

**Otsego Township Dam Area
Time Critical Removal Action**

**DRAFT
Final Maintenance and Monitoring Report**

Prepared for:
**Paul Ruesch
USEPA On-Scene Coordinator**

Prepared by:
**Wood Environment & Infrastructure Solutions, Inc.
Novi, Michigan**

On Behalf of :
Georgia-Pacific LLC, International Paper Company, Weyerhaeuser Company

November 15, 2019

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Figure 1-1 July and October 2019 Repair Locations

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Attachment A Completed Quarterly Maintenance and Monitoring Inspection Reports
Attachment B Photo Log

1.0 Introduction

Georgia-Pacific LLC, Georgia-Pacific Consumer Products LP and Fort James LLC (collectively Georgia-Pacific), International Paper Company (International Paper), and Weyerhaeuser NR Company (Weyerhaeuser) (Parties), are respondents to the Unilateral Administrative Order (UAO) (V-W-16-C-009) issued by the U.S. Environmental Protection Agency (USEPA) on April 14, 2016 (USEPA 2016), and conducted a Time Critical Removal Action (TCRA) to address polychlorinated biphenyls (PCBs) in bank soil and sediment within a portion of Operable Unit 5 (OU-5) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Specifically, the TCRA was performed within a portion of Area 3 of OU-5. The TCRA Site is the area that extends between the M-89 Bridge and the former Otsego Township Dam (also referred to as the Bittersweet Dam) in Otsego Township, Michigan (Figure 1-1). The TCRA was performed in accordance with the UAO and was completed with oversight of the USEPA under the Comprehensive Environmental Response, Compensation and Liability Act of 1980.

In accordance with paragraph 29 of the UAO, a Post-Removal Site Control Plan (PRSCP) was prepared to outline activities to be implemented to ensure that the applied remedies remain effective (Wood Environment and Infrastructure Solutions, Inc. [Wood] 2018). TCRA construction activities were approved by USEPA as complete on August 15, 2018. As outlined in the PRSCP, quarterly maintenance and monitoring (M&M) inspections were to be conducted for one year following completion of the TCRA. This report serves as the final M&M report, and describes the completed inspections and repairs completed as a result of the inspections.

This Final M&M Report is organized into the following chapters:

- Chapter 1.0 – Introduction
- Chapter 2.0 – Inspections
- Chapter 3.0 – Repairs
- Chapter 4.0 – References

2.0 Inspections

Representatives from Wood and USEPA's Superfund Technical Assessment and Response Team (START) completed four quarterly inspections. Inspections were completed on December 3-4, 2018, February 26, 2019, May 20-23, 2019, and August 26-27, 2019. Land- and boat-based inspections were completed in bank removal/stabilization areas (BRSA) 1, 3, 4, 6, 7, 8, and 9, the plunge pool area, and the former water control structure (WCS) corridor. In August 2018, Study Plots were established as a means to monitor vegetative success. Stem counts were completed in the Study Plots during the May 2019 inspection.

Observations and findings were recorded using the electronic data collection program Survey123. Observations and findings were photographed and GPS coordinates were collected. After completion of each inspection, quarterly inspection reports were prepared by Wood and submitted to USEPA. The quarterly inspection reports included completed inspection forms, photo logs, and a rolling action item list tracking items to continue to monitor, and findings that required repair. The May 2019 Inspection Report also contains the results of the stem count. The completed inspection reports are included as Attachment A.

3.0 Repairs

After completion of the May 2019 inspection, a repair scope of work (SOW) was submitted to and approved by the USEPA in June 2019 (Wood 2019a). The repair SOW described recommended repairs for findings from the first three quarterly inspections. Repairs outlined in the SOW were completed in July 2019. Additional findings requiring repair were observed during the fourth and final inspection completed in August 2019. A final repair SOW was submitted to and approved by the USEPA in October 2019 (Wood 2019b). These items were repaired in October 2019.

The completed repairs are described below, and were completed consistent with previously issued technical memoranda, design drawings, and restoration details. Repair locations are shown on Figure 1-1 and a photo log of the repairs is included as Attachment B. It should be noted that while Wood was on-Site to confirm completion of the repairs in October 2019, an MDNR contractor was observed using small equipment to plant trees in bank treatment areas, resulting in disturbance (e.g. ruts and tracks) in some of the restoration areas.

3.1 General Site Activities

In July 2019, the irrigation system (including PVC piping and associated equipment) was removed from the Site. Tree tubes on dead trees were also removed and disposed; tree tubes were left in place on live trees.

During the fourth and final M&M inspection (August 2019), low water levels revealed fabric from the sand bag cofferdams remaining in the river along BRSA 1 and 9. At the time of the repairs (October 2019), water levels had risen and the fabric was not visible. USEPA indicated its intention to inspect the Site on a quarterly basis and also indicated it will remove the fabric as water levels permit.

3.2 BRSA 1

During the May 2019 inspection, tree tubes near river station (RS) 60+00 were observed to have been removed (by trespassers [or vandals]) from trees and tied to the outside of the trees. These tubes were removed and properly disposed.

A hole along the right-descending bank of the Pine Creek confluence with the Kalamazoo River (RS 50+00) developed at the rootwad/joint planting transition. This was first observed during the December 2018 inspection and monitored during subsequent inspections. In October 2019, the hole was filled with MDOT plain riprap. (Photos 1a and 1b)

3.3 BRSA 4

Approximately 50 linear feet (LF) of rootwad restoration settled into the soft, muddy subgrade near RS 70+00. This was observed during the first quarterly inspection and monitored during subsequent inspections. In July 2019, the area was stabilized by installing 4-inch x 8-inch riprap mixed with common fill over the existing restoration to secure the rootwads. The area was then covered with approximately 6 inches of topsoil and seeded. Live stakes were subsequently harvested and planted in this area in October 2019. (Photos 2a and 2b). During the August 2019 inspection, an area of minor erosion was observed approximately 25 to 50 feet upstream

of these repairs, near RS 71+50. This area was repaired in October 2019 by installing 1-inch x 3-inch riprap, topsoil, and seed (Photos 3a and 3b).

An additional area of minor settling at the upstream end of BRSA 4 RS 86+00 was identified as an area to continue monitoring during the first, second, and third quarterly inspections; however, at the time of the July 2019 repairs, the decision was made to also repair this area by installing 1-inch x 3-inch riprap, topsoil, and seed (Photos 4a and 4b).

During a May 22 Site walk conducted by USEPA, Wood, and Envirocon, areas of sparse vegetation were observed in the residential restoration area. These areas were over-seeded using an upland seed mix in July 2019.

3.4 BRSA 6

During construction, “soft mud” warning signs were installed along the BRSA 6 bank. These signs were removed and properly disposed in July 2019.

During the May 2019, three areas totaling approximately 75-100 LF near RS 38+50 where ice and high near shore water velocities had scoured the bank were observed. The bank was repaired in July 2019 by installing Michigan Department of Transportation (MDOT) heavy riprap (36-inch thickness at D-50 of 18.5 inches), common fill, topsoil, seed (riparian seed mix) and live stakes over the existing grade (Photos 5a and 5b).

During the May 2019 inspection, live stake survivability was observed to be low in two areas where live stakes were planted at the end of the project, in mid-2018 (the oxbow discharge area RS 37+00 and along approximately 50 LF near RS 48+00). In July 2019, several locally available species of willow were harvested and planted in these areas. Live stake harvest locations were identified in coordination with Wood, USEPA, and the Michigan Department of Natural Resources (MDNR) (Photos 6a, 6b, 7a, and 7b).

3.5 BRSA 7

During the May 2019 inspection, an area where upland seepage outbreak/tributary was cutting into the bank near RS 29+50. In July 2019, this stretch of bank was repaired by installing additional 4-inch x 8-inch rip rap, topsoil, and seed (riparian seed mix) (Photos 8a and 8b).

3.6 BRSA 8

During the May 2019 inspection, an area of erosion along approximately 100-150 LF of bank was observed starting near RS 24+75. The erosion was likely due to high flows (before vegetative establishment) and/or ice scour of the common fill placed over the joint planting (at the toe of the slope). In July 2019, this area was hand graded, seeded, and additional live stakes were installed (Photos 9a and 9b).

During the August 2019 inspection, three minor erosion areas were repaired. According to the Final Repair SOW (Wood 2019b), following repair, these areas were to be covered with topsoil and seeded; however, after discussion with USEPA, it was decided to install additional live stakes, rather than re-seed. In October 2019, the three erosion areas were repaired as follows:

- Erosion area 1 RS 7+00 was raked and planted with additional live stakes (Photos 10a and 10b).

- Erosion area 2 RS 30+50 was filled with 1-inch x 3-inch riprap and topsoil, and additional live stakes were planted (Photos 11a and 11b).
- Erosion area 3 RS 7+00 was planted with additional live stakes (Photos 12a and 12b).

Several small areas of sparse vegetation were observed between RS 7+00 and RS 25+00 during the August 2019 inspection. Per the Final Repair SOW these areas were to be re-seeded. However, based on discussions with USEPA, it was decided to install additional live stakes rather than re-seed. A larger area of sparse vegetation was also observed during the August 2019 inspection. This area extended along approximately 150-200 LF at the top of bank near RS 26+50, and was repaired by installing additional topsoil, seed, and straw in October 2019 (Photo 13).

During completion of the October 2019 repairs, approximately 20 LF of erosion was observed at the toe of slope near RS 32+00. This was repaired by installing 1-inch x 3-inch riprap, common fill, topsoil, seed, and live stakes (Photo 14).

3.7 BRSA 9

During the December 2018 inspection, an area of soil at the top of slope was observed to have settled beneath the coir fabric creating an approximately 6-inch to 9-inch void space beneath the coir fabric near RS 36+00. In July 2019, the coir fabric was cut, secured with stout wood stakes, and additional upland seed mix was installed (Photos 15a and 15b).

During the August 2019 inspection, the soil in a second area at the top of slope was observed to have settled beneath the coir fabric creating a void beneath the coir fabric along 150 to 200 LF of bank RS 34+00. The coir fabric was cut, secured with stout wood stakes, and additional top soil and upland seed mix were installed (Photos 16a and 16b).

3.8 Plunge Pool

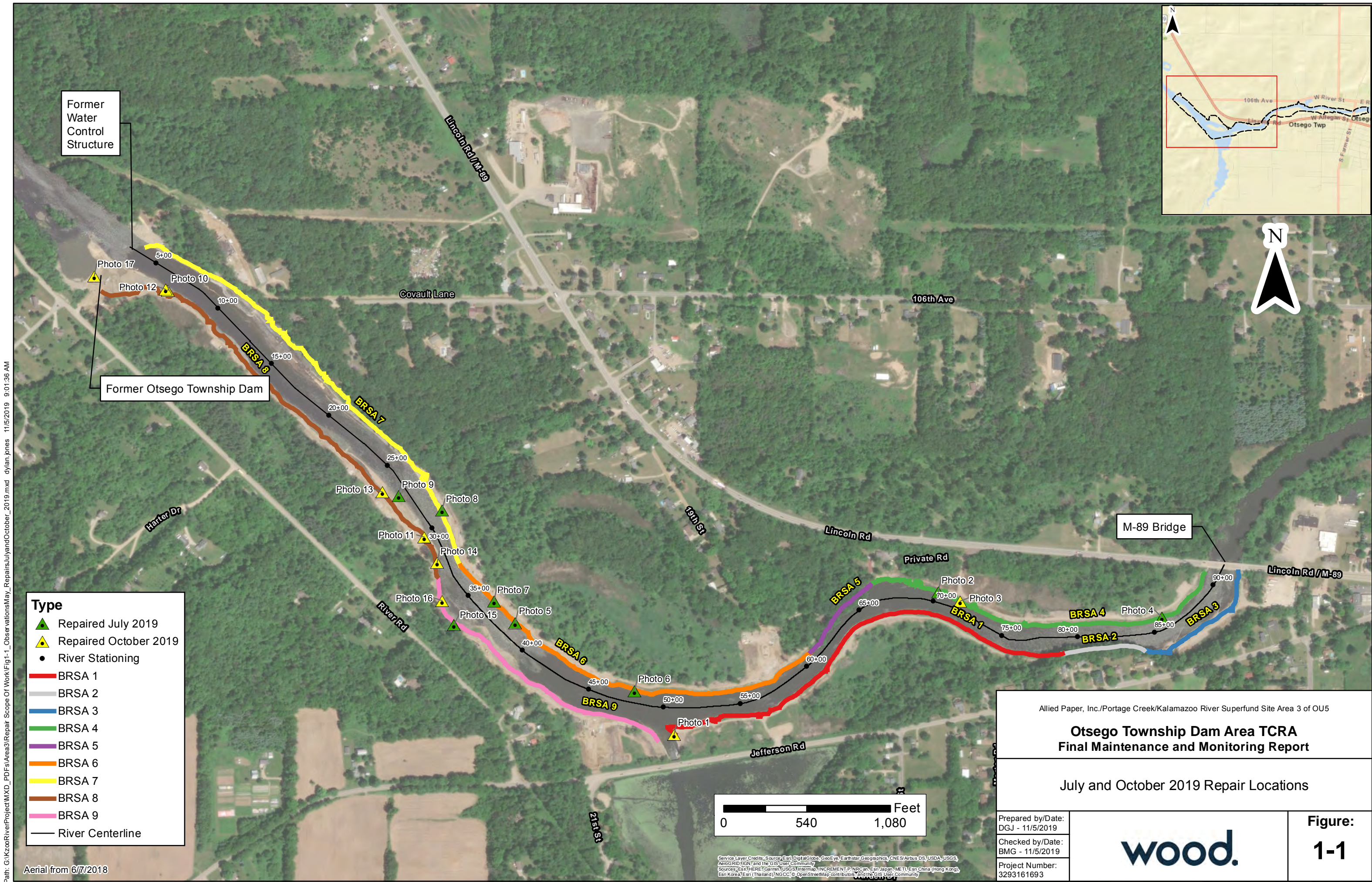
During the four quarterly M&M inspections, vegetation in the plunge pool area was observed to be sparse. In October 2019, the existing vegetation was mowed, new top soil placed, and the area was re-seeded and strawed (Photos 17a and 17b). This repair was not included in either Repair SOW but was repaired after submittal and approval of the Final Repair SOW based on discussions with USEPA and MDNR.

4.0 References

- USEPA. 2016. Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site, Otsego Township Dam Area, Unilateral Administrative Order for Removal Actions, Docket V-W-16-C-009. April 14, 2016.
- Wood. 2018. Post-Removal Site Control Plan. Otsego Township Dam Area Time-Critical Removal Action. December 11, 2018.
- Wood. 2019a. Post-Removal Site Control Plan Maintenance & Monitoring Repair Scope of Work. Otsego Township Dam Area Time-Critical Removal Action. June 14, 2019.
- Wood. 2019b. Post-Removal Site Control Plan Maintenance & Monitoring Final Repair Scope of Work. Otsego Township Dam Area Time-Critical Removal Action. October 4, 2019.

FIGURES

Path: G:\KzooRiverProject\MXD_PDFs\Area3\Repair_Scope\Of Work\Fig1-1_ObservationsMay_RepairsJulyandOctober_2019.mxd dylan.jones 11/5/2019 9:01:36 AM



Type

- ▲ Repaired July 2019
- ▲ Repaired October 2019
- River Stationing
- BRSA 1
- BRSA 2
- BRSA 3
- BRSA 4
- BRSA 5
- BRSA 6
- BRSA 7
- BRSA 8
- BRSA 9
- River Centerline

Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site Area 3 of OU5		
Otsego Township Dam Area TCRA Final Maintenance and Monitoring Report		
July and October 2019 Repair Locations		
Prepared by/Date: DGJ - 11/5/2019		Figure: 1-1
Checked by/Date: BMG - 11/5/2019		
Project Number: 3293161693		

Aerial from 6/7/2018

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, OpenStreetMap contributors, and the GIS User Community

ATTACHMENT A
COMPLETED QUARTERLY MAINTENANCE AND MONITORING INSPECTION REPORTS

**Otsego Township Dam Area
Time Critical Removal Action**

First Quarterly Maintenance and Monitoring Inspection Report

Prepared for:

**Paul Ruesch
USEPA On-Scene Coordinator**

Prepared by:

**Wood Environment and Infrastructure Solutions
Novi, Michigan**

On Behalf of :

Georgia-Pacific LLC, Weyerhaeuser Company, International Paper Company

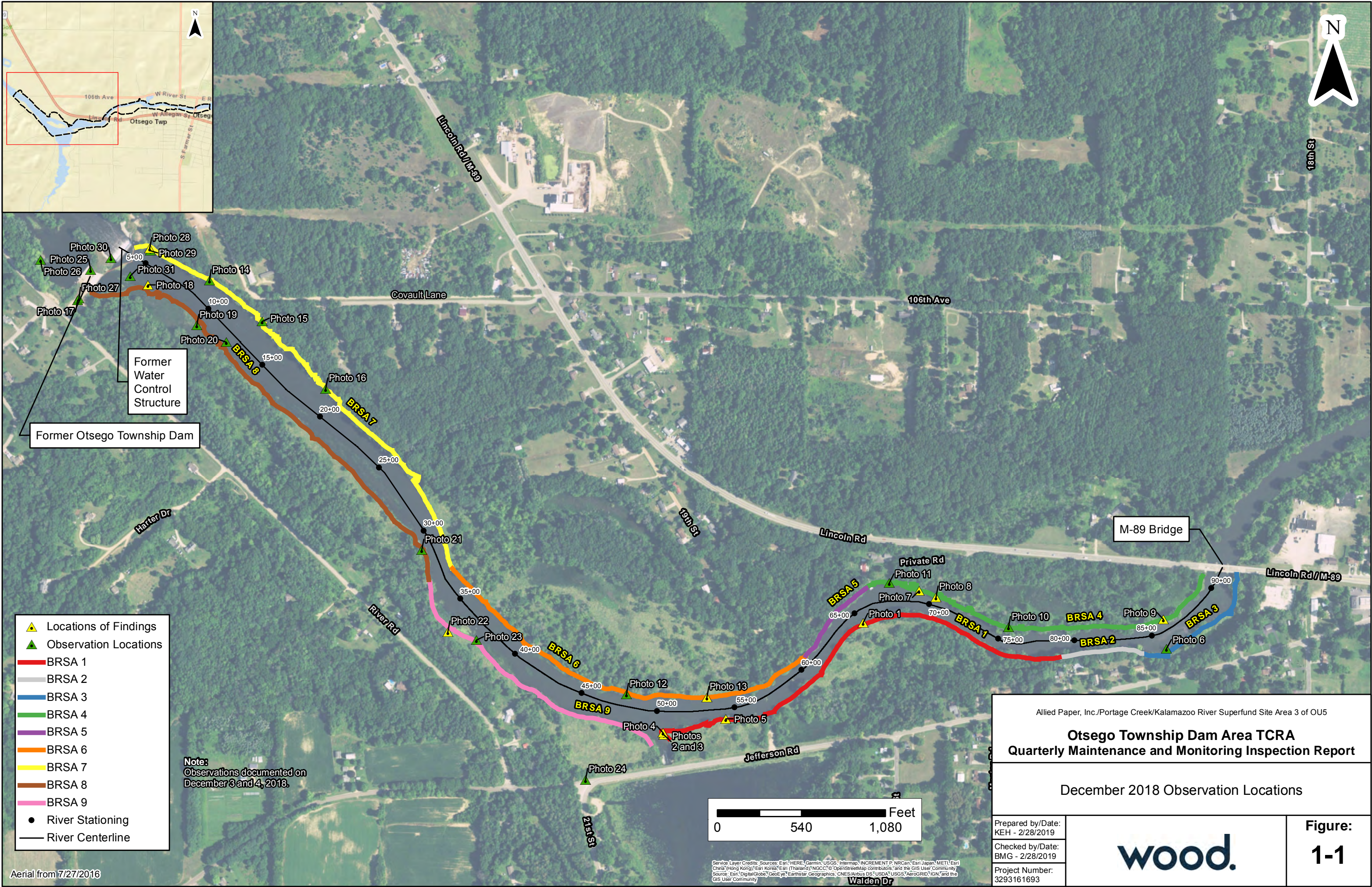
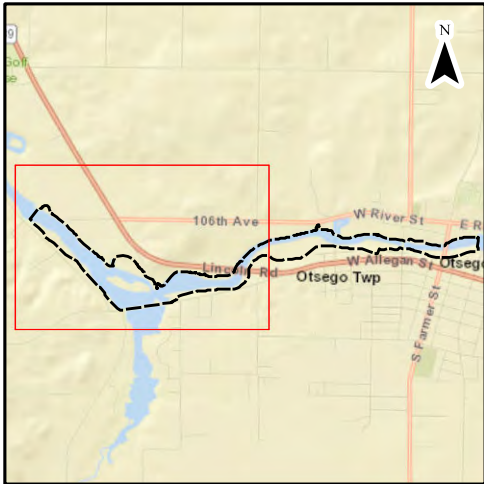
February 28, 2019

Georgia-Pacific LLC, Georgia-Pacific Consumer Products LP and Fort James LLC (collectively Georgia-Pacific), International Paper Company (International Paper), and Weyerhaeuser NR Company (Weyerhaeuser) (Parties), are respondents to the Unilateral Administrative Order (UAO) (V-W-16-C-009) issued by the U.S. Environmental Protection Agency (USEPA) on April 14, 2016, and conducted a Time Critical Removal Action (TCRA) to address polychlorinated biphenyls (PCBs) in bank soil and sediment within a portion of Operable Unit 5 (OU-5) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Specifically, the TCRA was performed within a portion of Area 3 of OU-5. The TCRA Site is the area that extends between the M-89 Bridge and the former Otsego Township Dam (also referred to as the Bittersweet Dam) in Otsego Township, Michigan. The TCRA was performed in accordance with the UAO and was completed with oversight of the USEPA under the Comprehensive Environmental Response, Compensation and Liability Act of 1980.

In accordance with paragraph 29 of the UAO, a Post Removal Site Control Plan (PRSCP) was prepared to outline activities to be implemented to ensure that the applied remedies remain effective. TCRA construction activities were considered complete on August 15, 2018. In preparation for evaluating vegetation success rates, vegetation study plots were established in August 2018 to establish a baseline from which to assess vegetative growth during the spring 2019 inspection. As outlined in the PRSCP, quarterly maintenance and monitoring (M&M) inspections are to be conducted for one year following completion of the TCRA. The first inspection was scheduled to be completed in November 2018, but due to inclement weather, the inspection was postponed with USEPA approval until December. Representatives from Wood Environment & Infrastructure Solutions, Inc. (Wood) and USEPA's Superfund Technical Assessment and Response Team (START) completed the first quarterly inspection December 3 and 4, 2018. The boat-based inspections of all BRSA's and land-based inspections of BRSA's 1, 3, 4, and 6 were completed on December 3, 2018, and the land-based inspections of BRSA's 7, 8, and 9, the plunge pool area and the former WCS corridor were completed on December 4, 2018.

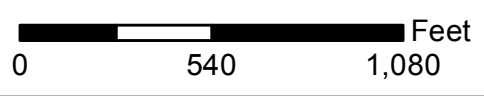
Inspection observations were recorded on a tablet using an electronic data collection program called Survey123. Observations were photographed and GPS coordinates were collected. Figure 1-1 shows the observation locations, with locations of findings (including areas to monitor) shown with a yellow triangle. Completed inspection forms are included as Attachment A, a photographic log is included as Attachment B, and a rolling action item list is included as Attachment C.

The second quarterly M&M inspection is scheduled to be completed in February 2019.



- ▲ Locations of Findings
- ▲ Observation Locations
- BRSA 1
- BRSA 2
- BRSA 3
- BRSA 4
- BRSA 5
- BRSA 6
- BRSA 7
- BRSA 8
- BRSA 9
- River Stationing
- River Centerline

Note:
Observations documented on
December 3 and 4, 2018.



Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site Area 3 of OU5

Otsego Township Dam Area TCRA
Quarterly Maintenance and Monitoring Inspection Report

December 2018 Observation Locations

Prepared by/Date: KEH - 2/28/2019		Figure: 1-1
Checked by/Date: BMG - 2/28/2019		
Project Number: 3293161693		

I. Inspection Information

Inspection Date and Time: December 3, 2018 at 1115

Weather Conditions: 30s, cloudy

Inspector: Cam Baron, Bonnie Gibney (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 1 Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?	X		Photos 2, 3, 5	Monitor areas of settling
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?	X		Photos 2, 3, 5	Monitor areas of settling
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?	X		Photos 2, 3, 5	Monitor areas of settling
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.				Stern count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?	X		Photo 4	At downstream end of BRSA 1, RDB of Pine Creek confluence
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)				Inspection conducted outside growing season; however, evidence of cocklebur observed
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?	X			Little to no growth observed on access road
Are the cuts in the access roads providing positive drainage to the river?	X			
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				

III. Post-Inspection Notifications and Recommended Actions

Notifications made and necessary corrective actions	Monitor areas of settling
	Plant live stakes at Pine Creek confluence
	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection

I. Inspection Information

Inspection Date and Time: December 3, 2018 at 1315

Weather Conditions: 30s, cloudy

Inspector: Cam Baron, Bonnie Gibney (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 3 Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X		
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?		X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X		
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.				Stem count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?		X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)				Inspection conducted outside growing season; however, evidence of cocklebur observed
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?	X			Little to no growth observed on access road
Are the cuts in the access roads providing positive drainage to the river?	X			
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				
III. Post-Inspection Notifications and Recommended Actions				
Notifications made and necessary corrective actions	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection			

I. Inspection Information

Inspection Date and Time: December 3, 2018 at 1420

Weather Conditions: 30s, cloudy

Inspector: Cam Baron, Bonnie Gibney (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 4 Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?	X		Photos 7, 8, 9	Areas of settling observed; continue to monitor and determine if repairs are necessary
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?	X		Photos 7, 8, 9	Areas of settling observed; continue to monitor and determine if repairs are necessary
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?	X		Photos 7, 8, 9	Areas of settling observed; continue to monitor and determine if repairs are necessary
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?	X		Photo 10	Vegetation to be assessed in May 2019
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.				Stern count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?		X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)				Inspection conducted outside growing season; however, evidence of cocklebur observed
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?	X			Little to no growth observed on access road
Are the cuts in the access roads providing positive drainage to the river?	X			
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				

III. Post-Inspection Notifications and Recommended Actions

Notifications made and necessary corrective actions	Continue to monitor areas of settling and determine if repairs are necessary
	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection

I. Inspection Information

Inspection Date and Time: December 3, 2018 at 1515

Weather Conditions: 30s, cloudy

Inspector: Cam Baron, Bonnie Gibney (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 6 Inspection Items		Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration					
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?			X		
Are there areas bare or void of coir fabric?			X		
Is there any evidence of soil movement or slope instability (sloughing)?			X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?			X		
Is there evidence of uneven soil settlement greater than approximately six inches?			X		
Is there evidence that high water has "pulled out" some of the potted vegetation?			X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)			X		
Are there drainage problems associated with the feeder streams contrary to their designed function?			X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.					Stem count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?			X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)					Inspection conducted outside growing season
B. Access Road/Gate					
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?			X		
Bare spots > 3 ft x 3 ft?	X				Little to no growth observed on access road
Are the cuts in the access roads providing positive drainage to the river?	X				
Is there evidence of any vandalism to the access gates or locks?			X		
C. General					
Comments					

III. Post-Inspection Notifications and Recommended Actions

Notifications made and necessary corrective actions	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection
	Root wads left standing in turn-around area; will confirm need to cut/knock over with MDNR

I. Inspection Information

Inspection Date and Time: December 4, 2018 at 0915

Weather Conditions: 30s, sunny

Inspector: Cam Baron (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 7 Inspection Items		Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration					
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X			
Are there areas bare or void of coir fabric?		X			
Is there any evidence of soil movement or slope instability (sloughing)?		X			
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X			
Is there evidence of uneven soil settlement greater than approximately six inches?		X			
Is there evidence that high water has "pulled out" some of the potted vegetation?		X			
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X			
Are there drainage problems associated with the feeder streams contrary to their designed function?		X			
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.					Stem count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?		X			
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)					Inspection conducted outside growing season
B. Access Road/Gate					
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X			
Bare spots > 3 ft x 3 ft?	X				Little to no growth observed on access road
Are the cuts in the access roads providing positive drainage to the river?	X				
Is there evidence of any vandalism to the access gates or locks?		X			
C. General					
Comments					
III. Post-Inspection Notifications and Recommended Actions					
Notifications made and necessary corrective actions	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection				

I. Inspection Information

Inspection Date and Time: December 4, 2018 at 1100

Weather Conditions: 30s, sunny

Inspector: Cam Baron (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 8 Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X		
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?		X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?	X		Photo 17	Area of settling observed; continue to monitor
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.				Stem count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?		X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)				Inspection conducted outside growing season
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?	X			Little to no growth observed on access road
Are the cuts in the access roads providing positive drainage to the river?	X			
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				

III. Post-Inspection Notifications and Recommended Actions

Notifications made and necessary corrective actions	Monitor area of settling
	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection

I. Inspection Information

Inspection Date and Time: December 4, 2018 at 1145

Weather Conditions: 30s, sunny

Inspector: Cam Baron; Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 9 Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X		
Are there areas bare or void of coir fabric?	X		Photo 21	Coir fabric not secure in approx. 6 x 35 ft area; re-stake and over-seed as needed
Is there any evidence of soil movement or slope instability (sloughing)?		X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X		
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.				Stem count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?		X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)				Inspection conducted outside growing season; however, evidence of cocklebur observed
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?	X			
Are the cuts in the access roads providing positive drainage to the river?	X			
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				
III. Post-Inspection Notifications and Recommended Actions				
Notifications made and necessary corrective actions	Restoke coir fabric where needed and over-seed as needed			
	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection			

I. Inspection Information

Inspection Date and Time: December 4, 2018 at 1045

Weather Conditions: 30s, sunny

Inspector: Cam Baron; Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

Plunge Pool Inspection Items		Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration					
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?			X		
Are there areas bare or not vegetated on the bank?		X			Inspection conducted outside growing season, vegetation will be assessed in spring 2019
Is there any evidence of soil movement or slope instability (sloughing)?			X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?			X		
Is there evidence of uneven soil settlement greater than approximately six inches?			X		
Is there evidence that high water has "pulled out" some of the potted vegetation?			X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)			X		
Are there drainage problems associated with the feeder streams contrary to their designed function?			X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.					Stem count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?			X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)					Inspection conducted outside growing season
B. Access Road/Gate					
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?			X		
Bare spots > 3 ft x 3 ft?					NA - no access road
Are the cuts in the access roads providing positive drainage to the river?					NA - no access road
Is there evidence of any vandalism to the access gates or locks?			X		
C. General					
Comments					
III. Post-Inspection Notifications and Recommended Actions					
Notifications made and necessary corrective actions	Vegetation will be assessed during spring 2019 M&M inspection				

I. Inspection Information

Inspection Date and Time: December 4, 2018 at 0900

Weather Conditions: 30s, sunny

Inspector: Cam Baron; Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

Former WCS Corridor Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X		
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?		X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?	X		Photo 27	Continue to monitor
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.				Stem count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?		X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)				Inspection conducted outside growing season
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?				NA - no access roads
Are the cuts in the access roads providing positive drainage to the river?				NA - no access roads
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				

III. Post-Inspection Notifications and Recommended Actions

Notifications made and necessary corrective actions	Continue to monitor erosional area at drainage area on RDB
	Vegetation will be assessed during spring 2019 M&M inspection



Photo 1: BRSA 1 erosional area repaired during construction; no new erosion observed.



Photo 2: BRSA 1 along right-descending bank (RDB) of Pine Creek confluence. Void observed below coir fabric at rootwad/joint planting transition. Void measures approx. 2 ft. deep by 3 ft. parallel to river by 6 ft. perpendicular to river.



Photo 3: BRSA 1 along RDB of Pine Creek confluence. Void observed below coir fabric at rootwad/joint planting transition (same location as Photo 2).



Photo 4: BRSA 1 at Pine Creek confluence. Note that live stakes are missing.



Photo 5: Approx. 10 square feet of surface erosion observed on BRSA 1 bank.



Photo 6: BRSA 3 deposition downstream of J-hooks. No issues observed.



Photo 7: Area of settling observed along approx. 32 lineal feet of BRSA 4 bank, downstream of staging area.



Photo 8: Area of settling observed on BRSA 4 bank, downstream of staging area (approx. 120 feet upstream of location in Photo 7).



Photo 9: Area of settling observed along approx. 20 lineal feet of BRSA 4 bank, located in root wads across from BRSA 3 J-hooks.



Photo 10: BRSA 4 shrubs appear to have been dislodged during high water event.



Photo 11: BRSA 4 residential restoration area. No issues observed.



Photo 12: BRSA 6, across from Pine Creek confluence. No issues observed.



Photo 13: BRSA 6 root wad trees left vertical in turnaround area.



Photo 14: BRSA 7 near transition to high bank zone. No issues observed.



Photo 15: BRSA 7 near constructed access road. No issues observed.



Photo 16: BRSA 7 residence with restored bank in foreground. No issues observed.



Photo 17: BRSA 8 floodplain near MDNR access and former auxiliary spillway. No issues observed.



Photo 18: Approx. 12 lineal feet (perpendicular to river) of settling observed on BRSA 8 bank.



Photo 19: BRSA 8 X-weir (typical). No issues observed.



Photo 20: BRSA 8 approaching former dam location. No issues observed.



Photo 21: BRSA 8 near river constriction point. No issues observed.



Photo 22: BRSA 9 approaching transition to BRSA 8, coir fabric not secure.



Photo 23: BRSA 9 near river shoals (natural grade control point). No issues observed.



Photo 24: BRSA 9 former staging area. No issues observed.



Photo 25: Live stakes planted on plunge pool area peninsula.



Photo 26: Left-descending bank (LDB) of plunge pool area. No issues observed.



Photo 27: Plunge pool view from MDNR parking area. No issues observed.



Photo 28: Approx. 8 lineal feet (perpendicular to river) of erosion observed at drainage area on RDB of former water control structure (WCS) corridor.



Photo 29: RDB of former WCS corridor. No issues observed.



Photo 30: View of former WCS corridor from plunge pool peninsula. No issues observed.



Photo 31: LDB (and low-flow bench) of former WCS corridor. No issues observed.

ATTACHMENT C - ROLLING ACTION ITEM LIST
Otsego Township Dam TCRA Maintenance and Monitoring
Otsego Township, MI

UNDER OBSERVATION (Item Number)	INSPECTION REFERENCE	REPAIR SCOPE OF WORK SUBMITTED? YES / NO	DATE REPORTED	DATE REPAIR COMPLETED	OTHER COMMENTS
1.0	BRSA 1 bank area of settling	No	12/3/2018		See photo 5
2.0	BRSA 4 shrubs dislodged	No	12/3/2018		See photo 10. Vegetation success will be assessed in spring 2019
3.0	BRSA 6 root wads	No	12/3/2018		See photo 13. Confirm next steps with MDNR
4.0	BRSA 8 bank area of settling	No	12/3/2018		See photo 18
MINOR REPAIRS (Item Number)	INSPECTION REFERENCE	REPAIR SCOPE OF WORK SUBMITTED? YES / NO	DATE REPORTED	DATE REPAIR COMPLETED	OTHER COMMENTS
1.0	BRSA 1 along RDB of Pine Creek - void below coir fabric at rootwad/joint planting transition	No	12/3/2018		Continue to monitor, repair in spring/summer 2019 (photos 2 and 3)
2.0	BRSA 1 at Pine Creek confluence - plant live stakes	No	12/3/2018		See photo 4
3.0	BRSA 4 settling along bank downstream of staging area	No	12/3/2018		Continue to monitor, repair in spring/summer 2019 (photo 7)
4.0	BRSA 4 settling along bank downstream of staging area	No	12/3/2018		Continue to monitor, repair in spring/summer 2019 (photo 8)
5.0	BRSA 4 settling along bank across from BRSA 3 J-hooks	No	12/3/2018		Continue to monitor, repair in spring/summer 2019 (photo 9)
6.0	BRSA 9 area of coir fabric not secured	No	12/4/2018		Re-stake coir fabric and over-seed as needed (photo 22)
7.0	Former WCS corridor erosion at drainage area on RDB	No	12/4/2018		Continue to monitor, repair in spring/summer 2019 (photo 28)
MAJOR REPAIRS (Item Number)	INSPECTION REFERENCE	REPAIR SCOPE OF WORK SUBMITTED? YES / NO	DATE REPORTED	DATE REPAIR COMPLETED	OTHER COMMENTS

**Otsego Township Dam Area
Time Critical Removal Action**

Second Quarterly Maintenance and Monitoring Inspection Report

Prepared for:

**Paul Ruesch
USEPA On-Scene Coordinator**

Prepared by:

**Wood Environment and Infrastructure Solutions
Novi, Michigan**

On Behalf of :

Georgia-Pacific LLC, International Paper Company, Weyerhaeuser Company

April 10, 2019

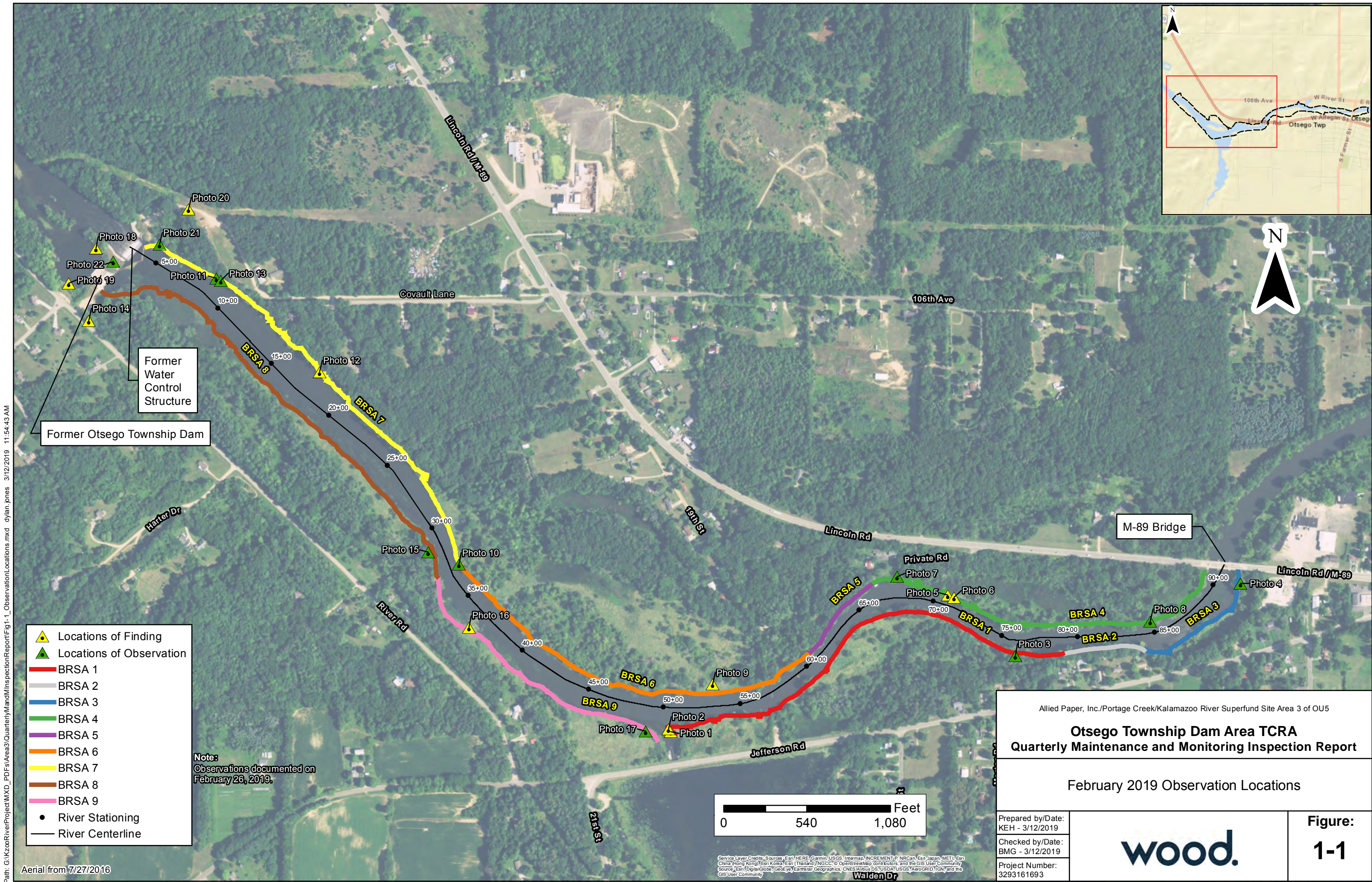
Georgia-Pacific LLC, Georgia-Pacific Consumer Products LP and Fort James LLC (collectively Georgia-Pacific), International Paper Company (International Paper), and Weyerhaeuser NR Company (Weyerhaeuser) (Parties), are respondents to the Unilateral Administrative Order (UAO) (V-W-16-C-009) issued by the U.S. Environmental Protection Agency (USEPA) on April 14, 2016, and conducted a Time Critical Removal Action (TCRA) to address polychlorinated biphenyls (PCBs) in bank soil and sediment within a portion of Operable Unit 5 (OU-5) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Specifically, the TCRA was performed within a portion of Area 3 of OU-5. The TCRA Site is the area that extends between the M-89 Bridge and the former Otsego Township Dam (also referred to as the Bittersweet Dam) in Otsego Township, Michigan. The TCRA was performed in accordance with the UAO and was completed with oversight of the USEPA under the Comprehensive Environmental Response, Compensation and Liability Act of 1980.

In accordance with paragraph 29 of the UAO, a Post Removal Site Control Plan (PRSCP) was prepared to outline activities to be implemented to ensure that the applied remedies remain effective. TCRA construction activities were considered complete on August 15, 2018. As outlined in the PRSCP, quarterly maintenance and monitoring (M&M) inspections are to be conducted for one year following completion of the TCRA. Representatives from Wood Environment & Infrastructure Solutions, Inc. (Wood) and USEPA's Superfund Technical Assessment and Response Team (START) completed the second quarterly inspection on February 26, 2019. Land-based inspections were completed in BRSA's 1, 3, 4, 6, 7, 8, and 9, the plunge pool, and the former WCS corridor. Due to unsafe walking conditions (snow/ice cover), portions of the BRSA's 7, 8, and 9 banks were not walked. Boat-based inspections were also not performed due to unsafe, cold water conditions. Additionally, snow and ice cover limited the ability to fully observe bank conditions.


Inspection observations were recorded on a tablet using the electronic data collection program Survey123. Observations were photographed and GPS coordinates were collected. Figure 1-1 shows the observation locations, with locations of findings (including areas to monitor) shown with a yellow triangle. Completed inspection forms are included as Attachment A, a photographic log is included as Attachment B, and a rolling action item list is included as Attachment C.

The third quarterly M&M inspection is scheduled to be completed in May 2019.

Path: G:\KzooRiverProject\MXD_PD\FsArea3\QuarterlyMandM\InspectionReport\Fig1-1_ObservationLocations.mxd dylan.pines 3/12/2019 11:54:43 AM



Aerial from 7/27/2016

Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site Area 3 of OU5		
Otsego Township Dam Area TCRA Quarterly Maintenance and Monitoring Inspection Report		
February 2019 Observation Locations		
Prepared by/Date: KEH - 3/12/2019		Figure: 1-1
Checked by/Date: BMG - 3/12/2019		
Project Number: 3293161693		

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

I. Inspection Information

Inspection Date and Time: February 26, 2019 at 0905

Weather Conditions: 16°F, cloudy, NE winds 5-10 mph

Inspector: Bonnie Strzalka, Samantha Todaro (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 1 Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?	X		Photo 1	Same issue as Q1 inspection. See Appendix C
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?	X		Photo 1	Same issue as Q1 inspection. See Appendix C
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?	X		Photo 1	Same issue as Q1 inspection. See Appendix C
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.				Stern count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?	X		Photo 2	At downstream end of BRSA 1, RDB of Pine Creek confluence
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)				Inspection conducted outside growing season
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?				Unable to observe due to snow cover
Are the cuts in the access roads providing positive drainage to the river?	X			
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments	Snow cover inhibited view of the ground surface for many areas.			
III. Post-Inspection Notifications and Recommended Actions				
Notifications made and necessary corrective actions	No new recommendations since first quarterly inspection. See Appendix C.			
	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection.			

I. Inspection Information

Inspection Date and Time: February 26, 2019 at 1205

Weather Conditions: 16°F, cloudy, NE winds 5-10 mph

Inspector: Bonnie Strzalka, Samantha Todaro (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 3 Inspection Items		Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration					
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?			X		
Are there areas bare or void of coir fabric?			X		
Is there any evidence of soil movement or slope instability (sloughing)?			X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?			X		
Is there evidence of uneven soil settlement greater than approximately six inches?			X		
Is there evidence that high water has "pulled out" some of the potted vegetation?			X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)			X		
Are there drainage problems associated with the feeder streams contrary to their designed function?			X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.					Stem count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?			X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)					Inspection conducted outside growing season
B. Access Road/Gate					
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?			X		
Bare spots > 3 ft x 3 ft?					Unable to observe due to snow cover
Are the cuts in the access roads providing positive drainage to the river?	X				
Is there evidence of any vandalism to the access gates or locks?			X		
C. General					
Comments	Snow cover inhibited view of the ground surface for many areas.				
III. Post-Inspection Notifications and Recommended Actions					
Notifications made and necessary corrective actions	No new recommendations since first quarterly inspection. See Appendix C.				
	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection.				

I. Inspection Information

Inspection Date and Time: February 26, 2019 at 1415

Weather Conditions: 16°F, cloudy, NE winds 5-10 mph

Inspector: Bonnie Strzalka, Samantha Todaro (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 4 Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?	X		Photos 5, 6	Same issue as Q1 inspection. See Appendix C
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?	X		Photos 5, 6	Same issue as Q1 inspection. See Appendix C
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?	X		Photos 5, 6	Same issue as Q1 inspection. See Appendix C
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.				Stern count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?		X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)				Inspection conducted outside growing season
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?				Unable to observe due to snow cover
Are the cuts in the access roads providing positive drainage to the river?	X			
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments	Snow cover inhibited view of the ground surface for many areas.			

III. Post-Inspection Notifications and Recommended Actions

Notifications made and necessary corrective actions	No new recommendations since first quarterly inspection. See Appendix C.
	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection.

I. Inspection Information

Inspection Date and Time: February 26, 2019 at 1505

Weather Conditions: 16°F, cloudy, NE winds 5-10 mph

Inspector: Bonnie Strzalka, Samantha Todaro (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 6 Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X		
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?		X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X		
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.				Stem count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?		X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)				Inspection conducted outside growing season
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?				Unable to observe due to snow cover
Are the cuts in the access roads providing positive drainage to the river?	X			
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments	Snow cover inhibited view of the ground surface for many areas.			

III. Post-Inspection Notifications and Recommended Actions

Notifications made and necessary corrective actions	No new recommendations since first quarterly inspection. See Appendix C.
	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection.

I. Inspection Information

Inspection Date and Time: February 26, 2019 at 1546

Weather Conditions: 16°F, cloudy, NE winds 5-10 mph

Inspector: Bonnie Strzalka, Samantha Todaro (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 7 Inspection Items		Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration					
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X			
Are there areas bare or void of coir fabric?		X			
Is there any evidence of soil movement or slope instability (sloughing)?		X			
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X			
Is there evidence of uneven soil settlement greater than approximately six inches?		X			
Is there evidence that high water has "pulled out" some of the potted vegetation?	X			Photo 12	Recommend standing trees back up or replanting trees
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X			
Are there drainage problems associated with the feeder streams contrary to their designed function?		X			
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.					Stem count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?		X			
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)					Inspection conducted outside growing season
B. Access Road/Gate					
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X			
Bare spots > 3 ft x 3 ft?					Unable to observe due to snow cover
Are the cuts in the access roads providing positive drainage to the river?	X				
Is there evidence of any vandalism to the access gates or locks?		X			
C. General					
Comments	Unable to fully walk BRSA 7 banks due to unsafe conditions (ice/snow cover).				
	Snow cover inhibited view of the ground surface for many areas.				
III. Post-Inspection Notifications and Recommended Actions					
Notifications made and necessary corrective actions	Recommend standing trees back up or replanting trees where grow tubes have been crushed/knocked down.				
	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection.				

I. Inspection Information

Inspection Date and Time: February 26, 2019 at 1057

Weather Conditions: 16°F, cloudy, NE winds 5-10 mph

Inspector: Bonnie Strzalka, Samantha Todaro (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 8 Inspection Items		Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration					
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?			X		
Are there areas bare or void of coir fabric?			X		
Is there any evidence of soil movement or slope instability (sloughing)?			X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?			X		
Is there evidence of uneven soil settlement greater than approximately six inches?			X		
Is there evidence that high water has "pulled out" some of the potted vegetation?			X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)			X		
Are there drainage problems associated with the feeder streams contrary to their designed function?			X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.					Stem count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?			X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)					Inspection conducted outside growing season
B. Access Road/Gate					
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		Photo 14	Notify MDNR about fallen tree
Bare spots > 3 ft x 3 ft?					Unable to observe due to snow cover
Are the cuts in the access roads providing positive drainage to the river?		X			
Is there evidence of any vandalism to the access gates or locks?			X		
C. General					
Comments	Unable to fully walk BRSA 8 banks due to unsafe conditions (ice/snow cover).				
	Snow cover inhibited view of the ground surface for many areas.				
III. Post-Inspection Notifications and Recommended Actions					
Notifications made and necessary corrective actions	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection.				
	Notify MDNR about fallen tree blocking driveway. (Mark Mills was present during the inspection).				

I. Inspection Information

Inspection Date and Time: February 26, 2019 at 1119

Weather Conditions: 16°F, cloudy, NE winds 5-10 mph

Inspector: Bonnie Strzalka, Samantha Todaro (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - below bank full

II. Inspection Results

BRSA 9 Inspection Items		Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration					
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?			X		
Are there areas bare or void of coir fabric?		X		Photo 16	Same issue as Q1 inspection. See RAIL
Is there any evidence of soil movement or slope instability (sloughing)?			X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?			X		
Is there evidence of uneven soil settlement greater than approximately six inches?			X		
Is there evidence that high water has "pulled out" some of the potted vegetation?			X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)			X		
Are there drainage problems associated with the feeder streams contrary to their designed function?			X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.					Stem count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?			X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)					Inspection conducted outside growing season
B. Access Road/Gate					
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?			X		
Bare spots > 3 ft x 3 ft?					Unable to observe due to snow cover
Are the cuts in the access roads providing positive drainage to the river?		X			
Is there evidence of any vandalism to the access gates or locks?			X		
C. General					
Comments	Unable to fully walk BRSA 9 banks due to unsafe conditions (ice/snow cover).				
	Snow cover inhibited view of the ground surface for many areas.				
III. Post-Inspection Notifications and Recommended Actions					
Notifications made and necessary corrective actions	No new recommendations since first quarterly inspection. See Appendix C.				
	Vegetation (including invasive species) will be assessed during spring 2019 M&M inspection.				

I. Inspection Information

Inspection Date and Time: February 26, 2019 at 1028

Weather Conditions: 16°F, cloudy, NE winds 5-10 mph

Inspector: Bonnie Strzalka, Samantha Todaro (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation - bank full

II. Inspection Results

Plunge Pool Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X		
Are there areas bare or not vegetated on the bank?		X		
Is there any evidence of soil movement or slope instability (sloughing)?		X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X		
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.			Photos 18, 19	Live stakes on LDB and peninsula appear to be knocked down, dislodged, or broken. Vegetative success will be evaluated during spring 2019 M&M inspection
Are there areas bare of vegetation larger than 3ft square?		X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)				Inspection conducted outside growing season
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?				NA - no access road
Bare spots > 3 ft x 3 ft?				NA - no access road
Are the cuts in the access roads providing positive drainage to the river?				NA - no access road
Is there evidence of any vandalism to the access gates or locks?				NA - no access road
C. General				
Comments	Snow cover inhibited view of the ground surface for many areas.			
III. Post-Inspection Notifications and Recommended Actions				
Notifications made and necessary corrective actions	Vegetation will be assessed during spring 2019 M&M inspection.			

I. Inspection Information

Inspection Date and Time: February 26, 2019 at 1624
Weather Conditions: 16°F, cloudy, NE winds 5-10 mph
Inspector: Bonnie Strzalka, Samantha Todaro (Wood); Dan Capone, Ben Rausch (START)
Observed River Elevation - below bank full

II. Inspection Results

Former WCS Corridor Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X		
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?		X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X		
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.				Stem count not completed, inspection conducted outside growing season
Are there areas bare of vegetation larger than 3ft square?		X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)				Inspection conducted outside growing season
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?	X		Photo 20	Notify MDNR about fallen tree
Bare spots > 3 ft x 3 ft?				NA - no access roads
Are the cuts in the access roads providing positive drainage to the river?				NA - no access roads
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments	Snow cover inhibited view of the ground surface for many areas.			
III. Post-Inspection Notifications and Recommended Actions				
Notifications made and necessary corrective actions	Vegetation will be assessed during spring 2019 M&M inspection.			
	Notify MDNR about fallen tree blocking driveway. (Mark Mills was present during the inspection).			



Photo 1: BRSA 1 along right-descending bank (RDB) of Pine Creek confluence. Void observed below coir fabric at rootwad/joint planting transition. No new erosion observed since first quarterly inspection.



Photo 2: BRSA 1 at Pine Creek confluence. Note that live stakes are missing. No new findings observed since first quarterly inspection.



Photo 3: BRSA 1 general view, looking downstream. No issues observed.



Photo 4: BRSA 3 general view, looking downstream. No issues observed.



Photo 5: Area of settling observed along approx. 30 lineal feet of BRSA 4 bank, downstream of staging area. Area of settling appears to have extended along bank since first quarterly inspection.

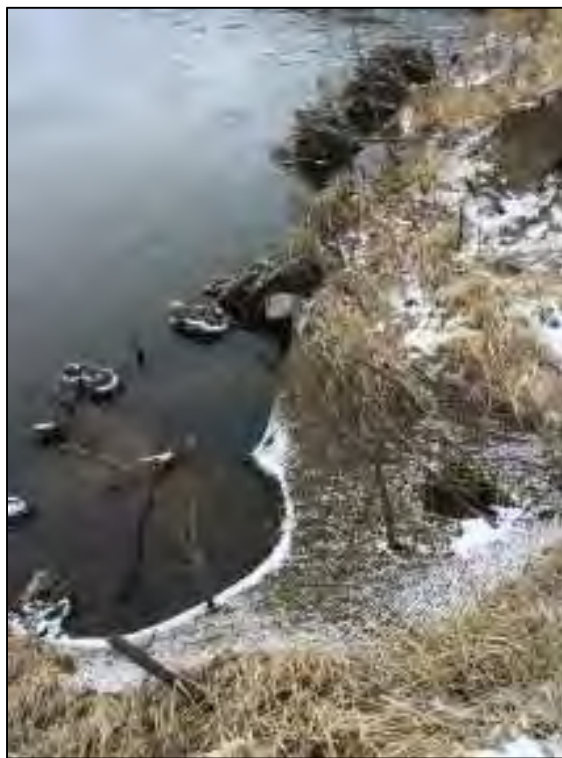


Photo 6: Area of settling observed on BRSA 4 bank, downstream of staging area (approx. 30 feet upstream of location in Photo 5). Area of settling appears to have extended along bank since first quarterly inspection.



Photo 7: BRSA 4 residential restoration area. No issues observed.



Photo 8: BRSA 4 general view, looking downstream. No issues observed.



Photo 9: BRSA 6 root wad trees left vertical in turnaround area. No changes observed during second quarterly inspection.



Photo 10: BRSA 6 general view, looking upstream. No issues observed.



Photo 11: BRSA 7 near transition to high bank zone. Unsafe to walk steep bank; however, no issues observed from view point.



Photo 12: Over 20 tree grow tubes crushed/knocked down along approx. 150 feet of BRSA 7 bank, near constructed access road.



Photo 13: BRSA 7 general view. No issues observed.



Photo 14: Fallen tree blocking BRSA 8 east access gate; notify the landowner (MDNR).



Photo 15: BRSA 8 general view, looking downstream. No issues observed.



Photo 16: BRSA 9 approaching transition to BRSA 8, coir fabric not secure. No new findings observed since first quarterly inspection.



Photo 17: BRSA 9 general view, looking downstream. No issues observed.



Photo 18: Live stakes knocked down on plunge pool area peninsula.



Photo 19: Live stakes appear to have been broken/dislodged on left-descending bank (LDB) of plunge pool area.



Photo 20: Fallen tree blocking access road to former WCS area; notify the landowner (MDNR).



Photo 21: RDB of former WCS corridor. No issues observed.



Photo 22: View of former WCS corridor from plunge pool peninsula. No issues observed.

ATTACHMENT C - ROLLING ACTION ITEM LIST
Otsego Township Dam Area TCRA Maintenance and Monitoring
Otsego Township, MI

UNDER OBSERVATION (Item Number)	INSPECTION REFERENCE	REPAIR SCOPE OF WORK SUBMITTED? YES / NO	DATE REPORTED	DATE REPAIR COMPLETED	OTHER COMMENTS
1.0	BRSA 1 bank area of settling	No	12/3/2018		See photo 1
2.0	BRSA 4 shrubs dislodged	No	12/3/2018		Not observed during second quarterly inspection; snow cover inhibited view of the ground surface in many areas. Vegetation success will be assessed in spring 2019
3.0	BRSA 6 root wads	No	12/3/2018		See photo 9. Confirm next steps with MDNR
4.0	BRSA 8 bank area of settling	No	12/3/2018		Not observed during second quarterly inspection; snow cover inhibited view of the ground surface in many areas.
5.0	Plunge pool live stakes dislodged	No	2/26/2019		Live stakes on LDB and peninsula appeared knocked down, dislodged, or broken (photos 18, 19)
MINOR REPAIRS (Item Number)	INSPECTION REFERENCE	REPAIR SCOPE OF WORK SUBMITTED? YES / NO	DATE REPORTED	DATE REPAIR COMPLETED	OTHER COMMENTS
1.0	BRSA 1 along RDB of Pine Creek - void below coir fabric at rootwad/joint planting transition	No	12/3/2018		Continue to monitor, repair in spring/summer 2019 (photo 1)
2.0	BRSA 1 at Pine Creek confluence - plant live stakes	No	12/3/2018		See photo 2
3.0	BRSA 4 settling along bank downstream of staging area	No	12/3/2018		Continue to monitor, repair in spring/summer 2019 (photo 5)
4.0	BRSA 4 settling along bank downstream of staging area	No	12/3/2018		Continue to monitor, repair in spring/summer 2019 (photo 6)
5.0	BRSA 4 settling along bank across from BRSA 3 J-hooks	No	12/3/2018		Not observed during second quarterly inspection; snow cover inhibited view of the ground surface in many areas. Continue to monitor, repair in spring/summer 2019
6.0	BRSA 9 area of coir fabric not secured	No	12/3/2018		Re-stake coir fabric and over-seed as needed (photo 16)
7.0	Former WCS corridor erosion at drainage area on RDB	No	12/4/2018		Not observed during second quarterly inspection; snow cover inhibited view of the ground surface in many areas. Continue to monitor, repair in spring/summer 2019
8.0	BRSA 7 growth tubes knocked down/crushed	No	2/26/2019		Stand trees back up or replant trees in spring/summer 2019 (photo 12)
9.0	BRSA 8 fallen tree blocking east access gate	No	2/26/2019	3/22/2019	USEPA removed fallen tree (photo 14)
10.0	Fallen tree blocking access road to former WCS area	No	2/26/2019	3/22/2019	USEPA removed fallen tree (photo 20)
MAJOR REPAIRS (Item Number)	INSPECTION REFERENCE	REPAIR SCOPE OF WORK SUBMITTED? YES / NO	DATE REPORTED	DATE REPAIR COMPLETED	OTHER COMMENTS

**Otsego Township Dam Area
Time Critical Removal Action**

Third Quarterly Maintenance and Monitoring Inspection Report

Prepared for:

**Paul Ruesch
USEPA On-Scene Coordinator**

Prepared by:

**Wood Environment and Infrastructure Solutions
Novi, Michigan**

On Behalf of :

Georgia-Pacific LLC, International Paper Company, Weyerhaeuser Company

July 18, 2019

Georgia-Pacific LLC, Georgia-Pacific Consumer Products LP and Fort James LLC (collectively Georgia-Pacific), International Paper Company (International Paper), and Weyerhaeuser NR Company (Weyerhaeuser) (Parties), are respondents to the Unilateral Administrative Order (UAO) (V-W-16-C-009) issued by the U.S. Environmental Protection Agency (USEPA) on April 14, 2016, and conducted a Time Critical Removal Action (TCRA) to address polychlorinated biphenyls (PCBs) in bank soil and sediment within a portion of Operable Unit 5 (OU-5) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Specifically, the TCRA was performed within a portion of Area 3 of OU-5. The TCRA Site is the area that extends between the M-89 Bridge and the former Otsego Township Dam (also referred to as the Bittersweet Dam) in Otsego Township, Michigan. The TCRA was performed in accordance with the UAO and was completed with oversight of the USEPA under the Comprehensive Environmental Response, Compensation and Liability Act of 1980.

In accordance with paragraph 29 of the UAO, a Post-Removal Site Control Plan (PRSCP) was prepared to outline activities to be implemented to ensure that the applied remedies remain effective. TCRA construction activities were considered complete on August 15, 2018. As outlined in the PRSCP, quarterly maintenance and monitoring (M&M) inspections are to be conducted for one year following completion of the TCRA. Representatives from Wood Environment & Infrastructure Solutions, Inc. (Wood) and USEPA's Superfund Technical Assessment and Response Team (START) completed the third quarterly inspection from May 20-23, 2019. At the time of this inspection, the river was near bankfull elevation. Land-based inspections were completed in BRSA 1, 3, 4, 6, 7, 8, and 9, the plunge pool area, and the former water control structure (WCS) corridor on May 20. Due to unsafe conditions (very soft mud), the BRSA 7 bank build-out area was not fully inspected by land. In August 2018, Study Plots were established for evaluating vegetative success. Stem counts were completed in the Study Plots on May 21 and 22 (discussions of the stem count findings and invasive species control are presented below). Boat based inspections were completed on May 23.

As part of this third M&M inspection, representatives from USEPA, Wood, and Envirocon conducted a Site walk on May 22, 2019 to assess areas of concern identified during the M&M inspections. Items that were determined to require attention are scheduled to be repaired in June and July 2019. Other items will continue to be monitored during the fourth quarterly M&M inspection.

Inspections and stem counts were completed by Wood and START. Observations and findings were recorded using the electronic data collection program Survey123. Observations were photographed and GPS coordinates were collected. Figure 1-1 shows locations of observations (green triangles), findings that are scheduled to be repaired (yellow triangles), and findings that will continue to be monitored during the next inspection (blue triangles). Completed inspection forms are included as Attachment A, a Stem Count Summary is included as Attachment B, a photographic log is included as Attachment C, and a rolling action item list is included as Attachment D. Note that some items previously listed on the action item list as "minor repairs" were changed to "under observation" based on decisions made during the May 22 Site walk.

The fourth and final quarterly M&M inspection is scheduled to be completed in August 2019.

Study Plot Findings

In general, vegetation is well-established and stabilizing the banks. Trees and shrubs are doing very well but the live stake survival is varied. Numerous volunteer plants (trees) were observed throughout the BRSA's, including some of the study plots. The volunteer species were identified by a senior biologist at Wood (refer to Attachment B). There were several areas where live

stakes did not show signs of growth – BRSA 7, BRSA 8, the Plunge Pool area, and the former WCS corridor, specifically.

It should be noted that live stakes often take two or more growing seasons before they begin to show signs of above-ground growth. BRSA 7, BRSA 8, the Plunge Pool area, and the former WCS corridor were planted late in 2018, so it is possible that the live stakes have simply not had sufficient time to produce above-ground growth. Additionally, the freezer trailer where live stakes were stored prior to planting malfunctioned toward the end of the project and many live stakes came out of dormancy before being planted. This may have also contributed to the low live stake survival in the previously mentioned Study Plots. A qualitative assessment of the Study Plots and volunteers will be completed during the final quarterly inspection.

Lastly, recreational use has been observed in the Plunge Pool and Peninsula areas. Live stakes appear to have been removed by passersby for use as kindling and to allow closer access for fishing. This area will likely continue to be disrupted by passersby. Therefore, the decision about whether to plant additional live stakes will be determined in consultation with USEPA and Michigan Department of Natural Resources (MDNR). Details of the study plot stem counts are provided in Attachment B.

Invasive Species Control

Invasive plant species were observed on portions of the bank at the Site (refer to Attachment A). In general, their occurrences were sporadic; however, stands of Canada thistle and reed canary grass were observed in BRSA 6 and 7. Wood will employ a subcontractor to spray for invasive plant species in July 2019. The primary goal of the vegetation is bank stability. Because there is a risk of overspray killing desired vegetation, it may be harmful to spray invasive plants that do not appear to be out-competing the desired vegetation. Therefore, areas to focus control efforts will be determined in consultation with USEPA and MDNR prior to herbicide application.

I. Inspection Information

Inspection Date and Time: May 20, 2019 at 0849

Weather Conditions: 45°F, cool, cloudy, W winds 10-20 mph

Inspector: Bonnie Strzalka (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation: near bankfull

II. Inspection Results

BRSA 1 Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?	X		Photos 1, 2	Observed during Q1 and Q2 inspections.
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?	X		Photos 1, 2	Observed during Q1 and Q2 inspections.
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?	X		Photos 1, 2	Observed during Q1 and Q2 inspections.
Is there evidence of uneven soil settlement greater than approximately six inches?	X		Photo 4	Observed during Q1 inspection, snow covered during Q2 inspection.
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)	X		Photo 5	Tree grow tubes appear to have been removed by passersby and tied to outside of trees along an approx. 300 foot stretch of bank.
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.		X	Photo 7	See study plot stem count results in Appendix B
Are there areas bare of vegetation larger than 3ft square?	X		Photo 3	Downstream end of BRSA 1 at Pine Creek confluence (observed in Q1 and Q2 inspections)
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)	X			Purple loosestrife seedlings
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?	X			Growth observed at far upstream end of access road; little to no growth on other areas of road
Are the cuts in the access roads providing positive drainage to the river?	X			
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				

III. Post-Inspection Notifications and Recommended Actions

Notifications made and necessary corrective actions	No corrective action necessary at this time, will continue to monitor observations during August inspection.

I. Inspection Information

Inspection Date and Time: May 20, 2019 at 1012
Weather Conditions: 45°F, cool, cloudy, W winds 10-20 mph
Inspector: Bonnie Strzalka (Wood); Dan Capone, Ben Rausch (START)
Observed River Elevation: near bankfull

II. Inspection Results

BRSA 3 Inspection Items		Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration					
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X			
Are there areas bare or void of coir fabric?		X			
Is there any evidence of soil movement or slope instability (sloughing)?		X			
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X			
Is there evidence of uneven soil settlement greater than approximately six inches?		X			
Is there evidence that high water has "pulled out" some of the potted vegetation?		X			
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X			
Are there drainage problems associated with the feeder streams contrary to their designed function?		X			
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.		X		Photo 9	See study plot stem count results in Appendix B
Are there areas bare of vegetation larger than 3ft square?		X			
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)	X				One black locust inside study plot
B. Access Road/Gate					
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X			
Bare spots > 3 ft x 3 ft?	X				Little to no growth on access road
Are the cuts in the access roads providing positive drainage to the river?	X				
Is there evidence of any vandalism to the access gates or locks?		X			
C. General					
Comments					
<u>III. Post-Inspection Notifications and Recommended Actions</u>					
Notifications made and necessary corrective actions	No corrective action necessary at this time.				

I. Inspection Information

Inspection Date and Time: May 20, 2019 at 1309

Weather Conditions: 45°F, cool, cloudy, W winds 10-20 mph

Inspector: Bonnie Strzalka (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation: near bankfull

II. Inspection Results

BRSA 4 Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?	X		Photos 11, 12, 13	Same issue as Q1 inspection. See Appendix D
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?	X		Photos 11, 12, 13	Same issue as Q1 inspection. See Appendix D
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?	X		Photos 11, 12, 13	Same issue as Q1 inspection. See Appendix D
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.		X	Photo 15	See study plot stem count results in Appendix B
Are there areas bare of vegetation larger than 3ft square?	X		Photo 14	Live stakes at downstream end planted in mid-channel bar material not showing signs of growth; minimal grass growth
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)	X			Purple loosestrife
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?	X			Little to no growth on access road
Are the cuts in the access roads providing positive drainage to the river?	X			
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				
III. Post-Inspection Notifications and Recommended Actions				
Notifications made and necessary corrective actions	Area of rootwad settling requires repair.			
	Area at upstream end with live stakes showing no signs of growth (Figure 1-1); will continue to monitor.			

I. Inspection Information

Inspection Date and Time: May 20, 2019 at 1414
Weather Conditions: 50°F, cool, cloudy, W winds 10-20 mph
Inspector: Bonnie Strzalka (Wood); Ben Rausch (START)
Observed River Elevation: near bankfull

II. Inspection Results

BRSA 6 Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?	X		Photo 18	Approx. 75-100 LF near RS 38+00
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?	X		Photo 18	
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X		
Is there evidence of uneven soil settlement greater than approximately six inches?	X		Photo 19	Hole approx. 1 ft deep extending approx. 3 ft. landward, below grade.
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.		X	Photo 20	See study plot stem count results in Appendix B
Are there areas bare of vegetation larger than 3ft square?	X		Photos 16, 17	Two areas outside of study plots where live stakes do not appear to be growing: oxbow discharge area and approx. 50 LF near RS 45+50
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)	X			Purple loosestrife, Canada thistle, likely reed canary grass (not flowering, difficult to ID. Large band, extending from 42.46063 N 085.74108W to 42.45974 N 085.74058 W, and also in river at oxbow discharge)
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?	X			Little to no growth on access road
Are the cuts in the access roads providing positive drainage to the river?	X			
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				
III. Post-Inspection Notifications and Recommended Actions				
Notifications made and necessary corrective actions	Repair scour area (approx. 75-100 LF).			
	Plant additional live stakes in areas outside of study plot where live stakes do not appear to be growing.			

I. Inspection Information

Inspection Date and Time: May 20, 2019 at 1451
Weather Conditions: 50°F, cool, cloudy, W winds 10-20 mph
Inspector: Bonnie Strzalka (Wood); Ben Rausch (START)
Observed River Elevation: near bankfull

II. Inspection Results

BRSA 7 Inspection Items		Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration					
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X			
Are there areas bare or void of coir fabric?		X			
Is there any evidence of soil movement or slope instability (sloughing)?		X			
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?	X			Photo 21	Upland water appears to be cutting into bank near RS 30+00
Is there evidence of uneven soil settlement greater than approximately six inches?		X			
Is there evidence that high water has "pulled out" some of the potted vegetation?	X				Trees knocked over and grow tubes crushed over winter; USEPA stood trees back up
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X			
Are there drainage problems associated with the feeder streams contrary to their designed function?		X			
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.	X			Photo 23	See study plot stem count results in Appendix B
Are there areas bare of vegetation larger than 3ft square?		X			
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)	X				Purple loosestrife (very few), likely reed canary grass (not flowering, difficult to ID)
B. Access Road/Gate					
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X			
Bare spots > 3 ft x 3 ft?	X				Little to no growth on access road
Are the cuts in the access roads providing positive drainage to the river?	X				
Is there evidence of any vandalism to the access gates or locks?		X			
C. General					
Comments	Unable to fully walk BRSA 7 banks due to unsafe conditions (very soft mud in bank build-out area).				

III. Post-Inspection Notifications and Recommended Actions

Notifications made and necessary corrective actions	Recommend repairing upland seepage area.

I. Inspection Information

Inspection Date and Time: May 20, 2019 at 1058

Weather Conditions: 45°F, cool, cloudy, W winds 10-20 mph

Inspector: Bonnie Strzalka (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation: near bankfull

II. Inspection Results

BRSA 8 Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X		
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?	X		Photos 25, 26	Common fill placed over joint planting along approx. 300-400 ft. starting near RS 24+75 appears to be washed away
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X		
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.		X	Photo 27	See study plot stem count results in Appendix B
Are there areas bare of vegetation larger than 3ft square?	X		Photo 24	Approx. 20 LF near RS 7+00 with no signs of live stake growth
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)	X			Japanese knotweed near parking lot (42.46441, 085.74865)
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?	X			Little to no growth on access road
Are the cuts in the access roads providing positive drainage to the river?	X			
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				

III. Post-Inspection Notifications and Recommended Actions

Notifications made and necessary corrective actions	Repair scour area (300-400 LF)
	Area at downstream end with live stakes showing no signs of growth (Figure 1-1); will continue to monitor.

I. Inspection Information

Inspection Date and Time: May 20, 2019 at 1131

Weather Conditions: 45°F, cool, cloudy, misting rain, W winds 5-20 mph

Inspector: Bonnie Strzalka (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation: near bankfull

II. Inspection Results

BRSA 9 Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X		
Are there areas bare or void of coir fabric?	X		Photo 28	Previously identified during Q1 and Q2 inspections. See RAIL
Is there any evidence of soil movement or slope instability (sloughing)?		X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X		
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.		X	Photo 30	See study plot stem count results in Appendix B
Are there areas bare of vegetation larger than 3ft square?		X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)	X			Garlic mustard
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?	X			Little to no growth on access road
Are the cuts in the access roads providing positive drainage to the river?	X			
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				
III. Post-Inspection Notifications and Recommended Actions				
Notifications made and necessary corrective actions	Repair coir fabric area. No new recommendations since 1st and 2nd quarterly inspections. See Appendix D.			

I. Inspection Information

Inspection Date and Time: May 20, 2019 at 1046

Weather Conditions: 45°F, cool, cloudy, W winds 10-20 mph

Inspector: Bonnie Strzalka (Wood); Dan Capone, Ben Rausch (START)

Observed River Elevation: near bankfull

II. Inspection Results

Plunge Pool Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X		
Are there areas bare or not vegetated on the bank?		X		
Is there any evidence of soil movement or slope instability (sloughing)?		X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X		
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.	X		Photos 33, 34	See study plot stem count results in Appendix B
Are there areas bare of vegetation larger than 3ft square?	X		Photo 32	Little grass growth observed on peninsula between Plunge Pool and former WCS corridor
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)		X		
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?	X			Passersby appear to be removing live stakes (live stakes found in former bonfire area)
Bare spots > 3 ft x 3 ft?				NA - no access road
Are the cuts in the access roads providing positive drainage to the river?				NA - no access road
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				
III. Post-Inspection Notifications and Recommended Actions				
Notifications made and necessary corrective actions	No corrective action necessary at this time, will continue to monitor observations/vegetation during August inspection.			

I. Inspection Information

Inspection Date and Time: May 20, 2019 at 1558
Weather Conditions: 50°F, cloudy, W winds 10-20 mph
Inspector: Bonnie Strzalka (Wood); Ben Rausch (START)
Observed River Elevation: near bankfull

II. Inspection Results

Former WCS Corridor Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X		
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?		X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X		
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees? See attachment.	X		Photo 36	See study plot stem count results in Appendix B
Are there areas bare of vegetation larger than 3ft square?		X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)		X		
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?				NA - no access road
Are the cuts in the access roads providing positive drainage to the river?				NA - no access roads
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				

III. Post-Inspection Notifications and Recommended Actions

Notifications made and necessary corrective actions	No corrective action necessary at this time, will continue to monitor observations/vegetation during August inspection.

Study Plot:	BRSA 1	BRSA 3	BRSA 4	BRSA 6	BRSA 7	BRSA 8	BRSA 9	Plunge Pool	Peninsula	WCS Corridor
# Live Stakes Observed	44	18	19	22	1	0	18	0	1	12
Baseline Live Stakes Planted	52	38	54	20	19	59	46	29	11	90
# Live Shrubs Observed	6	5	3	7	10	7	6	0	0	0
Baseline Shrubs Planted	6	5	2	6	12	7	6	0	0	0
# Live Trees Observed	2	5	2	4	10	3	5	4	5	0
Baseline Trees Planted	2	5	6	5	10	3	5	4	5	0
Number of Volunteers	12	86	77	88	10	102	104	0	0	37
Percent Survival (Live Stakes)	85	47	35	110	5	0	39	0	9	13
Percent Survival (Shrubs)	100	100	67	86	120	100	100	NA	NA	NA
Percent Survival (Trees)	100	100	33	80	100	100	100	100	100	NA
Total Percent Survival (Including Volunteers)	107	238	163	390	76	162	233	12	38	54
Volunteer Species Description:	All first-year seedlings. 4 Willows 7 Box elder 1 Sumac	All first-year seedlings. 23 Staghorn sumac 51 Cottonwood 2 Box elder 6 Red maple 3 Silver maple 1 Oak	All first-year seedlings. 31 Maple 46 Cottonwood	All first-year seedlings. 71 Cottonwood 2 Box elder 6 Maple 9 Willow	All first-year seedlings. 2 oaks 1 cottonwood 1 unidentified woody seedling Type A 4 unidentified woody seedling Type B (along north boundary of plot) 2 box elder - existing stump sprouts on north boundary	All first-year seedlings. 100 cottonwood 2 maple	All first-year seedlings. 39 willow 5 box elder 7 maple 52 cottonwood 1 sumac	No volunteers observed	No volunteers observed	All first-year seedlings. 34 Cottonwood 1 Red maple 2 Maple (other)
Stressed Native Species Description:	None	2 stressed trees - one hornbeam (simple ovate entire), unable to ID other with grow tube. Marked with flagging	None Note one shrub likely misidentified as a live stake during baseline	None	Chokecherries appear to be doing well, other shrubs appear lightly stressed. Recommended evaluating in fall.	Live stakes not showing growth, planted late in 2018	None	Live stakes not showing growth, planted late in 2018	Live stakes not showing growth, planted late in 2018	Live stakes not showing growth, planted late in 2018
Other Comments:	Shrubs: American cranberry, black choke berry, southern arrowwood, hornbeam Live stakes: willow, red osier dogwood, cranberry, choke berry, silky dogwood	Shrubs: black chokeberry, alder, meadowsweet Live stakes: silky dogwood, willow, winter berry	6 trees - 2 have leaves, 3 without but probably living (likely oaks, slow to leaf), 1 likely dead. Trees not obviously alive marked with flagging Live stakes: black willow, dogwood, Shrubs: black chokeberry, hornbeam	Live stakes: willows Shrubs: cranberry (maybe nine bark), blueberry, hornbeam, black chokeberry Purple loosestrife observed	Two trees without grow tubes, at least one likely misidentified as shrub during baseline Shrubs: chokecherry, highbush blueberry, winterberry holly, possible hornbeam Live stake: Willow	Shrubs: swamp rose, blueberry, alder, winterberry holly	Shrubs: bladdernut, blueberry, chokecherry (tentative), ninebark, chokecherry Live stakes: willow, silky dogwood,	Live stakes appear to have been removed or dislodged during high water. Approx. 12 remain.		Live stakes: willow, silky dogwood



Photo 1: BRSA 1 along right-descending bank (RDB) of Pine Creek confluence. Void observed below coir fabric at rootwad/joint planting transition. No significant changes observed since first quarterly inspection.



Photo 2: Boat-based view of BRSA 1 along RDB of Pine Creek confluence (same location as Photo 1).



Photo 3: BRSA 1 at Pine Creek confluence where live stakes are missing. Previously identified; no new findings observed.



Photo 4: BRSA 1 area of settling. Previously observed during 1st Quarterly Inspection, but snow covered during 2nd Quarterly Inspection. Continue to monitor.



Photo 5: BRSA 1 grow tubes tied to outside of trees. Approx. 7-9 trees along approx. 300 ft. of bank.



Photo 6: Boat-based view of BRSA 1 bank identified for monitoring during 1st Quarterly Inspection; no issues observed.



Photo 7: BRSA 1 Study Plot.



Photo 8: BRSA 3 general view. No issues observed.



Photo 9: BRSA 3 Study Plot.



Photo 10: BRSA 4 residential restoration area. No issues observed.



Photo 11: BRSA 4 area of sloughing observed during 1st and 2nd Quarterly Inspections. No new issues observed.



Photo 12: Boat-based view of BRSA 4 area of sloughing observed during 1st and 2nd Quarterly Inspections.



Photo 13: BRSA 4 area of sloughing observed across from BRSA 3 J-hooks during 1st and 2nd Quarterly Inspections. No new issues observed.



Photo 14: BRSA 4 live stakes do not appear to be growing in area where mid-channel bar material was placed; live stakes are growing higher on bank.



Photo 15: BRSA 4 Study Plot.



Photo 16: Approx. 50 ft. of BRSA 6 with low-growth on live stakes. Previously identified, no new issues observed.



Photo 17: BRSA 6 oxbow discharge area – live stakes not showing signs of growth.



Photo 18: Approx. 75-100 linear feet of scouring along BRSA 6 bank.



**Photo 19: Hole observed in BRSA 6 bank, approx. 1 ft. deep, extending landward approx. 3 ft.
Continue to monitor.**



Photo 20: BRSA 6 Study Plot.



Photo 21: Upland water cutting into BRSA 7 bank.



Photo 22: BRSA 7 area where trees were previously knocked over by ice flows. No issues observed.



Photo 23: BRSA 7 study plot.



Photo 24: Approx. 20 ft. of BRSA 8 bank with no signs of growth on live stakes.



Photo 25: Scour observed along approx. 300-400 linear feet of BRSA 8 bank, beginning near RS 24+75.



Photo 26: Boat-based view of BRSA 8 scour shown in Photo 25.



Photo 27: BRSA 8 Study Plot.



Photo 28: BRSA 9 coir fabric repair area, previously identified in 1st and 2nd Quarterly Inspections.



Photo 29: BRSA 9 general view. No issues observed.



Photo 30: BRSA 9 Study Plot.



Photo 31: General view of Plunge Pool RDB. No issues observed.



Photo 32: General view of Plunge Pool peninsula. Limited grass and live stake growth observed.



Photo 33: Plunge Pool Study Plot. Note that live stakes appear to have been removed by passersby.



Photo 34: Peninsula study plot.



Photo 35: Former WCS corridor area identified during Q1 inspection as area to monitor; no significant change observed.



Photo 36: Former WCS corridor Study Plot.

UNDER OBSERVATION (Item Number)	INSPECTION REFERENCE	REPAIR SCOPE OF WORK SUBMITTED? YES / NO	DATE REPORTED	DATE REPAIR COMPLETED	OTHER COMMENTS
1.0	BRSA 1 along RDB of Pine Creek - void below coir fabric at rootwad/joint planting transition	No	12/3/2018		Continue to monitor, repair not necessary at this time (photos 1 and 2)
2.0	BRSA 1 at Pine Creek confluence - live stakes missing	No	12/3/2018		Continue to monitor, repair not necessary at this time (photo 3)
3.0	BRSA 1 bank area of settling	No	12/3/2018		Continue to monitor, repair not necessary at this time (photo 4)
4.0	BRSA 4 shrubs dislodged	No	12/3/2018		Not observed during Q2 inspection (likely due to snow cover) or Q3 inspection (likely due to vegetative cover)
5.0	BRSA 4 settling along bank across from BRSA 3 J-hooks	No	12/3/2018		Not observed during Q2 inspection (likely due to snow cover) or Q3 inspection (likely due to vegetative cover).
6.0	BRSA 4 area of no live-stake growth	No	5/20/2019		Live stakes planted in mid-channel bar material do not appear to be growing (photo 14)
7.0	BRSA 6 root wads	No	12/3/2018		Confirm next steps with MDNR
8.0	BRSA 6 hole observed in bank	No	5/20/2019		Approx. 1 ft deep, extending landward approx. 3 ft. (photo 19). Repair not necessary at this time.
9.0	BRSA 8 bank area of settling	No	12/3/2018		Not observed during Q2 inspection (likely due to snow cover) or Q3 inspection (likely due to vegetative cover)
10.0	BRSA 8 area of no live stake growth	No	5/20/2019		Approx. 20 ft. of bank with no signs of live stake growth (photo 24). Continue to monitor.
11.0	Plunge pool live stakes dislodged	No	2/26/2019		Continue to monitor, repair not necessary at this time
12.0	Peninsula showing limited grass and live stake growth	No	5/20/2019		Continue to monitor, repair not necessary at this time (Photo 32)
13.0	Former WCS corridor erosion at drainage area on RDB	No	12/4/2018		Continue to monitor, repair not necessary at this time (photo 35)
MINOR REPAIRS (Item Number)	INSPECTION REFERENCE	REPAIR SCOPE OF WORK SUBMITTED? YES / NO	DATE REPORTED	DATE REPAIR COMPLETED	OTHER COMMENTS
1.0	BRSA 1 tree tubes tied to outside of trees	Yes	12/3/2018		Grow tubes will be removed and properly disposed, scheduled for June and July 2019 (photo 5)
2.0	BRSA 4 settling along bank, approx. 50 LF downstream of staging area	Yes	12/3/2018		Repair scheduled for June/July 2019 (photos 11, 12, 13)
3.0	BRSA 6 - two areas where live stakes are not growing	Yes	5/20/2019		Plant additional live stakes, scheduled for June and July 2019 (photos 16 and 17)
4.0	BRSA 6 scouring along approx. 75-100 LF	Yes	5/20/2019		Repair scheduled for June/July 2019 (photo 18)
5.0	BRSA 7 upland water cutting into bank	Yes	5/20/2019		Repair scheduled for June/July 2019 (photo 21)
6.0	BRSA 8 bank scour, approx. 300-400 LF	Yes	5/20/2019		Repair scheduled for June/July 2019 (photos 25 and 26)
7.0	BRSA 9 area of coir fabric not secured	Yes	12/3/2018		Repair scheduled for June/July 2019 (photo 28)
8.0	BRSA 7 growth tubes knocked down/crushed	No	2/26/2019	4/1/2019	USEPA stood trees back up (photo 22)
9.0	BRSA 8 fallen tree blocking east access gate	No	2/26/2019	3/22/2019	USEPA removed fallen tree
10.0	Fallen tree blocking access road to former WCS area	No	2/26/2019	3/22/2019	USEPA removed fallen tree
MAJOR REPAIRS (Item Number)	INSPECTION REFERENCE	REPAIR SCOPE OF WORK SUBMITTED? YES / NO	DATE REPORTED	DATE REPAIR COMPLETED	OTHER COMMENTS

Notes:
1. Completed action items are shaded gray.
2. Some items previously listed as “minor repairs” are now listed as “under observation” based on decisions made during the May 22, 2019 Site walk conducted by USEPA, Wood, and Envirocon.

**Otsego Township Dam Area
Time Critical Removal Action**

Fourth Quarterly Maintenance and Monitoring Inspection Report

Prepared for:

**Paul Ruesch
USEPA On-Scene Coordinator**

Prepared by:

**Wood Environment and Infrastructure Solutions
Novi, Michigan**

On Behalf of :

Georgia-Pacific LLC, International Paper Company, Weyerhaeuser Company

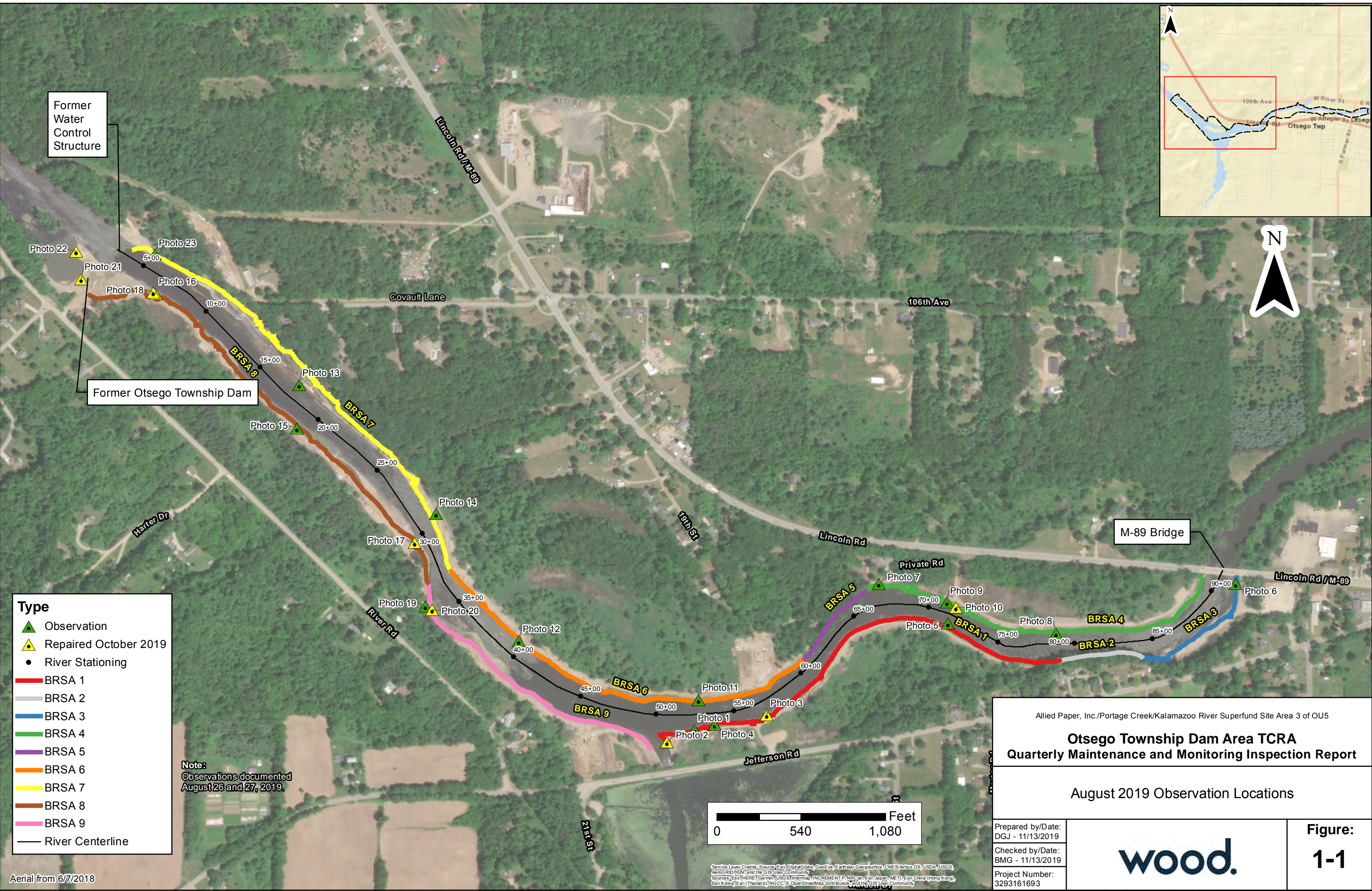
November 15, 2019

Georgia-Pacific LLC, Georgia-Pacific Consumer Products LP and Fort James LLC (collectively Georgia-Pacific), International Paper Company (International Paper), and Weyerhaeuser NR Company (Weyerhaeuser) (Parties), are respondents to the Unilateral Administrative Order (UAO) (V-W-16-C-009) issued by the U.S. Environmental Protection Agency (USEPA) on April 14, 2016, and conducted a Time Critical Removal Action (TCRA) to address polychlorinated biphenyls (PCBs) in bank soil and sediment within a portion of Operable Unit 5 (OU-5) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Specifically, the TCRA was performed within a portion of Area 3 of OU-5. The TCRA Site is the area that extends between the M-89 Bridge and the former Otsego Township Dam (also referred to as the Bittersweet Dam) in Otsego Township, Michigan. The TCRA was performed in accordance with the UAO and was completed with oversight of the USEPA under the Comprehensive Environmental Response, Compensation and Liability Act of 1980.

In accordance with paragraph 29 of the UAO, a Post-Removal Site Control Plan (PRSCP) was prepared to outline activities to be implemented to ensure that the applied remedies remain effective. TCRA construction activities were approved by USEPA as complete on August 15, 2018. As outlined in the PRSCP, quarterly maintenance and monitoring (M&M) inspections were to be conducted for one year following completion of the TCRA. Representatives from Wood Environment & Infrastructure Solutions, Inc. (Wood) and USEPA's Superfund Technical Assessment and Response Team (START) completed the fourth and final quarterly inspection on August 26 and 27, 2019. At the time of this inspection, the river was below bankfull elevation. Boat-based inspections of BRSA 1, 3, 4, 6, and 8 were completed on August 26; however, due to low water, it was not possible to complete a boat-based inspection of BRSA 9 as the boat could not safely navigate upstream through the narrows located between BRSA 6 and 9. Land-based inspections of BRSA 1, 3, 4, 6, 7, 8, and 9, the plunge pool area, and the former water control structure (WCS) corridor were completed on August 27. Items that were determined to require attention were repaired in October 2019.

Observations and findings were recorded using the electronic data collection program Survey123. Observations were photographed and GPS coordinates were collected. Figure 1-1 shows locations of observations (green triangles), findings that were repaired (yellow triangles), and findings that were determined not to require repair (blue triangles). Completed inspection forms are included as Attachment A, a photographic log is included as Attachment B, and a rolling action item list is included as Attachment C. Refer to the Final M&M Report for additional repair details.

Path: G:\KzooRiverProject\MXD_PDFs\Area3\Repair_Scope\Of Work\Fig1-1_ObservationsMay_Repair\August_2019.mxd dylan.jones 11/13/2019 3:57:24 PM



I. Inspection Information

Inspection Date and Time: August 27, 2019 at 1700

Weather Conditions: 70s °F, sunny, SW winds 5-10 mph

Inspector: Bonnie Strzalka, Phil Perhamus (Wood); Dan Capone (START)

Observed River Elevation: below bankfull

II. Inspection Results

Former WCS Corridor Inspection Items	Yes	No	Photograph Collected	Corrective Action
A. Bank Restoration				
Is there evidence of active bank erosion, loss of stone protection, or undercutting of the bank toe?		X		
Are there areas bare or void of coir fabric?		X		
Is there any evidence of soil movement or slope instability (sloughing)?		X		
Is there evidence of soil erosion (rills, cracks, gullies, or washouts) greater than six inches deep?		X		
Is there evidence of uneven soil settlement greater than approximately six inches?		X		
Is there evidence that high water has "pulled out" some of the potted vegetation?		X		
Are there other noticeable actionable items? (for example rubbish from river flows, significant damage from beavers, wind damage to trees etc.)		X		
Are there drainage problems associated with the feeder streams contrary to their designed function?		X		
Is vegetation survival rate less than the performance criteria for live stakes, shrubs, trees?	NA	NA	Photo 23	Stem count not required for 4th quarterly M&M inspection; however, vegetation appears successful
Are there areas bare of vegetation larger than 3ft square?		X		
Is there evidence of invasive weeds or undesirable vegetative growth? (e.g., canary grass, purple loosestrife, Japanese knotweed, tree of heaven, etc.)	X			Purple loosestrife
B. Access Road/Gate				
Are there problems with the controls on the access roads (blocks, gates) that prevent public use?		X		
Bare spots > 3 ft x 3 ft?				NA - no access road
Are the cuts in the access roads providing positive drainage to the river?				NA - no access roads
Is there evidence of any vandalism to the access gates or locks?		X		
C. General				
Comments				
III. Post-Inspection Notifications and Recommended Actions				
Notifications made and necessary corrective actions	No corrective action necessary at this time.			



Photo 1: BRSA 1 general view.



Photo 2: BRSA 1 right-descending bank of Pine Creek confluence. Void observed at rootwad/joint planting transition (observed during previous inspections).



Photo 3: Fabric from cofferdam system remaining in river along BRSA 1 (fabric also observed along BRSA 9).



Photo 4: BRSA 1 area of minor settling. Observed during previous inspections. No change in condition observed.



Photo 5: General view of BRSA 1 bank during boat-based inspection.



Photo 6: BRSA 3 general view.



Photo 7: BRSA 4 general view of residential restoration area.



Photo 8: BRSA 4 general view during boat-based inspection.



Photo 9: BRSA 4 bank repair area (repair completed July 2019), no live stakes were installed as part of the repair.



Photo 10: BRSA 4 area of erosion, approximately 25-50 feet upstream of July 2019 repairs.



Photo 11: BRSA 6 general view.



Photo 12: BRSA 6 bank repair area (repair completed July 2019).



Photo 13: BRSA 7 general view.



Photo 14: BRSA 7 bank repair area (repair completed July 2019).



Photo 15: BRSA 8 general view.



Photo 16: BRSA 8 area of minor erosion (Erosion Area 1).



Photo 17: BRSA 8 second area of minor erosion (Erosion Area 2).



Photo 18: BRSA 8 third area of minor erosion (Erosion Area 3).



Photo 19: BRSA 9 general view.



Photo 20: BRSA 9 void observed beneath approximately 150-200 linear feet of coir fabric.



Photo 21: Plunge Pool general view. Sparse vegetation observed on peninsula.



Photo 22: Peninsula general view. Sparse vegetation observed.



Photo 23: Former Water Control Structure corridor general view.

UNDER OBSERVATION (Item Number)	INSPECTION REFERENCE	REPAIR SCOPE OF WORK SUBMITTED? YES / NO	DATE REPORTED	DATE REPAIR COMPLETED	OTHER COMMENTS
1.0	BRSA 1 live stakes missing at Pine Creek confluence	No	12/3/2018	NA	Observed during each inspection. Area continues to be trafficked and live stakes would likely not survive. Repair not required.
2.0	BRSA 1 area of bank settling	No	12/3/2018	NA	Observed during Q1 inspection and monitored during subsequent inspections. No change in condition observed. Repair not required.
3.0	BRSA 4 shrubs dislodged	No	12/3/2018	NA	Observed during Q1 inspection. Not observed during Q2 inspection (likely due to snow cover) or Q3 and Q4 inspections (likely due to vegetative cover). Repair not required.
4.0	BRSA 4 area of no live-stake growth	No	5/20/2019	NA	Live stakes planted in mid-channel bar material do not appear to be growing; however, due to coarse substrate and low organic material, growth is not likely. Therefore, replanting is not required.
5.0	Extra BRSA 6 root wads left standing in turnaround	No	12/3/2018	NA	Leftover root wads were turned over to MDNR. No action required.
6.0	BRSA 6 hole observed in bank	No	5/20/2019	NA	Observed during Q3 inspection. Not observed during Q4 inspection, likely due to vegetative cover. Repair not required.
7.0	BRSA 8 area of bank settling	No	12/3/2018	NA	Observed during Q1 inspection, but not during subsequent inspections. Repair not required.
8.0	Plunge pool live stakes dislodged	No	2/26/2019	NA	Observed during Q2, Q3, and Q4 inspections. Area continues to be trafficked and live stakes would likely not survive. Repair not required.
9.0	Former WCS corridor minor erosion at drainage area on RDB	No	12/4/2018	NA	Area observed during Q1 inspection and monitored during subsequent inspections. No change in condition observed over time. Repair not required.
MINOR REPAIRS (Item Number)	INSPECTION REFERENCE	REPAIR SCOPE OF WORK SUBMITTED? YES / NO	DATE REPORTED	DATE REPAIR COMPLETED	OTHER COMMENTS
1.0	BRSA 1 tree tubes tied to outside of trees	Yes	12/3/2018	July 2019	Tree tubes removed.
2.0	BRSA 4 settling along bank, approx. 50 LF downstream of staging area	Yes	12/3/2018	July 2019	Installed riprap, common fill, topsoil, seed, and straw; live stakes installed in October 2019.
3.0	BRSA 4 settling along bank across from BRSA 3 J-hooks	No	12/3/2018	July 2019	Installed riprap, topsoil, and seed. Previously listed as Under Observation, but the decision was made to repair during July repairs. No issues observed during Q4 inspection.
4.0	BRSA 6 two areas observed where live stakes were not growing	Yes	5/20/2019	July 2019	Additional live stakes planted.
5.0	BRSA 6 scouring along approx. 75-100 LF of the bank	Yes	5/20/2019	July 2019	Installed riprap, common fill, topsoil, seed, straw, and live stakes. No issues observed during Q4 inspection.
6.0	BRSA 7 upland seep venting to the river causing bank erosion	Yes	5/20/2019	July 2019	Installed riprap, topsoil, seed, and straw. No issues observed during Q4 inspection.
7.0	BRSA 8 scouring along approx. 300-400 LF of the bank	Yes	5/20/2019	July 2019	Bank was hand-graded. Seed and straw were installed. No issues observed during Q4 inspection.
8.0	BRSA 9 area of coir fabric not secured	Yes	12/3/2018	July 2019	Coir fabric cut and staked to secure; area seeded. No issues observed during Q4 inspection.
9.0	BRSA 7 Trees and tree tubes knocked down/crushed	No	2/26/2019	4/1/2019	USEPA stood trees back up.
10.0	BRSA 8 fallen tree blocking east access gate	No	2/26/2019	3/22/2019	USEPA removed fallen tree.
11.0	Fallen tree blocking access road between Command Center and former WCS area	No	2/26/2019	3/22/2019	USEPA removed fallen tree.
12.0	BRSA 1 along RDB of Pine Creek - hole observed in coir fabric at rootwad/joint planting transition	Yes	8/27/2019	October 2019	Riprap installed to fill void.
13.0	BRSA 8 area of no live stake growth	Yes	5/20/2019	October 2019	Live stakes planted in low-growth areas. Previously listed as Under Observation.
14.0	BRSA 9 second area of coir fabric not secured	Yes	8/27/2019	10/1/2019	Coir fabric cut and staked to secure; topsoil and seed installed.
15.0	Plunge Pool Peninsula showing limited grass and live stake growth	Yes	5/20/2019	September 2019	Existing vegetation was mown, new top soil placed, and area re-seeded/strawed. Previously listed as Under Observation.
MAJOR REPAIRS (Item Number)	INSPECTION REFERENCE	REPAIR SCOPE OF WORK SUBMITTED? YES / NO	DATE REPORTED	DATE REPAIR COMPLETED	OTHER COMMENTS

Note: Completed action items are shaded gray.

ATTACHMENT B
PHOTO LOG



Photo 1A (Before): BRSA 1 near RS 50+00, along the right-descending bank (RDB) of the Pine Creek confluence. Void observed below coir fabric at rootwad/joint planting transition (May 2019).



Photo 1B (After): BRSA 1 near RS 50+00, repair of void along RDB of Pine Creek confluence at rootwad/joint planting transition (October 2019).



Photo 2A (Before): BRSA 4 near RS 70+00, area of sloughing observed during Q1 through Q3 Inspections (May 2019).



Photo 2B (After): BRSA 4 near RS 70+00, area of sloughing bank repair (July 2019).



Photo 3A (Before): BRSA 4 near RS 71+50, area of erosion approximately 25-50 feet upstream of July 2019 repairs (August 2019).



Photo 3B (After): BRSA 4 near RS 71+50, area of erosion bank repair (October 2019).



Photo 4A (Before): BRSA 4 near RS 86+00, area of sloughing observed across from BRSA 3 J-hooks during Q1 through Q3 Inspections (May 2019).



Photo 4B (After): BRSA 4 near RS 85+50, area of sloughing bank repair (July 2019).



Photo5A (Before): BRSA 6 near RS 38+50, bank scour along approximately 75-100 linear feet (LF) of bank (May 2019).



Photo 5B (After): BRSA 6 near RS 38+50, bank scour repair (July 2019).



Photo 6A (Before): BRSA 6 near RS 48+00, area of low-growth on live stakes along approximately 50 LF (May 2019).



Photo 6B (After): BRSA 6 near RS 48+00, additional live stakes planted in area of low-growth (July 2019).



Photo 7A (Before): BRSA 6 near RS 37+00 (oxbow discharge area), live stakes not showing signs of growth (May 2019).



Photo 7B (After): BRSA 6 near RS 37+00 (oxbow discharge area), additional live stakes planted in area of no growth (July 2019).



Photo 8A (Before): BRSA 7 near RS 29+50, upland water cutting into bank (May 2019).



Photo 8B (After): BRSA 7 near RS 29+50, bank repair (July 2019).



Photo 9A (Before): BRSA 8 starting near RS 24+75, area of scouring observed along approximately 300-400 LF of bank (May 2019).



Photo 9B (After): BRSA 8 near RS 27+00, area of scouring bank repair (July 2019).



Photo 10A (Before): BRSA 8 near RS 7+00, area of minor erosion (Erosion Area 1, August 2019).



Photo 10B (After): BRSA 8 near RS 7+00, Erosion Area 1 repair (October 2019).



Photo 11A (Before): BRSA 8 near RS 30+50, second area of minor erosion (Erosion Area 2, August 2019).



Photo 11B (After): BRSA 8 near RS 30+50, Erosion Area 2 repair (October 2019).



Photo 12A (Before): BRSA 8 near RS 7+00, third area of minor erosion (Erosion Area 3, August 2019).



Photo 12B (After): BRSA 8 near RS 7+00, Erosion Area 3 repair (October 2019).



Photo 13: BRSA 8 near RS 26+50, topsoil, seed, and straw placed at top of bank in area of sparse vegetation. Repaired at the request of MDNR during October repair activities (October 2019).



Photo 14: BRSA 8 near RS 32+00, erosion observed during October 2019 repairs. Repaired at the request of MDNR by installing riprap, common fill, topsoil, seed, and live stakes (October 2019).



Photo 15A (Before): BRSA 9 near RS 36+00, void beneath approximately 35 LF of coir fabric observed during Q1 through Q3 inspections (May 2019).



Photo 15B (After): BRSA 9 near RS 36+00, area of coir fabric repair (July 2019).



Photo 16A (Before): BRSA 9 near RS 34+00, void observed beneath approximately 150 to 200 LF of coir fabric (August 2019).



Photo 16B (After): BRSA 9 near RS 34+00, coir fabric repair (October 2019).



Photo 17A (Before): Plunge Pool near 0+00, general view of peninsula. Limited grass and live stake growth observed (May 2019).



Photo 17B (After): Plunge Pool near 0+00, new topsoil and seed installed (October 2019).