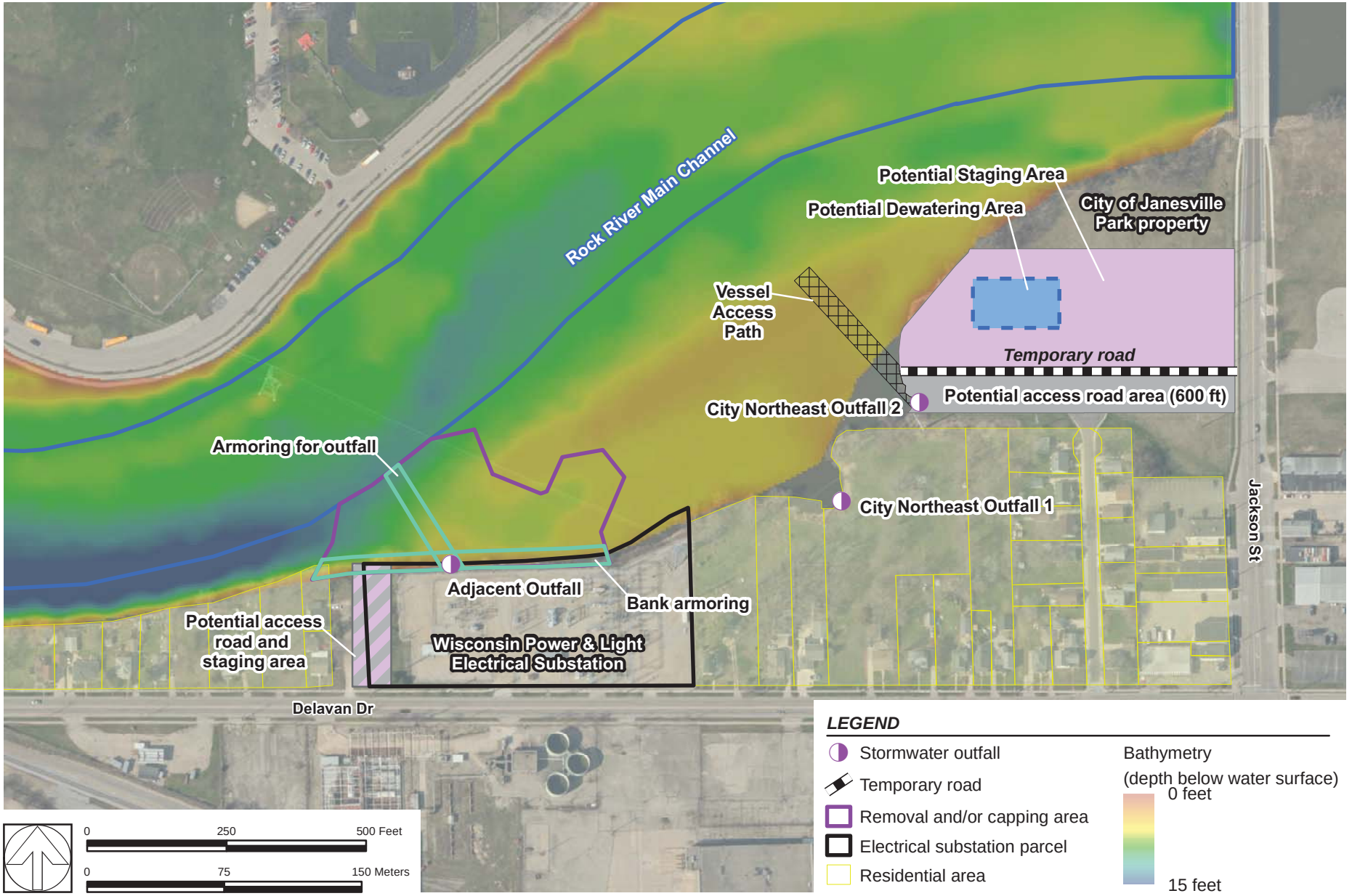


Figure 2.3 Conceptual Layout of Option 2a: Mechanical Dredging with Silt curtains (High Water Level) and Filter Press Dewatering
ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE, WISCONSIN
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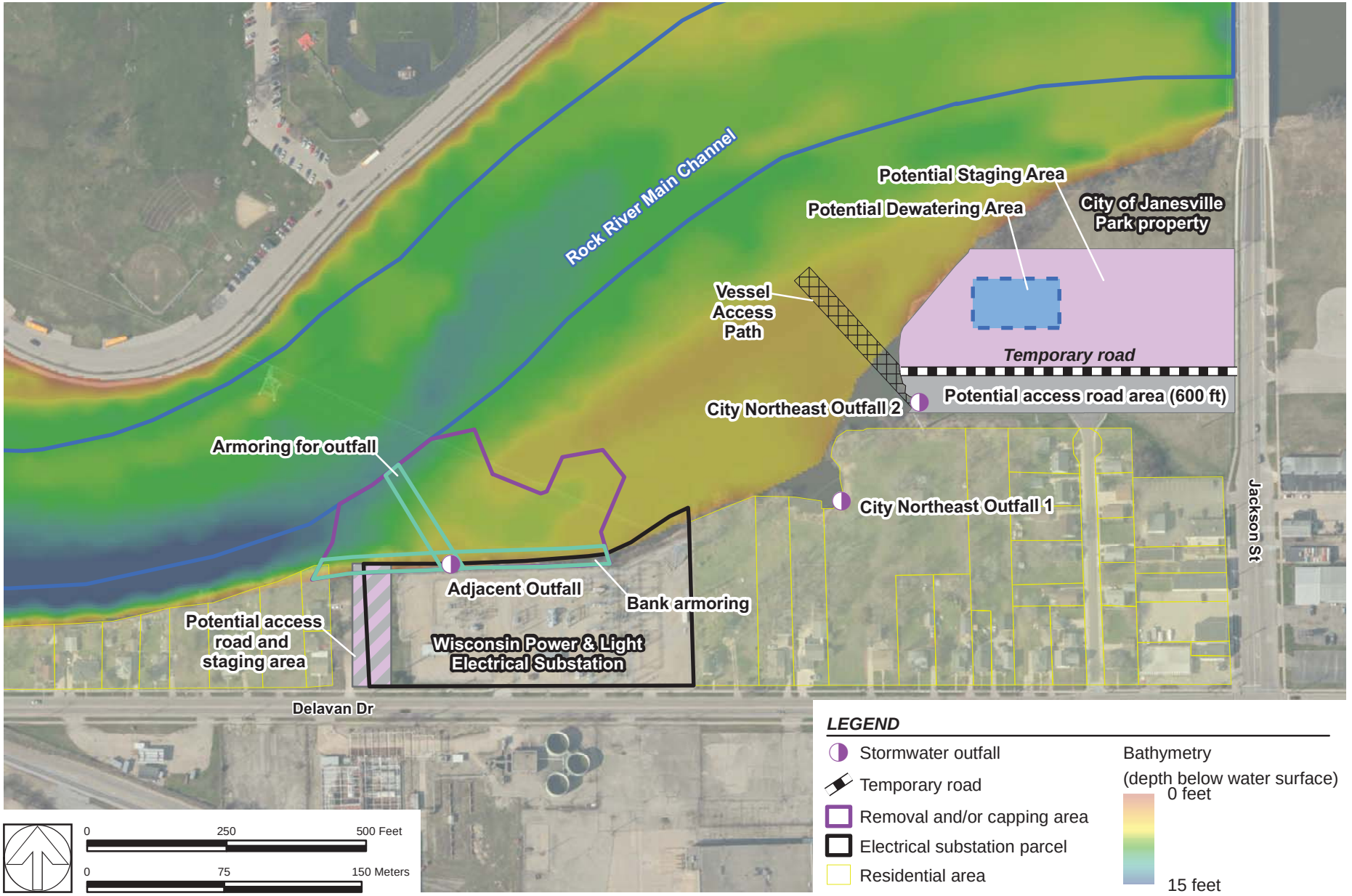

Figure 2.4 Conceptual Layout of Option 2a-S: Mechanical Dredging with Silt Curtains (High Water Level) and Stabilization Amendment
ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE, WISCONSIN
REMEDIAL ACTION OPTIONS REPORT

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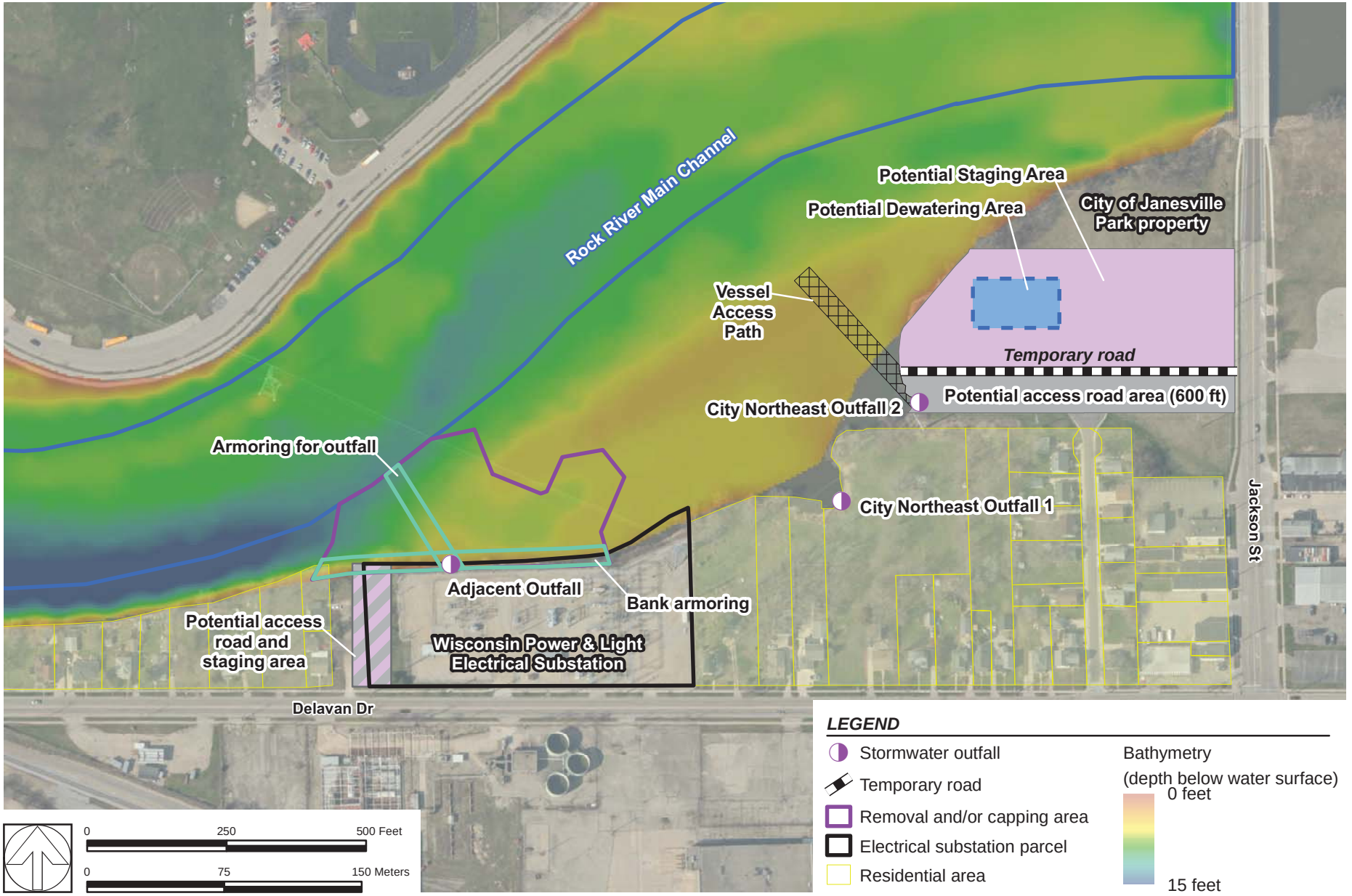

Figure 2.5 Conceptual Layout of Option 2b: Hydraulic Dredging with Silt Curtains (High Water Level)
ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE, WISCONSIN
REMEDIAL ACTION OPTIONS REPORT

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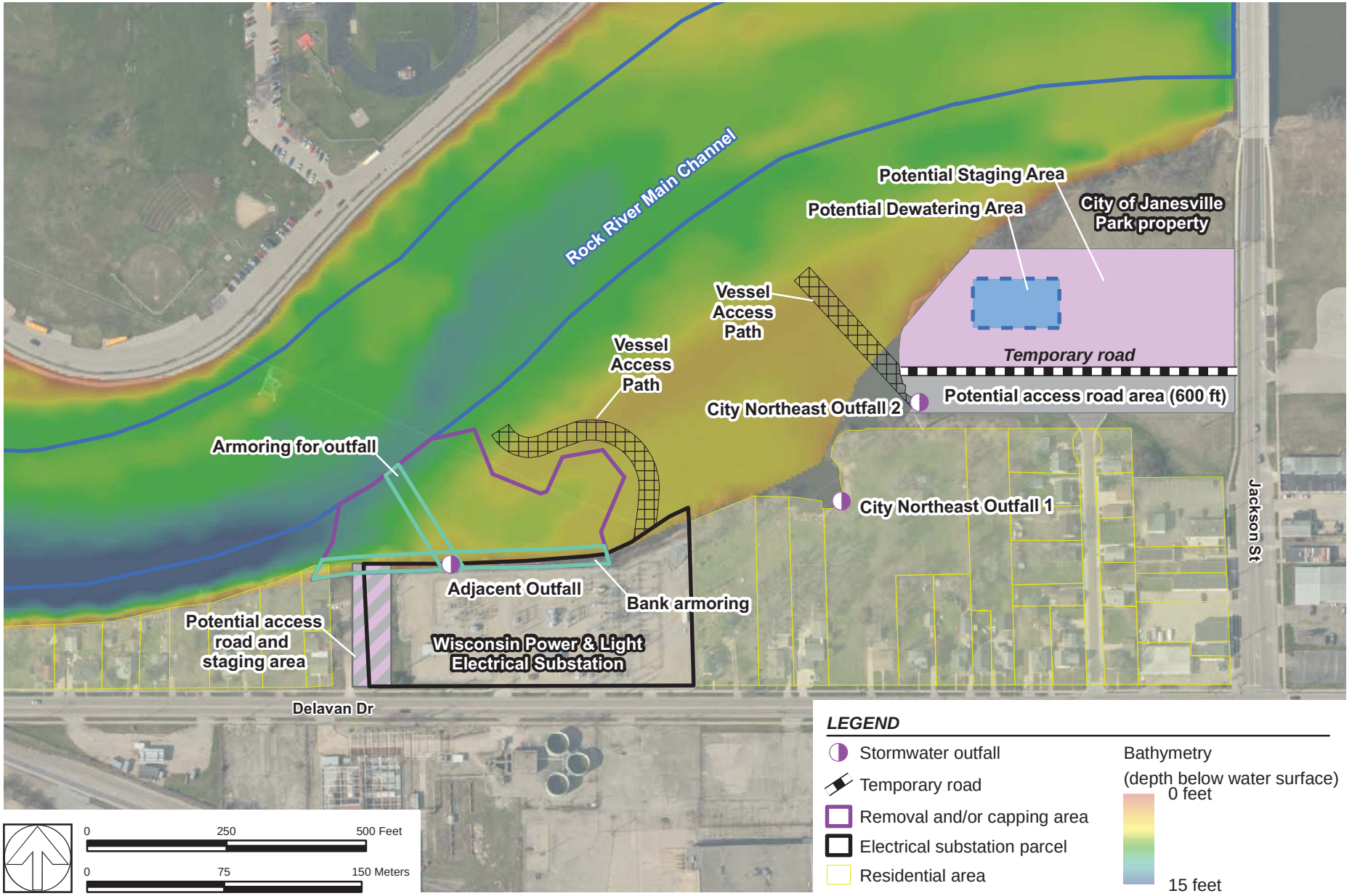

Figure 2.6 Conceptual Layout of Option 2c: Hydraulic Dredging Within Cofferdam (High Water Level)
ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE, WISCONSIN
REMEDIAL ACTION OPTIONS REPORT

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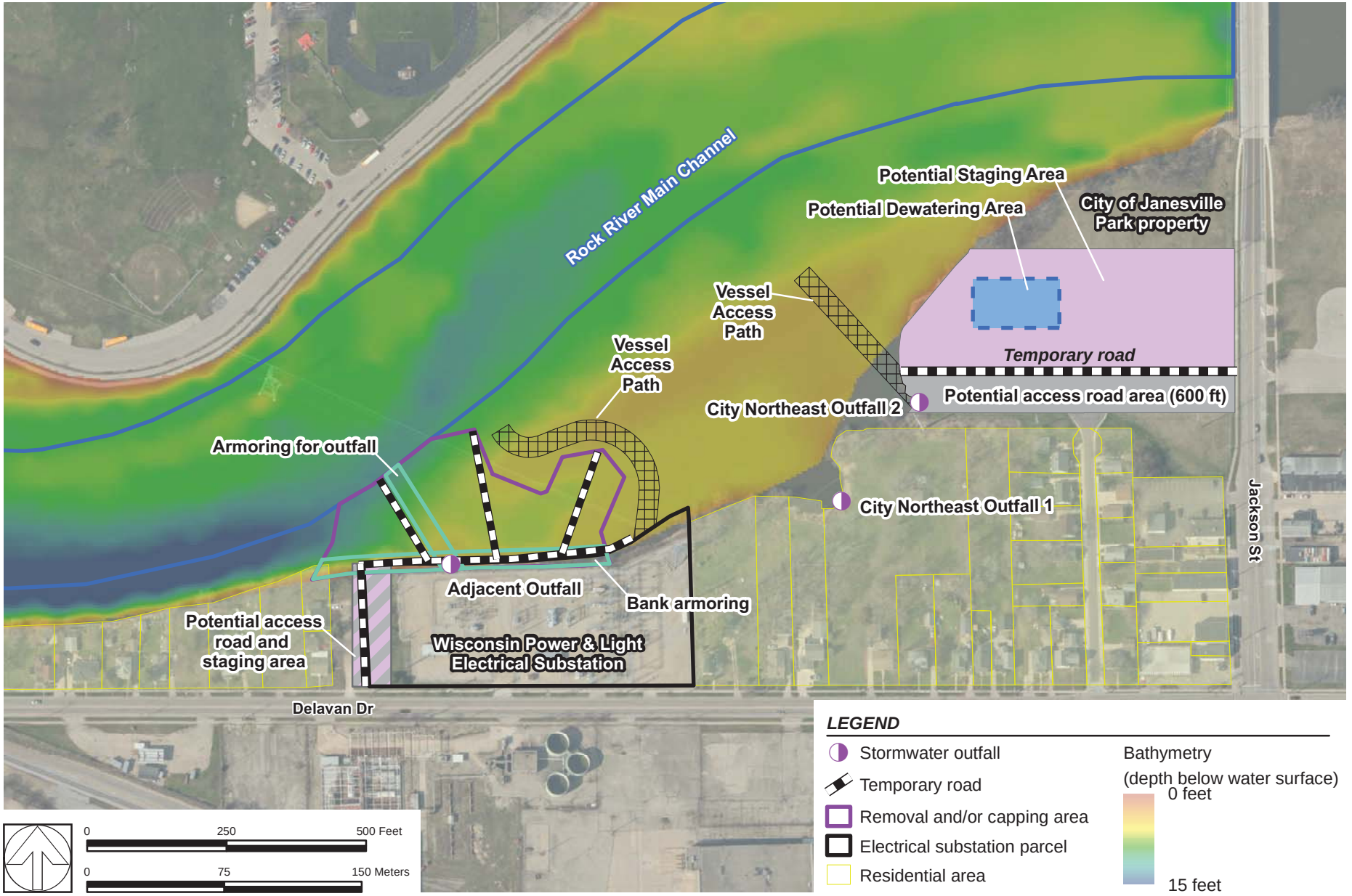

Figure 2.7 Conceptual Layout of Option 2d: Excavation Within Cofferdam (High or Low Water Level)
ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE, WISCONSIN
REMEDIAL ACTION OPTIONS REPORT

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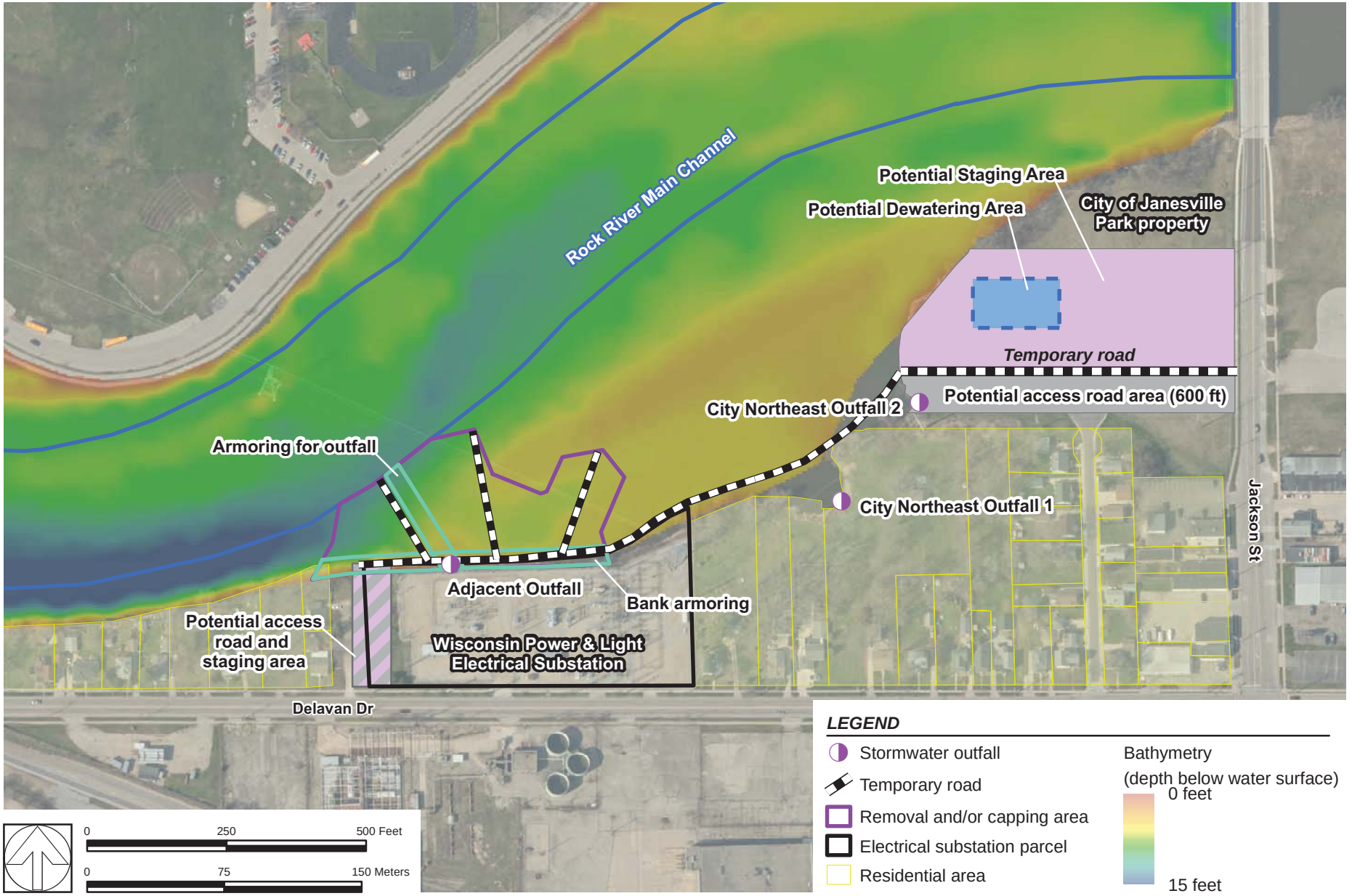

Figure 2.8 Conceptual Layout of Option 2e: Excavation with Silt Fence (Low Water Level)
ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE, WISCONSIN
REMEDIAL ACTION OPTIONS REPORT

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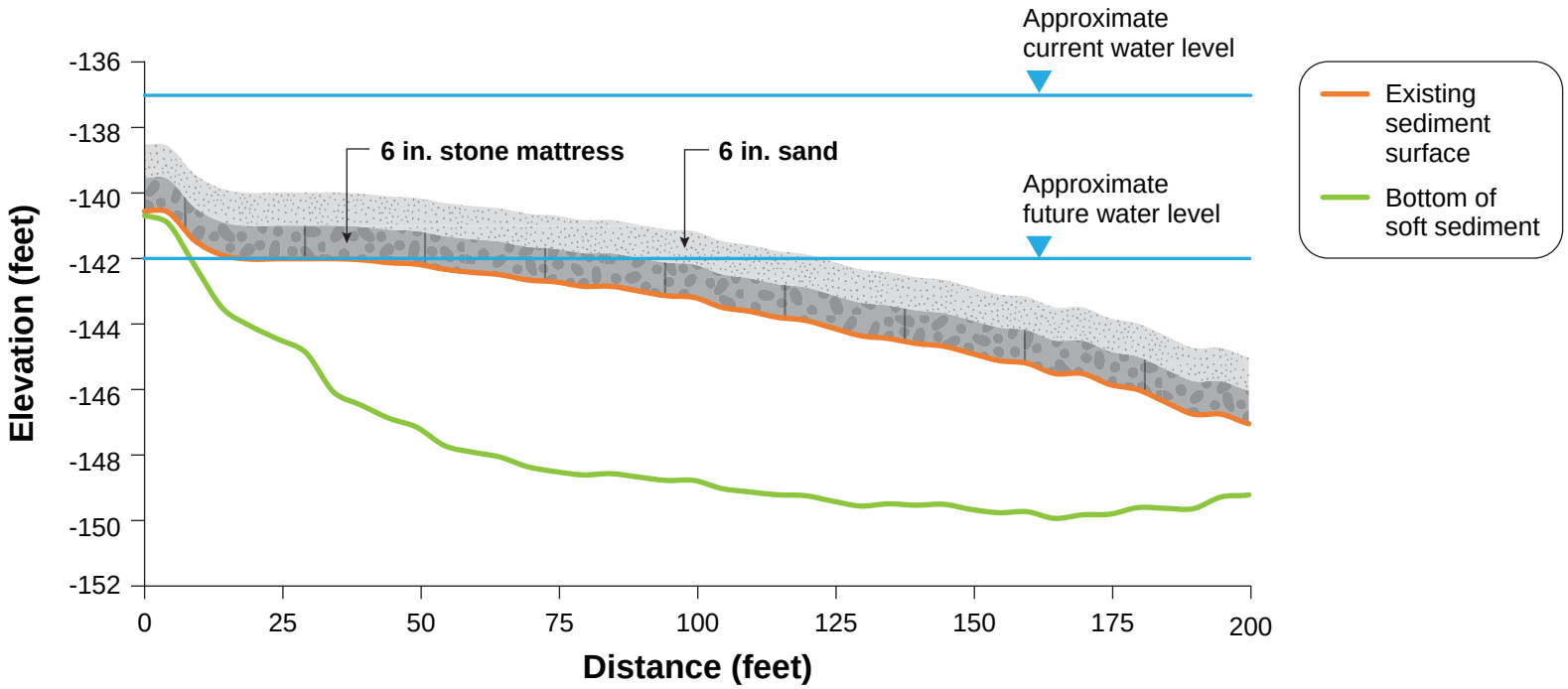

Figure 2.9 Conceptual Cross Section for Option 3: Engineered Isolation Cap
ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE, WISCONSIN
REMEDIAL ACTION OPTIONS REPORT

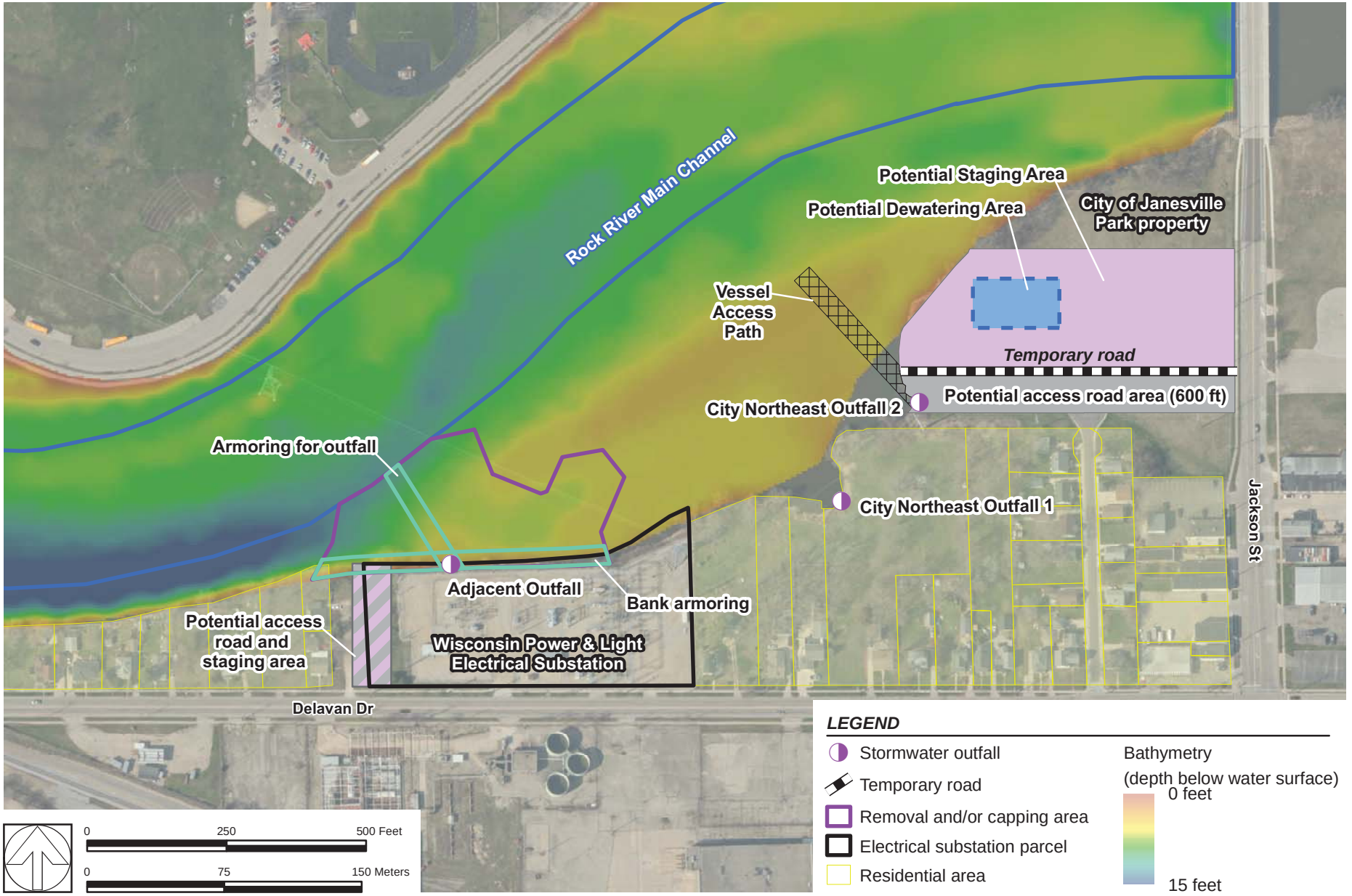

Figure 2.10 Conceptual Layout of Option 3: Engineered Isolation Cap (Using Stone Mattress) (High or Low Water Level)
ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE, WISCONSIN
REMEDIAL ACTION OPTIONS REPORT

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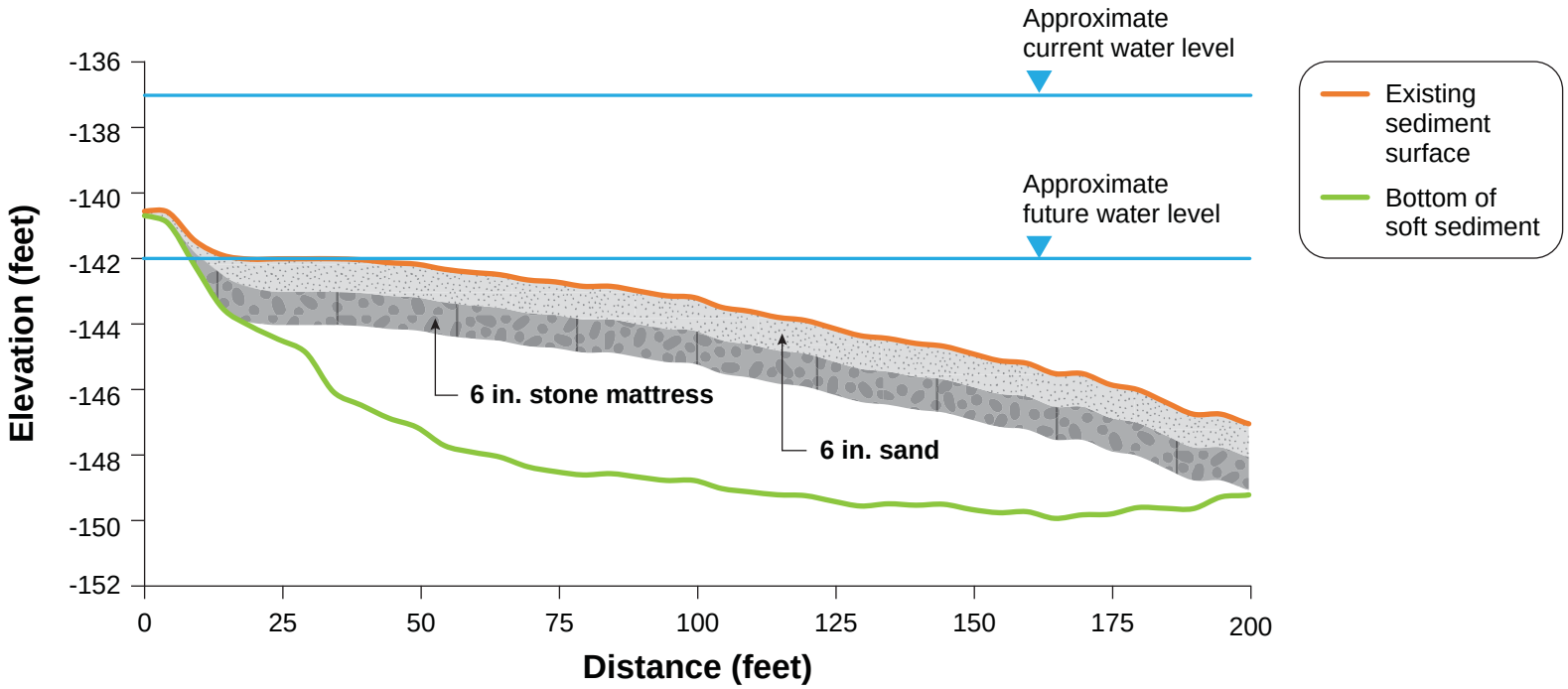

Figure 2.11 Conceptual Cross Section for Option 4a: Engineered Isolation Cap (Using Stone Mattress) with Partial Removal
ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE, WISCONSIN
REMEDIAL ACTION OPTIONS REPORT

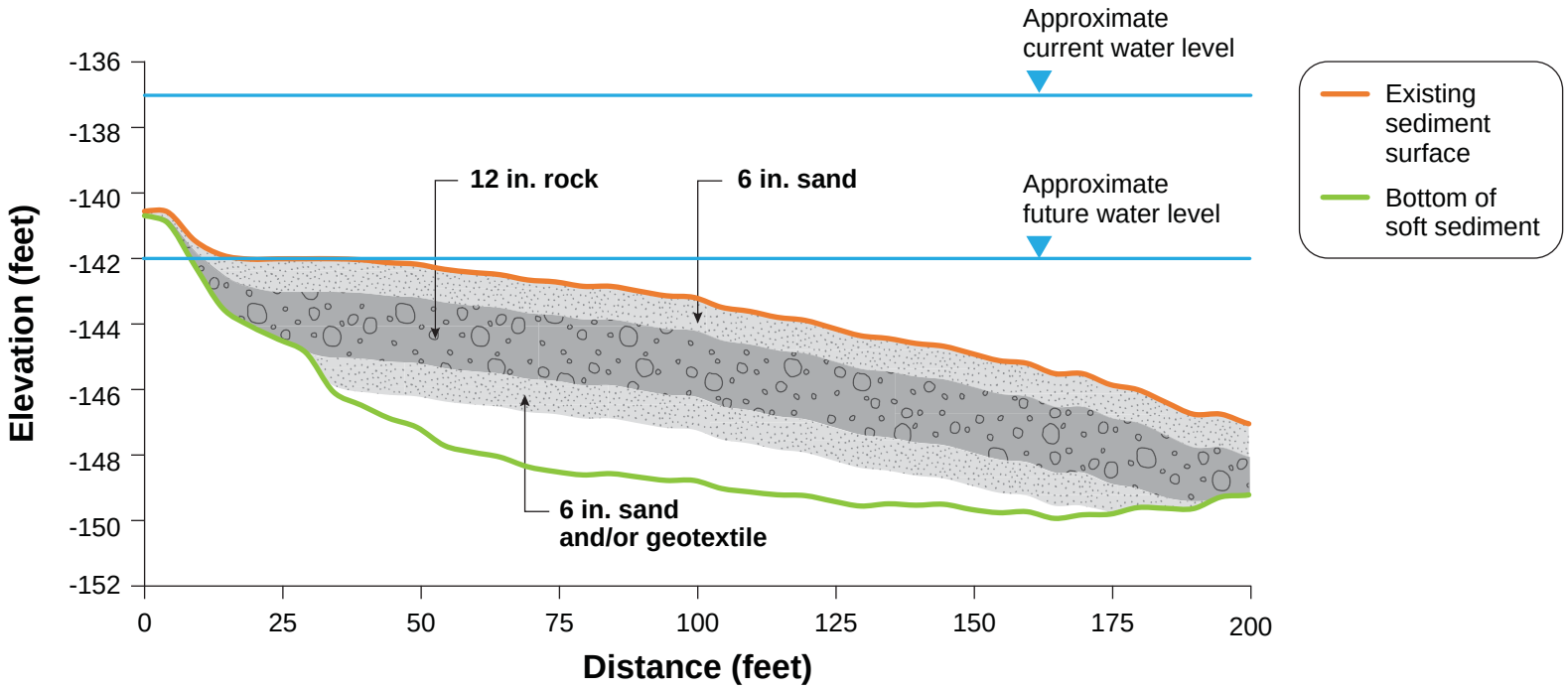

Figure 2.12 Conceptual Cross Section for Option 4b: Engineered Isolation Cap (Using Sand/Rock) with Partial Removal
ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE, WISCONSIN
REMEDIAL ACTION OPTIONS REPORT

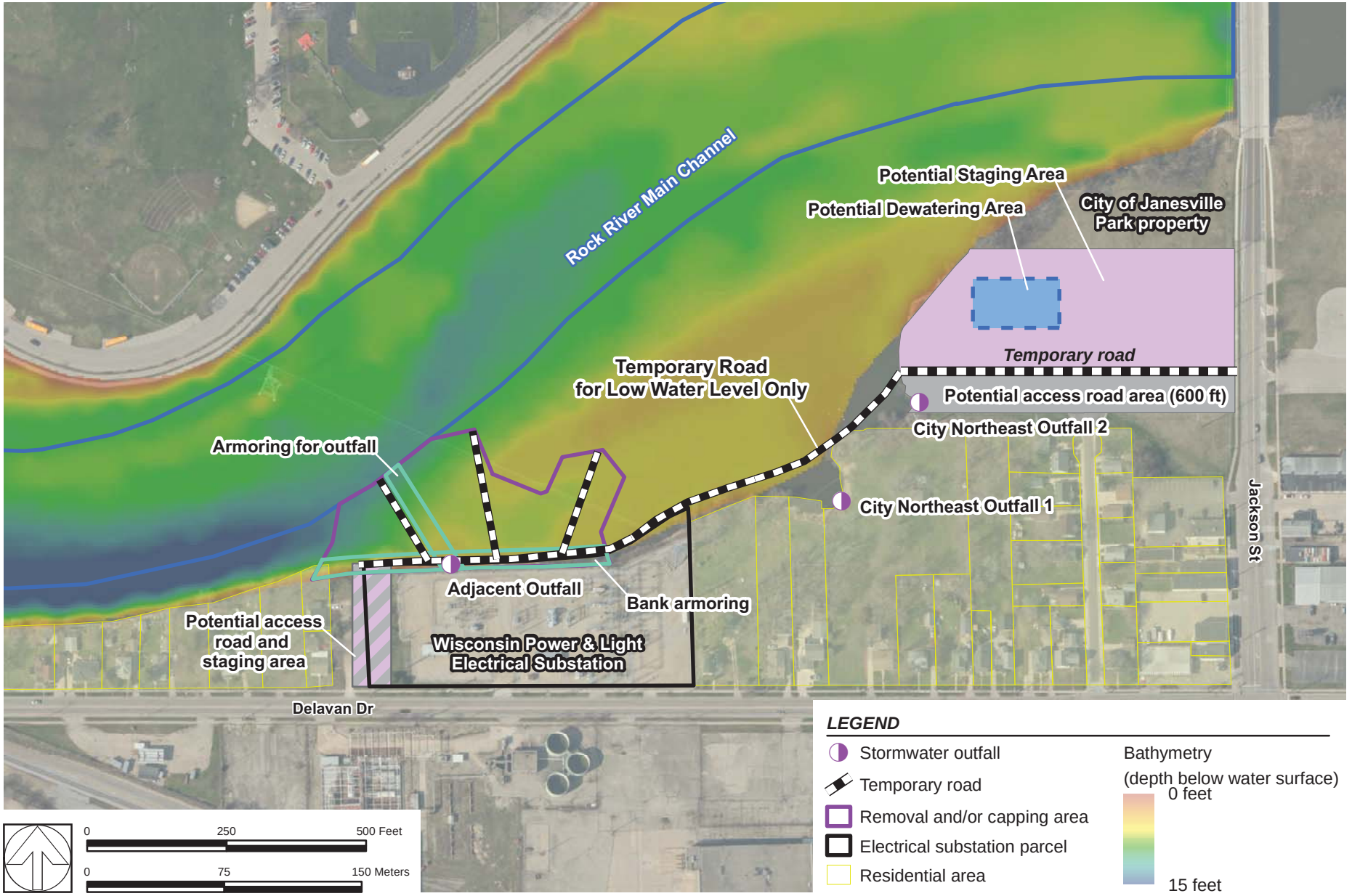

Figure 2.13 Conceptual Layout of Option 4a: Engineered Isolation Cap (Using Stone Mattress) (High or Low Water Level)
ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE, WISCONSIN
REMEDIAL ACTION OPTIONS REPORT

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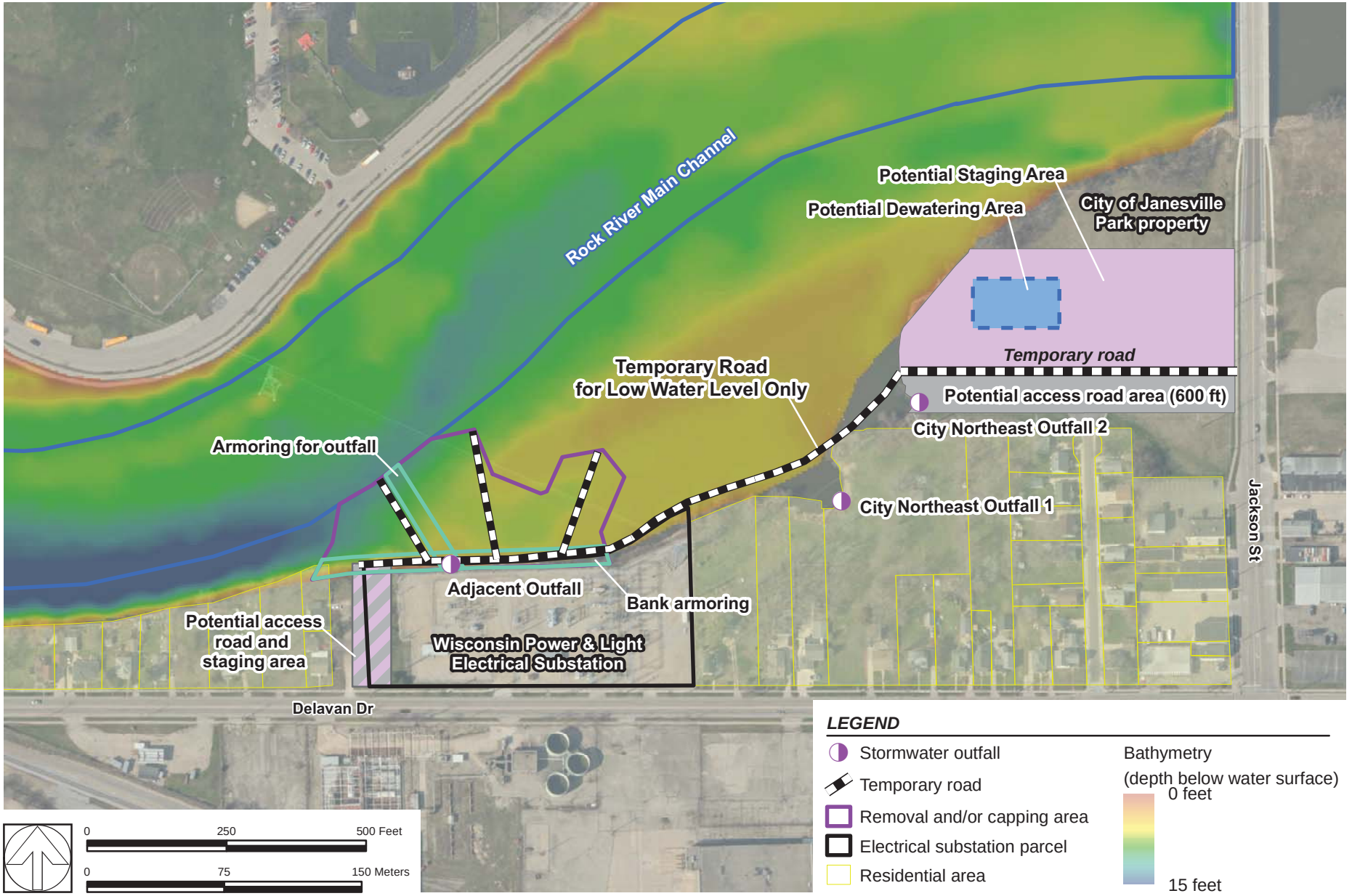

Figure 2.14 Conceptual Layout of Option 4b: Engineered Isolation Cap (Using Sand/Rock) with Partial Removal and Disposal (High or Low Water Level)
ROCK RIVER (RM 178.5 TO 180.5), JANESVILLE, WISCONSIN
REMEDIAL ACTION OPTIONS REPORT

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Table 2.1. Initial Screening of Appropriate Technologies for High Water Level (retained technologies are boldfaced)

General Response Action	Remedial Technology	Process Options	Description	Effectiveness	Implementability	Cost	Retained (Yes/No) and Rationale for Not Retaining
I. No Action	**None**		**No action is performed at the site.**	**not effective**	**implementable**	**low**	**yes – retained as required by NCP**
II. Institutional Controls	A. Activity or use limitations or other legal controls	Can include access restrictions and other legal options	Uses administrative and other means to limit access and exposure to contaminated areas.	not effective for addressing ecological risk	implementable	low	no – would not address ecological risk
III. Containment	**A. Capping**	1. Thick sand cap	Uses a layer of material to isolate and limit exposure to contaminated materials.	problematic in shallow water due to potential erosion and scour	implementable	low to moderate	no - not effective on its own
		2. Composite cap	**Sand or rock and geotextile cap (e.g., rock mattress) to prevent erosion and resuspension of contaminated materials.**	**effective**	**implementable**	**high**	**yes**
		3. Armoring	**Uses rocks or gravel to cap sediments and prevent erosion.**	**effective with other technologies**	**implementable**	**moderate**	**yes**
		4. Layered cap	**Consists of a combination of sand, rocks, geotextile, and any other enhancements as cap layers.**	**effective**	**implementable**	**high**	**yes**
IV. *In Situ* Treatment	A. Monitored natural recovery (MNR)		Uses natural processes such as degradation, bioturbation, and burial by sediment deposition, along with monitoring.	not effective; erosion and sediment loss may occur	implementable	low	no - not effective
	B. Enhanced monitored natural recovery (EMNR)		Uses placement of thin (~6 inches) cap in addition to natural processes like degradation, mixing, and burial, along with monitoring.	not effective; erosion and sediment loss may occur	implementable	moderate	no - not effective
V. Removal	**A. Dredging**	**1. Mechanical**	**Uses equipment such as a clamshell environmental bucket to remove sediment.**	**effective**	**implementable**	**moderate**	**yes**

Table 2.1. Initial Screening of Appropriate Technologies for High Water Level (retained technologies are boldfaced)

General Response Action	Remedial Technology	Process Options	Description	Effectiveness	Implementability	Cost	Retained (Yes/No) and Rationale for Not Retaining
		2. Hydraulic	**Uses centrifugal pumps to remove and transport sediment and water via a pipeline to a barge or disposal facility.**	**effective**	**implementable**	**high**	**yes**
	B. Excavation	**1. Excavator**	**Uses bucket for excavation of sediments.**	**effective**	**implementable; operation on soft sediments must be considered**	**moderate**	**yes**
		2. Clamshell excavator	**Uses equipment such as a clamshell bucket to remove sediment.**	**effective**	**implementable; site access and ability to reach impacted sediments must be considered**	**high**	**yes**
VI. *Ex Situ* Treatment	**A. Dewatering**	1. Passive	Removes excess water from excavated or dredged sediment through passive means (e.g., gravity drainage).	effective	implementable; site space and time concerns as well potential air quality/odor concerns	low	no - implementability and acceptability concerns
		2. Mechanical	**Uses pressure to reduce water content in sediment (e.g., Geotubes® or filter press).**	**effective**	**implementable**	**moderate**	**yes**
	B. Physical separation	1. Screening	Uses physical screening to separate different size fractions from the sediment.	not effective for fine sediments present at site	implementable	low	no - not effective
		2. Sediment washing	Contaminants sorbed onto fine soil particles are separated from bulk sediment on the basis of particle size. The wash water may be augmented with a basic leaching agent, surfactant, pH adjustment, or chelating agent to help remove organics and heavy metals.	not effective for fine sediments present at site	implementable	high	no - not effective
		3. Centrifugal separation	Uses a vortex to generate centrifugal force for density-based separation.	not effective for fine sediments present at site	implementable	moderate	no - not effective

Table 2.1. Initial Screening of Appropriate Technologies for High Water Level (retained technologies are boldfaced)

General Response Action	Remedial Technology	Process Options	Description	Effectiveness	Implementability	Cost	Retained (Yes/No) and Rationale for Not Retaining
	C. Chemical extraction	1. Acid or solvent extraction	Contaminated sediment and an acid or solvent extractant are mixed in an extractor, thereby dissolving the contaminants. The extracted solution is then placed in a separator where the contaminants and extractant are separated for treatment and further use.	not effective for low-level threat wastes[a]	implementable	moderate	no - not effective
		2. Slurry oxidation	Aqueous slurry is created by combining sediments with water and oxidizing agents (e.g., ozone, peroxide, Fenton's reagent). Upon completion, slurry is dewatered and sediment is extracted and disposed of.	not effective for metals	implementable	high	no - not effective
	D. Thermal treatment	1. Thermal desorption, incineration, pyrolysis, high pressure oxidation	Thermal processes used to volatilize, combust, or decompose organic contaminants.	not effective for metals[b]	implementable	moderate	no - not effective
	E. Immobilization	**1. Chemical fixation**	**Uses cementitious materials to stabilize sediment, immobilizing the contaminants within the matrix and/or reducing free water.**	**potentially effective as a process option for disposal**	**implementable**	**high**	**yes – process option for disposal**
	F. Biological treatment	1. Composting and biodegradation	Excavated sediment is composted in above-ground piles or heaps and bacterial or fungal degradation of contaminants occurs. Substrate amendments may be made to enhance degradation and composting.	not effective for metals	implementable	low	no - not effective
VII. Disposal	A. Confined aquatic disposal (CAD)		Dredged contaminated sediment is placed in an aquatic disposal site and capped.	effective, but requires institutional controls and monitoring/maintenance	not implementable, water levels too low, no suitable locations	high	no - water level too low for CAD construction

Table 2.1. Intial Screening of Appropriate Technologies for High Water Level (retained technologies are boldfaced)

General Response Action	Remedial Technology	Process Options	Description	Effectiveness	Implementability	Cost	Retained (Yes/No) and Rationale for Not Retaining
	B. Confined disposal facility (CDF)		Dredged contaminated sediment is placed in a disposal facility that is separated from the river by a physical barrier (e.g., sheet pile).	effective; requires institutional controls and monitoring/maintenance	implementable	high	no – longevity and cost concerns
	C. Nearshore biofiltration cell		Dredged contaminated sediment is placed in a confined treatment facility where biodegradation is implemented or enhanced.	not effective for metals	may not be implementable given site setting	moderate	no - not effective
	D. Onshore/ upland disposal	**1. Onsite landfill (non-hazardous waste)**	**Dredged or excavated contaminated sediment is placed as an onshore fill and capped.**	**effective**	**may be implementable depending on future site use**	**moderate**	**yes**
		2. Regional landfill (non-hazardous waste)	**Dredged or excavated contaminated sediment is transported to a regional landfill for disposal. May be combined with an *ex situ* treatment technology to meet disposal requirements.**	**effective**	**implementable**	**moderate**	**yes**
		3. Hazardous waste landfill	**Dredged or excavated contaminated sediment is transported to a regional hazardous waste landfill for disposal.**	**effective**	**implementable**	**high**	**yes**

Note: Bolded technologies were retained for assembly of remedial alternatives.

[a] EPA's presumptive remedy for metals-in-soil sites identifies the technologies that are applicable to principal-threat wastes and low-level threat wastes. Confinement is the presumptive remedy for low-threat-level wastes (U.S. EPA. 1999. Presumptive remedy for metals-in-soil sites. EPA 540-F-98-054. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC.).

[b] Not effective for metals other than mercury.

Table 2.2 Initial Screening of Appropriate Technologies for Low Water Level (retained technologies are boldfaced)

General Response Action	Remedial Technology	Process Options	Description	Effectiveness	Implementability	Cost	Retained (Yes/No) and Rationale for Not Retaining
I. No Action	**None**		**No action is performed at the site.**	**not effective**	**easily implemented**	**low**	**yes – retained as required by NCP**
II. Institutional Controls	A. Activity or use limitations or other legal controls	Can include access restrictions and other legal options	Uses administrative and other means to limit access and exposure to contaminated areas.	not effective for addressing ecological risk	implementable	low	no – would not address ecological risk
III. Containment	**A. Capping**	1. Thick sand cap	Uses a layer of material to isolate and limit exposure to contaminated materials.	problematic in shallow water or floodplain due to potential erosion and scour	implementable	low to moderate	no - not effective on its own
		2. Composite or layered cap	**Soil or rock and geotextile cap (e.g., rock mattress) to prevent erosion of contaminated materials.**	**effective**	**implementable**	**high**	**yes**
		3. Armoring	**Uses rocks or gravel to cap sediments and prevent erosion.**	**effective in combination with other technologies**	**implementable**	**moderate**	**yes**
		4. Layered cap	**Consists of a combination of sand, rocks, geotextile, and any other enhancements as cap layers.**	**effective**	**implementable**	**high**	**yes**
IV. *In Situ* Treatment	A. Monitored natural recovery (MNR)		Uses natural processes such as degradation and bioturbation, along with monitoring.	not effective; erosion and sediment loss may occur	implementable	low	no - not effective
	B. Enhanced monitored natural recovery (EMNR)		Uses placement of thin (~6 inches) cap in addition to natural processes like degradation and mixing, along with monitoring.	not effective; erosion and sediment loss may occur	implementable	moderate	no - not effective
	C. Dewatering	**1. Sump pumping**	**Removes excess water from excavated or dredged sediment through sump pumping to facilitate other treatment or disposal options.**	**effective**	**implementable**	**moderate**	**yes**

Table 2.2 Initial Screening of Appropriate Technologies for Low Water Level (retained technologies are boldfaced)

General Response Action	Remedial Technology	Process Options	Description	Effectiveness	Implementability	Cost	Retained (Yes/No) and Rationale for Not Retaining
	D. Immobilization	1. Chemical fixation	Chemical reactions are induced between a stabilizing agent and contaminants to reduce contaminant mobility.	may not be effective for low-level metals and PAHs	implementable; *in situ* mixing and water quality management required	high	no - not effective
V. Removal	**A. Excavation**	**1. Excavator**	**Uses bucket for excavation of sediments.**	**effective**	**implementable; operation on soft sediments/soils must be considered**	**moderate**	**yes**
		2. Clamshell excavator	**Uses equipment such as a clamshell bucket to remove sediment.**	**effective**	**implementable; site access and ability to reach impacted sediments must be considered**	**high**	**yes**
VI. *Ex Situ* Treatment	**A. Dewatering**	1. Passive dewatering	Removes excess water from excavated or dredged sediment through gravity-based drainage to facilitate other treatment or disposal options.	effective	implementable; site space and time concerns as well potential air quality/odor concerns	low	no - implementability concerns
		2. Mechanical	**Uses pressure to reduce water content in sediment (e.g., Geotubes® or filter press)**	**effective**	**implementable**	**high**	**yes**
	B. Physical separation	1. Screening	Uses physical screening to separate different size fractions from the sediment.	not effective for fine soils/sediments present at site	implementable	low	no - not effective
		2. Sediment washing	Contaminants sorbed onto fine soil particles are separated from bulk sediment based on particle size. The wash water may be augmented with a basic leaching agent, surfactant, pH adjustment, or chelating agent to help remove organics and heavy metals.	not effective for fine soils/sediments present at site	implementable	high	no - not effective
		3. Centrifugal separation	Uses a vortex to generate centrifugal force for density-based separation.	not effective for fine soils/sediments present at site	implementable	moderate	no - not effective

Table 2.2 Initial Screening of Appropriate Technologies for Low Water Level (retained technologies are boldfaced)

General Response Action	Remedial Technology	Process Options	Description	Effectiveness	Implementability	Cost	Retained (Yes/No) and Rationale for Not Retaining
	C. Chemical Extraction	1. Acid or solvent extraction	Contaminated sediment and an acid or solvent extractant are mixed in an extractor, thereby dissolving the contaminants. The extracted solution is then placed in a separator where the contaminants and extractant are separated for treatment and further use.	not effective for low-level threat wastes[a]	implementable	moderate	no - not effective
		2. Slurry oxidation	Aqueous slurry is created by combining sediments with water and oxidizing agents (e.g., ozone, peroxide, Fenton's reagent). Upon completion, slurry is dewatered and sediment is extracted and disposed of.	not effective for metals	implementable	high	no - not effective
	D. Thermal treatment	1. Thermal desorption, incineration, pyrolysis, high pressure oxidation	Thermal processes used to volatilize, combust, or decompose organic contaminants.	not effective for metals[b]	implementable	moderate	no - not effective
	E. Immobilization	**1. Chemical fixation**	**Uses cementitious materials to stabilize sediment, immobilizing the contaminants within the matrix and/or reducing free water.**	**potentially effective as a process option for disposal**	**implementable**	**high**	**yes – process option for disposal**
	F. Biological treatment	1. Composting and biodegradation	Excavated sediment is composted in above-ground piles or heaps and bacterial or fungal degradation of contaminants occurs. Substrate amendments may be made to enhance degradation and composting.	not effective for metals	implementable	low	no - not effective
VII. Disposal	**A. Onshore/ upland disposal**	**1. Onsite landfill (non-hazardous waste)**	**Dredged or excavated contaminated sediment is placed as an onshore fill and capped.**	**effective**	**may be implementable depending on future site use**	**high**	**yes**
		2. Regional landfill (non-hazardous waste)	**Dredged or excavated contaminated sediment is transported to a regional landfill for disposal. May be combined with an *ex situ* treatment technology to meet disposal requirements.**	**effective**	**implementable**	**moderate**	**yes**

Table 2.2 Initial Screening of Appropriate Technologies for Low Water Level (retained technologies are boldfaced)

General Response Action	Remedial Technology	Process Options	Description	Effectiveness	Implementability	Cost	Retained (Yes/No) and Rationale for Not Retaining
		3. Hazardous waste landfill	**Dredged or excavated contaminated sediment is transported to a regional hazardous waste landfill for disposal.**	**effective**	**implementable**	**high**	**yes**
	B. Confined disposal facility (CDF)		**Contaminated sediment is placed in a disposal facility that is separated from the river by a physical barrier (e.g., sheet pile).**	**effective**	**implementable**	**moderate**	**yes**

Note: Bolded technologies were retained for assembly of remedial alternatives.

[a] EPA's presumptive remedy for metals-in-soil sites identifies the technologies that are applicable to principal-threat wastes and low-level threat wastes. Confinement is the presumptive remedy for low-threat-level wastes (U.S. EPA. 1999. Presumptive remedy for metals-in-soil sites. EPA 540-F-98-054. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC.).

[b] Not effective for metals other than mercury.

Appendices

Appendix A
Conceptual Design and Implementation Details for Option 2

Option 2a—Mechanical Dredging with Silt Curtains (High Water Level) and Filter Press Dewatering

Site Preparation and Staging

- **Staging Area:** It is assumed that a temporary staging area will be developed on a City of Janesville park property located north of Industrial Court and west of Jackson Street. The staging area will be used to provide access to the river for waterborne equipment, as well as to conduct land-based dewatering operations, materials handling, and construction material and equipment storage for the duration of the remedial activities. Temporary road access is possible directly from Jackson Street (a primary road) or from Industrial Court (a residential street). It is assumed that the City of Janesville will be compensated for the temporary repurposing of the park property.

- **Access Path for Vessels:** To allow for launching and maneuvering of loaded barges, it is assumed that an access path between the staging area and deeper waters of the main Rock River channel may be necessary. It is assumed that sediment from the access dredging activities will be dewatered and disposed of in a landfill analogous to sediments within the remediation area.

- **Silt Curtain Installation:** Silt curtains will be deployed from vessels to surround the extent of the removal area. Silt curtains will be placed away from the delineated removal area to account for dredging layback.

Sediment Removal and Dewatering

- **Mechanical Dredging:** Barge-based excavation equipment will be deployed within the removal area contained by the silt curtain. Hopper barges will be deployed to accept sediments brought up during dredging. Filled hopper barges will periodically transport sediment to the staging area for offloading and subsequent dewatering and disposal.

- **Dredged Sediment Unloading:** Wheeled and/or tracked loaders will remove sediments from hopper barges for dewatering by filter press.

- **Filter Press Dewatering:** Unloaded sediments will be slurried to facilitate filter press loading, and processed through a filter press, separating water from solids.

- **Water Disposal:** Water produced during filter press operations is assumed to be disposed of in a municipal sanitary sewer. Other potential options may include returning the produced water to the Rock River or treating it at the existing onsite stormwater treatment facility. Water quality analyses and monitoring will be conducted to ensure compliance with permit requirements.

- **Landfill Disposal of Solids:** Solids from filter press operations will be loaded on trucks for transport and offsite landfill disposal. Solids characterization and monitoring will be conducted to ensure compliance with applicable landfill disposal requirements.

Site Construction

- **Construction:** Construction will be completed by placing a thin layer of sand (approximately 12 inches) throughout the entire removal area. Commercially-available clean sand will be used. The sand will be transported by trucks to the staging area and loaded onto a barge. Sand placement will be accomplished by hydraulically washing clean sand from a barge, clamshell placement, or by distributing the sand via barge-based articulating conveyor.
- **Armoring:** Rock armoring will be provided along the shoreline of the removal area and Adjacent Outfall to protect against erosion.
- **Bathymetry & Sediment Sampling:** Bathymetry and sediment core sampling will be conducted before and after media placement.
- **Silt Curtain Removal:** Silt curtains will be removed by deploying vessels and disconnecting and dislodging them.

Staging Area Demobilization

- **Road Removal:** Temporary access roads will be removed.
- **Staging Area Restoration:** The staging area will be cleared of temporary structures and features, seeded, sodded, and replanted.

Option 2a-S—Mechanical Dredging with Silt Curtains (High Water Level) and Stabilization Amendment

Option 2a-S ("S" is for "stabilization amendment") is essentially Option 2a with a substitution of filter press dewatering with stabilization amendment. Dredged sediment will be amended with Portland cement as a stabilization reagent to improve handling, transport and disposal of the sediment.

Site Preparation and Staging

- **Staging Area:** It is assumed that a temporary staging area will be developed on a City of Janesville park property located north of Industrial Court and west of Jackson Street. The staging area will be used to provide access to the river for waterborne equipment, as well as to conduct land-based dewatering operations, materials handling, and construction material and equipment

storage for the duration of the remedial activities. Temporary road access is possible directly from Jackson Street (a primary road) or from Industrial Court (a residential street). It is assumed that the City of Janesville will be compensated for the temporary repurposing of the park property.

- **Access Path for Vessels:** To allow for launching and maneuvering of loaded barges, it is assumed that an access path between the staging area and deeper waters of the main Rock River channel may be necessary. It is assumed that sediment from the access dredging activities will be dewatered and disposed of in a landfill analogous to sediments within the remediation area.

- **Silt Curtain Installation:** Silt curtains will be deployed from vessels to surround the extent of the removal area. Silt curtains will be placed away from the delineated removal area to account for dredging layback.

Sediment Removal and Dewatering

- **Mechanical Dredging:** Barge-based excavation equipment will be deployed within the removal area contained by the silt curtain. Hopper barges will be deployed to accept sediments brought up during dredging. Filled hopper barges will periodically transport sediment to the staging area for offloading and subsequent dewatering and disposal.

- **Dredged Sediment Unloading:** Wheeled and/or tracked loaders will remove sediments from hopper barges for stabilization by Portland cement amendment.

- **Stabilization:** Dredged sediment will be amended with Portland cement as a stabilization reagent to improve handling, transport, and disposal of sediment. The sediment will be mixed with Portland cement using standard earthmoving equipment.

- **Water Disposal:** Any water remaining after amendment addition is assumed to be disposed of in a municipal sanitary sewer. Other potential options may include returning the produced water to the Rock River or treating it at the existing onsite stormwater treatment facility. Water quality analyses and monitoring will be conducted to ensure compliance with permit requirements.

- **Landfill Disposal of Solids:** Amendment-stabilized solids will be loaded on trucks for transport and offsite landfill disposal. Solids characterization and monitoring will be conducted to ensure compliance with applicable landfill disposal requirements.

Site Construction

- **Construction:** construction will be completed by placing a thin layer of sand (approximately 12 inches) throughout the entire removal area. Commercially-available clean sand will be used. The sand will be transported by trucks to

the staging area and loaded onto a barge. Sand placement will be accomplished by hydraulically washing clean sand from a barge, clamshell placement, or by distributing the sand via barge-based articulating conveyor.

- **Armoring:** Rock armoring will be provided along the shoreline of the removal area and Adjacent Outfall to protect against erosion.
- **Bathymetry & Sediment Sampling:** Bathymetry and sediment core sampling will be conducted before and after media placement.
- **Silt Curtain Removal:** Silt curtains will be removed by deploying vessels and disconnecting and dislodging them.

Staging Area Demobilization

- **Road Removal:** Temporary access roads will be removed.
- **Staging Area Restoration:** The staging area will be cleared of temporary structures and features, seeded, sodded, and replanted.

Option 2b—Hydraulic Dredging with Silt Curtains (High Water Level)

Site Preparation and Staging

- **Staging Area:** It is assumed that a temporary staging area will be developed on a City of Janesville park property located north of Industrial Court and west of Jackson Street. The staging area will be used to provide access to the river for waterborne equipment, as well as to conduct land-based dewatering operations, materials handling, and construction material and equipment storage for the duration of the remedial activities. Temporary road access is possible directly from Jackson Street (a primary road) or from Industrial Court (a residential street). It is assumed that the City of Janesville will be compensated for the temporary repurposing of the park property.
- **Geotube Placement:** A portion of the staging area will be dedicated specifically for geotube placement, by clearing, grubbing, leveling, and constructing berms and pads to facilitate geotube operations and produced water handling.
- **Access Path for Vessels:** To allow for launching and maneuvering of loaded barges, it is assumed that an access path between the staging area and deeper waters of the main Rock River channel may be necessary. It is assumed that sediment from the access dredging activities will be dewatered and disposed of in a landfill analogous to sediments within the remediation area.

- **Silt Curtain Installation:** Silt curtains will be deployed from vessels to surround the extent of the removal area. Silt curtains will be placed away from the delineated removal area to account for dredging layback.

Sediment Removal and Dewatering

- **Hydraulic Dredging:** A hydraulic dredge will be used within the removal area encompassed by the silt curtain. Sediments will be dredged using a suction tube and hydraulically transported to land via floating pipeline for dewatering through geotubes.

- **Geotube Dewatering:** Sediments will be pumped from the dredge discharge pipeline into geotubes for dewatering. Geotubes will be cited in the staging area.

- **Water Disposal:** Water produced during geotube operations is assumed to be disposed of in a municipal sanitary sewer. Other potential options may include returning the produced water to the Rock River or treating it at the existing onsite stormwater treatment facility. Water quality analyses and monitoring will be conducted to ensure compliance with permit requirements.

- **Landfill Disposal of Solids:** Solids retained by geotubes will be loaded on trucks for transport and offsite landfill disposal. Solids characterization and monitoring will be conducted to ensure compliance with applicable landfill disposal requirements.

Site Construction

- **Construction:** Construction will be completed by placing a thin layer of sand (approximately 12 inches) throughout the entire removal area. Commercially-available clean sand will be used. The sand will be transported by trucks to the staging area and loaded onto a barge. Sand placement will be accomplished by hydraulically washing clean sand from a barge, clamshell placement, or by distributing the sand via barge-based articulating conveyor.

- **Armoring:** Rock armoring will be provided along the shoreline of the removal area and Adjacent Outfall to protect against erosion.

- **Bathymetry & Sediment Sampling:** Bathymetry and sediment core sampling will be conducted before and after media placement.

- **Silt Curtain Removal:** Silt curtains will be removed by deploying vessels and disconnecting and dislodging them.

Staging Area Demobilization

- **Road Removal:** Temporary access roads will be removed.

- **Staging Area Restoration:** The staging area will be cleared of temporary structures and features, seeded, sodded, and replanted.

Option 2c—Hydraulic Dredging within Cofferdam (high water level)

Site Preparation and Staging

- **Staging Area:** It is assumed that a temporary staging area will be developed on a City of Janesville park property located north of Industrial Court and west of Jackson Street. The staging area will be used to provide access to the river for waterborne equipment, as well as to conduct land-based dewatering operations, materials handling, and construction material and equipment storage for the duration of the remedial activities. Temporary road access is possible directly from Jackson Street (a primary road) or from Industrial Court (a residential street). It is assumed that the City of Janesville will be compensated for the temporary repurposing of the park property.

- **Access Path for Vessels:** To allow for launching and maneuvering of loaded barges, it is assumed that an access path between the staging area and deeper waters of the main Rock River channel may be necessary. It is assumed that sediment from the access dredging activities will be dewatered and disposed of in a landfill analogous to sediments within the remediation area.

- **Silt Curtain Installation:** Silt curtains will be deployed from vessels to surround the extent of the removal area and minimize sediment transport during cofferdam installation. Silt curtains will be placed away from the delineated removal area to account for dredging layback.

- **Cofferdam Installation:** Cofferdams will be installed along the extent of the removal area by advancing hot rolled PZ 22 sheet piles by barge-based excavator with a side grip pile driver.

Sediment Removal and Dewatering

- **Hydraulic Dredging:** A hydraulic dredge will be used within the removal area encompassed by the silt curtain. Sediments will be dredged using a suction tube and hydraulically transported to land via floating pipeline for dewatering through geotubes.

- **Geotube Dewatering:** Sediments will be pumped from the dredge discharge pipeline into geotubes for dewatering. Geotubes will be cited in the staging area.

- **Water Disposal:** Water produced during geotube operations is assumed to be disposed of in a municipal sanitary sewer. Other potential options may include returning the produced water to the Rock River or treating it at the

existing onsite stormwater treatment facility. Water quality analyses and monitoring will be conducted to ensure compliance with permit requirements.

- **Landfill Disposal of Solids:** Solids retained by geotubes will be loaded on trucks for transport and offsite landfill disposal. Solids characterization and monitoring will be conducted to ensure compliance with applicable landfill disposal requirements.

Site Construction

- **Construction:** Construction will be completed by placing a thin layer of sand (approximately 12 inches) throughout the entire removal area. Commercially-available clean sand will be used. The sand will be transported by trucks to the staging area and loaded onto a barge. Sand placement will be accomplished by hydraulically washing clean sand from a barge, clamshell placement, or by distributing the sand via barge-based articulating conveyor.
- **Armoring:** Rock armoring will be provided along the shoreline of the removal area and Adjacent Outfall to protect against erosion.
- **Bathymetry & Sediment Sampling:** Bathymetry and sediment core sampling will be conducted before and after media placement.
- **Cofferdam Removal:** Cofferdam sheet piles will be removed by barge-based equipment located outside the cofferdam area. During cofferdam removal, river water will be allowed to infiltrate and inundate the dammed and dredged area.
- **Silt Curtain Removal:** Silt curtains will be removed by deploying vessels and disconnecting and dislodging the curtain.

Staging Area Demobilization

- **Road Removal:** Temporary access roads will be removed.
- **Staging Area Restoration:** The staging area will be cleared of temporary structures and features, seeded, sodded, and replanted.

Option 2d—Excavation within Cofferdam (high or low water level)

Site Preparation and Staging

- **Staging Area:** It is assumed that a temporary staging area will be developed on a City of Janesville park property located north of Industrial Court and west of Jackson Street. The staging area will be used to provide access to the river for waterborne equipment, as well as to conduct land-based dewatering operations, materials handling, and construction material and equipment storage for the duration of the remedial activities. Temporary road access is

possible directly from Jackson Street (a primary road) or from Industrial Court (a residential street). It is assumed that the City of Janesville will be compensated for the temporary repurposing of the park property.

- **Access Path for Vessels:** To allow for launching and maneuvering of a cofferdam installation barge, it is assumed that an access path between the staging area and deeper waters of the main Rock River channel may be necessary. It is assumed that sediment from the access dredging activities will be dewatered and disposed of in a landfill analogous to sediments within the remediation area.

- **Silt Curtain Installation:** Silt curtains will be deployed from vessels to surround the extent of the removal area and minimize sediment transport during cofferdam installation. Silt curtains will be placed away from the delineated removal area to account for excavation layback.

- **Cofferdam Installation:** Cofferdams will be installed along the extent of the removal area by advancing hot rolled PZ 22 sheet piles by barge-based excavator with a side grip pile driver.

- **Temporary Road to Cofferdam:** A temporary access road to dammed recovery area will be constructed west of the Wisconsin Power and Light (WPL) electrical substation.

Sediment Removal and Dewatering

- **Dewatering Dammed Area - High Water Level:** Under high water level conditions, water overlying the area encompassed by the cofferdam will be dewatered by actively pumping it out of the dammed area. Potential destinations for the overlying water may include direct pumping to the Rock River, pumping to a sanitary sewer, or pumping to the existing onsite stormwater treatment system. When most of the water overlying the dammed sediment has been removed, a depression will be excavated using a shore-based excavator to facilitate passive dewatering of the remaining sediment by acting as a sump. Due to the anticipated high turbidity of the water in the sump depression, the sump will be actively pumped to a water treatment unit to separate suspended sediment from water. The filtered water may then be pumped to the Rock River or a sanitary sewer, while the water-treatment derived sediments will be loaded onto trucks and transported to a landfill for disposal.

- **Dewatering Dammed Area - Low Water Level:** Under low water level conditions, it is assumed that only a sump will be necessary to dewater the sediments within the cofferdam. A depression will be excavated and the sump will be actively pumped to a water treatment unit to separate suspended sediment from water. The filtered water may then be pumped to the Rock

River or a sanitary sewer, while the water-treatment derived sediments will be loaded onto trucks and transported to a landfill for disposal.

- **Temporary Roads within Dammed Area:** A network of temporary access roads will be installed to facilitate excavation equipment travel on top of sediments. The temporary roads should provide sufficient access to allow excavation of the dammed area. Temporary access roads can be removed by excavators in stages following excavation of the surrounding area.

- **Excavation:** Once water within the cofferdam is removed, sediments will be excavated using wheeled and/or tracked excavator equipment within the cofferdam. Sediments will be loaded on trucks for transport to a filter press located in the staging area.

- **Filter Press Dewatering:** Sediments will be slurried to facilitate filter press loading and processed through a filter press, separating water from solids.

- **Water Disposal:** Water produced during filter press operations is assumed to be disposed of in a municipal sanitary sewer. Other potential options may include returning the produced water to the Rock River or treating it at the existing onsite stormwater treatment facility. Water quality analyses and monitoring will be conducted to ensure compliance with permit requirements.

- **Landfill Disposal of Solids:** Solids from the filter press will be loaded on trucks for transport and offsite landfill disposal. Solids characterization and monitoring will be conducted to ensure compliance with applicable landfill disposal requirements.

Site Construction

- **Construction:** Construction will be completed by placing a thin layer of sand (approximately 12 inches) throughout the entire removal area. Commercially-available clean sand will be used. If the water level is high, sand placement will be accomplished by hydraulically washing clean sand from a barge, clamshell placement, or by distributing the sand via barge-based articulating conveyor. If the water level is low, a land-based articulating conveyor will be utilized for clean sand placement.

- **Armoring:** Rock armoring will be provided along the shoreline of the removal area and Adjacent Outfall to protect against erosion.

- **Bathymetry & Sediment Sampling:** Bathymetry and sediment core sampling will be conducted before and after media placement.

- **Cofferdam Removal:** Cofferdam sheet piles will be removed by barge-based equipment located outside the cofferdam area under high water level conditions. Under low water level conditions, cofferdam sheet piles may be

removed by a land-based crane depending on expected infiltration of river water into the removal zone.

- **Silt Curtain Removal:** Silt curtains will be removed by deploying vessels and disconnecting and dislodging them.

Staging Area Demobilization

- **Road Removal:** Temporary access roads will be removed.
- **Staging Area Restoration:** The staging area will be cleared of temporary structures and features, seeded, sodded, and replanted.

Option 2e—Excavation with Silt Fence (low water level)

Site Preparation and Staging

- **Staging Area:** It is assumed that a temporary staging area will be developed on a City of Janesville park property located north of Industrial Court and west of Jackson Street. The staging area will be used to provide access to the river for waterborne equipment, as well as to conduct land-based dewatering operations, materials handling, and construction material and equipment storage for the duration of the remedial activities. Temporary road access is possible directly from Jackson Street (a primary road) or from Industrial Court (a residential street). It is assumed that the City of Janesville will be compensated for the temporary repurposing of the park property.
- **Silt Fence Installation:** Silt fences will be deployed from vessels to surround the extent of the removal area. Silt fences will be placed away from the delineated removal area to account for excavation layback.
- **Temporary Road to Silt Fenced Area:** A temporary access road will be constructed from the staging area along the south shore to the recovery area.

Sediment Removal and Dewatering

- **Temporary Roads within Dammed Area:** A network of temporary access roads will be installed to facilitate excavation equipment travel on top of sediments. The temporary roads should provide sufficient access to allow excavation of the dammed area. Temporary access roads can be removed by excavators in stages following excavation of the surrounding area.
- **Excavation:** Sediments will be excavated using wheeled and/or tracked excavator equipment within the silt fence and will be loaded on trucks for transport to a filter press located in the staging area.
- **Filter Press Dewatering:** Sediments will be slurried to facilitate filter press loading and processed through a filter press, separating water from solids.

- **Water Disposal:** Water produced during filter press operations is assumed to be disposed of in a municipal sanitary sewer. Other potential options may include returning the produced water to the Rock River or treating it at the existing onsite stormwater treatment facility. Water quality analyses and monitoring will be conducted to ensure compliance with permit requirements.
- **Landfill Disposal of Solids:** Solids from filter press operations will be loaded on trucks for transport and offsite landfill disposal. Solids characterization and monitoring will be conducted to ensure compliance with applicable landfill disposal requirements.

Site Construction

- **Construction:** Construction will be completed by placing a thin layer of sand (approximately 12 inches) throughout the entire removal area. Commercially-available clean sand will be used. A land-based articulating conveyor will be utilized for clean sand placement.
- **Armoring:** Rock armoring will be provided along the shoreline of the removal area and Adjacent Outfall to protect against erosion.
- **Bathymetry & Sediment Sampling:** Bathymetry and sediment core sampling will be conducted before and after media placement.
- **Silt Fence Removal:** Silt fences will be removed by deploying vessels and disconnecting and dislodging them.

Staging Area Demobilization

- **Road Removal:** Temporary access roads will be removed.
- **Staging Area Restoration:** The staging area will be cleared of temporary structures and features, seeded, sodded, and replanted.

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