

**FLOODWAY HABITAT MITIGATION PLAN 2022 ANNUAL REPORT  
FW-29895 & FW-30899  
ELLIOTT DITCH – REACHES 1 – 3 INTERIM MEASURES PROJECT  
ARCONIC LAFAYETTE OPERATIONS  
3131 EAST MAIN STREET  
LAFAYETTE, INDIANA 47905**

**Prepared for:**

**STATE OF INDIANA DEPARTMENT OF NATURAL RESOURCES  
CENTRAL REGION ENVIRONMENTAL BIOLOGIST  
DIVISION OF WATER  
402 W. WASHINGTON ST., RM W264  
INDIANAPOLIS, IN 46204-2641**

**Prepared by:**

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**On Behalf of:**



**ARCONIC**

**MR. ROBERT PREZBINDOWSKI  
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**CEC PROJECT 315-052**

**DECEMBER 2022**



**Civil & Environmental Consultants, Inc.**

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## 1.0 INTRODUCTION

Civil & Environmental Consultants, Inc (CEC), on behalf of Arconic Lafayette, LLC (Arconic), is pleased to provide the Indiana Department of Natural Resources (IDNR) this Floodway Habitat Mitigation Plan (HMP) Annual Report (Report) as required by the IDNR Construction-in-a-Floodway Permit (Permit) Application Approval No. FW-30899, included in **Appendix A**. The intent of this report is to document the implementation of the HMP and the first year of performance monitoring.

This Report includes the following components:

- Project background and mitigation area site selection;
- Mitigation plan implementation and planting summary;
- Mitigation monitoring methods and results; and,
- Conclusions and Recommendations

### 1.1 Background

Arconic has performed the remediation of PCB impacted sediment and soil in Reaches 1 through 3 of Elliott Ditch in accordance with Interim Measure Work Plans (IMWPs) approved by the Indiana Department of Environmental Management (IDEM) and the United States Environmental Protection, Region 5 (U.S. EPA). Elliott Ditch is a tributary to Wea Creek, which is a tributary to the Wabash River within the Middle Wabash – Little Vermillion watershed (HUC 05120108) downstream of Lafayette, Indiana. The project was executed in two phases: soil remediation of the levee located in Reach 1 (Phase 1) and the remediation of sediment and isolated soil in Reaches 1 through 3 (Phase 2). The work was performed as part of Resource Conservation and Recovery Act (RCRA) Corrective Action administered by the IDEM Office of Land Quality (OLQ) and with risk-based approval from the U.S. EPA, Region 5.

The HMP was originally approved as part of IDNR Application No. FW-29895 associated with Phase 1 of the Elliott Ditch Remediation Project that was performed in 2020 and estimated the riparian disturbance in Phase 2 of the project based on information known at the time. In preparation for Phase 2 and at the direction of IDNR, Arconic prepared a new Construction-in-a-Floodway Permit and updated the HMP in January 2021 based upon the refined remedial footprints. IDNR approved the updated HMP and issued the IDNR Construction-in-a-Floodway Permit (Permit) Application Approval No. FW-30899. Phase 2 activities were performed from June through mid-September, 2021, with the final portion being completed in October 2022.

The initial phase of the project disturbed 4.67 acres in the floodway as part of Application No. FW-29895. Of the 4.67 acres, riparian habitat disturbance included 1.07 acres of non-wetland tree removal and 1.24 acres of successional habitat. The initial application also included an estimated

the riparian disturbances anticipated as part of Phase 2 of the project. As provided in the December 2020 IDNR Construction-in-a-Floodway Permit application (FW-30899), Phase 2 of the project disturbed an additional 0.18 acres in the floodway in Reach 1 and 1.27 acres in the floodway in Reaches 2 and 3, for a total additional disturbance of 1.45 acres. Of the 1.45 acres, riparian habitat disturbance included 0.53 acres of non-wetland tree removal and 0.6 acres of successional habitat. The total unavoidable impact requiring mitigation was 1.60 acres (total acreage of non-wetland tree removal); therefore, the total compensatory 2:1 mitigation was 3.20 acres.

Arconic intends to provide mitigation monitoring reports to IDNR referencing IDNR approval FW-30899 moving forward. Success of the mitigation will satisfy both IDNR permits (FW-29895 and FW-30899) associated with the two phases of the project.

The approved HMP has been included in **Appendix B** for reference purposes.

## 1.2 Mitigation Area Selection

The HMP proposed the restoration and enhancement of 3.20 acres of floodway immediately adjacent to Elliott Ditch. In the HMP, Arconic identified a 9.1-acre area to potential accommodate of the mitigation footprint. Arconic ultimately selected the mitigation site to be located on a 3.20-acre portion of 3107 Olympia Drive, Lafayette, Indiana, east of Elliott Ditch and north of Norfolk Southern's active railroad crossing within the proposed area. This parcel is owned by UAW Local Union #2317 (UAW).

The mitigation area was selected in order to avoid future disturbance by Tippecanoe County. Tippecanoe County requested that the stone haul road remain in place to be used for future maintenance equipment access and that the area between the stone road and Elliott Ditch not be used for mitigation purposes due to potential construction of a dual staged ditch. Tippecanoe County is considering constructing a dual stage ditch in Reach 1 of Elliott Ditch and the plantings would be disturbed or removed should that project move forward. The HMP effort was discussed with UAW prior to implementation. UAW agreed to the habitat mitigation planting occurring on its property per the executed Access and Use Agreement. A copy of the Access and Use Agreement has been included in **Appendix C**.

The mitigation site is depicted on **Figures 1 and 2**.

## 2.0 MITIGATION PLAN IMPLEMENTATION AND PLANTING SUMMARY

Implementation of the HMP was performed by Williams Creek Management Corp. (Williams Creek) and commenced in late November 2021 and was completed in December 2021. Components of the mitigation included site preparation, invasive species removal, groundcover seeding, shrub/tree planting, and the installation of mitigation signage. Woody plants were selected and placed in accordance with IDNR’s Bulletin #17 (Fourth Amendment): Floodway Habitat Mitigation dated January 15, 2019 (Bulletin), to establish diversity and ecological function of the mitigation area. A total of 1,451 trees/shrubs were planted. The following tables (Tables 1-3) document the planted species, amounts, and sizes:

**Table 1: Understory Herbaceous Seeding.**

PLS oz/Acre	Scientific Name	General Name <sup>1</sup>
<b>Grasses</b>		
16	<i>Andropogon gerardii</i>	Big Bluestem
16	<i>Bouteloua curtipendula</i>	<b>Side-Oats Grama</b>
32	<i>Elymus canadensis</i>	Canada Wild Rye
16	<i>Elymus virginicus</i>	Virginia Wild Rye
16	<i>Schizachyrium scoparium</i>	<b>Little Bluestem</b>
16	<i>Sorghastrum nutans</i>	<b>Indian Grass</b>
<b>Forbs</b>		
0.5	<i>Asclepias syriaca</i>	<b>Common Milkweed</b>
3	<i>Echinacea purpurea</i>	<b>Purple Coneflower</b>
0.5	<i>Eryngium yuccifolium</i>	<b>Rattlesnake Master</b>
3	<i>Heliopsis helianthoides</i>	False Sunflower
0.5	<i>Monarda fistulosa</i>	<b>Bergamot</b>
1	<i>Oligoneuron rigidum</i>	<b>Stiff Goldenrod</b>
1	<i>Penstemon digitalis</i>	<b>Foxglove Beardtongue</b>
4	<i>Ratibida pinnata</i>	<b>Yellow Coneflower</b>
3	<i>Rudbeckia hirta</i>	<b>Black-Eyed Susan</b>
3	<i>Senna hebecarpa</i>	<b>Wild Senna</b>
2	<i>Silphium integrifolium</i>	<b>Rosinweed</b>
2	<i>Silphium terebinthinaceum</i>	<b>Prairie Dock</b>
0.5	<i>Symphotrichum novae-angliae</i>	<b>New England Aster</b>

Notes: PLS oz/acre – Pure Live Seed Ounces/Acre

<sup>1</sup> The general species names that are a **bold font** were selected by Williams Creek Management Corporation (Williams Creek) and differ from what was provided in the HMP. However, these species were confirmed to be native to Tippecanoe County, Indiana by referencing the USDA Plants Database: <https://plants.sc.egov.usda.gov/home/stateSearch>. These species were readily available from the seed supplier and were also selected based upon Williams Creek’s experience with utilizing these species at other mitigation sites in central Indiana during colder months.

**Table 2: Planted Tree Species.**

Number of Stems	Scientific Name	General Name	Size
73	<i>Acer rubrum</i>	Red Maple	1 gallon RR 2-3'
14	<i>Acer rubrum</i>	Red Maple	1 gallon RR 3-4'
14	<i>Acer rubrum</i>	Red Maple	1 gallon RR 4-5'
7	<i>Acer rubrum</i>	Red Maple	1 gallon RR 4-5'
67	<i>Acer rubrum</i>	Red Maple	3 gallon RF 3-4'
100	<i>Carya cordiformis</i>	Bitternut Hickory	3 gallon RF 6"-1'
63	<i>Celtis occidentalis</i>	Hackberry	1 gallon RR 2-3'
34	<i>Celtis occidentalis</i>	Hackberry	1 gallon RR 3-4'
70	<i>Fraxinus pennsylvanica</i>	Green Ash	3 gallon RF 6-7'
27	<i>Platanus occidentalis</i>	Sycamore	3 gallon RF 6-7'
1	<i>Quercus alba</i>	White Oak	1 gallon RR 1-2'
99	<i>Quercus alba</i>	White Oak	1 gallon RR 2-3'
18	<i>Quercus alba</i>	White Oak	1 gallon RR 2-3'
17	<i>Quercus alba</i>	White Oak	1 gallon RR 3-4'
13	<i>Quercus alba</i>	White Oak	1 gallon RR 3-4'
25	<i>Quercus palustris</i>	Pin Oak	1 gallon RR 4-5'
2	<i>Quercus palustris</i>	Pin Oak	1 gallon RR 4-5'
148	<i>Quercus palustris</i>	Pin Oak	3 gallon RF 6-7'
130	<i>Quercus rubra</i>	Red Oak	1 gallon RR 1-2'
42	<i>Quercus rubra</i>	Red Oak	1 gallon RR 2-3'
3	<i>Quercus rubra</i>	Red Oak	1 gallon RR 3-4'

**Table 3: Planted Shrub Species.**

Number of Plants	Scientific Name	General Name	Size
95	<i>Cornus amomum</i>	Silky Dogwood	1 gallon 3-4'
35	<i>Cornus racemosa</i>	Gray Dogwood	1 gallon 1-2'
60	<i>Cornus racemosa</i>	Gray Dogwood	3 gallon 1-2'
100	<i>Hydrangea arborescens</i>	Smooth Hydrangea	3 gallon 2-3'
99	<i>Ilex verticillata</i>	Winterberry	1 gallon 1-2'
66	<i>Prunus serotina</i>	Black Cherry	3 gallon RF 2-3'
29	<i>Prunus serotina</i>	Black Cherry	3 gallon RF 2-3'

### 3.0 MITIGATION MONITORING

The approved permit includes requirements for monitoring the success of the habitat mitigation. In general, routinely scheduled monitoring events collect data that measures the mitigation progress toward meeting the success criteria established in the permit conditions. The mitigation site must be monitored for a minimum of three years, with a report submitted to IDNR by December 31 of each year to document initiation, progress, and success of the mitigation site. Additional reports may be required until the mitigation site is determined to be successful. IDNR Monitoring reports are to include a narrative that describes the activity accomplished to date, the number of acres planted, the number of plants planted, the list of species planted on site, appropriate pictures of vegetative plantings, and the estimated survival of planted material. This report represents the second IDNR monitoring report.

#### 3.1 MONITORING METHODS

A CEC ecologist visited the mitigation site on September 9, 2022, to document progress of the mitigation. Photographs of the site were taken to document conditions of the mitigation site at various locations (Appendix D, Figure 2). A floristic quality assessment (FQA) of herbaceous species was performed during a walkthrough of the mitigation site (Appendix E). Woody plant species were monitored through stem counts within two, surveyed permanent rectangular plots. The plots were approximately 0.10 acres each and the locations of the plots are identified on Figure 2. Percent ground cover was also noted.

#### 3.2 MONITORING RESULTS

A walkthrough of the site identified 24 herbaceous species, of which 3 were planted species. Half of the identified species were native and the other half non-native. The identified herbaceous species can be found in Appendix E. A total of 73 living trees/shrubs were identified within the two (2) 0.10-acre rectangular plots. Tree/shrub survival within these plots extrapolated to 3.20 acres equates to approximately 1,168 living trees/shrubs. This equates to a survival rate of approximately 80%. Tree/shrub species identified as living within the plots are provided below in Table 4.

**Table 4: Tree/Shrub Species Identified in Both 0.1-Acre Plots.**

Number of Stems	Scientific Name	General Name
7	<i>Acer rubrum</i>	Red Maple
5	<i>Carya cordiformis</i>	Bitternut Hickory
8	<i>Celtis occidentalis</i>	Hackberry

Number of Stems	Scientific Name	General Name
7	<i>Fraxinus pennsylvanica</i>	Green Ash
1	<i>Platanus occidentalis</i>	Sycamore
7	<i>Prunus serotina</i>	Black Cherry
8	<i>Quercus alba</i>	White Oak
9	<i>Quercus palustris</i>	Pin Oak
21	<i>Quercus rubra</i>	Red Oak

### 3.3 MONITORING SUCCESS CRITERIA

Non-wetland forest mitigation success will be measured based upon percent survival of planted trees and shrubs (75-percent per acre). Total vegetation cover criteria includes 80-percent cover, and of the 80-percent, 75-percent being of native species. The mitigation site will be evaluated against this criteria on an annual basis for a minimum of three years, or until the success criteria are satisfied. After three years, assuming success criteria have been satisfied, Arconic will petition IDNR to terminate monitoring.

The mitigation site is currently at an 80-percent survival rate for planted trees and shrubs, which slightly exceeds the 75-percent survival criteria for trees and shrubs. Vegetation cover of the site is approximately 100-percent, however, approximately 50-percent of the identified species are non-native. The 50-percent estimation was made following a regular maintenance mowing event making native species identification more challenging. Native species cover will be re-evaluated next year prior to scheduled maintenance activities to better assess the survival rate.

### 3.4 PROTECTION OF THE MITIGATION SITE

To protect the mitigation site, Williams Creek installed signage with language identifying the location as a mitigation site and prohibiting mowing and spraying. After three years, assuming success criteria have been satisfied, signage will be removed. A few signs were stolen and/or vandalized in the fall of 2022 and will be replaced in 2023.

In addition to signage, Arconic will continue to maintain the Access & Use Agreement with UAW in order to perform the required monitoring and maintenance activities until success criteria have been achieved. The Access & Use Agreement has provisions for restoration and monitoring and stipulates that the agreement is in effect until Arconic has satisfied the requirements of the regulatory agencies. CEC also communicated with UAW in advance of the mitigation explaining the intent of the mitigation is to return the riparian corridor back to an acceptable habitat, as defined by IDNR. CEC also explained the restrictions associated with the mitigation to UAW.



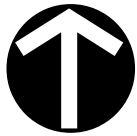
#### 4.0 CONCLUSIONS AND RECOMMENDATIONS

After the first full growing season, the mitigation site appears to be developing successfully. Tree/Shrub survival is currently 5-percent above the required rate. Survival rates will be re-evaluated in the summer of 2023 prior to initiating any supplemental planting that may be required to stay above the 75-percent survival rate. The mitigation site was mowed prior to the mitigation monitoring visit, hence identification of herbaceous species was difficult and an accurate percent cover estimation was not possible. Herbaceous species evaluation and percent cover will be re-evaluated during the 2023 monitoring period before any additional actions are recommended. Additionally, the missing mitigation signs will be replaced in 2023.

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## **FIGURES**

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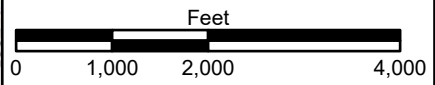
NORTH

REFERENCE:  
USGS TOPOGRAPHIC MAP/ ARCGIS MAP SERVICE:  
HTTP://GOTO.ARCGISONLINE.COM/MAPS/  
USA\_TOPO\_MAP, ACCESSED 12/15/2022

Site Location  
(40.376151, -86.864981)



**LEGEND**  
 Mitigation Boundary



**Civil & Environmental Consultants, Inc.**

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FLOODWAY MITIGATION MONITORING  
LAFAYETTE, INDIANA  
FW-30899

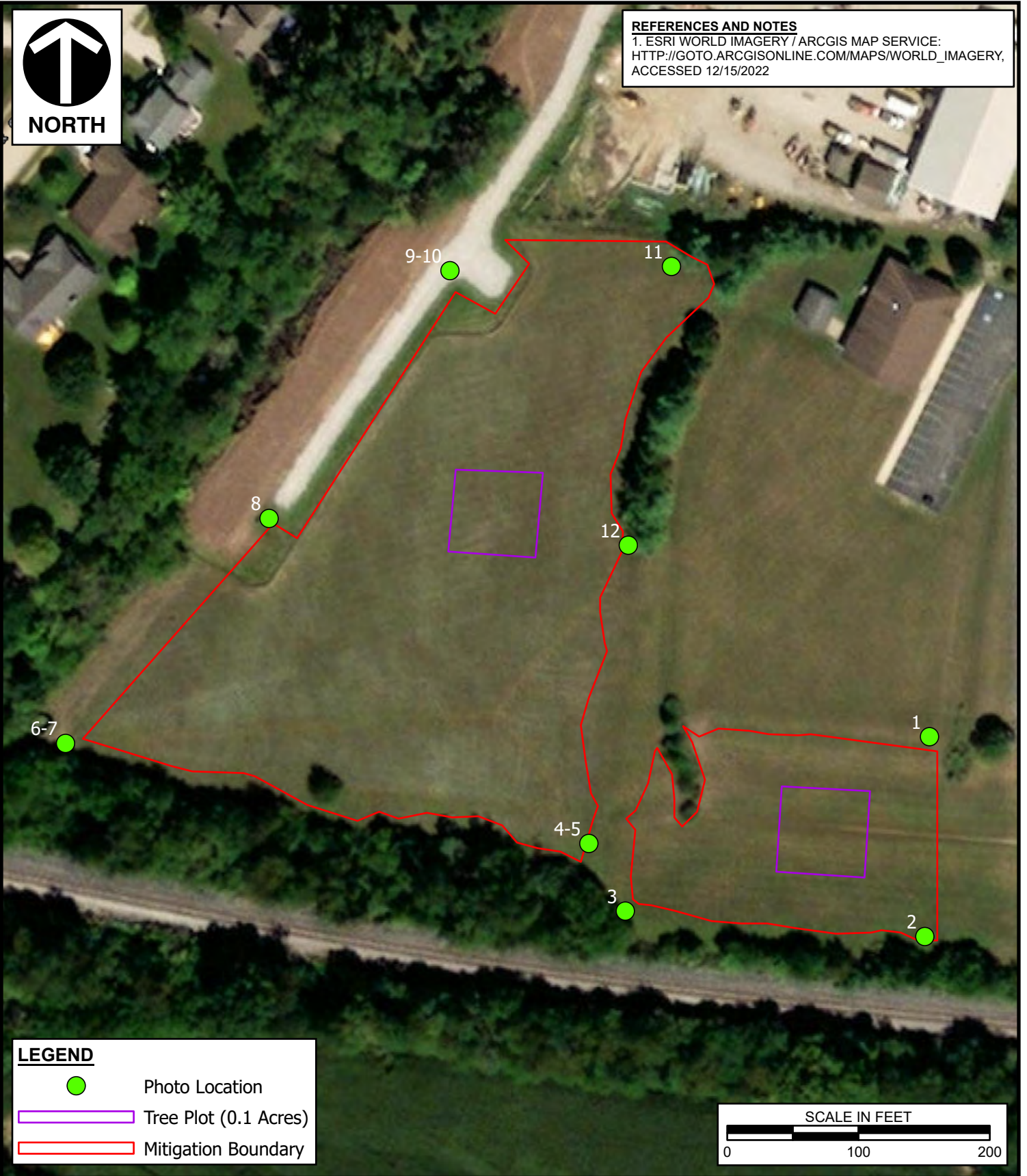
TOPOGRAPHIC MAP

DRAWN BY:	STG	CHECKED BY:	GAW	APPROVED BY:	JMB*	FIGURE NO:	<b>1</b>
DATE:	10/20/2022	SCALE:	1"=2,000'	PROJECT NO:	315-052		


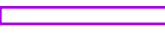

\*Hand Signature on file

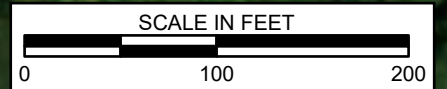


**REFERENCES AND NOTES**  
 1. ESRI WORLD IMAGERY / ARCGIS MAP SERVICE:  
 HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD\_IMAGERY,  
 ACCESSED 12/15/2022



**LEGEND**

-  Photo Location
-  Tree Plot (0.1 Acres)
-  Mitigation Boundary



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**ARCONIC - LAFAYETTE OPERATIONS  
 FLOODWAY MITIGATION MONITORING  
 LAFAYETTE, INDIANA  
 FW-30899**

**AERIAL MAP**

DRAWN BY:	STG	CHECKED BY:	GAW	APPROVED BY:	JMB*	FIGURE NO:	<b>2</b>
DATE:	12/15/2022	SCALE:	1" = 100'	PROJECT NO:	315-052		

\*Hand Signature on file

P:\310-000\315-052-GIS\Maps\EC08\_MitigationMonitoring\315-052 Mitigation Mapping.aprx 12/15/2022 8:52 AM (sgoodfellow)

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**APPENDIX A:  
IDNR CONSTRUCTION IN A FLOODWAY PERMIT APPROVAL NO.  
FW-30899**

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**CERTIFICATE OF APPROVAL**

**Application #: FW-30899-0**

This Certificate of Approval is a Permit for Construction under the authority of the Indiana Flood Control Act, IC 14-28-1 with 312 IAC 10 and IC 14-29-1 with 312 IAC 6 as administered by the Department of Natural Resources.

**Approval Issued To:** Arconic Inc, Robert Prezbindowski, 2300 North Wright Road, Alcoa, TN 37701

**Approval Issued By:**

*Markita Shepherdson*

**Mail Date:** 5/24/2021

Markita Shepherdson, CFM, Division of Water

**Permit Effective Date:** 06/11/2021

**Permit Expiration Date:** 05/24/2023

Pursuant to 312 IAC 2-5-1, this Permit becomes Effective eighteen (18) days from the Mail Date to provide a stay period for a Petition for Administrative Review with the Indiana Natural Resources Commission, Division of Hearings. Initiating construction authorized in this Permit prior to the Permit Effective Date constitutes a violation. This Permit is only valid until the Permit Expiration Date.

This Permit may be renewed one (1) time if a written request is received at the DNR, Division of Water, prior to the Permit Expiration Date.

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**PROJECT INFORMATION:**

Waterbody: Elliott Ditch

County: Tippecanoe

Project Description Narrative: Approximately 7,725 cubic yards of PCB impacted sediment will be removed from Elliott Ditch, and approximately 2,590 cubic yards of additional soil will be removed from the floodway of Elliott Ditch. Sediment removal in Reach 1 (first 0.5 miles of the project) will be completed following the installation of a bypass system. Removed material will be disposed at an approved landfill. After the sediment has been removed, clean backfill will be installed and site will be restored to match existing grade. Pump-around equipment, flow diversion structures, and a temporary access road will be used during construction. All disturbed upland areas will be stabilized with native grass species. Tree and brush clearing will take place to allow site access. A Habitat Mitigation Plan is included. This project is taking place under the supervision of the U.S. Environmental Protection Agency, Region 5, and the Indiana Department of Environmental Management Office of Land Quality.

Project Location: Approximately 500' south and 600' west of the intersection of Brady Lane and South Concord Road East at Lafayette

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**PERMIT CONDITIONS:**

This Certificate of Approval is valid only if the construction project is in compliance with all Conditions in this Permit.

DNR PROJECT SPECIFIC PERMIT CONDITIONS

- 1) Implement the mitigation plan received at the Division of Water on January 25, 2021, by the end of spring 2023.
- 2) The mitigation site must be monitored for the survival of the plantings for a minimum of three years. A report must be submitted to the Central Region Environmental Biologist at the Division of Water, 402 W. Washington St., RM W264, Indianapolis, IN 46204-2641 by December 31 of each year to monitor the initiation, progress, and success of the mitigation site. The report must include appropriate pictures of vegetative plantings; a narrative must describe the activity accomplished to date, acres planted, number planted, list of species planted on site, and estimated survival. Reports must be submitted each year, even if work has not been initiated on site, a minimum of three reports are required with additional reports until the mitigation site is complete or determined to be successful. If the mitigation site is not successful three years after work initiation, the permit will be considered in violation, and another plan must be submitted for approval.
- 3) The replacement habitat areas must have a minimum survival of 75% of planted material at the end of the monitoring period or additional trees and shrubs must be installed to meet the minimum survival; if the site fails to meet success in any year, replanting shall occur prior to the next monitoring period; an additional year of monitoring shall be required for each year of additional planting.
- 4) The species approved by the DNR in a mitigation plan or a planting plan become part of the permit. If modifications become necessary to the approved species, a Division of Fish and Wildlife biologist must approve all changes.
- 5) Post "Do Not Mow or Spray" signs or an approved equal along the boundary of the proposed mitigation area(s).
- 6) Revegetate all bare and disturbed areas that are not currently mowed and maintained with a mixture of grasses, sedges, and wildflowers native to Central Indiana and specifically for stream bank/floodway stabilization purposes as soon as possible upon completion; turf-type grasses (including low-endophyte, friendly endophyte, and endophyte free tall fescue but excluding all other varieties of tall fescue) may be used in currently mowed areas only. A native herbaceous seed mixture must include at least 5 species of grasses and sedges and 5 species of wildflowers.
- 7) Do not construct any temporary runarounds, access bridges, causeways, cofferdams, diversions, or pumparounds beyond those specifically detailed in the permit application.
- 8) Do not dewater directly into the stream. Dewater into a sediment bag, into a roll off box, and onto a riprap apron, or similar system.
- 9) Dewatering pumps must incorporate filters or bypasses to avoid injuring or killing fish and other aquatic organisms.
- 10) Minimize and contain within the project limits inchannel disturbance and the clearing of trees and brush.
- 11) Do not work in the waterway from April 1 through June 30 without the prior written approval of the Division of Fish and Wildlife.
- 12) Do not cut any trees suitable for Indiana bat or Northern Long-eared bat roosting (greater than 5 inches dbh, living or dead, with loose hanging bark, or with cracks, crevices, or cavities) from April 1 through September 30.
- 13) Minimize the movement of resuspended bottom sediment from the immediate project area.
- 14) Appropriately designed measures for controlling erosion and sediment must be implemented to prevent sediment from entering the stream or leaving the construction site; maintain these measures until construction is complete and all disturbed areas are stabilized.
- 15) Seed and protect all disturbed streambanks and slopes not protected by other methods that are 3:1 or steeper with erosion control blankets that are heavy-duty, biodegradable, and net free or that use loose-woven / Leno-woven netting to minimize the entrapment and snaring of small-bodied wildlife such as snakes and turtles (follow manufacturer's recommendations for selection and installation); seed and apply mulch on all other disturbed areas.
- 16) Except for the material used as backfill as shown on the plans submitted for the permit application, place all excavated material landward of the floodway\*.
- 17) Do not leave felled trees, brush, or other debris in the floodway\*.
- 18) Upon completion of the project, remove all construction debris from the floodway\*.
- 19) Completely remove the pump-around equipment, flow diversion structures, and temporary access road and any related appurtenances from the floodway\* upon completion of the project.
- 20) \* Note: For regulatory purposes, the floodway is defined on the attached Floodway Map.

## DNR PROJECT GENERAL PERMIT CONDITIONS

- 1) Any modifications or additional construction beyond what was shown on plans received at the Division of Water shall require an additional review and approval from the Department of Natural Resources.
- 2) This Permit must be posted and maintained at the project site until the project is completed.
- 3) This Permit shall not be assigned or transferred without the prior written approval of the Department of Natural Resources.
- 4) If any prehistoric or historic archaeological artifacts or human remains are uncovered during construction, demolition, or earthmoving activities, state law (Indiana Code 14-21-1-27 and 29) requires that the discovery must be reported to the Department of Natural Resources within two (2) business days.
- 5) This Permit may be revoked by the Department of Natural Resources for violation of any condition or applicable statute or rule.
- 6) The Department of Natural Resources shall have the right to enter upon the site of the permitted activity for the purpose of inspecting the work authorized under this Permit.

Certificate of Approval Attachments: FW-30899 Floodplain Map.pdf

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**RIGHT TO ADMINISTRATIVE REVIEW:**

A party may appeal this Department of Natural Resources Action through the administrative review procedures found in the Administrative Orders and Procedures Act, IC 4-21.5, and the rules promulgated thereunder 312 IAC 3-1. If an appeal is filed, the final agency determination will be made by the Natural Resources Commission following a legal proceeding conducted before an Administrative Law Judge. The Department of Natural Resources will be represented by legal counsel at all stages of administrative review.

In order to obtain an administrative review, a written petition must be filed with the Division of Hearings within 18 days of the Mail Date of the Action. The petition must contain specific reasons for the appeal and indicate the portion or portions of the project to which the appeal pertains. The petition must be addressed to the Division of Hearings, Indiana Government Center North, Room N103, 100 North Senate Avenue, Indianapolis, Indiana 46204

---

**SERVICE LIST:**

Applicant(s):

Arconic Inc, Robert Prezbindowski, 2300 North Wright Road, Alcoa, TN 37701

Agent(s):

Civil and Environmental Consultants, J Matthew Bruck, 2704 Cherokee Farm Way, Suite 101, Knoxville, TN 37920

Adjacent Landowners and Interested Parties:

Robert and Ann Buckley, 1842-17 Summertime Trail, Lafayette, IN 47909  
City of Lafayette, 20 North 6th Street, Lafayette, IN 47901  
Duke Energy LLC, 550 South Tyron Street, Charlotte, NC 28202  
Sandra Bratton, 185 Coldbrook Court, Lafayette, IN 47909  
Edith Brooks, 108 Coldbrook Drive, Lafayette, IN 47909  
Daniel Grayson, 195 Coldbrook Court, Lafayette, IN 47909  
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Timothy Lawson, 175 Coldbrook Court, Lafayette, IN 47909  
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Micky Foust, 64 Coldbrook Drive, Lafayette, IN 47909  
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James Usher and Janeace Klein, 3131 Brady Lane, Lafayette, IN 47909  
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Rolan Solutions LLC, 40 Olympia Court, Lafayette, IN 47909  
Tippecanoe County Properties LLC, 188 Farabee Drive, Lafayette, IN 47905  
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Courtesy Notification:

US Army Corps of Engineers, Louisville District PO Box 59, Louisville, KY 40201  
Tippecanoe County SWCD, Chris Remley, 1812 Troxel Drive, Suite C3, Lafayette, IN 47909  
Sallie Fahey, 20 North 3rd Street, Lafayette, IN 47901  
Tippecanoe County Drainage Board, County Surveyor, 20 North 3rd Street, Pier 6, Lafayette, IN 47901  
Indiana Department of Natural Resources, Division of Law Enforcement District 3 Headquarters 4112 East State Road  
225, West Lafayette, IN 47906

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**ADDITIONAL PERMITTING AGENCIES:**

This is not a waiver of any local ordinance or other state or federal law and does not relieve the permittee of any liability for the effects which the project may have upon the safety of the life or property of others.

This does not relieve the permittee of the responsibility of obtaining permits, approvals, easements, etc. under other regulatory programs administered by, but not limited to, the U.S. Army Corps of Engineers, County Drainage Board, Indiana Department of Environmental Management and local, city, or county floodplain management, planning or zoning commissions.

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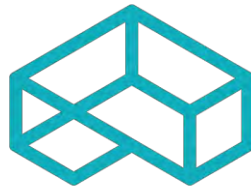
**APPENDIX B:  
HABITAT MITIGATION PLAN UPDATED JANUARY 2021**

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**FLOODWAY HABITAT MITIGATION PLAN**

**ELLIOTT DITCH – LEVEE REMEDIATION  
ARCONIC LAFAYETTE OPERATIONS  
3131 EAST MAIN STREET  
LAFAYETTE, INDIANA 47905**

**Prepared for:**



**ARCONIC**

**MR. ROBERT PREZBINDOWSKI  
TENNESSEE OPERATIONS – NORTH PLANT  
2300 NORTH WRIGHT ROAD  
ALCOA, TENNESSEE 37701**

**Prepared by:**

**CIVIL & ENVIRONMENTAL CONSULTANTS, INC.  
2704 CHEROKEE FARM WAY, SUITE 101  
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**CEC PROJECT 172-367.0043**

**OCTOBER 2019  
UPDATED JANUARY 2021**



**Civil & Environmental Consultants, Inc.**

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## 1.0 EXECUTIVE SUMMARY

Civil & Environmental Consultants, Inc (CEC), on behalf of Arconic Corporation (Arconic), is pleased to provide the Indiana Department of Natural Resources (INDR) this updated Floodway Habitat Mitigation Plan (HMP) previously approved as part of the Construction in a Floodway Permit (Permit) application submitted to the Indiana Department of Natural Resources (IDNR) in April 2019 (Application #: FW-29895). Arconic is in the process of obtaining the regulatory approvals to execute the next phase of the Elliott Ditch remediation project that includes the removal of PCB impacted sediment within and isolated soil along Elliott Ditch. The PCB impacts are associated with historic releases from Arconic Lafayette Operations (Facility) Outfall 001. An Interim Measures Work Plan (IMWP) for this phase of work (referred to as the 2020 IMWP in this submittal) was submitted to the Indiana Department of Environmental Management (IDEM) and United States Environmental Protection Agency (U.S. EPA), Region 5 in June 2020 for consideration and approval. A revised version of the IMWP was resubmitted in December 2020. The HMP previously incorporated anticipated downstream disturbances (i.e., total acreages) in the total compensatory mitigation calculation. Since the engineering design was not completed prior to the development of the initial HMP, estimates were provided. Arconic has since refined the total estimated disturbance footprints, as described in the 2020 IMWP, within the riparian corridor and has updated this HMP accordingly. Arconic intends to implement the HMP in accordance with the conditions outlined in the previously approved Permit application number FW-29895.

The excavation and removal of soil associated with the Elliott Ditch Levee IMWP impacted 1.07 acres of riparian forest in the floodway during the execution of the project from March 2020 through August 2020. The refined estimated disturbance footprint of the riparian forest for the next phase of work is 0.53 acres. To help restore the ecosystem function at the Site, this HMP proposes a 2:1 restoration mitigation (totaling 3.2 acres) immediately adjacent to Elliott Ditch. The HMP has been developed in accordance with the Indiana Natural Resources Commission Information Bulletin #17 (Fourth Amendment): Floodway Habitat Mitigation dated January 15, 2019 (Bulletin). This HMP identifies the mitigation area and lays out guidelines for the preparation of soil and planting of native trees, shrubs, forbs, and ground cover. The HMP identifies additional follow-up activities, in accordance with the Bulletin, to promote the success of Site restoration and enhancement efforts. These efforts include visits to the mitigation site and the submittal of monitoring reports to IDNR documenting the success of habitat restoration. Implementation of the approved HMP will help restore the loss of environmental benefit or ecological function from remedial activities.

## 2.0 INTRODUCTION

This HMP describes the mitigation approach to compensate for habitat impacts required as part of remedial activities being completed by Arconic along and within Elliott Ditch located in Lafayette, Indiana (i.e., Tippecanoe County) (see **Figures 1 and 2**). As provided in the IDNR Construction in a Floodway Assessment form submitted as part of application number FW-29895, the Levee Interim Measures (IM) project disturbed 4.67 acres in the floodway. Of the 4.67 acres, riparian habitat disturbance included 1.07 acres of non-wetland tree removal and 1.24 acres of successional habitat. The location of the levee project is depicted on Figure 1. As provided in the December 2020 IDNR Construction-in-a-Floodway Permit application, Arconic anticipates disturbing an additional 0.18 acres in the floodway in Reach 1 and 1.27 acres in the floodway in Reaches 2 and 3, for a total additional disturbance of 1.45 acres. Of the 1.45 acres, riparian habitat disturbance includes 0.53 acres of non-wetland tree removal and 0.6 acres of successional habitat. The anticipated areas in Reaches 2 and 3 that will be disturbed are depicted on Figure 2A and Figure 2B. The total unavoidable projected impact requiring mitigation is 1.60 acres (total acreage of non-wetland tree removal); therefore, the total compensatory 2:1 mitigation is 3.2 acres. This HMP includes the following components:

- Project background;
- Project objective;
- Mitigation site selection;
- Existing site conditions;
- Mitigation work plan;
- Maintenance plan;
- Success criteria; and,
- Monitoring plan.

### 2.1 Background

Arconic has unilaterally decided to remediate PCB impacted sediment and isolated soil in Reaches 1 through 3 of Elliott Ditch. The 2020 IMWP has been prepared to address the safe movement and disposal of these materials, as well as restoration activities. The Project is being performed as part of Resource Conservation and Recovery Act (RCRA) Corrective Action administered by the Indiana Department of Environmental Management (IDEM) Office of Land Quality (OLQ) with coordinated approval from the United States Environmental Protection Agency (U.S. EPA), Region 5. Regulatory approval of the 2020 IMWP is currently pending. Clearing of brush/trees and the installation of site improvements (i.e., access roads, decontamination pads, etc.) will be performed to facilitate access and support the successful execution of the Project. Approximately 7,725 cubic yards (cy) of sediment from within Elliott Ditch will be removed for off-site disposal and replaced with clean fill material to match the natural stream gradient. In addition,

approximately 2,950 cy of soil along Elliott Ditch will be removed for off-site disposal and replaced with clean fill material, installed in 9 inch lifts and compacted to 95 percent standard proctor, to match pre-excavation conditions. Sediment and soil removal will be completed within the county drainage easement, which extends 75 feet from the top of the ditch banks.

Unavoidable impacts to the riparian habitat will be required to support the successful execution of the Project. Arconic proposes that the mitigation site to compensate for this removal be located within the regulated floodway of Elliott Ditch. Another consideration that was evaluated as part of selecting the mitigation site was the presence of an existing City of Lafayette sanitary sewer easement which does not allow tree planting to be completed.

## 2.2 Objective

The objective of this HMP is to identify the efforts that will be taken to restore the riparian habitat of Elliott Ditch from approximately Concord Road (near Outfall 001) to the 9<sup>th</sup> Street crossing after completion of the Project. The HMP has been prepared specifically to satisfy the IDNR habitat mitigation requirements as outlined in the *Indiana Natural Resources Commission Information Bulletin #17 (Fourth Amendment): Floodway Habitat Mitigation* dated January 15, 2019 (Bulletin).

## 2.3 Site Selection

Arconic is committed to performing mitigation activities upon successful completion of the Project. Arconic has identified a 9.1 acre area which will be utilized to accommodate the mitigation footprint (i.e., 3.2 acres)<sup>1</sup>. The use of this area is contingent upon property owner approval and acceptance by the Tippecanoe County Drainage Board and City of Lafayette. The latter approval is required since a portion of the targeted mitigation area resides within the drainage easement under control of the drainage board, and due to the presence of a sanitary sewer paralleling Elliott Ditch.

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<sup>1</sup> In the October 2019 version of the HMP, Arconic identified a 13.0 acre area to accommodate the mitigation footprint. Per the request of Tippecanoe County, this footprint was decreased in order to accommodate Tippecanoe County's proposed capital improvement project which includes the installation of a two-stage ditch.



### 3.0 EXISTING SITE CONDITIONS

The proposed mitigation area is located along the left descending bank of Elliott Ditch (east/south bank), a tributary to Wea Creek, which is a tributary to the Wabash River within the Middle Wabash – Little Vermillion watershed (HUC 05120108) downstream of Lafayette, Indiana. The ditch is identified as a regulated drain until the 9<sup>th</sup> Street crossing, slightly more than 1.60 miles downstream of Facility Outfall 001. The Tippecanoe County Drainage Board maintains the regulated drains within the county, subject to Indiana Code (IC) 36-9-27. Regulated drains include an easement that typically extends 75-feet from the top of each bank. These easements are intended to provide access for maintenance activities to support proper functionality of the drain. The proposed mitigation site consists of a built environment that has undergone disturbances during establishment of the Elliott Ditch levee, municipal construction, and anthropogenic activities. These activities have ultimately led to a low-quality, riparian habitat consisting largely of pioneer plant species. The proposed mitigation site is depicted on **Figure 3**.

The floodway forest strata at the mitigation site are currently dominated by box elder (*Acer negundo*), eastern white pine (*Pinus strobus*), Amur honeysuckle (*Lonicera maackii*), and wild ginger (*Asarum canadense*). Non-dominant species include honeysuckle (*Lonicera maackii*), white avens (*Geum canadense*), perennial ryegrass (*Lolium perenne*), Virginia creeper (*Parthenocissus quinquefolia*), poison ivy (*Toxicodendron radicans*), giant ragweed (*Ambrosia trifida*), and Frank's sedge (*Carex frankii*). Representative photographs of current site conditions have been provided in **Appendix A**.

As part of investigation activities completed prior the preparation of the 2020 IMWP, soil borings were advanced along the levee, as well as at upland locations downstream, to assess soil conditions. Sediment poling within Elliott Ditch was also completed to assess the locations and overall thickness of sediment deposits. Organic material and silty loam was typically present at 0.0 to 0.5-feet below grade. Under this horizon, the majority of soils consist of an aggregate of clay loam, silty clay, and clay with sand. Between 0.5 and 4.0-feet below grade, soils were typically reddish brown or brown to dark brown in color, moderately to very plastic with fine granular structure. Very plastic, black clay with sand was present at some locations along the levee at depths between 2.5 and 4.0-feet below grade. While most samples had gravel content less than 15-percent, isolated horizons less than 0.5-feet in thickness were identified containing greater than 60-percent gravel.

Finally, the City of Lafayette maintains and operates a sanitary sewer along the Elliott Ditch levee. The sanitary sewer line parallels Elliott Ditch in the uplands along the left descending bank and includes a 30-foot easement.

## 4.0 MITIGATION PLAN

The HMP proposes the restoration and enhancement of 3.0 acres of floodway forest immediately adjacent to Elliott Ditch. As previously stated, Arconic has identified a 9.1 acre area which will be utilized to accommodate the current known mitigation footprint. **Figure 3** depicts the 9.1 acre footprint identified for restoration and enhancement activities. The HMP recognizes avoidance of impact as the most effective method of mitigating against environmental impact to the Site. Effort will be made to protect existing habitat and reduce impacts to riparian habitat in the area both during planning and execution of remedial activities. Components of the HMP include site preparation, groundcover seeding and species, shrub/tree planting and species, schedule for implementation, protection measures, and reporting.

### 4.1 Site Preparation

Prior to mitigation planting activities, the soil will be tilled to a depth of 8-inches to improve aeration, infiltration of precipitation, and reduce runoff in the targeted area. Topsoil containing sufficient organic material will be imported and spread over the mitigation area and tilled into the subsurface material, if necessary. Soil amendments (e.g. nitrolized tree bark, organic compost) will be added in approved proportions and tilled into the soil to a depth of up to one-foot across the disturbed mitigation area, if necessary.

An approved erosion and sedimentation control plan will be prepared and implemented to reduce excess runoff and reduce erosion to the mitigation site, and reduce the potential for sedimentation to Elliott Ditch or other nearby tributaries. Engineering controls such as silt fencing installation and sowing temporary seed/mulch on exposed surfaces will be completed, as necessary.

### 4.2 Understory Herbaceous Seeding - Groundcover

Following soil layer preparation, the mitigation area will be seeded with grasses and herbaceous plants native to Indiana and included in the United States Department of Agriculture (USDA) Plants database specific to Tippecanoe County. A seed mixture will be used that includes at least ten species of grasses, sedges, and wildflowers identified in **Table 1** provided below. Seeds will be mixed proportionally to ensure that no one species will dominate the understory. Fertilizers will not be used. Areas that are broadcast-seeded will be lightly raked after spread to ensure purchase of seed in soil. Rate of application will be completed as determined by the seed provided.

<b>Table 1</b>			
<b>Plant Species List - Herbaceous</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Strata</b>	<b>Indicator Status</b>
<i>Allium cernuum</i>	Nodding Wild Onion	Wildflower	FACU
<i>Amphicarpaea bracteata</i>	Hog Peanut	Wildflower	FAC
<i>Aquilegia canadensis</i>	Wild Columbine	Wildflower	FAC
<i>Carex blanda</i>	Eastern Woodland Sedge	Sedge	FAC
<i>Carex vulpinoidea</i>	Fox Sedge	Sedge	OBL
<i>Geranium maculatum</i>	Wild Geranium	Wildflower	FACU
<i>Heliopsis helianthoides</i>	Smooth Oxeye	Wildflower	FACU
<i>Impatiens capensis</i>	Orange Jewelweed	Wildflower	FACW
<i>Juncus tenuis</i>	Poverty Rush	Rush	FAC
<i>Solidago gigantea</i>	Late Goldenrod	Wildflower	FACW
<i>Vernonia gigantea</i>	Ironweed	Wildflower	FAC
<i>Vernonia missurica</i>	Missouri Ironweed	Wildflower	FACU
<b>Plant Species List - Groundcover</b>			
<i>Schizachyrium scoparium</i>	Little Bluestem	Grass	FACU
<i>Elymus virginicus</i>	Virginia Wildrye	Grass	FACW
<i>Andropogon gerardii</i>	Big Bluestem	Grass	FAC
<i>Dichanthelium latifolium</i>	Broad-leaved Panicgrass	Grass	FACU
<i>Dichanthelium dichotomum</i>	Cypress Panicgrass	Grass	FAC
<i>Desmodium canescens</i>	Hoary tick trefoil	Grass	UPL
<i>Panicum Virgatum</i>	Switch Grass	Grass	FAC

- Note: Equivalent native species may be substituted based upon availability and IDNR Approval

When seeding along a slope of 3:1 or steeper, additional measures will be used to help establish vegetation. Soil will be stabilized with biodegradable erosion control blankets (i.e., net free or loose woven netting), or a bonded fiber hydro-mulch if seeding occurs during the dormant season.

### 4.3 Understory Shrub and Tree Planting

Woody plants will be selected and placed in accordance with IDNR’s Bulletin to ensure the diversity and ecological function of the mitigation area. To promote the future development of the riparian forest in the floodway, woody vegetation will be randomly placed rather than planted in rows to simulate natural stocking. Key principals include: a minimum of five canopy tree species, four shrub species, and one non-canopy tree species with no one species accounting for more than 20-percent of planted individuals. A maximum of one maple species will be planted and a minimum of two hard mast species will be planted. Spacing will follow the guidelines as established by IDNR.

Species will be selected from a list of approved plants native to Indiana and having been verified by voucher as present in Tippecanoe County per the USDA database. A list of woody plant species

is found in **Table 2** provided below. Plants will be selected and distributed per the planting principles included in Section VII.B of the Bulletin. Site selection will also be considered when placing plants (e.g. facultative upland (FACU) plants will be placed in the floodway furthest from Elliott Ditch, facultative wetland (FACW) will be placed in the wettest areas of floodway). Contingency plantings are not considered appropriate due to the potential effect on spacing.

<b>Table 2</b>				
<b>Woody Plant Species List - Trees</b>				
<b>Scientific Name</b>	<b>Common Name</b>	<b>Strata</b>	<b>Coefficient of Conservatism</b>	<b>Indicator Status</b>
<i>Acer saccharinum</i>	Silver Maple	Large Canopy Tree	6	FACW
<i>Acer rubrum</i>	Red Maple	Large Canopy Tree	5	FAC
<i>Aesculus glabra</i>	Buckeye	Large Understory Tree	5	FACU
<i>Carpinus caroliniana</i>	American Hornbeam	Medium Understory Tree	5	FAC
<i>Carya cordiformis</i>	Bitternut hickory	Large Canopy Tree	5	FACU
<i>Celtis occidentalis</i>	Hackberry	Large Canopy Tree	3	FACU
<i>Cornus dummondii</i>	Roughleaf Dogwood	Large Canopy Tree	2	FAC
<i>Fagus grandifolia</i>	American Beech	Large Canopy Tree	8	FACU
<i>Fraxinus pennsylvanica</i>	Green Ash	Tree	1	FACW
<i>Ilex verticillata</i>	Common Winterberry	Medium Canopy Tree	8	FACW
<i>Juglans nigra</i>	Black Walnut	Large Canopy Tree	2	FACU
<i>Morus rubra</i>	Red Mullberry	Medium Understory Tree	4	FACU
<i>Platanus occidentalis</i>	Sycamore	Large Canopy Tree	3	FACW
<i>Quercus Alba</i>	White Oak	Large Canopy Tree	5	FAC
<i>Quercus macrocarpa</i>	Bur Oak	Small Canopy Tree	5	FACU
<i>Quercus muehlenbergii</i>	Chinkapin oak	Medium to Large Canopy Tree	4	FACU
<i>Quercus palustris</i>	Pin Oak	Small Canopy Tree	3	FACW
<i>Quercus rubra</i>	Northern Red Oak	Large Canopy Tree	4	FACU
<i>Robinia pseudoacacia</i>	Black locust	Tree	1	FAC
<i>Sassafras albidum</i>	Sassafras	Medium Understory Tree	1	FACU
<i>Thuja occidentalis</i>	White Cedar	Tree	10	FACW
<i>Tilia americana</i>	American Basswood	Large Canopy Tree	5	FACU
<b>Woody Plant Species List - Shrubs</b>				
<i>Cephalanthus occidentalis</i>	Buttonbush	Shrub	5	OBL
<i>Cornus drummondii</i>	Gray Dogwood	Shrub	2	FAC
<i>Cornus obliqua</i>	Pale Dogwood	Shrub	5	FACW
<i>Corylus americana</i>	American Hazlenut	Shrub	4	FACU
<i>Hydrangea arborescens</i>	Wild Hydrangea	Shrub	7	FAC
<i>Ilex verticillata</i>	Winterberry	Shrub	8	FACW
<i>Populus deltoides</i>	Eastern Cottonwood	Medium Shrub	1	FAC
<i>Prunus serotina</i>	Black Cherry	Medium Shrub	1	FACU
<i>Ptelea trifoliata</i>	Common Hop-Tree	Medium Shrub	4	FACU
- Note: Equivalent native species may be substituted based upon availability and IDNR Approval				

#### **4.4 Schedule**

In accordance with the IDNR Permit approval number FW-29895-0, Arconic will begin implementation of the HMP by the end of fall 2021. Soil preparation will be accomplished during drier conditions (i.e., late spring or summer). If soil preparation is completed in the spring, native and annual groundcover seeding will be completed simultaneously. However, if soil preparation occurs in summer or fall, the native groundcover will be postponed until the following spring. Trees/shrub planting will be completed during the first dormant season following soil preparation and native/annual ground cover seeding.

#### **4.5 Protection of the Mitigation Site**

Arconic does not have the authority to record restrictive covenants on the private properties identified for potential mitigation without consent from the various owners. As discussed with IDNR in a phone call on February 14, 2020, if restrictive covenants are not able to be administered, Arconic will perform the following:

- Signage will be installed at each property where the mitigation is completed for a minimum of three years. The signage will include language identifying the location as a mitigation site, and will prohibit mowing and spraying. After three years, assuming success criteria have been satisfied, signage will be removed.
- Maintain Access & Use Agreements with the various property owners in order to perform the required monitoring and maintenance activities until success criteria have been achieved.
- Provide letters to each of the impacted property owners in advance of the mitigation explaining the intent of the mitigation is to return the riparian corridor back to an acceptable habitat, as defined by IDNR, through the implementation of the HMP. The letter will also explain restrictions associated with the mitigation.

#### **4.6 Reporting**

A report documenting the successful implementation of the HMP will be submitted to IDNR within 60 days after the completion of the work. Items to be included in the report include:

- Summary of field activities;
- An as-built survey of the mitigation area;
- List of planted species including stem counts;
- Seed application rates;
- Photographic documentation; and,
- Proposed monitoring points for IDNR's consideration.

## 5.0 MAINTENANCE PLAN

Maintenance will be conducted on an as needed basis based upon findings from regular site visits (i.e., semi-annual) performed as part of the Monitoring Plan. Maintenance activities may include:

- Reseeding or replanting;
- Watering;
- Control of invasive species; and,
- Erosion repair.

Completed maintenance activities will be disclosed to IDNR during annual reporting (see **Section 6**).

## 6.0 SUCCESS CRITERIA

Non-wetland forest mitigation success will be measured based upon percent survival of planted trees and shrubs (75-percent per acre). Total vegetation cover criteria includes 80-percent cover, and of the 80-percent, 75-percent being of native species. In addition, erosion/sedimentation will be evaluated and corrected, as necessary. The mitigation site will be evaluated against this criteria on an annual basis for a minimum of three years, or until the success criteria are satisfied. After three years, assuming success criteria have been satisfied, monitoring will be terminated.

## 7.0 MONITORING PLAN

Mitigation success will be assessed by the execution of a monitoring plan for three years. An annual monitoring report based upon routine site visits will document progress toward meeting the success criteria. Elements of the monitoring report are defined in Section IX of the Bulletin. The monitoring report will be submitted to the IDNR every year for three years after a full growing season elapses. Monitoring reports will continue on an annual basis should monitoring continue beyond three years until year five. In the event that mitigation is determined to not have been successful after year five, another mitigation plan will be submitted that includes an extended monitoring period along with corrective actions. Success of mitigation will be based on the criteria listed above and further defined in Section IX.B of the Bulletin.

### 7.1 Woody Plant Survival

Woody plant species will be monitored through stem counts within one, surveyed permanent rectangular plot. The plot will be approximately 0.1 acres, and a comprehensive list of woody species observed will be maintained.

### 7.2 Groundcover Establishment

Percentage of groundcover will be evaluated within the surveyed permanent rectangular plot identified in **Section 6.1**. Observed species within the plot will be identified and assigned a standard Daubenmire percent cover class, or a similar approach will be completed. A comprehensive list of herbaceous species observed will be maintained.

### 7.3 Overall Site Development

During monitoring visits, the mitigation site will be inspected for:

- Areas of erosion;
- Instability;
- Presence of invasive species;
- Vandalism; and,
- Trash dumping.

Photographic documentation will be completed of overall site conditions and plant communities.



## **7.4 SCHEDULE**

Monitoring will include a minimum of two visits per year (i.e., one in the late spring/ early summer, and one in the late summer/early fall). Monitoring will begin in the first growing season following planting activities. Monitoring will be conducted for three years, or until the performance standards have been met and the project has received release from IDNR.

## **7.5 MONITORING REPORTING**

Annual monitoring reports will be submitted to IDNR summarizing field data and will discuss project success against the criteria presented above. The annual report will be submitted by December 31 of the calendar year.

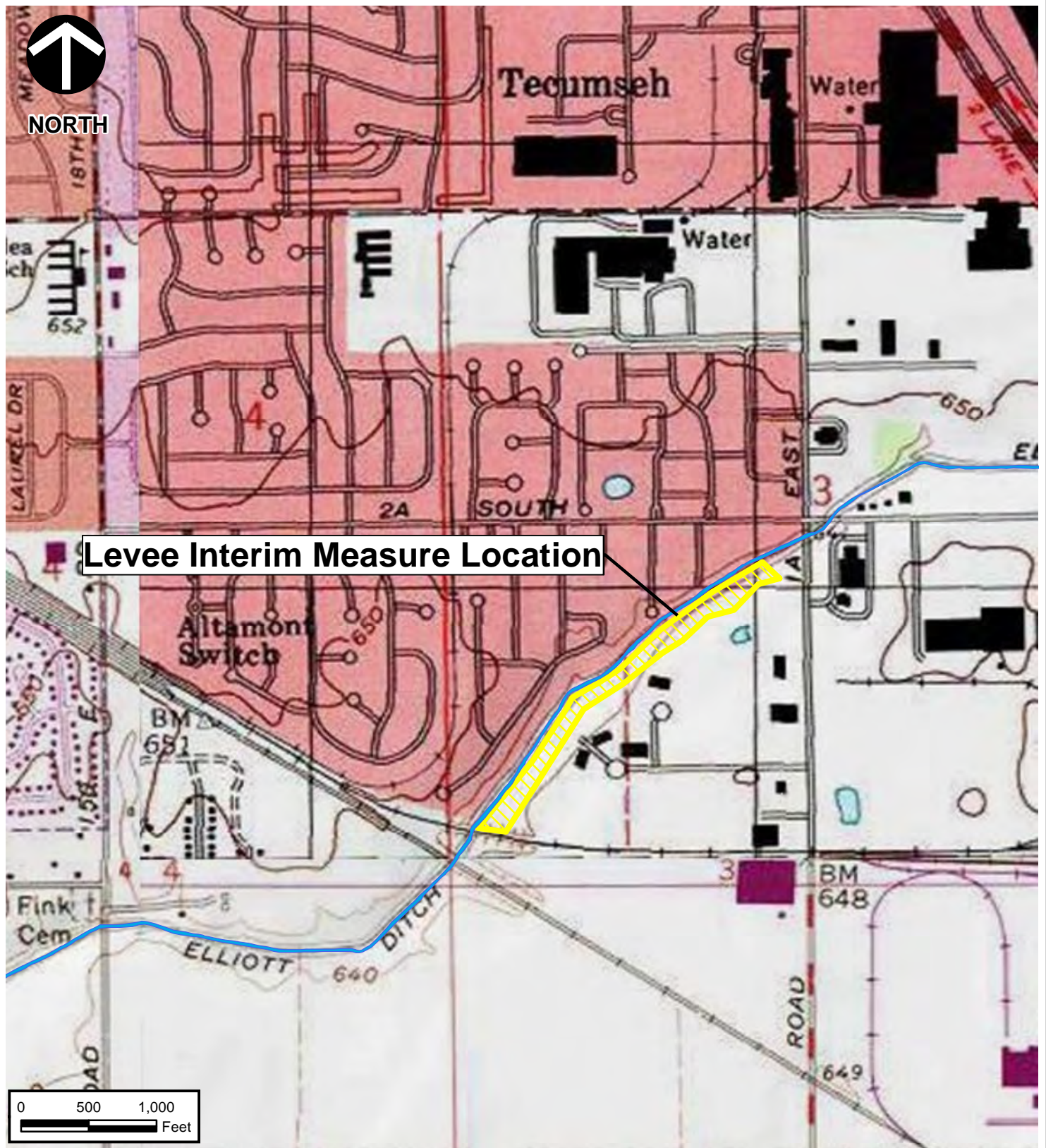
## **7.6 RELEASE FROM MONITORING**

Once the performance standards are met, the project will be considered complete and Arconic will be released from further monitoring.

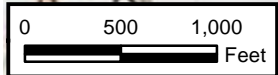
## **FIGURES**



NORTH



Levee Interim Measure Location



SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: [HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD\\_IMAGERY](http://gto.arcgis.com/maps/world_imagery). LAST ACCESSED: 9/3/2019  
IMAGE DATE: 03/12/2011



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[www.cecinc.com](http://www.cecinc.com)

ARCONIC INC. - LAFAYETTE OPERATIONS  
HABITAT MITIGATION PLAN  
LAFAYETTE, INDIANA

ELLIOTT DITCH LEVEE SITE LOCATION MAP

DRAWN BY:	GDS	CHECKED BY:	GAW	APPROVED BY:	JMB*	FIGURE NO:
DATE:	SEPTEMBER 03, 2019	DWG SCALE:	1" = 1,000'	PROJECT NO:	172-367.0043	<b>1</b>

Signature on File \*

P:\2017\172-367\GIS\Maps\Task\_0043 - Sediment Remediation\IDNR\_Coordination\Floodway\_Mitigation - Acreage Calcs\172-367 ED R1-3 Floodway Mitigation Acreage Estimation - 2A.mxd - 12/15/2020 - 3:42:46 PM (kmcnally)



SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD\_IMAGERY. LAST ACCESSED: 12/15/2020  
 IMAGE DATE: 03/12/2011



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ARCONIC CORP. - LAFAYETTE OPERATIONS  
 ELLIOTT DITCH MITIGATION PLAN  
 LAFAYETTE, INDIANA

REACH 1 AND 2 - DISTURBED AREA LOCATIONS

DRAWN BY: JRO	CHECKED BY: JMB	APPROVED BY: JMB*	FIGURE NO: 2A
DATE: DECEMBER 15, 2020	DWG SCALE: 1" = 300'	PROJECT NO: 172-367.0043	

Signature on File \*

P:\2017\172-367\GIS\Maps\Task 0043 - Sediment Remediation\IDNR Coordination\Floodway Mitigation - Acreage Calcs\172-367 ED R1-3 Floodway Mitigation Acreage Estimation\_2B.mxd - 12/15/2020 - 3:36:57 PM (kmcnally)



SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD\_IMAGERY. LAST ACCESSED: 12/15/2020  
 IMAGE DATE: 03/12/2011



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ARCONIC CORP. - LAFAYETTE OPERATIONS  
 ELLIOTT DITCH MITIGATION PLAN  
 LAFAYETTE, INDIANA

REACH 3 - DISTURBED AREA LOCATIONS

DRAWN BY: JRO	CHECKED BY: JMB	APPROVED BY: JMB*	FIGURE NO: 2B
DATE: DECEMBER 15, 2020	DWG SCALE: 1" = 300'	PROJECT NO: 172-367.0043	

Signature on File \*



SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: [HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD\\_IMAGERY](http://gto.arcgis.com/maps/world_imagery). LAST ACCESSED: 1/19/2021  
 IMAGE DATE: 03/12/2011



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ARCONIC INC. - LAFAYETTE OPERATIONS  
 HABITAT MITIGATION PLAN  
 LAFAYETTE, INDIANA

**PROPOSED MITIGATION SITE**

DRAWN BY: KAM	CHECKED BY: GAW	APPROVED BY: JMB*	FIGURE NO: 3
DATE: JANUARY 19, 2021	DWG SCALE: 1" = 500'	PROJECT NO: 172-367.0020	

Signature on File \*

P:\2017\172-367-Draft Documents\Task.0020 - Tree Mitigation Plan\Figure\GIS\172-367 Elliott Ditch Mitigation\_Figure 3\_County Plans.mxd - 1/19/2021 - 4:33:04 PM (kmcnally)

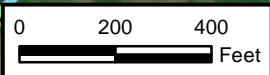
**APPENDIX A – PHOTO LOG**

\\SVR-KNOXVIL-LEI\Projects\2017\172-367-GIS\Maps\Task\_0043 - Sediment Remediation\_IDNR\_Coordination\172-367.0043 ED R1-3 IDNR 8-2A.mxd - 11/5/2020 - 12:09:31 PM (irickfordobrien)



**Applicant: Arconic Inc.**  
**Agent: CEC, Inc.**

Legend	
+	Photo Location - Bank
+	Photo Location - Instream
+	Soil Remediation Areas
■	Sediment Remediation Areas
■	Elliott Ditch



SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD\_IMAGERY. LAST ACCESSED: 11/5/2020



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ARCONIC CORP  
 LAFAYETTE OPERATIONS  
 ELLIOTT DITCH REACHES 1-3 SEDIMENT AND SOIL  
 LAFAYETTE, INDIANA

REACH 1 PHOTO LOCATIONS

DRAWN BY: JRO	CHECKED BY: GAW	APPROVED BY: JMB*	FIGURE NO:
DATE: NOVEMBER 05, 2020	DWG SCALE: 1" = 400'	PROJECT NO: 172-367.0043	<b>8-2A</b>

Signature on File \*



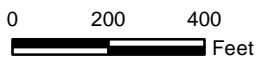
\\SRV-KNOXVILLE\Projects\2017\172-367-GIS\Maps\Task\_0043 - Sediment Remediation IDNR Coordination\172-367.0043 ED R1-3 IDNR 8-2B.mxd - 11/5/2020 - 2:00:47 PM (rickfordobrien)



NORTH



**Applicant: Arconic Inc.**  
**Agent: CEC, Inc.**



**Legend**

- + Photo Location - Bank
- + Photo Location - Instream
- Soil Remediation Areas
- Sediment Remediation Areas
- Elliott Ditch

SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: [HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD\\_IMAGERY](http://gto.arcgis.com/maps/world_imagery). LAST ACCESSED: 11/5/2020



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ARCONIC CORP  
LAFAYETTE OPERATIONS  
ELLIOTT DITCH REACHES 1-3 SEDIMENT AND SOIL  
LAFAYETTE, INDIANA

REACH 2 PHOTO LOCATIONS

DRAWN BY: JRO	CHECKED BY: GAW	APPROVED BY: JMB*	FIGURE NO:
DATE: NOVEMBER 05, 2020	DWG SCALE: 1" = 400'	PROJECT NO: 172-367.0043	<b>8-2B</b>

Signature on File



\\SVR-KNOXVIL\LEI\Projects\2017\172-367-GIS\Maps\Task\_0043 - Sediment Remediation IDNR Coordination\172-367.0043 ED R1-3 IDNR 8-2C.mxd - 11/5/2020 - 2:11:33 PM (jrickfordobrien)



**Applicant: Arconic Inc.**  
**Agent: CEC, Inc.**

**Legend**

- Photo Location - Bank
- Photo Location - Instream
- Soil Remediation Areas
- Sediment Remediation Areas
- Elliott Ditch

SOURCE: ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: [HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD\\_IMAGERY](http://gto.arcgis.com/maps/world_imagery). LAST ACCESSED: 11/5/2020



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ARCONIC CORP  
LAFAYETTE OPERATIONS  
ELLIOTT DITCH REACHES 1-3 SEDIMENT AND SOIL  
LAFAYETTE, INDIANA

REACH 3 PHOTO LOCATIONS

DRAWN BY: JRO	CHECKED BY: GAW	APPROVED BY: JMB*	FIGURE NO:
DATE: NOVEMBER 05, 2020	DWG SCALE: 1" = 400'	PROJECT NO: 172-367.0043	<b>8-2C</b>

Signature on File



Photo 1: Levee view from northeast extent, facing southwest (Location 1) (Photo Date: 3/21/19)



Photo 2: Elliott Ditch bank conditions, facing southwest (Location 1) (Photo Date: 3/21/19)



Photo 3: Levee/Elliott Ditch bank view, facing northeast (Location 2)\*

(Photo Date: 3/21/19)



Photo 4: Levee/Elliott Ditch bank view, facing southwest (Location 2)\*

(Photo Date: 3/21/19)

Note:

\*Clearing and grubbing of this area was completed in March 2020 in accordance with approved IDNR Construction in a Floodway Permit (FW-29895-0). The area was stabilized after remedial activities with native grasses. Mitigation will be completed per the approved Floodway Habitat Mitigation Plan as part of Permit FW-29895-0.



Photo 5: Arconic Outfall 001, showing Elliott Ditch bank conditions, facing west (Location 3)\*

(Photo Date: 3/21/19)



Photo 6: Levee/Elliott Ditch bank view showing Outfall 001, facing southwest (Location 2)\*

(Photo Date: 3/21/19)

Note:

\*Clearing and grubbing of this area was completed in March 2020 in accordance with approved IDNR Construction in a Floodway Permit (FW-29895-0). The area was stabilized after remedial activities with native grasses. Mitigation will be completed per the approved Floodway Habitat Mitigation Plan as part of Permit FW-29895-0.



Photo 7: Levee/Elliott Ditch bank conditions, facing northeast (Location 3)\*

(Photo Date: 3/21/19)



Photo 8: Levee conditions, facing east-northeast (Location 3)\*

(Photo Date: 3/21/19)

Note:

\*Clearing and grubbing of this area was completed in March 2020 in accordance with approved IDNR Construction in a Floodway Permit (FW-29895-0). The area was stabilized after remedial activities with native grasses. Mitigation will be completed per the approved Floodway Habitat Mitigation Plan as part of Permit FW-29895-0.



Photo 9: Elliott Ditch conditions, facing southwest, downstream (Location 4)

(Photo Date: 10/3/17)



Photo 10: Elliott Ditch conditions, longitudinal bar, facing southwest, downstream (Location 4)

(Photo Date: 10/3/17)



Photo 11: Levee/Elliott Ditch bank conditions, facing northeast (Location 5)\*

(Photo Date: 3/21/19)



Photo 12: Levee/Elliott Ditch bank conditions, facing west (Location 5)\*

(Photo Date: 3/21/19)

Note:

\*Clearing and grubbing of this area was completed in March 2020 in accordance with approved IDNR Construction in a Floodway Permit (FW-29895-0). The area was stabilized after remedial activities with native grasses. Mitigation will be completed per the approved Floodway Habitat Mitigation Plan as part of Permit FW-29895-0.





Photo 13: Levee conditions, facing northeast (Location 6)\* (Photo Date: 3/21/19)



Photo 14: Levee/Elliott Ditch bank conditions, facing west (Location 6)\* (Photo Date: 3/21/19)

Note:

\*Clearing and grubbing of this area was completed in March 2020 in accordance with approved IDNR Construction in a Floodway Permit (FW-29895-0). The area was stabilized after remedial activities with native grasses. Mitigation will be completed per the approved Floodway Habitat Mitigation Plan as part of Permit FW-29895-0.



Photo 15: Levee/Elliott Ditch bank conditions, facing northeast (Location 7)\*

(Photo Date: 3/21/19)



Photo 16: Levee conditions, facing southwest (Location 7)\*

(Photo Date: 3/21/19)

Note:

\*Clearing and grubbing of this area was completed in March 2020 in accordance with approved IDNR Construction in a Floodway Permit (FW-29895-0). The area was stabilized after remedial activities with native grasses. Mitigation will be completed per the approved Floodway Habitat Mitigation Plan as part of Permit FW-29895-0.



Photo 17: Elliott Ditch bank conditions, facing west (Location 7)\*

(Photo Date: 3/21/19)



Photo 18: Elliott Ditch bank conditions, facing west-northwest (Location 7)\*

(Photo Date: 3/21/19)

Note:

\*Clearing and grubbing of this area was completed in March 2020 in accordance with approved IDNR Construction in a Floodway Permit (FW-29895-0). The area was stabilized after remedial activities with native grasses. Mitigation will be completed per the approved Floodway Habitat Mitigation Plan as part of Permit FW-29895-0.



Photo 19: Elliott Ditch conditions, facing northeast, upstream (Location 8)

(Photo Date: 10/3/17)



Photo 20: Elliott Ditch conditions, facing southwest, downstream (Location 8)

(Photo Date: 10/3/17)

Note:

\*Clearing and grubbing of this area was completed in March 2020 in accordance with approved IDNR Construction in a Floodway Permit (FW-29895-0). The area was stabilized after remedial activities with native grasses. Mitigation will be completed per the approved Floodway Habitat Mitigation Plan as part of Permit FW-29895-0.



Photo 21: Levee conditions, facing northeast (Location 9)\*

(Photo Date: 3/21/19)



Photo 22: Levee conditions, facing southwest (Location 9)\*

(Photo Date: 3/21/19)

Note:

\*Clearing and grubbing of this area was completed in March 2020 in accordance with approved IDNR Construction in a Floodway Permit (FW-29895-0). The area was stabilized after remedial activities with native grasses. Mitigation will be completed per the approved Floodway Habitat Mitigation Plan as part of Permit FW-29895-0.



Photo 23: Levee/Elliott Ditch bank conditions, facing west (Location 9)\*

(Photo Date: 3/21/19)



Photo 24: Levee conditions, facing northeast (Location 10)\*

(Photo Date: 3/21/19)

Note:

\*Clearing and grubbing of this area was completed in March 2020 in accordance with approved IDNR Construction in a Floodway Permit (FW-29895-0). The area was stabilized after remedial activities with native grasses. Mitigation will be completed per the approved Floodway Habitat Mitigation Plan as part of Permit FW-29895-0.



Photo 25: Levee conditions, facing northeast (Location 10)\*

(Photo Date: 3/21/19)



Photo 26: Levee conditions, facing southwest (Location 10)\*

(Photo Date: 3/21/19)

Note:

\*Clearing and grubbing of this area was completed in March 2020 in accordance with approved IDNR Construction in a Floodway Permit (FW-29895-0). The area was stabilized after remedial activities with native grasses. Mitigation will be completed per the approved Floodway Habitat Mitigation Plan as part of Permit FW-29895-0.



Photo 27: Levee/Elliott Ditch bank conditions, facing west (Location 10)\*

(Photo Date: 3/21/19)



Photo 28: Upland conditions (typical), facing east (Location 10)\*

(Photo Date: 3/21/19)

Note:

\*Clearing and grubbing of this area was completed in March 2020 in accordance with approved IDNR Construction in a Floodway Permit (FW-29895-0). The area was stabilized after remedial activities with native grasses. Mitigation will be completed per the approved Floodway Habitat Mitigation Plan as part of Permit FW-29895-0.





Photo 29: Elliott Ditch conditions, facing northeast, upstream (Location 11) (Photo Date: 10/4/17)



Photo 30: Elliott Ditch conditions, facing southwest, downstream (Location 11) (Photo Date: 10/4/17)





Photo 31: Levee and upland conditions, facing northeast (Location 12)\* (Photo Date: 3/21/19)



Photo 32: Levee/Elliott Ditch bank conditions, facing southwest (Location 12)\* (Photo Date: 3/21/19)

Note:

\*Clearing and grubbing of this area was completed in March 2020 in accordance with approved IDNR Construction in a Floodway Permit (FW-29895-0). The area was stabilized after remedial activities with native grasses. Mitigation will be completed per the approved Floodway Habitat Mitigation Plan as part of Permit FW-29895-0.



Photo 33: Elliott Ditch conditions, facing northeast, upstream (Location 13) (Photo Date: 10/4/17)



Photo 34: Elliott Ditch conditions, facing southwest, downstream (Location 13) (Photo Date: 10/4/17)



Photo 35: Elliott Ditch bank conditions, facing west (Location 14)

(Photo Date: 7/8/20)



Photo 36: Elliott Ditch bank conditions, facing northeast (Location 15)

(Photo Date: 7/8/20)



Photo 37: Elliott Ditch bank conditions, facing southwest (Location 16) (Photo Date: 10/28/20)



Photo 38: Elliott Ditch bank conditions, facing northeast (Location 16) (Photo Date: 10/28/20)



Photo 39: Elliott Ditch bank conditions, facing west (Location 17) (Photo Date: 10/28/20)



Photo 40: Elliott Ditch bank conditions, facing east (Location 17) (Photo Date: 10/28/20)



Photo 41: Elliott Ditch bank conditions, facing west (Location 18) (Photo Date: 10/28/20)



Photo 42: Elliott Ditch conditions, facing east, upstream (Location 19) (Photo Date: 10/28/20)



Photo 43: Elliott Ditch conditions, facing west, downstream (Location 19)

(Photo Date: 10/28/20)



Photo 44: Elliott Ditch conditions (from 18th St. bridge), facing west, downstream (Location 20)

(Photo Date: 10/28/20)





Photo 45: Elliott Ditch bank conditions, facing northeast (Location 21) (Photo Date: 10/28/20)



Photo 46: Elliott Ditch conditions facing northeast, upstream (Location 22) (Photo Date: 10/28/20)

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**APPENDIX C:  
UAW ACCESS AGREEMENT**

---



**ARCONIC**

**ACCESS AND USE AGREEMENT**

This Access and Use Agreement ("Agreement") is entered into this 8<sup>th</sup> day of September 2017, by and between Arconic Inc. ("Arconic"), formerly known as Alcoa, and [insert property owner].

In connection with an environmental cleanup project concerning Elliott Ditch in Lafayette, Indiana, which project is under the oversight of the United States Environmental Protection Agency (U.S. EPA) and the Indiana Department of Environmental Management (IDEM), your property has been identified as an appropriate location in support of the assessment, remediation, restoration, and/or monitoring of the ditch. By signing below, I represent that I am in fact the owner of the property described as [insert property address and parcel ID] ("Property").  
3107 Olympia Drive, Lafayette, IN 47909

This Agreement allows Arconic, its agents, consultants, or other authorized representatives including employees and authorized representatives of the U.S. EPA and the IDEM, to access your Property and perform assessment (including the collection of soil samples), remediation, restoration, and monitoring on your Property ("Permitted Activities"). At least one week in advance of accessing your Property to perform any of such Permitted Activities, Arconic will notify you and provide you with the precise locations and scope of Permitted Activities. While performing any of the Permitted Activities, Arconic will as best as possible ensure that impacts and/or other damage to your Property are minimized, and if any damage is caused, Arconic shall be responsible for repairs prior to the expiration of this Agreement.

This Agreement shall become effective on the date written above and shall expire when U.S. EPA and IDEM advise Arconic that the assessment, remediation, restoration, and/or monitoring of Elliott Ditch are no longer needed. At such time, Arconic will notify you of this and thereafter, this Agreement shall be null and void.

**ARCONIC INC.**

**[PROPERTY OWNER]**

Robert A. Rezbindowski

Alcoa

Name: Robert A. Rezbindowski

Name: Rodney Graves

Title: ARCONIC Env. PM

Title (if necessary): Financial Secretary

---

**APPENDIX D:  
PHOTOGRAPHS**

---



Photograph 1: Mitigation area overview, facing southwest.



Photograph 2: Mitigation area overview, facing northwest.



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Knoxville, TN 37920  
Phone: 865-977-9997

ARCONIC – LAFAYETTE OPERATIONS  
FLOODWAY MITIGATION MONITORING  
LAFAYETTE INDIANA  
CEC PROJECT # 315-052  
FW-30899

PHOTOGRAPHS TAKEN: September 9, 2022



Photograph 3: Mitigation area overview, facing northeast.



Photograph 4: Mitigation area overview, facing west.



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Phone: 865-977-9997

ARCONIC – LAFAYETTE OPERATIONS  
FLOODWAY MITIGATION MONITORING  
LAFAYETTE INDIANA  
CEC PROJECT # 315-052  
FW-30899

PHOTOGRAPHS TAKEN: September 9, 2022



Photograph 5: Mitigation area overview, facing northwest.



Photograph 6: Mitigation area overview, facing east.



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ARCONIC – LAFAYETTE OPERATIONS  
FLOODWAY MITIGATION MONITORING  
LAFAYETTE INDIANA  
CEC PROJECT # 315-052  
FW-30899

PHOTOGRAPHS TAKEN: September 9, 2022



Photograph 7: Mitigation area overview, facing northwest.



Photograph 8: Mitigation area overview, facing east.



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ARCONIC – LAFAYETTE OPERATIONS  
FLOODWAY MITIGATION MONITORING  
LAFAYETTE INDIANA  
CEC PROJECT # 315-052  
FW-30899

PHOTOGRAPHS TAKEN: September 9, 2022





Photograph 9: Mitigation area overview, facing east.



Photograph 10: Mitigation area overview, facing southeast.



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Knoxville, TN 37920  
Phone: 865-977-9997

ARCONIC – LAFAYETTE OPERATIONS  
FLOODWAY MITIGATION MONITORING  
LAFAYETTE INDIANA  
CEC PROJECT # 315-052  
FW-30899

PHOTOGRAPHS TAKEN: September 9, 2022



Photograph 11: Mitigation area overview, facing southwest.



Photograph 12: Mitigation area overview, facing west.



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ARCONIC – LAFAYETTE OPERATIONS  
FLOODWAY MITIGATION MONITORING  
LAFAYETTE INDIANA  
CEC PROJECT # 315-052  
FW-30899

PHOTOGRAPHS TAKEN: September 9, 2022

---

**APPENDIX E:  
FLORISTIC QUALITY ASSESSMENT (FQA)**

---



# Inventory Assessment

[Edit This Inventory](#)

[Download Report](#)

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## 2022

### » Date & Location:

2022-09-09

Elliott Ditch

Lafayette

Tippecanoe, IN

### » FQA Database:

Region: **Indiana**

Year Published: **2019**

Description:

Update of 2004 Indiana database

### » Details:

Practitioner: **Scott Goodfellow**

Latitude:

Longitude:

Weather Notes:

Duration Notes:

Community Type Notes:

Other Notes:

This assessment is **public** (viewable by all users of this website).

### » **Conservatism-Based Metrics:**

Total Mean C: **1.4**

Native Mean C: **2.8**

Total FQI: **6.9**

Native FQI: **9.7**

Adjusted FQI: **19.8**

% C value 0: **66.7%**

% C value 1-3: **12.5%**

% C value 4-6: **12.5%**

% C value 7-10: **8.3%**

Native Tree Mean C: **n/a**

Native Shrub Mean C: **n/a**

Native Herbaceous Mean C: **2.8**

### » **Species Richness:**

Total Species: **24**

Native Species: **12 (50%)**

Non-native Species: **12 (50%)**

### » **Species Wetness:**

Mean Wetness: **3**

Native Mean Wetness: **2.8**

### » **Physiognomy Metrics:**

Tree: **0 (0%)**

Shrub: **0 (0%)**

Vine: **0 (0%)**

Forb: **17 (70.8%)**

Grass: 7 (29.2%)

Sedge: 0 (0%)

Rush: 0 (0%)

Fern: 0 (0%)

Bryophyte: 0 (0%)

### » Duration Metrics:

Annual: 6 (25%)

Perennial: 16 (66.7%)

Biennial: 2 (8.3%)

Native Annual: 2 (8.3%)

Native Perennial: 9 (37.5%)

Native Biennial: 1 (4.2%)

### » Species:

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
<i>Abutilon theophrasti</i>	Malvaceae	ABUTHE	non-native	0	3	forb	annual	buttonweed
<i>Ambrosia artemisiifolia</i>	Asteraceae	AMBART	native	0	3	forb	annual	common ragweed
<i>Apocynum cannabinum</i>	Apocynaceae	APOCAN	native	2	0	forb	perennial	dogbane
<i>Bouteloua curtipendula</i> var. <i>curtipendula</i>	Poaceae	BOUCUR	native	7	5	grass	perennial	side-oats grama
<i>Bromus inermis</i>	Poaceae	BROINE	non-native	0	3	grass	perennial	hungarian brome
<i>Chenopodium album</i>	Amaranthaceae	CHEALB	non-native	0	3	forb	annual	lambs quarters
<i>Cichorium intybus</i>	Asteraceae	CICINT	non-native	0	3	forb	perennial	chickory
<i>Conyza canadensis</i>	Asteraceae	CONCAN	native	0	3	forb	annual	horseweed

Daucus carota	Apiaceae	DAUCAR	non-native	0	5	forb	biennial	queen annes lace
Digitaria sanguinalis	Poaceae	DIGSAN	non-native	0	3	grass	annual	hairy crab grass
Heliopsis helianthoides (including 1 variety)	Asteraceae	HELHEL	native	4	3	forb	perennial	false sunflower
Lolium perenne	Poaceae	LOLPER	non-native	0	3	grass	perennial	perennial rye grass
Oenothera biennis	Onagraceae	OENBIE	native	0	3	forb	biennial	common evening primrose
Plantago lanceolata	Plantaginaceae	PLALAN	non-native	0	3	forb	perennial	english plantain
Setaria pumila subsp. pumila	Poaceae	SETPUM	non-native	0	3	grass	annual	pigeon grass
Silphium asteriscus var. trifoliatum	Asteraceae	SILAST	native	8	5	forb	perennial	rosin weed
Silphium terebinthinaceum (including 1 variety)	Asteraceae	SILTER	native	6	0	forb	perennial	cut-leaved prairie dock
Solanum carolinense var. carolinense	Solanaceae	SOLCAR	native	0	3	forb	perennial	horse nettle
Sorghastrum nutans	Poaceae	SORNUT	native	4	3	grass	perennial	indian grass
Taraxacum officinale	Asteraceae	TAROFF	non-native	0	3	forb	perennial	common dandelion
Tridens flavus var. flavus	Poaceae	TRIFLA	native	1	5	grass	perennial	common purpletop
Trifolium pratense	Fabaceae	TRIPRA	non-native	0	3	forb	perennial	red clover
Trifolium repens	Fabaceae	TRIREP	non-native	0	3	forb	perennial	white clover

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Vernonia gigantea

Asteraceae

VERGIG

native

2 0 forb

perennial tall ironweed

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