



Matt Goering  
Asset Closure  
Luminant  
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Irving, TX 75039  
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U.S. Army Corps of Engineers  
Louisville District  
Indianapolis Regulatory Office  
8902 Otis Avenue, Suite S106B  
Indianapolis, IN 46216  
ATTN: (b) (6)

June 28, 2018

RE: Middle Fork Vermilion River Erosion Mitigation and Streambank Stabilization  
Vermilion Site; Oakwood, Illinois  
Section 404 and 401 Joint Permit Application

(b) (6)

Pleased find enclosed our section 404 and 401 joint permit application, for a proposed, 1,900 linear feet streambank stabilization project located along the right descending bank of the Middle Fork Vermilion (MFV) River. Luminant is requesting a meeting with your office, to further review our design approach.

Please contact Mr. Phil Morris, a member of our Corporate Environmental team, with any questions or concerns at [phil.morris@vistraenergy.com](mailto:phil.morris@vistraenergy.com) or (618) 343-7794.

Sincerely,  
Dynergy Midwest Generation, LLC

Matt Goering  
Vice President – Asset Closure

Enclosures

cc

United States Department of Interior  
National Park Service  
Midwest Region  
601 Riverfront Drive  
Omaha, Nebraska 68102-4226  
ATTN: Mr. Hector Santiago

Illinois Department of Natural Resources  
Planning Division  
One Natural Resources Way  
Springfield, Illinois 62702-1271  
ATTN: Mr. Louis Yockey

Illinois Environmental Protection Agency  
Bureau of Water  
Division of Water Pollution Control  
Facility Evaluation Unit  
1021 North grand Avenue East  
Springfield, Illinois 62794-9276



**SCI ENGINEERING, INC.**

650 Pierce Boulevard  
O'Fallon, Illinois 62269  
618-624-6969  
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**Project Summary and Section 404/401 Joint Permit Application**

**MIDDLE FORK VERMILION RIVER  
EROSION MITIGATION AND STREAMBANK STABILIZATION**

**VERMILION SITE  
OAKWOOD, ILLINOIS  
June 2018**

**Prepared for:  
DYNEGY MIDWEST GENERATION, LLC**

**SCI No. 2017-3081.31**



**SCI ENGINEERING, INC.**

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GEOTECHNICAL  
ENVIRONMENTAL  
NATURAL RESOURCES  
CULTURAL RESOURCES  
CONSTRUCTION SERVICES

June 14, 2018

Mr. Phil Morris  
Dynegy Midwest Generation, LLC  
1500 Eastport Plaza Drive  
Collinsville, Illinois 62234

RE: Project Summary and Section 404/401 Joint Permit Application  
Middle Fork Vermilion River Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Oakwood, Illinois  
SCI No. 2017-3081.31

Dear Mr. Morris:

SCI Engineering, Inc. (SCI) has prepared the following *Project Summary and Section 404/401 Joint Permit Application* for a proposed project located at the Dynegy Midwest Generation, LLC Vermilion Site along a portion of the Middle Fork Vermilion (MFV) River. The enclosed information is intended to provide the U.S. Army Corps of Engineers (USACE), the Illinois Environmental Protection Agency (IEPA), and the Illinois Department of Natural Resources (IDNR) the documentation typically needed to initiate the Section 404/401 application process. A combination of stone toe protection, embedded toe boulders, void-filled riprap, and live branch layering is being proposed to stabilize a segment of the riverbank on the project site. The project will stabilize an area below the ordinary high-water mark that is approximately

1,900 linear feet (LF) along the right descending bank of the MFV River. This report and the attached Section 404/401 Joint Permit Application Form should be submitted to the USACE, IEPA, and IDNR to initiate the permitting process. The attached report should be read in its entirety. We appreciate the opportunity to provide you with our natural resource services.

If you have any questions, or if we can be of further assistance, please do not hesitate to call.

Respectfully,

**SCI ENGINEERING, INC.**

A handwritten signature in blue ink, appearing to read 'Scott E. Billings'.

Scott E. Billings  
Project Scientist

A handwritten signature in blue ink, appearing to read 'Michael R. Hartoin'.

Michael R. Hartoin  
Vice President

SEB/MRH/tlw

Enclosure



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## **Project Summary and Section 404/401 Joint Permit Application**

### **MIDDLE FORK VERMILION RIVER EROSION MITIGATION AND STREAMBANK STABILIZATION**

#### **VERMILION SITE OAKWOOD, ILLINOIS**

## **1.0 INTRODUCTION**

As part of the Section 404/401 permitting process, Dynegy Midwest Generation, LLC (Dynegy) is submitting a Section 404/401 Joint Permit Application to the U.S. Army Corps of Engineers (USACE), Illinois Environmental Protection Agency (IEPA), and the Illinois Department of Natural Resources (IDNR). The permit application is being prepared for a proposed streambank stabilization project located along a stretch of the Middle Fork Vermilion (MFV) River. The project will stabilize approximately 1,900 linear feet (LF) of the riverbank. This portion of the MFV River is experiencing erosion along the right descending bank within the northern portion of the Vermilion Site, located near Oakwood, Illinois. Bank stabilization within this section of the river is important to mitigate the erosion and lateral migration of the MFV River. Stantec, Inc. has prepared a stream stabilization plan that includes the utilization of stone toe protection, embedded toe boulders, void-filled riprap, and live branch layering (Appendix B). This report includes the plan prepared by Stantec, as well as a summary of the proposed direct disturbance to areas below the ordinary high-water mark (OHWM) along this stretch of the MFV River.

## **2.0 PROJECT DESCRIPTION**

The project area is located along the MFV River near Oakwood, Illinois (T20N, R12W, Section 21). The 1,900-foot-long project area is located within a 17.1-mile stretch of the MFV River that is listed as a nationally-designated scenic river that falls under the regulations of the National Wild and Scenic River Act.

Bank stabilization is being proposed to mitigate river migration and must be determined allowable under the criteria of the National Wild and Scenic Rivers Act (Public Law 90-542). Under Public Law 90-542, no water resource project can be implemented within the designated area that will have any adverse impact on the scenic, geologic, fish and wildlife, ecological, recreational or historic resources of the river system.

### **3.0 EROSION MITIGATION AND STABILIZATION PLAN**

On April 27, 2017, representatives from Dynergy, Stantec, and SCI Engineering, Inc. (SCI) performed a field exploration of the subject site to assess current conditions and discuss the concept of streambank stabilization. Following the meeting, Stantec developed a stabilization plan that includes a combination of stone toe protection, embedded toe boulders, void-filled riprap, and live branch layering along approximately 1,900 LF of the right descending bank of the MFV River. As part of the project, the existing gabion baskets along the river edge within the central portion of the 1,900 LF disturbance area will be removed. A photographic summary of the representative site conditions is included as Appendix A. The proposed plan is included on the drawings completed by Stantec titled *Middle Fork Vermilion River – Erosion Mitigation and Riverbank Stabilization*, dated May 2018 (Appendix B).

Based on the plans developed by Stantec, the proposed project will feature stabilization along the right-descending bank of the MFV River. Approximately 1,900 LF of the right-descending bank of the MFV River has been identified for streambank stabilization, including the use of stone toe protection, embedded toe boulders, void-filled riprap, live branch layering, and removal of exiting gabion baskets. Based on calculations provided by Stantec, the result is approximately 2,130 cubic yards of stone toe protection boulders and approximately 20,240 cubic yards of void-filled riprap to be placed below the OHWM of the MFV River. More details on the specific quantities and locations of riprap fill and grading for construction access can be found on the site drawings completed by Stantec (Appendix B). In addition, the details of the proposed planting and maintenance as part of the project can be found in the *Middle Fork Vermilion River – Erosion Mitigation and Riverbank Stabilization Planting and Maintenance Plan* prepared by Stantec, and included as Appendix G.

### **4.0 EROSION CONTROL PLAN**

The project will be conducted under the guidance of IEPA National Pollutant Discharge Elimination System (NPDES) permit requirements. An erosion control plan and subsequent Best Management Practice's (BMP's) will be submitted and approved by the IEPA prior to project construction.

### **5.0 THREATENED AND ENDANGERED SPECIES**

Various available resources were consulted to determine the listed threatened and endangered species that may be present within the vicinity of the project area. The United States Fish and Wildlife Service (USFWS) Information, Planning and Conservation (IPaC) tool was utilized on June 4, 2018 to obtain a species list for the project to be used in project planning. Additionally, a list was obtained from IDNR by utilizing the Ecological Compliance Assessment Tool (EcoCAT). Both the IPaC and EcoCAT reports provide a list of the threatened and endangered species or their critical habitat that may exist within the

June 2018

vicinity of the area for project planning, however they are not a substitute for detailed site surveys or field surveys required for environmental assessments. Both the USFWS IPaC document and the IEPA EcoCAT report should be read in their entirety and are enclosed as Attachments E and F, respectively.

According to information compiled by the USFWS IPaC report, there are six federally threatened and/or endangered species that have the potential to occur within the site boundaries and/or may be affected by the proposed project. These species include: Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), clubshell mussel (*Pleurobema clava*), rabbitsfoot mussel (*Quadrula cylindrica cylindrica*), Eastern prairie fringed orchid (*Platanthera leucophaea*), and Mead's milkweed (*Asclepias meadii*). In addition, certain birds are protected under the Migratory Bird Treaty Act, as well as the Bald and Golden Eagle Protection Act. Based on the results of the IPaC report, 12 bird species or particular concern were identified because they occur on the USFWS Birds of Conservation Concern list or warrant special attention within the project location. The birds of concern are identified on the IPaC report and attached as Appendix E.

Additionally, the IDNR EcoCAT report lists eight state-listed threatened and/or endangered species that have the potential to occur within the vicinity of the project area. Most listed species are aquatic mussels, and include the clubshell (*Pleurobema clava*), little spectaclecase (*Villosa lienosa*), Northern riffleshell (*Epioblasma torulosa rangiana*), purple wartyback (*Cyclonaias tuberculata*), salamander mussel (*Simpsonaias ambigua*), and wavy-rayed lampmussel (*Lampsilis fasciola*). Additionally, one fish species (blue breast darter, *Etheostoma camurum*), one plant species (fibrous-rooted sedge, *Carex communis*), and six Illinois Natural Area Inventory (INAI) Sites and conservation areas were listed within the vicinity of the project boundaries. As stated in the attached USFWS and IDNR correspondence, further discussions and coordination with the USFWS and/or IDNR will likely be required to determine if the listed species will potentially be affected by the project actions.

SCI previously performed a field exploration of the project site to determine if suitable summer roosting habitat for the federally-listed endangered Indiana bat (*Myotis sodalis*) and the threatened northern long-eared bat (*Myotis septentrionalis*) exists within the project boundaries. A team of SCI scientists, led by a Federally-licensed bat biologist, performed the bat habitat assessment along the right descending bank of the MFV River within the limits of the proposed stabilization area on March 5, 2018. The area surveyed during the field exploration extended beyond the proposed construction limits as detailed on the attached Figure 3. The survey area was determined to have low suitability as Indiana and northern long-eared bat

summer roosting habitat, as only two suitable snag trees were identified in the northern portion of the site. No additional potential roost trees were identified in the central and southern areas of the site. Our findings are provided in the *Bat Habitat Assessment Report*, included as Appendix D.

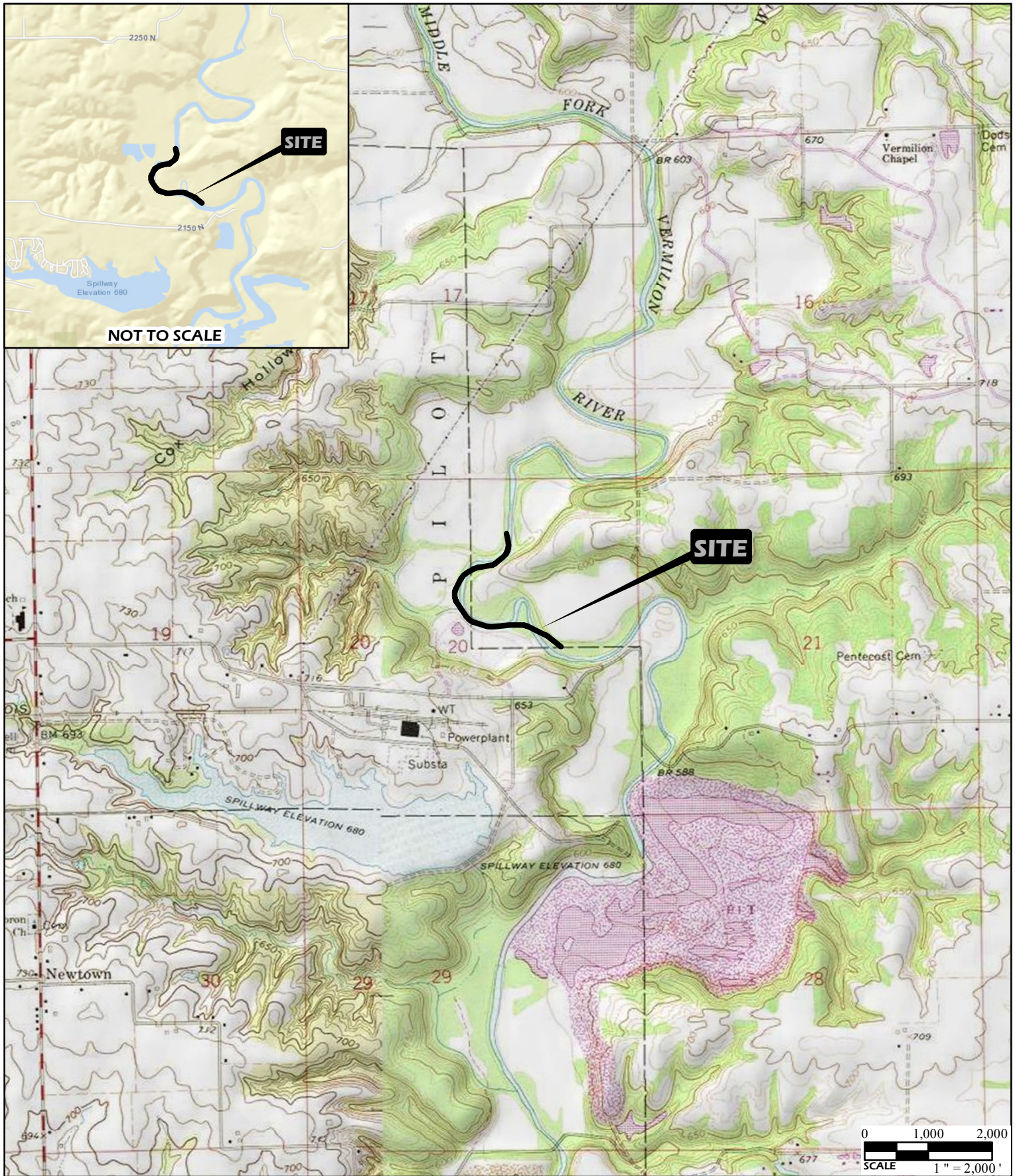
## **7.0 SUMMARY**


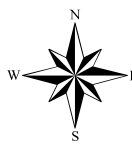
Dynergy will stabilize and protect approximately 1,900 LF of the right descending bank of the MFV River to reduce and mitigate the potential effects of erosion. As the stabilization area becomes established following construction, the stone toe protection and live branch layering are intended to restore the eroding bank to a stable condition. Based on the proposed impacts to a water of the United States, the project will require a Section 404 Permit from the USACE, Section 401 Water Quality Certification from IEPA, and may require general wetland permits or further authorization from IDNR. The *Joint Permit Application Form* is included as Appendix C for submittal to the USACE, IEPA, and IDNR.

## **8.0 LIMITATIONS**

This report has been prepared for the exclusive use of Dynergy, the USACE, IEPA, and IDNR. SCI is not responsible for independent conclusions or recommendations made by others. SCI is not responsible for surveys, calculations, or plans that were prepared by others. The anticipated impacts to the MFV River as presented in this report are based on the information and drawings prepared and provided by Stantec, dated May 2018 and attached as Appendix B. Any variation from this plan may require additional submittals to the regulatory agencies.





	<b>PROJECT NAME</b> VERMILION SITE OAKWOOD, ILLINOIS			<b>GENERAL NOTES/LEGEND</b> USGS TOPOGRAPHIC MAP COLLISION, ILLINOIS QUADRANGLE DATED 1968 DANVILLE NW, ILLINOIS QUADRANGLE DATED 1978 10' CONTOURS		
	VICINITY AND TOPOGRAPHIC MAP					
	<b>DRAWN BY</b>	<b>RCV</b>	<b>DATE</b>			<b>JOB NUMBER</b>
	<b>CHECKED BY</b>	<b>SEB</b>	06/2018			2017-3081.31
				STREET MAP <a href="http://GOTO.ARCGISONLINE.COM/MAPS/WORLD_STREET_MAP">HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_STREET_MAP</a>	<b>FIGURE</b> <b>1</b>	





## NATIONAL WETLANDS INVENTORY

**JOB NUMBER**  
2017-3081.31

USGS TOPOGRAPHIC MAP  
COLLISION, ILLINOIS QUADRANGLE  
DATED 1968  
DANVILLE NW, ILLINOIS QUADRANGLE  
DATED 1978

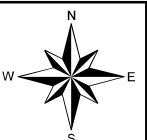
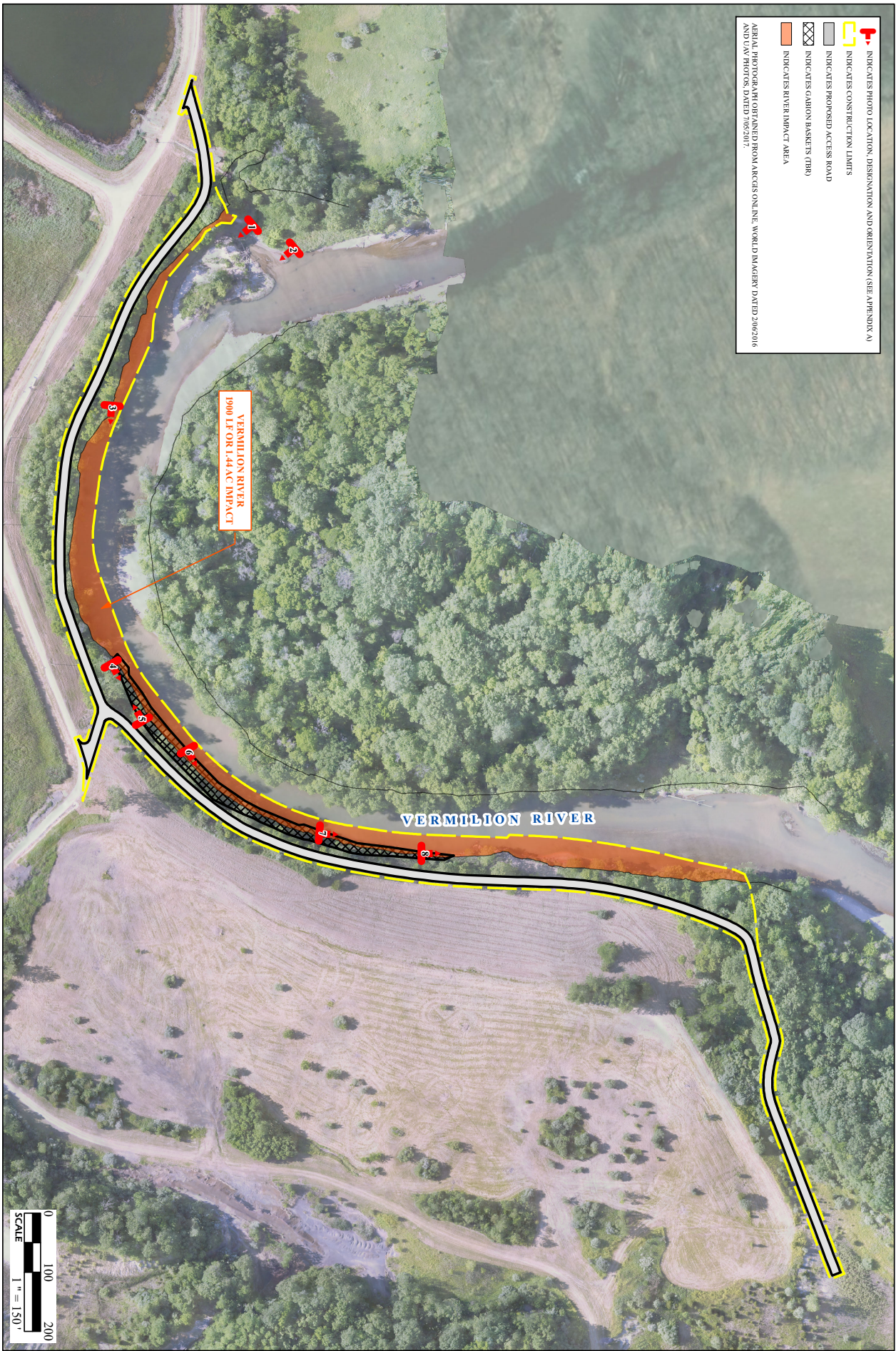


FIGURE  
2





INDICATES PHOTO LOCATION, DESIGNATION AND ORIENTATION (SEE APPENDIX A)

INDICATES CONSTRUCTION LIMITS

INDICATES PROPOSED ACCESS ROAD

INDICATES GABION BASKETS (TRB)

INDICATES RIVER IMPACT AREA

AERIAL PHOTOGRAPH OBTAINED FROM ARCGIS ONLINE, WORLD IMAGERY DATED 2/06/2016 AND UAV PHOTOS, DATED 7/05/2017.



<p>FIGURE 3</p>		<p>PROJECT NAME</p> <p>VERMILION SITE</p> <p>OAKWOOD, ILLINOIS</p> <p>IMPACT ASSESSMENT &amp; AERIAL PHOTOGRAPH</p>	<p>GENERAL NOTES/LEGEND</p>
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# **APPENDIX A**

Middle Fork Vermilion River  
Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Appendix A



Photo 1. Upstream portion of the project area along the right descending river bank, facing downstream southwest (4-26-17)

Middle Fork Vermilion River  
Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Appendix A



Photo 2. Northern portion of the project area. Project location will be along the right descending bank, facing downstream southwest (4-26-17)



Middle Fork Vermilion River  
Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Appendix A



Photo 3. Photo taken from right descending bank of the river showing the central portion of the project site, facing downstream south (4-26-17)

Middle Fork Vermilion River  
Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Appendix A



Photo 4. Photo along the right descending bank of the river showing the existing gabion baskets, facing downstream south (4-26-17)



Middle Fork Vermilion River  
Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Appendix A



Photo 5. Photo along right descending bank of the river near existing gabion area, facing upstream north (4-26-17)

Middle Fork Vermilion River  
Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Appendix A

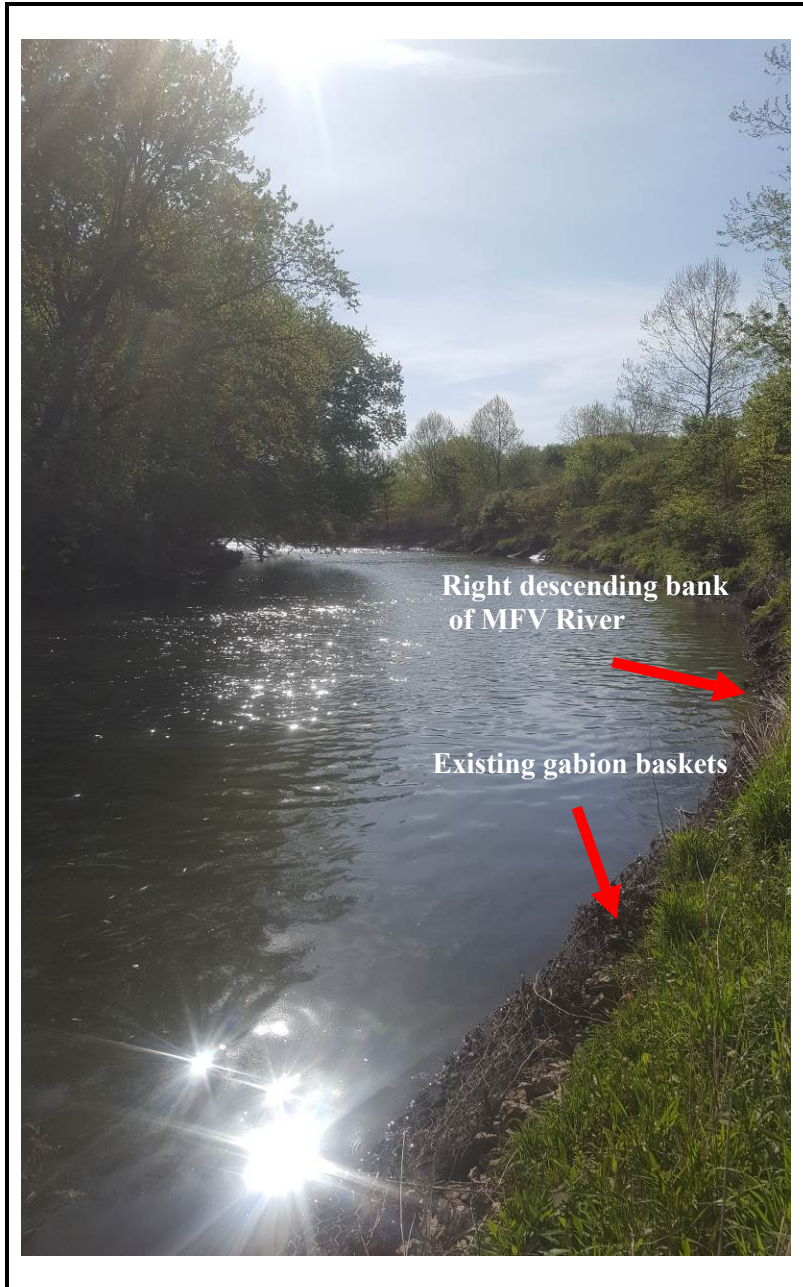


Photo 6. Central portion of the project area along the right descending bank of the river. Photo taken near bend in the river and near existing gabion area, facing downstream southeast (4-26-17)



Middle Fork Vermilion River  
Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Appendix A

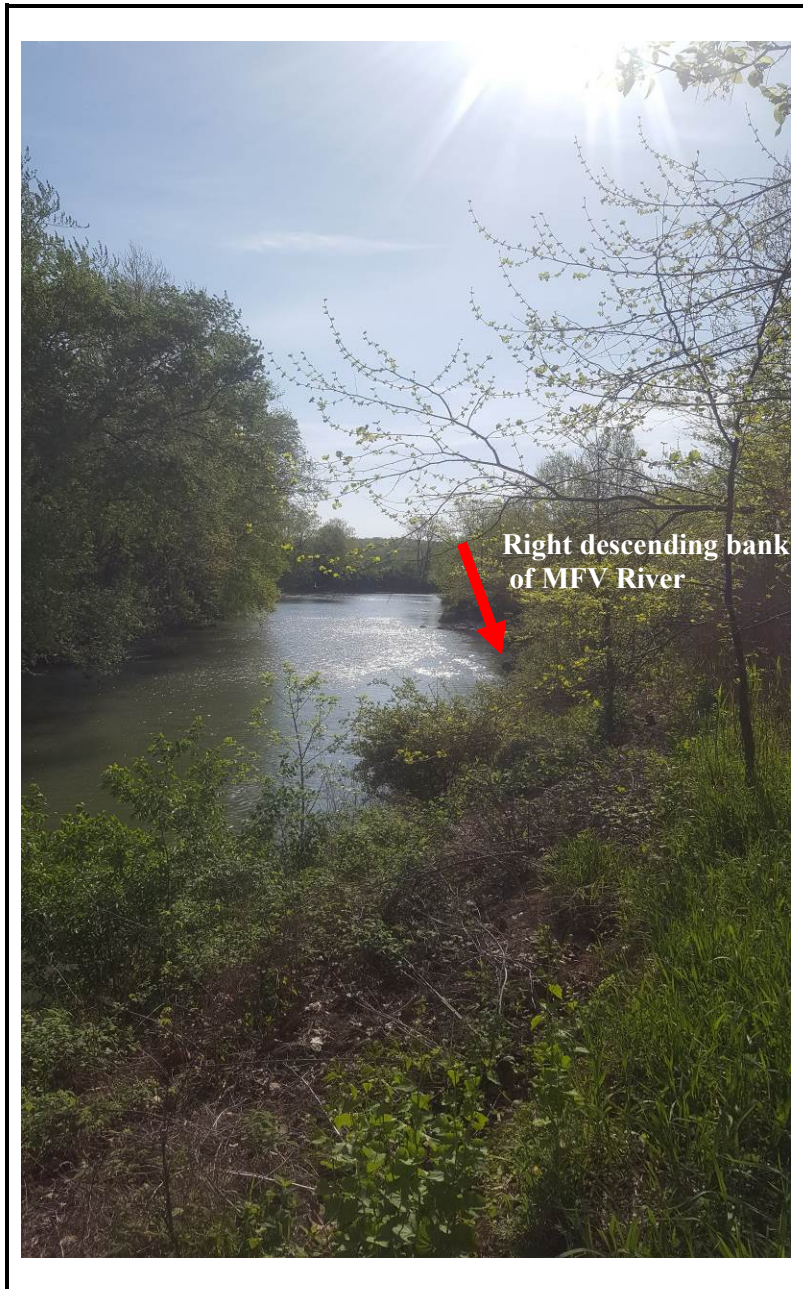


Photo 7. View of the southern portion of the project area from the right descending river bank, facing downstream east (4-26-17)



Middle Fork Vermilion River  
Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Appendix A



Photo 8. Southern portion of the project area facing downstream. Photo taken from the right descending river bank, facing east (4-26-17)

## **APPENDIX B**



Stantec

# MIDDLE FORK VERMILION RIVER EROSION MITIGATION AND RIVERBANK STABILIZATION DRAWINGS FOR PERMIT APPLICATION NOT FOR CONSTRUCTION

DYNEGY MIDWEST GENERATION, LLC  
1500 EASTPORT PLAZA DRIVE  
COLLINGSVILLE, ILLINOIS 62234

MAY 2018

DRAFT - NOT FOR  
CONSTRUCTION  
SEAL PLACEHOLDER

Client/Project  
DYNEGY MIDWEST GENERATION, LLC  
MIDDLE FORK VERMILION RIVER EROSION  
MITIGATION AND RIVERBANK STABILIZATION  
OAKWOOD, ILLINOIS  
OVERVIEW

**DRAFT - NOT FOR  
CONSTRUCTION**

**SEAL PLACEHOLDER**

Project Number: 175657154

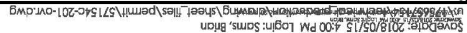
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Rev	Desc	By	Check	Date
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Drawing No. 2

Revision

0 2 of 15





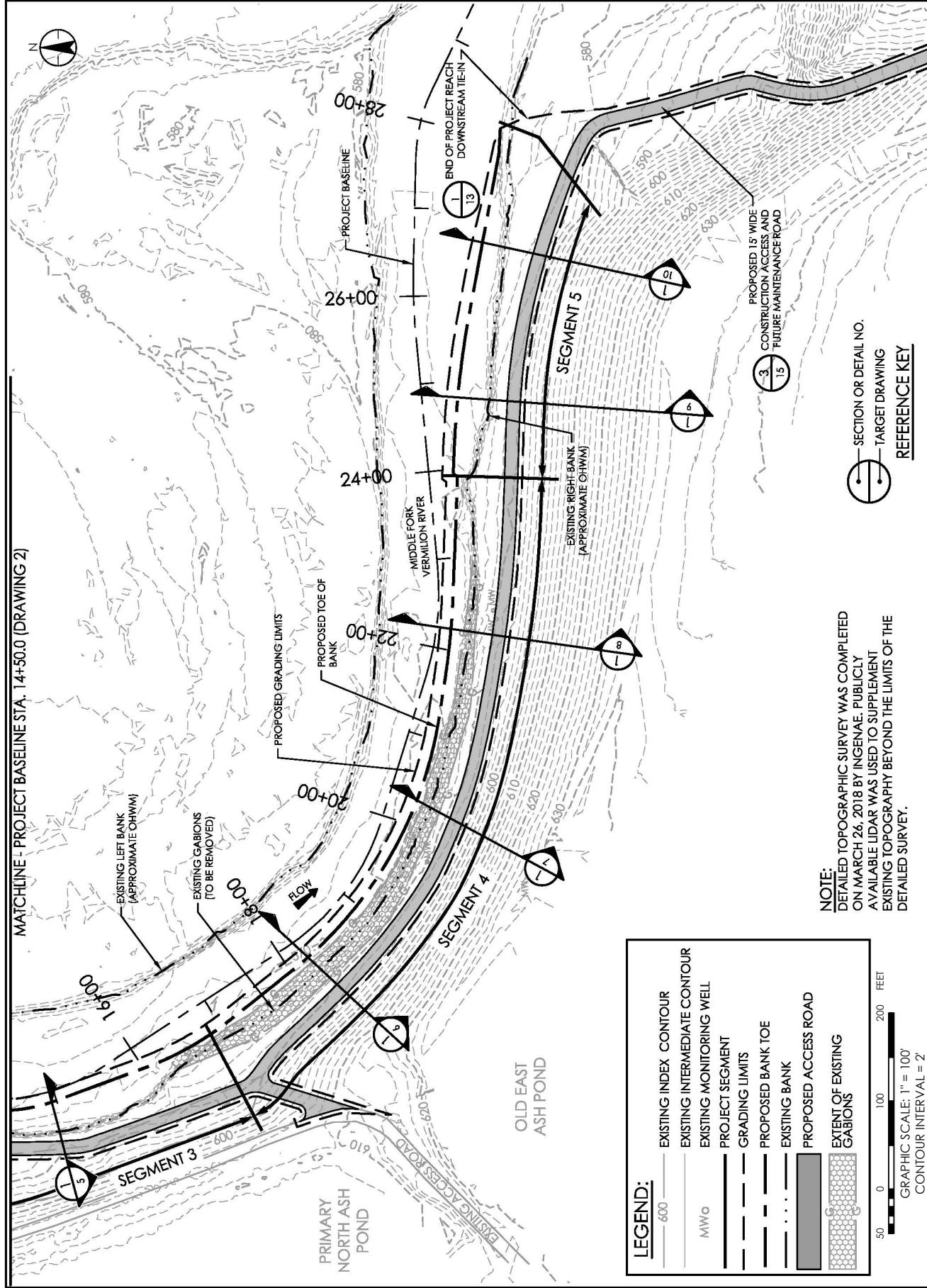
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Client/Project  
DYNegy MIDWEST GENERATION, LLC  
MIDDLE FORK VERMILION RIVER EROSION  
MITIGATION AND RIVERBANK STABILIZATION  
OAKWOOD, ILLINOIS  
Title  
OVERVIEW

DRAFT - NOT FOR  
CONSTRUCTION  
SEAL PLACEHOLDER

Project Number: 175657154  
File Name: 371546-201-civil.dwg

0 3 of 15





**NOTE:** EXISTING CHANNEL BED WAS DRY DURING FIELD SURVEY CONDUCTED ON 3/08/18.

SECTION OR DETAIL NO.  
TARGET DRAWING  
REFERENCE KEY

Project Number: 175657154

File Name: 57154-001.scdrawing

WS	30P	1CD	1600.15
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Drawing No. 4

Revision Sheet

0 4 of 15

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CONSTRUCTION**

Permit-Seed

Client/Project  
DYNEGY MIDWEST GENERATION, LLC

MIDDLE FORK VERMILION RIVER EROSION  
MITIGATION AND RIVERBANK STABILIZATION  
OAKWOOD, ILLINOIS

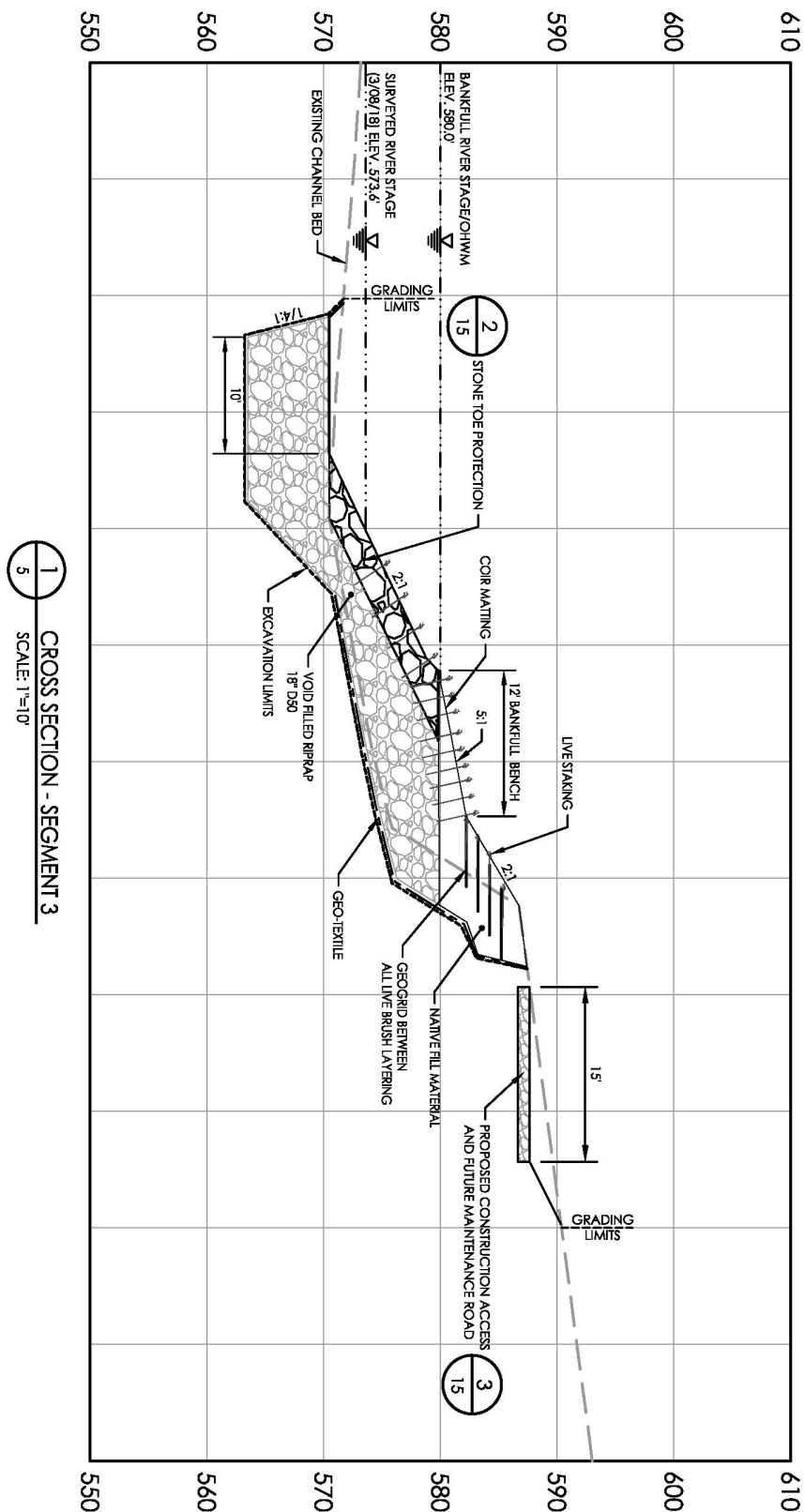
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Revision	By	Approved	YYMMDD
Issued	By	Approved	YYMMDD



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SECTION OR DETAIL NO.  
—●— TARGET DRAWING  
REFERENCE KEY

Project Number: 175657154

File Name: 171546-001.ecadrawing

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CONSTRUCTION**

Permit-Seed

Client/Project  
DYNEGY MIDWEST GENERATION, LLC

MIDDLE FORK VERMILION RIVER EROSION  
MITIGATION AND RIVERBANK STABILIZATION  
OAKWOOD, ILLINOIS

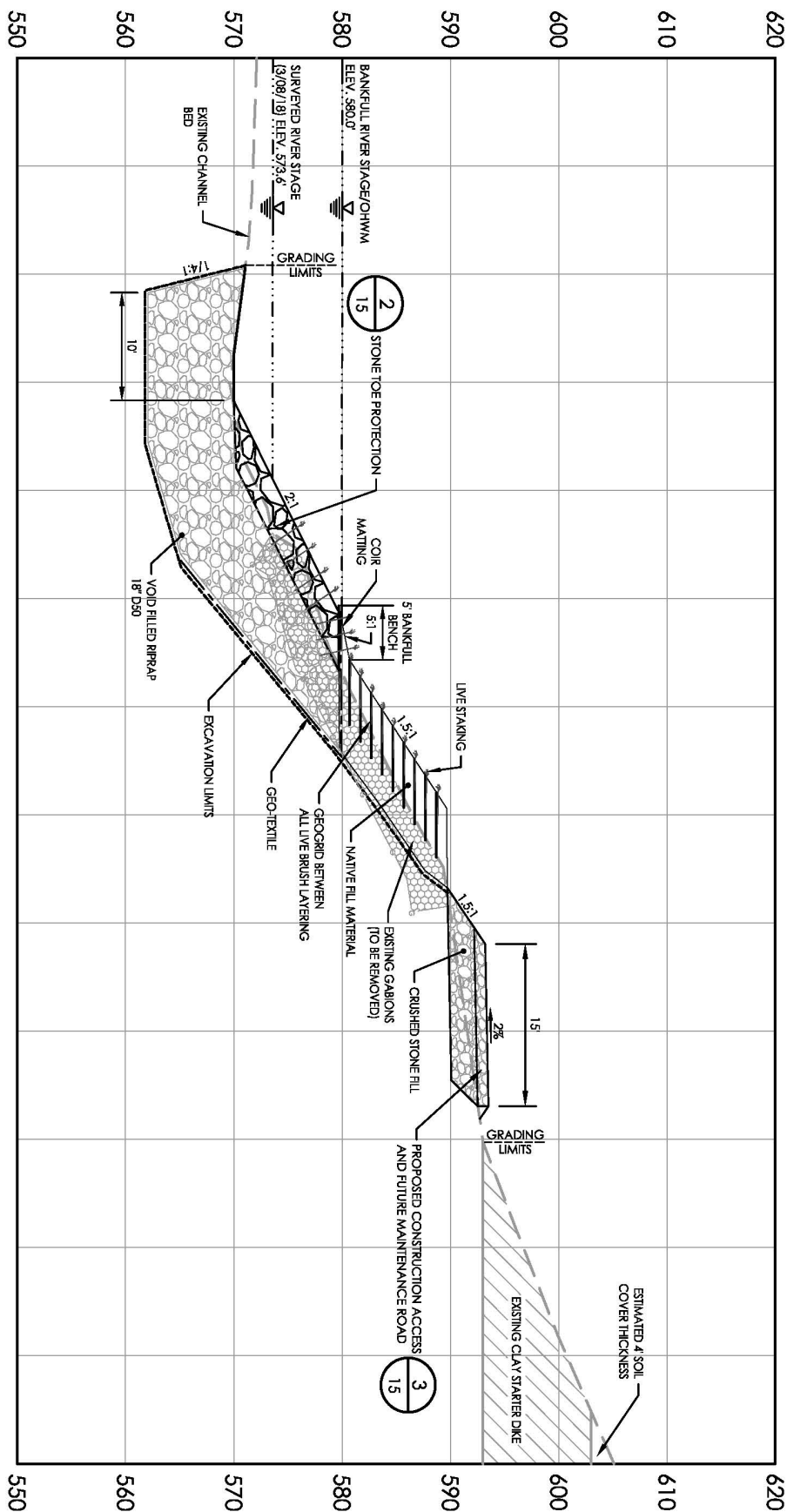
Title  
CROSS SECTION - SEGMENT 3

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Permit-See Client/Project DYNEGY MIDWEST GENERATION, LLC		MIDDLE FORK VERMILION RIVER EROSION MITIGATION AND RIVERBANK STABILIZATION OAKWOOD, ILLINOIS	
DRAFT - NOT FOR CONSTRUCTION SEAL PLACEHOLDER		Title CROSS SECTION - SEGMENT 4	
Project Number: 17565754 Revision: 07/16/2016			
Date 06/16/2016	Drawn by CJD	Scale 1"=40'	Title Block 17565754
Drawing No. 0	Sheet 6 of 15		

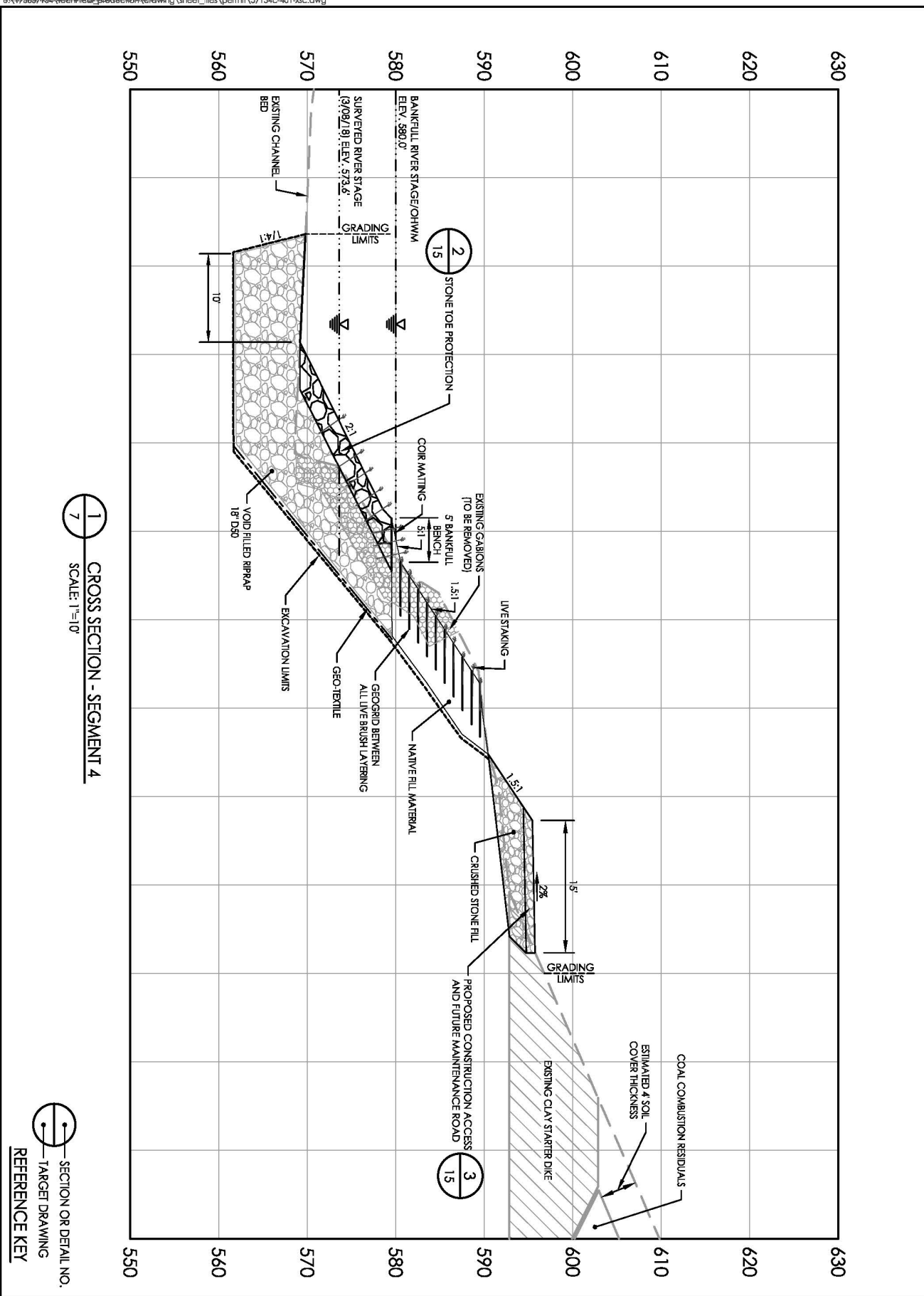
Revision	By	Appd.	YJAM/DO
Issued	By	Appd.	YJAM/DO



3032 Seaboard Centre Circle  
Lexington, Kentucky 40513  
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DYNEGY MIDWEST GENERATION, LLC

MIDDLE FORK VERMILION RIVER EROSION  
MITIGATION AND RIVERBANK STABILIZATION  
OAKWOOD, ILLINOIS

Title  
CROSS SECTION - SEGMENT 4

**DRAFT - NOT FOR  
CONSTRUCTION**

**SEAL PLACEHOLDER**

**Project Number: 175657154**

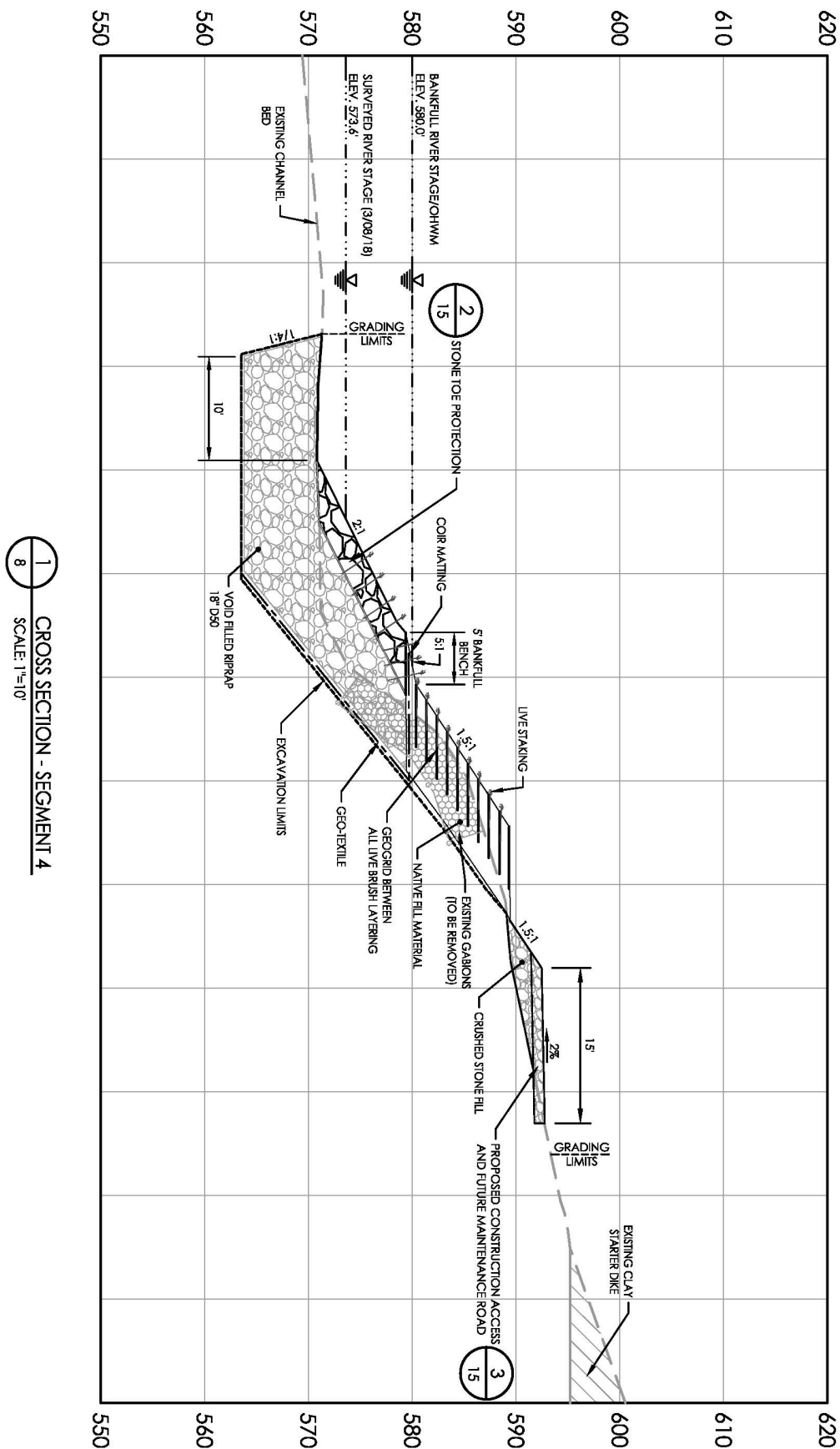
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Dim.	CHL	DWG.	TY. JARDED

**Drawing No. 7**

Revision      Sheet

0      7 of 15



SECTION OR DETAIL NO.  
— TARGET DRAWING  
REFERENCE KEY

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 Dim: Chkd: Dgns: 171546-001

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CONSTRUCTION  
SEAL PLACEHOLDER

Permit-Seed

Client/Project  
DYNEGY MIDWEST GENERATION, LLC

MIDDLE FORK VERMILION RIVER EROSION  
MITIGATION AND RIVERBANK STABILIZATION  
OAKWOOD, ILLINOIS

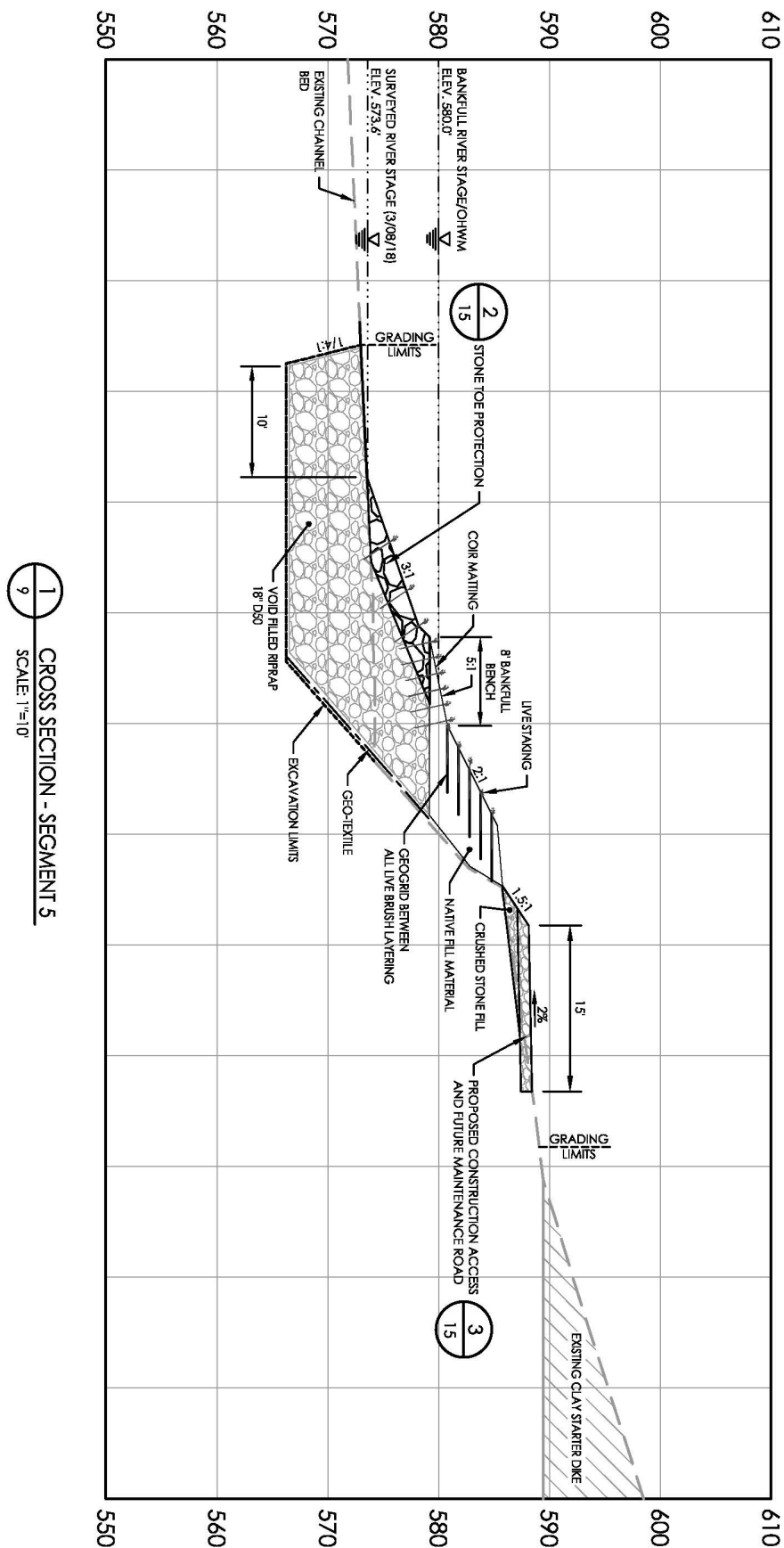
Title  
CROSS SECTION - SEGMENT 4

Revision	By	Approved	YYMMDD
Issued	By	Approved	YYMMDD



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SECTION OR DETAIL NO.  
— TARGET DRAWING  
REFERENCE KEY

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File Name: 171546-001.ecadrawing

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Dim.	Chisel	Dig.	77.7444.00

Drawing No. 9

Revision Sheet

0 9 of 15

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CONSTRUCTION**

Permit-Seed

Client/Project  
DYNEGY MIDWEST GENERATION, LLC

MIDDLE FORK VERMILION RIVER EROSION  
MITIGATION AND RIVERBANK STABILIZATION  
OAKWOOD, ILLINOIS

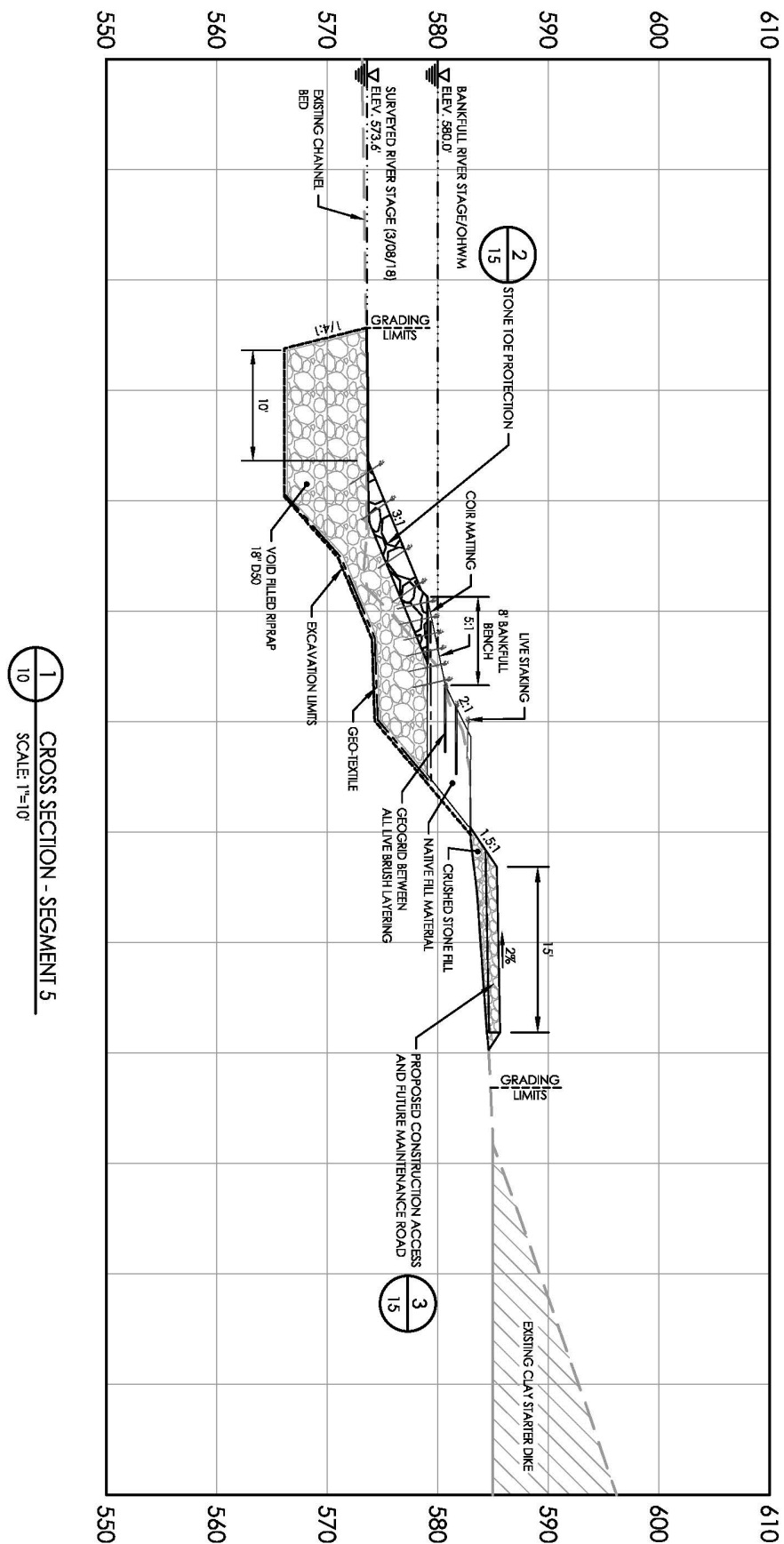
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Revision	By	Approved	YYMMDD
Issued	By	Approved	YYMMDD



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SECTION OR DETAIL NO.  
— TARGET DRAWING  
REFERENCE KEY

Project Number: 175657154

File Name: 57154-001.scd

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Drawing No. 10

Revision Sheet

0 10 of 15

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CONSTRUCTION**

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Client/Project  
DYNEGY MIDWEST GENERATION, LLC

MIDDLE FORK VERMILION RIVER EROSION  
MITIGATION AND RIVERBANK STABILIZATION  
OAKWOOD, ILLINOIS

Title  
CROSS SECTION - SEGMENT 5

Revision	By	Appld.	YYMMDD
Issued	By	Appld.	YYMMDD



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Client/Project:	DYNegy MIDWEST GENERATION, LLC
	MIDDLE FORK VERMILION RIVER EROSION
	MITIGATION AND RIVERBANK STABILIZATION
	OAKWOOD, ILLINOIS
Title	PLAN - UPSTREAM TIE-IN

DRAFT - NOT FOR  
CONSTRUCTION  
SEAL PLACEHOLDER

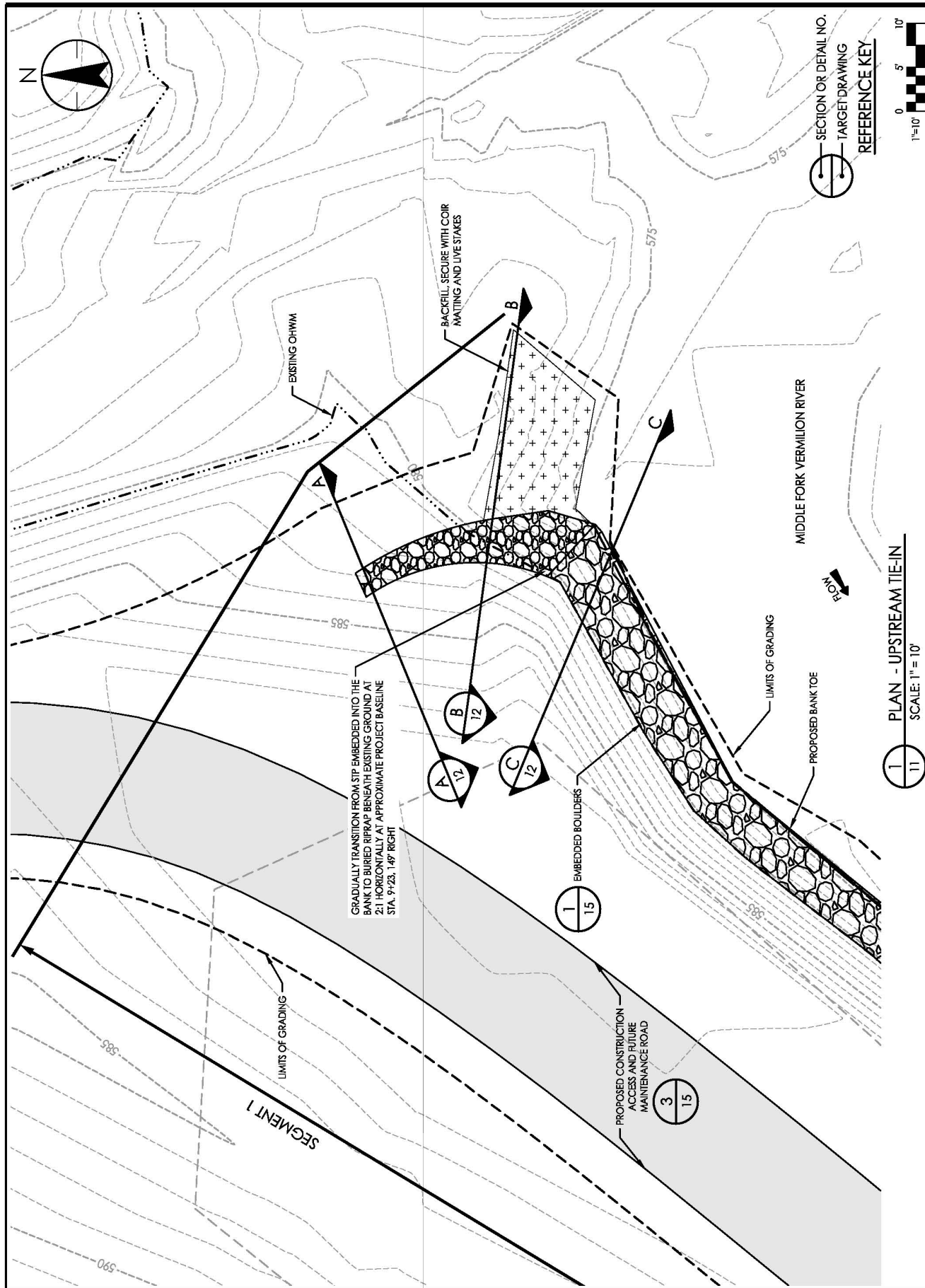
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File Name: 571545-301-5a.dmg

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Dem. / ... M. 11			

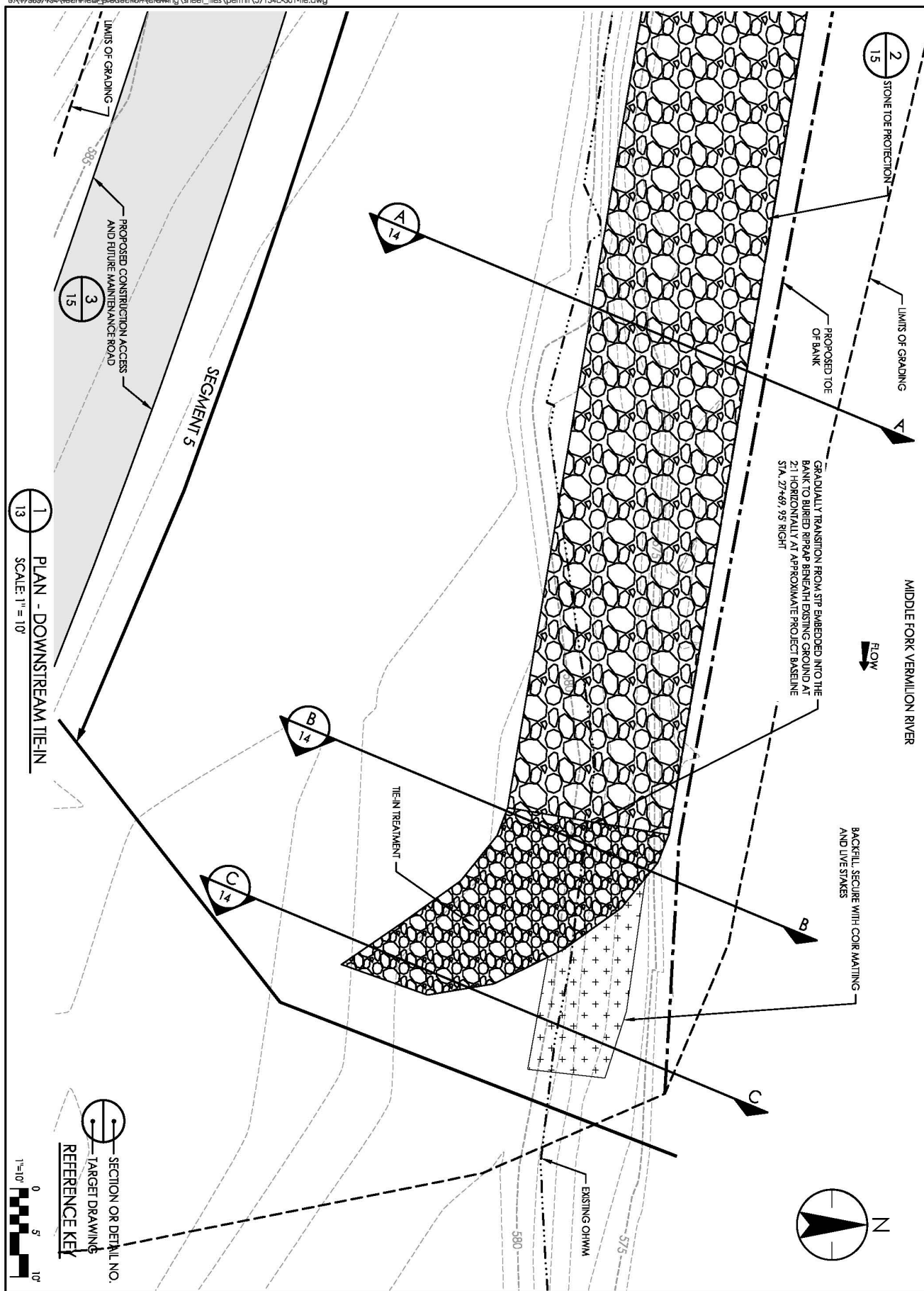
Revision	Sheet
0	

253









Revision	By	Appd.	YYMMDD
Issued	By	Appd.	YYMMDD

Client/Project  
DYNEGY MIDWEST GENERATION, LLC

MIDDLE FORK VERMILION RIVER EROSION  
MITIGATION AND RIVERBANK STABILIZATION  
OAKWOOD, ILLINOIS

Title  
PLAN - DOWNSTREAM TIE-IN

**DRAFT - NOT FOR  
CONSTRUCTION**

**SEAL PLACEHOLDER**

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**Project Number:** 175657/54

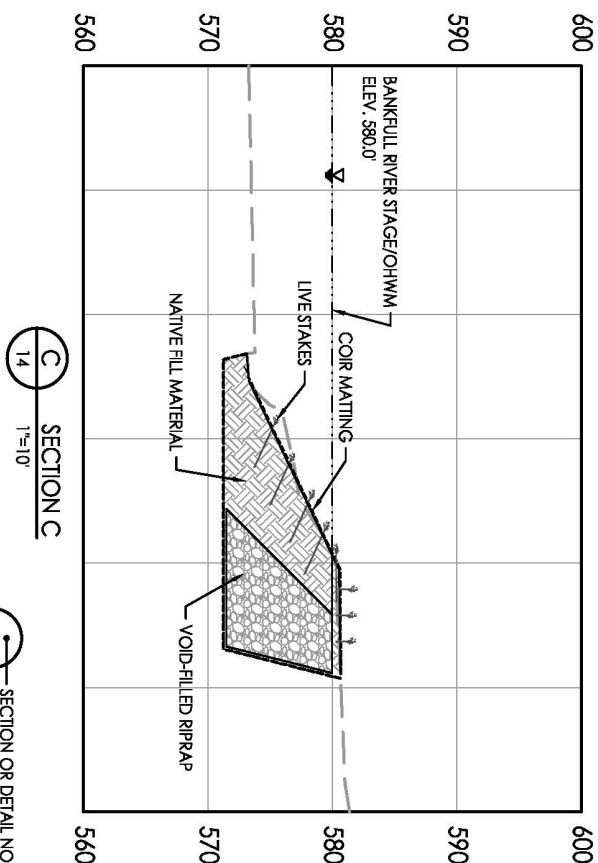
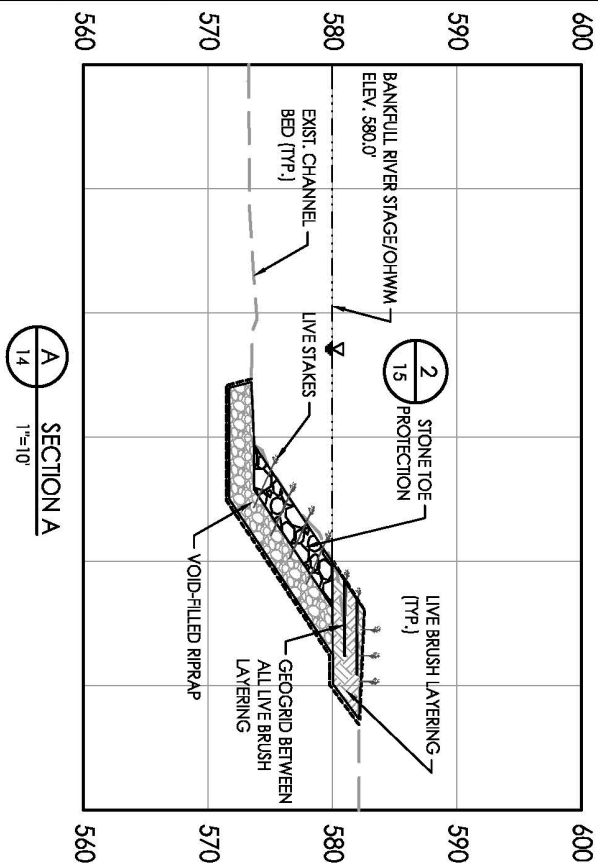
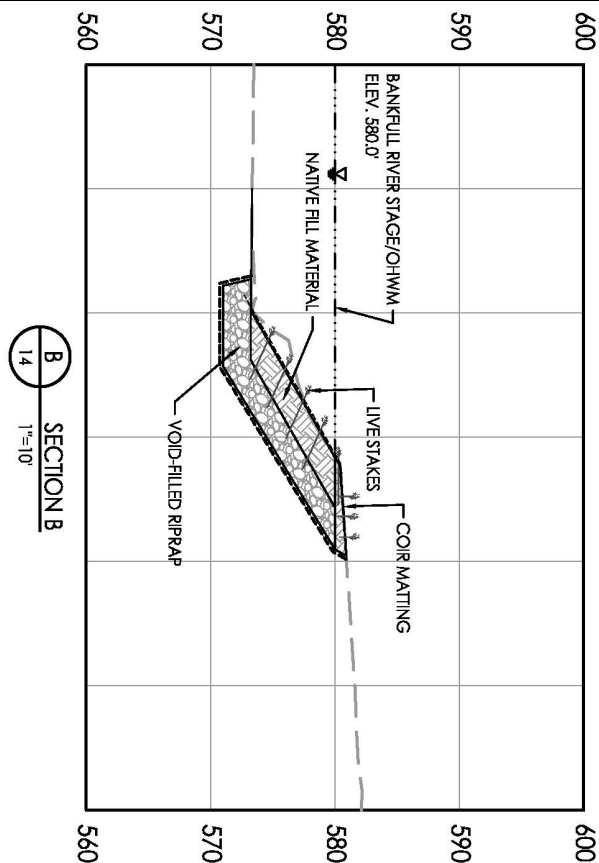
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REV	DATE	BY	APP'D
0			

**Drawing No. 13**

**Revision**      **Sheet**

13 of 15



SECTION OR DETAIL NO.  
TARGET DRAWING  
REFERENCE KEY

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Title Name: 271540-301-154.dwg			
BS	3XP	ICD	16.03.15
Dwn.	Chd	Dgn.	TYMAD.D
Drawing No. 14			
Revision		Sheet	
0		14 of 15	

**DRAFT - NOT FOR  
CONSTRUCTION  
SEAL PLACEHOLDER**

Permit-Seed

Client/Project  
DYNEGY MIDWEST GENERATION, LLC

MIDDLE FORK VERMILION RIVER EROSION  
MITIGATION AND RIVERBANK STABILIZATION  
OAKWOOD, ILLINOIS

Title  
CROSS SECTION - DOWNSTREAM TIE-IN

Revision	By	Appd.	YYMMDD
Issued	By	Appd.	YYMMDD



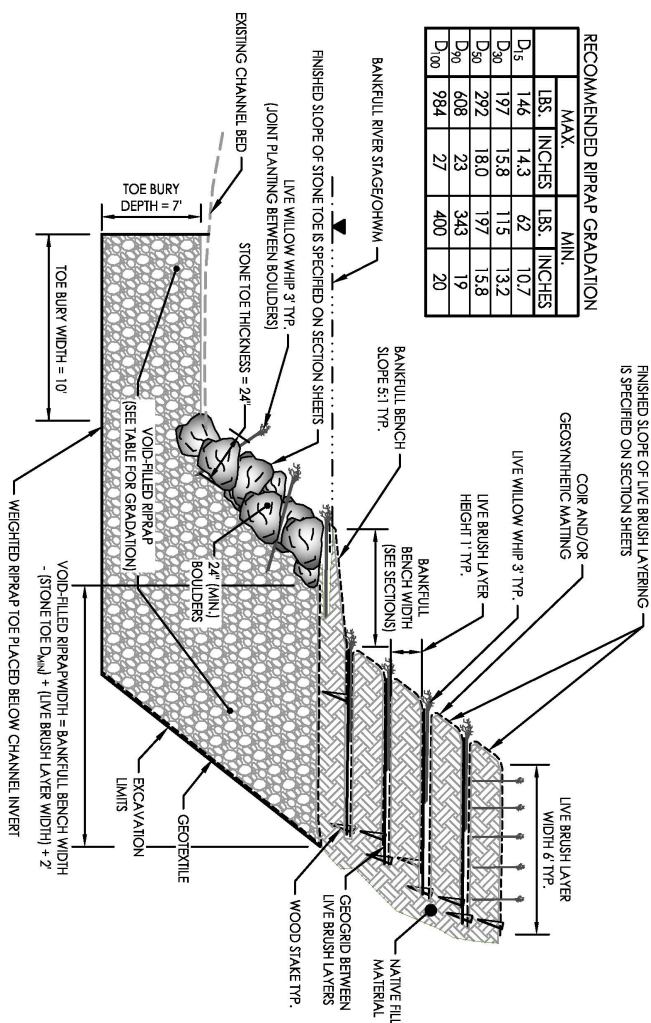
The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Skanska without delay. The Copyrights to all designs and drawings are the property of Skanska. Reproduction or use for any purpose other than that authorised by Skanska is forbidden.



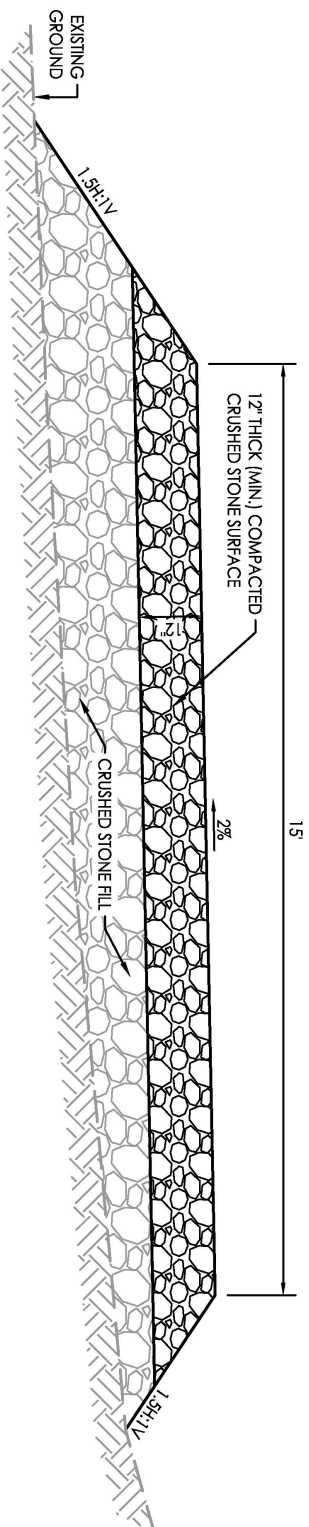
**DETAIL - EMBEDDED BOULDERS - SEGMENT 1**  
**NOT TO SCALE**

RECOMMENDED RIRAP GRADUATION					
	MAX.		MIN.		
	LBS.	INCHES	LBS.	INCHES	
D <sub>5</sub>	146	14.3	62	10.7	
D <sub>20</sub>	197	15.8	115	13.2	
D <sub>50</sub>	292	18.0	197	15.8	
D <sub>90</sub>	608	23	343	19	
D <sub>100</sub>	984	27	400	20	

**DETAIL - STONE TOE PROTECTION - SEGMENTS 2-5**  
**NOT TO SCALE**



**DETAIL - CONSTRUCTION ACCESS AND FUTURE MAINTENANCE ROAD**  
SCALE: 1/2" = 1'-0"



SECTION OR DETAIL NO.  
— TARGET DRAWING  
REFERENCE KEY

## **APPENDIX C**

# JOINT APPLICATION FORM FOR ILLINOIS

## ITEMS 1 AND 2 FOR AGENCY USE

1. Application Number	2. Date Received
-----------------------	------------------

## 3. and 4. (SEE SPECIAL INSTRUCTIONS) NAME, MAILING ADDRESS AND TELEPHONE NUMBERS

<b>3a. Applicant's Name:</b> <b>Phil Morris</b> Company Name (if any): Dynegy Midwest Generation, LLC Address: <b>1500 Eastport Plaza Drive</b> <b>Collinsville, Illinois 62234</b>  Email Address: phil.morris@vistraenergy.com	<b>3b. Co-Applicant/Property Owner Name</b> (if needed or if different from applicant):  Company Name (if any):  Address:   Email Address:	<b>4. Authorized Agent (an agent is not required):</b>  Company Name (if any):  Address:   Email Address:
Applicant's Phone Nos. w/area code Business: 618-343-7794 Residence: Cell: Fax:	Applicant's Phone Nos. w/area code Business: Residence: Cell: Fax:	Agent's Phone Nos. w/area code Business: Residence: Cell: Fax:

## STATEMENT OF AUTHORIZATION

I hereby authorize, \_\_\_\_\_ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

\_\_\_\_\_  
Applicant's Signature

\_\_\_\_\_  
Date

## 5. ADJOINING PROPERTY OWNERS (Upstream and Downstream of the water body and within Visual Reach of Project)

Name	Mailing Address	Phone No. w/area code
a. IDNR, Wayne Rosenthal	One Natural Resources Way, Springfield, IL 62702	217 782-6302
b. Kenneth Divan	9370E 2100N Road, Oakwood, IL 61858	217 354-4446
c. Tom Fletcher	9287E 2085N Road, Oakwood, IL 61858	217 354-4000
d. John Sandusky	9878E 2150N Road, Danville, IL 61834	217 776-2746

## 6. PROJECT TITLE:

**Middle Fork Vermilion River Erosion Mitigation and Streambank Stabilization - Vermilion Site**

## 7. PROJECT LOCATION:

LATITUDE: 40.18307 °N LONGITUDE: -87.74537 °W	UTM's Northing: Easting:										
STREET, ROAD, OR OTHER DESCRIPTIVE LOCATION <b>Vermilion Site, 10188 E 2150N</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">LEGAL DESCRIPT</th> <th style="width: 15%;">QUARTER</th> <th style="width: 15%;">SECTION</th> <th style="width: 20%;">TOWNSHIP NO.</th> <th style="width: 35%;">RANGE</th> </tr> <tr> <td></td> <td style="text-align: center;">SE</td> <td style="text-align: center;">20</td> <td style="text-align: center;">20N</td> <td style="text-align: center;">12W</td> </tr> </table>	LEGAL DESCRIPT	QUARTER	SECTION	TOWNSHIP NO.	RANGE		SE	20	20N	12W
LEGAL DESCRIPT	QUARTER	SECTION	TOWNSHIP NO.	RANGE							
	SE	20	20N	12W							
<input type="checkbox"/> IN OR <input checked="" type="checkbox"/> NEAR CITY OF TOWN (check appropriate box) Municipality Name <b>Oakwood</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 75%;">WATERWAY</th> <th style="width: 25%;">RIVER MILE (if applicable)</th> </tr> <tr> <td style="text-align: center; height: 40px;"><b>Middle Fork Vermilion River</b></td> <td></td> </tr> </table>	WATERWAY	RIVER MILE (if applicable)	<b>Middle Fork Vermilion River</b>							
WATERWAY	RIVER MILE (if applicable)										
<b>Middle Fork Vermilion River</b>											
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 30%;">COUNTY</th> <th style="width: 20%;">STATE</th> <th style="width: 50%;">ZIP CODE</th> </tr> <tr> <td style="text-align: center;"><b>Vermilion</b></td> <td style="text-align: center;"><b>IL</b></td> <td style="text-align: center;"><b>61858</b></td> </tr> </table>	COUNTY	STATE	ZIP CODE	<b>Vermilion</b>	<b>IL</b>	<b>61858</b>					
COUNTY	STATE	ZIP CODE									
<b>Vermilion</b>	<b>IL</b>	<b>61858</b>									

Revised 2010

☐ Corps of Engineers

☐ IL Dep't of Natural Resources

☐ IL Environmental Protection Agency

☐ Applicant's Copy



8. PROJECT DESCRIPTION (Include all features):

The proposed project is for approximately 1,900 linear feet (LF) of river bank stabilization along the right descending bank of the Middle Fork Vermilion (MFV) River at Dynegy Midwest Generation, LLC's (Dynegy) Vermilion Site. In an effort to prevent erosional issues along this stretch of the river, Dynegy is proposing to lay back the embankments and construct an access bench at the toe of the embankment to provide construction access. The stabilization methods will include a combination of stone toe protection, embedded toe boulders, void-filled rip rap, and live branch layering. In addition, the existing gabion baskets along the river edge within the project area will be removed as part of the project. A detailed description of the proposed site plan is included in the plans completed by Stantec titled: Middle Fork Vermilion River Erosion Mitigation and Riverbank Stabilization, dated May 2018 (see attached report).

9. PURPOSE AND NEED OF PROJECT:

The purpose of the project is to protect the eroding streambank from the continued lateral migration of the stretch of the MFV River as noted in the project description.

**COMPLETE THE FOLLOWING FOUR BLOCKS IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED**

10. REASON(S) FOR DISCHARGE:

Installation of void-filled rip rap, embedded boulders, and live branch layering to facilitate the construction of the proposed stone toe protection along a reach of the MFV River.

11. TYPE(S) OF MATERIAL BEING DISCHARGED AND THE AMOUNT OF EACH TYPE IN CUBIC YARDS FOR WATERWAYS:

TYPE: rip rap (various gradation), boulders (minimum of 24 inches)

AMOUNT IN CUBIC YARDS:

Stone Toe Protection Boulders - 2,130 CY / Void-Filled Rip Rap - 20,240 CY

12. SURFACE AREA IN ACRES OF WETLANDS OR OTHER WATERS FILLED (See Instructions)

1,900 LF or 1.44 acres

13. DESCRIPTION OF AVOIDANCE, MINIMIZATION AND COMPENSATION (See Instructions)

Several design alternatives were considered to provide an engineering plan that meets the purpose and need of the project. The combined embedded boulders, live brush layering, and stone toe protection plan is the preferred project plan to provide the necessary bank stabilization.

14. Date activity is proposed to commence

Fall 2018

Date activity is expected to be completed

Summer 2019

15. Is any portion of the activity for which authorization is sought now complete?

Yes ☐

No ☒

NOTE: If answer is "YES" give reasons in the Project Description and Remarks section. Indicate the existing work on drawings.

Month and Year the activity was completed N/A

16. List all approvals or certification and denials received from other Federal, Interstate, state, or local agencies for structures, construction, discharges or other activities described in this application.

Issuing Agency

Type of Approval

Identification No.

Date of Application

Date of Approval

Date of Denial


17. CONSENT TO ENTER PROPERTY LISTED IN PART 7 ABOVE IS HEREBY GRANTED.

Yes ☒

No ☐

18. APPLICATION VERIFICATION (SEE SPECIAL INSTRUCTIONS)

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

  
Signature of Applicant or Authorized Agent

6-28-18  
Date

\_\_\_\_\_  
Signature of Applicant or Authorized Agent

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Applicant or Authorized Agent

\_\_\_\_\_  
Date

☐ Corps of Engineers  
Revised 2010

☐ IL Dep't of Natural Resources

☐ IL Environmental Protection  
Agency

☐ Applicant's Copy

SEE INSTRUCTIONS FOR ADDRESS

## **APPENDIX D**



**SCI ENGINEERING, INC.**

**EARTH • SCIENCE • SOLUTIONS**

GEOTECHNICAL  
ENVIRONMENTAL  
NATURAL RESOURCES  
CULTURAL RESOURCES  
CONSTRUCTION SERVICES

March 15, 2018

Mr. Vic Modeer, P.E., D.GE  
Dynegy Midwest Generation, LLC  
1500 Eastport Plaza Drive  
Collinsville, Illinois 62234

RE: Bat Habitat Assessment  
Middle Fork Vermilion River  
Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Oakwood, Illinois  
SCI No. 2017-3081.3B Task 200

Dear Mr. Modeer:

SCI Engineering, Inc. (SCI) performed a bat habitat assessment at the above referenced site. Our scope of work included performing a site reconnaissance to determine if suitable summer roosting habitat for the federally-listed endangered Indiana bat (*Myotis sodalis*) and the threatened northern long-eared bat (*Myotis septentrionalis*) exists within the proposed project boundaries. SCI understands that Dynegy is requesting permitting services for the submittal of a Section 404/401 permit application to the U.S. Army Corps of Engineers (USACE) and the Illinois Environmental Protection Agency (IEPA) for stabilization work on approximately 1,900 linear feet along the Middle Fork Vermilion (MFV) River. It is our understanding that Stantec, Inc. is currently preparing a stream stabilization plan for the project. However, a final design plan has not been determined at this time. As such, an approximate acreage of woodland that may need to be felled during project activities is currently not available.

## **BAT HABITAT ASSESSMENT SUMMARY**

On February 27, 2018, a team of SCI Scientists, led by a Federally-licensed bat biologist, performed a field exploration of the project site in an effort to identify potentially suitable Indiana bat and northern long-eared bat summer roosting habitat, as defined in the U.S. Fish and Wildlife Service (USFWS) Range-wide Indiana Bat Summer Survey Guidelines, dated May 2017. Some of the necessary habitat characteristics include live and/or dead snag trees  $\geq 3$  inches in diameter at breast height (DBH) that have sloughing bark, cracks, crevices, and/or hollows. The *Indiana Bat Habitat Assessment Datasheets* of the Range-wide Guidelines, provided as Appendix 1, were completed at four representative locations within the survey area. The location of these sample sites can be found on the *Bat Habitat Assessment and Aerial Photograph*, enclosed as Figure 2.

## **Surrounding Area**

The surrounding area consists of forested areas fragmented by agricultural fields, the Dynegy Vermilion facility to the south, the MFV River to the east, and a large lake to the southwest of the project area. There are sparse residential developments within 3 miles, but the area is primarily developed for



agricultural purposes. Within a 10-mile radius, the project area is within proximity of two conservation areas and State parks. The project site is approximately 2.5 miles north of Middle Fork Woods Nature Preserve and approximately 3 miles north of Kickapoo State Recreation Area.

### **On-Site Habitat Assessment**

Sample Site 1 occurs in the northernmost portion of the site near an existing pump station. The wooded area contains a densely vegetated understory, midstory and moderately vegetated canopy. Dominant mature tree species in the site include black walnut (*Juglans nigra*), American elm (*Ulmus americana*), honey locust (*Gleditsia triacanthos*), American sycamore (*Platanus occidentalis*), eastern red cedar (*Juniperus virginiana*), and black cherry (*Prunus serotina*). Two snags were documented along the forested hillside in the northern portion of the site. These trees contain sloughing bark, crevices, and/or cracks that are suitable for roosting Indiana and northern long-eared bats. The remaining trees within the site contain smooth bark that are not suitable for summer roosting bats. **As such, Sample Site 1 has low suitability as summer roosting habitat for Indiana and northern long-eared bats.**

Sample Site 2 occurs within the northern portion of the site and southwest of Sample Site 1. The wooded area contains a densely vegetated understory, midstory and moderately vegetated canopy. Dominant mature tree species in the site include American elm, eastern cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), honey locust, and American sycamore. No snags or live trees that contain sloughing bark, crevices, and/or cracks that are suitable for roosting Indiana and northern long-eared bats were identified within Sample Site 2. **As such, Sample Site 2 is not suitable as summer roosting habitat for Indiana and northern long-eared bats.**

Sample Site 3 occurs in the southern forested portion of the site and southeast of Sample Site 2. The wooded area contains a sparsely vegetated understory, midstory and canopy. Dominant mature tree species in the site include eastern red cedar, American basswood (*Tilia americana*), white poplar (*Populus alba*), and American sycamore. No snags or live trees that contain sloughing bark, crevices, and/or cracks that are suitable for roosting Indiana and northern long-eared bats were identified within Sample Site 3. **As such, Sample Site 3 is not suitable as summer roosting habitat for Indiana and northern long-eared bats.**

Sample Site 4 occurs in the southern forested portion of the site and southeast of Sample Site 3. The site contains a sparse stand of young trees. The wooded corridor contains an open understory, midstory and moderately vegetated canopy. Dominant mature tree species in the site include American sycamore and box elder (*Acer negundo*). No snags or live trees that contain sloughing bark, crevices, and/or cracks that are suitable for roosting Indiana and northern long-eared bats were identified within Sample Site 4. The remaining trees within the site contain smooth bark that are not suitable for summer roosting bats. **As such, Sample Site 4 is not suitable as summer roosting habitat for Indiana and northern long-eared bats.**

In summary, based on the site characteristics and surrounding land use, the project site has low suitability as Indiana and northern long-eared bat summer roosting habitat. The only suitable habitat (low suitability) present occurs within Sample Site 1. The remaining sites (Sample Site 2 through 4) are not suitable as roosting habitat. Based on the surrounding landscape, the site may be used as a travel and foraging corridor for bats, as the forested corridor is part of a larger contiguous woodland corridor that runs north to south and connects with other large woodlands.

Project sites containing suitable bat habitat have the potential to result in a USFWS “may affect” determination and will likely require additional consultation with the USFWS if impacts to suitable habitat are proposed. The USFWS may request a presence/probable absence survey to determine if threatened and endangered species are present within the project area and/or will be affected by project activities. Please note that the official USFWS mandated summer survey season for Indiana and northern long-eared bats is May 15 to August 15.

SCI is providing our professional opinion regarding the suitability of habitat for the Indiana and northern long-eared bats, as defined in the USFWS Range-wide Indiana Bat Summer Survey Guidelines, dated May 2017. Please keep in mind that the USFWS has the sole authority to determine which areas are classified as suitable habitat. Additionally, the USFWS has the authority to regulate any action which may affect a listed threatened or endangered species. If desired, SCI is available to submit this assessment to the USFWS for their review.

If you have any questions regarding this assessment or need additional information, please contact me at (618) 206-3038 or [sbillings@sciengineering.com](mailto:sbillings@sciengineering.com).

Respectfully,

**SCI ENGINEERING, INC.**



Vona Kuczynska  
Staff Scientist



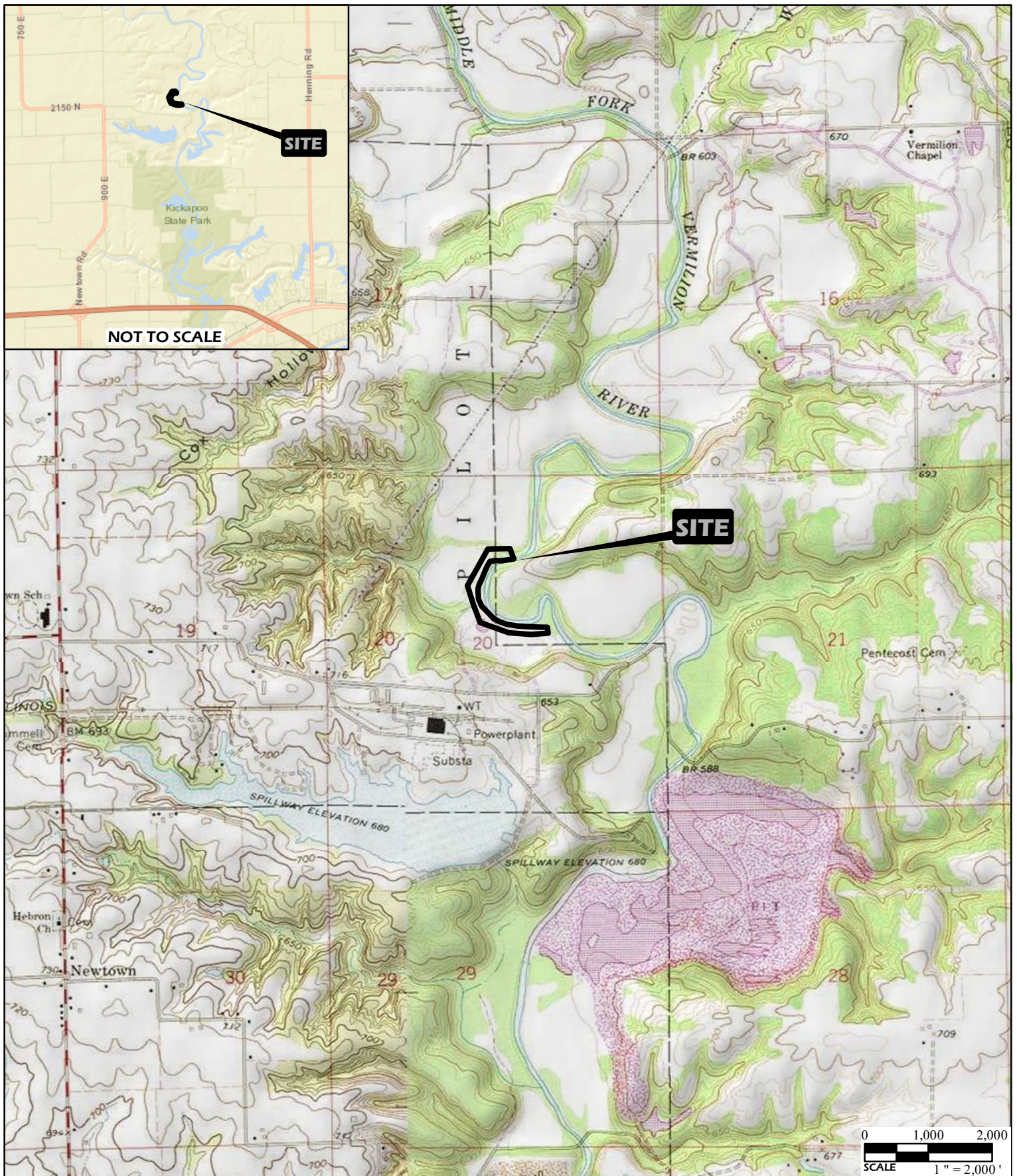
Scott E. Billings  
Project Scientist


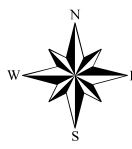
VK/SEB/tlw

Enclosures

- Figure 1 – Vicinity and Topographic Map
- Figure 2 – Bat Habitat Assessment and Aerial Photograph
- Appendix 1 – Indiana Bat Habitat Assessment Datasheets
- Appendix 2 – Photographic Summary

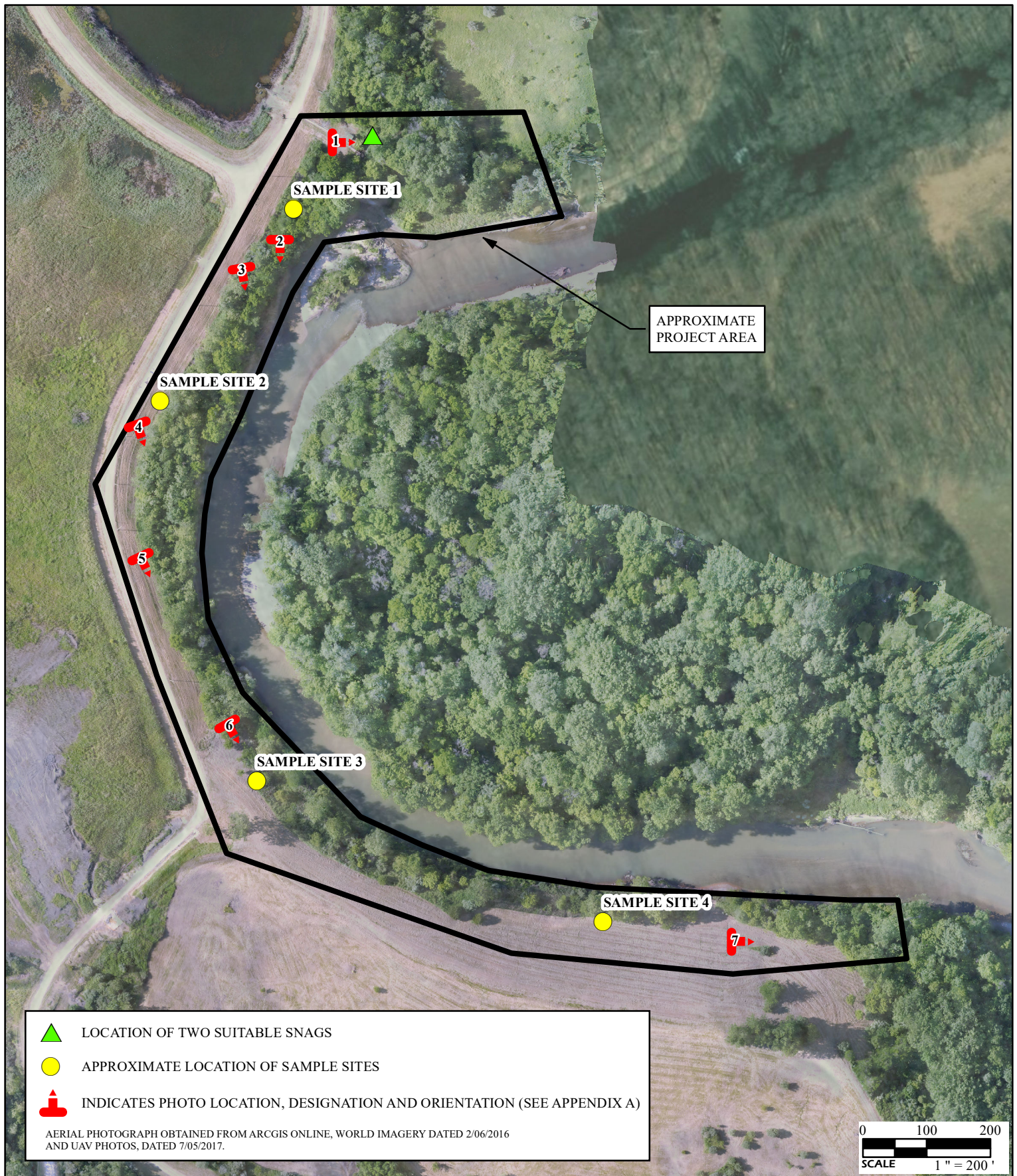






	<b>PROJECT NAME</b> VERMILION SITE OAKWOOD, ILLINOIS			<b>GENERAL NOTES/LEGEND</b> USGS TOPOGRAPHIC MAP COLLISON, ILLINOIS QUADRANGLE DATED 1968 DANVILLE NW, ILLINOIS QUADRANGLE DATED 1978 10' CONTOURS		
	VICINITY AND TOPOGRAPHIC MAP					
	<b>DRAWN BY</b>	RCV	<b>DATE</b>			<b>JOB NUMBER</b>
	<b>CHECKED BY</b>	VK	03/2018			2017-3081.3B
STREET MAP <a href="http://GOTO.ARCGISONLINE.COM/MAPS/WORLD_STREET_MAP">HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_STREET_MAP</a>						
<b>FIGURE</b> 1						

**FIGURE**  
**1**





	PROJECT NAME			GENERAL NOTES/LEGEND	
	VERMILION SITE				
	OAKWOOD, ILLINOIS				
	BAT HABITAT ASSESSMENT & AERIAL PHOTOGRAPH				
	DRAWN BY	BDG	DATE		
CHECKED BY	VK	03/2018	2017-3081.3B	FIGURE	2



# **Appendix 1**

## INDIANA AND NORTHERN LONG-EARED BAT HABITAT ASSESSMENT FORM

<b>Project Name</b>	Vermilion Site - Stabilization	<b>Project No.</b>	2017.3081.3B
<b>Township/Range/Section</b>	Oakwood, Illinois	<b>Survey Date</b>	2/27/2018
<b>Latitude/Longitude</b>	40.183527°, -87.745912°	<b>Surveyor</b>	Vona Kuczynska

### Project Description:

SCI understands that Dynegy is planning to submit a Section 404/401 permit application to the U.S. Army Corps of Engineers and the Illinois Environmental Protection Agency for stabilization work on approximately 1,900 linear feet along the Middle Fork Vermilion (MFV) River at the Vermilion site, located near Oakwood, Illinois.

### Project Area

Total Acres	Forested Acres		Open Acres (non-forested or developed)	
	% of Site	% w/in 1 mile	% of Site	% Site w/in 1 mile
1,900 LF	80%	50%	20%	60%

### Proposed Project Tree Removal (acres)

Completely Cleared	Partially Cleared (will leave trees)	Reserved (no clearing)
N/A	N/A	N/A

### Landscape Within 3 Mile Radius

#### Corridors to other forested areas?

The trees on site are part of a contiguous riparian corridor that is adjacent to the MFV River.

#### Describe Adjacent Property (e.g. forest, grassland, commercial, residential development, water resources).

The surrounding area consist of forested areas fragmented by agricultural fields, the MFV River to the east, and a large lake to the southwest of the project area. There are sparse residential developments within 3 miles, but the area is primarily developed for agricultural purposes.

### Proximity to Public Land Within 10 miles

What is the distance (miles) from the project area to public lands? (i.e. national and state parks, conservation areas, local parks). Use the distance between the boundaries of the site and the public land.

Location	Distance (miles)
Kickapoo State Recreation Area	less than 0.5
Middle Fork Woods Nature Preserve	less than 0.5



<b>Site Name</b>	Vermillion River Stabilization	<b>Visit Date</b>	2/27/18
<b>Sample Point</b>	1		

General Description
Sample Site 1 occurs in the northern portion of the project site. The area contains mostly young trees less than 8 inches in diameter at breast height. There are two suitable snags present on the border of the site. Otherwise the site does not contain suitable trees.

Water Resources At Sample Site			
	Ephemeral	Intermittent	Perennial
Nr. & Length	N/A	N/A	1 - MFV River

Wetlands		
	Permanent	Seasonal
Approx. Acreage	N/A	N/A

Number and Size of Ponds/Pools	Open and Accessible to Bats?
N/A	Yes <input type="checkbox"/> No <input type="checkbox"/>

Describe Existing Condition of Water Resources:
The MFV River is adjacent to the site and contains fast flowing water.

Dominant Species of Mature Trees
Black walnut, American elm, honey locust, black willow, American sycamore, eastern red cedar, black cherry.

% Closure/Density of Vegetation		
Understory	Midstory	Canopy
3	3	2
1 = 1-10%	2 = 11-20%	3 = 21-40%
4 = 41-60%	5 = 61-80%	6 = 81-100%

Size Composition of Trees		
Small	Medium	Large
90	10	0
Small (4-8)	Medium (8-15)	Large (>15)

Preferred Tree Species ≥ 9 DBH						
Tree Species	N/A	N/A	N/A	N/A	N/A	N/A
Relative Abundance (%)	N/A	N/A	N/A	N/A	N/A	N/A
% with > 30 % Exfoliating Bark	N/A	N/A	N/A	N/A	N/A	N/A

% Dominance = The relative density of the tree species within the sample plot

% of trees of this species in the sample plot containing exfoliating bark

<b>Number of Suitable Snag Trees</b>	2
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Includes standing dead trees with sloughing bark, crevices, or holes.

<b>Is site suitable for Indiana bats?</b>	(check)	<b>Yes</b>	<b>X</b>	<b>No</b>	
*Level may not be applicable		<b>Level?</b>	L	(L = Low, M = Moderate, H = High)	
<b>For northern long-eared bats?</b>	(check)	<b>Yes</b>	<b>X</b>	<b>No</b>	
*Level may not be applicable		<b>Level?</b>	L	(L = Low, M = Moderate, H = High)	

Notes

<b>Site Name</b>	Vermillion River Stabilization			<b>Visit Date</b>	2/27/18	
<b>Sample Point</b>	2					

General Description						
Sample Point 2 occurs in the northern portion of the forested corridor and south of Sample Site 1.						

Water Resources At Sample Site			
	Ephemeral	Intermittent	Perennial
Number & Length	N/A	N/A	1 - MFV River

Wetlands		
	Permanent	Seasonal
Approx. Acreage	N/A	N/A

Number and Size of Ponds/Pool	Open and Accessible to Bats?
None	Yes <input type="checkbox"/> No <input type="checkbox"/>

Describe Existing Condition of Water Resources:
The MFV River is adjacent to the site and contains fast flowing water.

Dominant Species of Mature Trees
American sycamore, eastern cottonwood, silver maple, honey locust.

% Closure/Density of Vegetation		
Understory	Midstory	Canopy
3	3	2

1 = 1-10%    2 = 11-20%    3 = 21-40%  
4 = 41-60%    5 = 61-80%    6 = 81-100%

Size Composition of Trees		
Small	Medium	Large
90	10	0

Small (4-8)    Medium (8-15)    Large (>15)

Preferred Tree Species ≥ 9 DBH						
Tree Species	N/A	N/A	N/A	N/A	N/A	N/A
Relative Abundance (%)	N/A	N/A	N/A	N/A	N/A	N/A
% with > 30 % Exfoliating Bark	N/A	N/A	N/A	N/A	N/A	N/A

% Dominance = The relative density of the tree species within the sample plot

% of trees of this species in the sample plot containing exfoliating bark

<b>Number of Suitable Snag Trees</b>	0
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Includes standing dead trees with sloughing bark, crevices, or holes.

<b>Is site suitable for Indiana bats?</b>	(check)	<b>Yes</b>		<b>No</b>	<b>X</b>
*Level may not be applicable		<b>Level?</b>		(L = Low, M = Moderate, H = High)	
<b>For northern long-eared bats?</b>	(check)	<b>Yes</b>		<b>No</b>	<b>X</b>
*Level may not be applicable		<b>Level?</b>		(L = Low, M = Moderate, H = High)	

Notes

<b>Site Name</b>	Vermillion River Stabilization	<b>Visit Date</b>	2/27/18
<b>Sample Point</b>	3		

General Description
Sample Point 3 occurs along the southern boundary of the clearing limits and northwest of Sample Point 2.

Water Resources At Sample Site			
	Ephemeral	Intermittent	Perennial
Number & Length	N/A	N/A	1 - MFV River

Wetlands		
	Permanent	Seasonal
Approx. Acreage	N/A	N/A

Number and Size of Ponds/Pool	Open and Accessible to Bats?
N/A	Yes <input type="checkbox"/> No <input type="checkbox"/>

Describe Existing Condition of Water Resources:
The MFV River is adjacent to the site and contains fast flowing water.

Dominant Species of Mature Trees
Eastern red cedar, American basswood, white poplar, American sycamore.

% Closure/Density of Vegetation		
Understory	Midstory	Canopy
1	1	1
1 = 1-10%	2 = 11-20%	3 = 21-40%
4 = 41-60%	5 = 61-80%	6 = 81-100%

Size Composition of Trees		
Small	Medium	Large
50	50	0
Small (4-8) (8-15) Large (>15)		

Preferred Tree Species ≥ 9 DBH						
Tree Species	N/A	N/A	N/A	N/A	N/A	N/A
Relative Abundance (%)	N/A	N/A	N/A	N/A	N/A	N/A
% with > 30 % Exfoliating Bark	N/A	N/A	N/A	N/A	N/A	N/A

% Dominance = The relative density of the tree species within the sample plot

% of trees of this species in the sample plot containing exfoliating bark

Number of Suitable Snag Trees	0
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Includes standing dead trees with sloughing bark, crevices, or holes.

Is site suitable for Indiana bats?	(check)	Yes		No	X
*Level may not be applicable		Level?		(L = Low, M = Moderate, H = High)	
For northern long-eared bats?	(check)	Yes		No	X
*Level may not be applicable		Level?		(L = Low, M = Moderate, H = High)	

Notes



<b>Site Name</b>	Vermillion River Stabilization	<b>Visit Date</b>	2/27/18
<b>Sample Point</b>	4		

General Description			
Sample Site 4 occurs in the southern forested corridor and southeast of Sample Site 3. The site contains a sparse stand of young trees that are not suitable as bat habitat.			

Water Resources At Sample Site			
	Ephemeral	Intermittent	Perennial
Number & Length	N/A	N/A	1 - MFV River

Wetlands		
	Permanent	Seasonal
Approx. Acreage	N/A	N/A

Number and Size of Ponds/Pool	Open and Accessible to Bats?
N/A	Yes <input type="checkbox"/> No <input type="checkbox"/>

Describe Existing Condition of Water Resources:
The MFV River is adjacent to the site and contains fast flowing water.

Dominant Species of Mature Trees
American sycamore, box elder maple, white poplar.

% Closure/Density of Vegetation		
Understory	Midstory	Canopy
1	1	1
1 = 1-10%	2 = 11-20%	3 = 21-40%
4 = 41-60%	5 = 61-80%	6 = 81-100%

Size Composition of Trees		
Small	Medium	Large
75	25	0
Small (4-8)	Medium (8-15)	Large (>15)

Preferred Tree Species $\geq$ 9 DBH						
Tree Species	N/A	N/A	N/A	N/A	N/A	N/A
Relative Abundance (%)	N/A	N/A	N/A	N/A	N/A	N/A
% with > 30 % Exfoliating Bark	N/A	N/A	N/A	N/A	N/A	N/A

% Dominance = The relative density of the tree species within the sample plot

% of trees of this species in the sample plot containing exfoliating bark

<b>Number of Suitable Snag Trees</b>	0
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Includes standing dead trees with sloughing bark, crevices, or holes.

<b>Is site suitable for Indiana bats?</b>	(check)	<b>Yes</b>		<b>No</b>	<b>X</b>
*Level may not be applicable		<b>Level?</b>	H	(L = Low, M = Moderate, H = High)	
<b>For northern long-eared bats?</b>	(check)	<b>Yes</b>		<b>No</b>	<b>X</b>
*Level may not be applicable		<b>Level?</b>	H	(L = Low, M = Moderate, H = High)	

Notes

# **Appendix 2**

Middle Fork Vermilion River  
Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Appendix 2

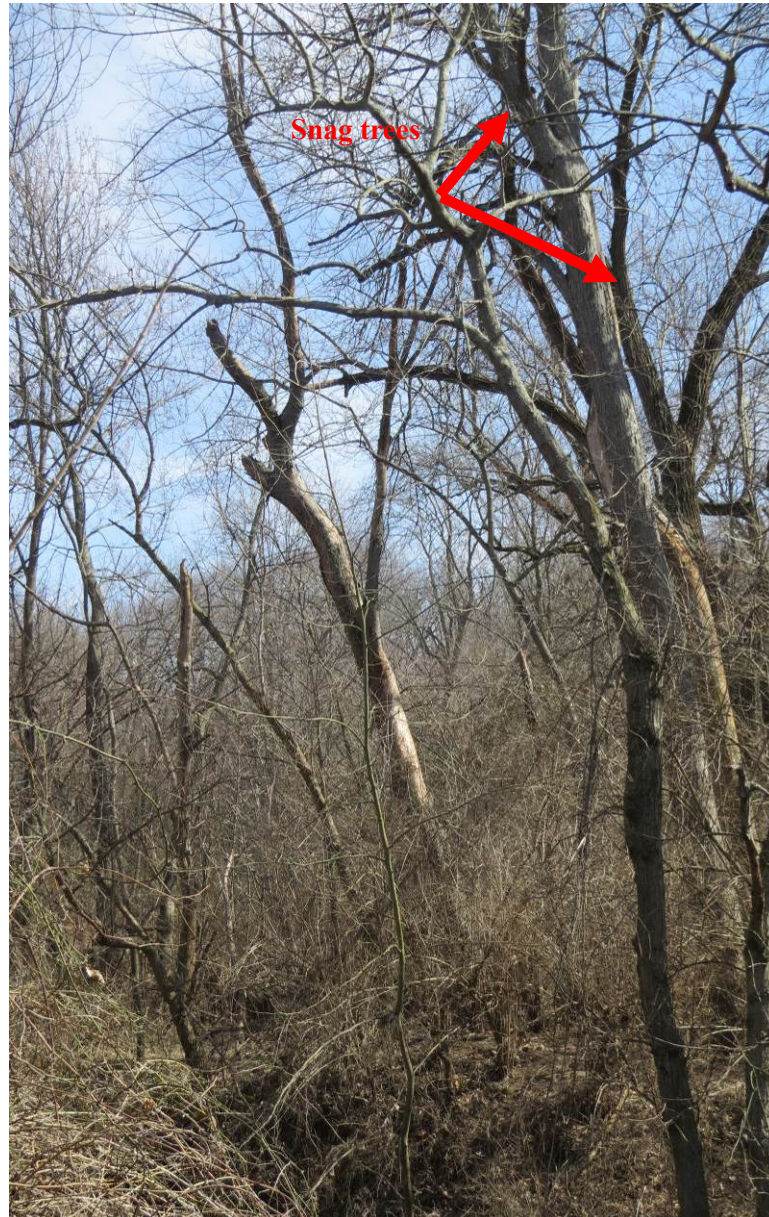


Photo 1. Photo showing the two identified snag trees within Sample Site 1, located near the northern portion of the project area. Facing east (2-27-18)



Middle Fork Vermilion River  
Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Appendix 2



Photo 2. Representative view of the younger trees that dominate the majority of Sample Site 1 within the northern portion of the site, facing south (2-27-18)



Photo 3. Photo depicting the representative size of the existing trees within Sample Site 1, facing south (2-27-18)



Middle Fork Vermilion River  
Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Appendix 2



Photo 4. View of the forested area within Sample Site 2 that was found to be dominated by young trees unsuitable for bat roosting habitat, facing south (2-27-18)



Photo 5. Existing conditions along the edge of the forested corridor along the right descending bank of the MFV River between Sample Site 2 and Sample Site 3, facing south (2-27-18)



Middle Fork Vermilion River  
Erosion Mitigation and Streambank Stabilization – Vermilion Site  
Appendix 2



Photo 6. Photo showing the relatively narrow riparian corridor along the right descending bank of the MFV river near the location of Sample Site 3, facing southeast (2-27-18)



Photo 7. Forested area near the southern portion of the project site along the right descending bank of the MFV River near Sample Site 4, facing east (2-27-18)



## **APPENDIX E**

# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

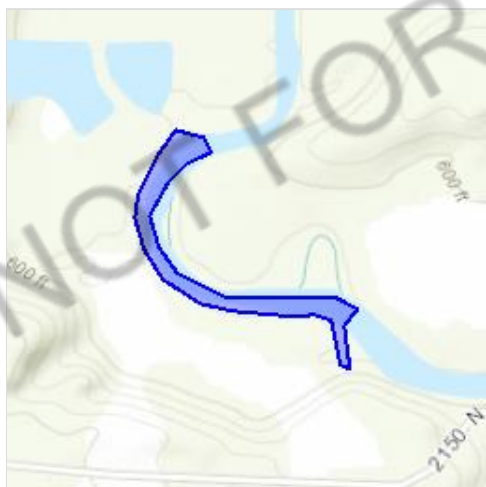
## Project information

### NAME

Vermilion Bank Stabilization Project

### LOCATION

Vermilion County, Illinois



## Local offices

Illinois-Iowa Ecological Services Field Office

☎ (309) 757-5800

📠 (309) 757-5807

Illinois & Iowa Ecological Services Field Office  
1511 47th Ave

Moline, IL 61265-7022

Southern Illinois Sub-Office

☎ (618) 997-3344

📠 (618) 997-8961

Marion Illinois Sub-office

8588 Route 148

Marion, IL 62959-5822

<http://www.fws.gov/midwest/Endangered/section7/s7process/step1.html>

NOT FOR CONSULTATION



# Endangered species

**This resource list is for informational purposes only and does not constitute an analysis of project level impacts.**

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

## Mammals

NAME

STATUS

**Indiana Bat** *Myotis sodalis***Endangered**

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/5949>

**Northern Long-eared Bat** *Myotis septentrionalis***Threatened**

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/9045>

## Clams

NAME	STATUS
<b>Clubshell</b> <i>Pleurobema clava</i> No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/3789">https://ecos.fws.gov/ecp/species/3789</a>	<b>Endangered</b>
<b>Rabbitsfoot</b> <i>Quadrula cylindrica cylindrica</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. <a href="https://ecos.fws.gov/ecp/species/5165">https://ecos.fws.gov/ecp/species/5165</a>	<b>Threatened</b>

## Flowering Plants

NAME	STATUS
<b>Eastern Prairie Fringed Orchid</b> <i>Platanthera leucophaea</i> No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/601">https://ecos.fws.gov/ecp/species/601</a>	<b>Threatened</b>
<b>Mead's Milkweed</b> <i>Asclepias meadii</i> No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/8204">https://ecos.fws.gov/ecp/species/8204</a>	<b>Threatened</b>

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)



**American Golden-plover** *Pluvialis dominica*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds elsewhere

**Bald Eagle** *Haliaeetus leucocephalus*

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Breeds Oct 15 to Aug 31

**Bobolink** *Dolichonyx oryzivorus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 20 to Jul 31

**Cerulean Warbler** *Dendroica cerulea*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/2974>

Breeds Apr 21 to Jul 20

**Henslow's Sparrow** *Ammodramus henslowii*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3941>

Breeds May 1 to Aug 31

**Kentucky Warbler** *Oporornis formosus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds Apr 20 to Aug 20

**Least Bittern** *Ixobrychus exilis*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

<https://ecos.fws.gov/ecp/species/6175>

Breeds Aug 16 to Oct 31

**Lesser Yellowlegs** *Tringa flavipes*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9679>

Breeds elsewhere

**Prothonotary Warbler** *Protonotaria citrea*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds Apr 1 to Jul 31

**Red-headed Woodpecker** *Melanerpes erythrocephalus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 10 to Sep 10

**Short-billed Dowitcher** *Limnodromus griseus*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9480>

**Wood Thrush** *Hylocichla mustelina*

Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

## Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

### Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

### Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

### Survey Effort (I)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

### No Data (—)

A week is marked as having no data if there were no survey events for that week.

### Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.







Wood Thrush  
BCC Rangewide  
(CON) (This is a Bird  
of Conservation  
Concern (BCC)  
throughout its range  
in the continental  
USA and Alaska.)



**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the migratory birds potentially occurring in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [E-bird Explore Data Tool](#).

**What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

**How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

**What are the levels of concern for migratory birds?**

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

### Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

### What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

### Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

## Facilities



## Wildlife refuges and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

## Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

LAKE

[L1UBHh](#)

RIVERINE

[R2UBH](#)

[R4SBC](#)

[R2USA](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

### Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

### Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters.

Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

### **Data precautions**

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

## **APPENDIX F**



*Applicant:* SCI Engineering, Inc

*IDNR Project Number:* 1811584

*Contact:* Scott E. Billings 06/04/2018 *Date:*

*Address:* 650 Pierce Boulevard  
O'Fallon, IL 62269

*Project:*

Vermilion River Bank Stabilization

*Address:*

East 2150 North Road, Oakwood

*Description:* The project is proposing stabilization work on approximately 2,000 linear feet (LF) along the Middle Fork Vermilion (MFV) River from the old East Ash Pond (OEAP) to the North Ash Pond (NAP) system at the Vermilion Power site. This portion of the MFV River is experiencing erosion along the right descending bank within the eastern portion of the power station.

## **Natural Resource Review Results**

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*This project was submitted for information only. It is not a consultation under Part 1075.*

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Kennekuk Cove County Park INAI Site  
Middle Fork Of The Vermilion River INAI Site  
Orchid Hill INAI Site  
Vermilion040 INAI Site  
Kickapoo Hill Prairie Land And Water Reserve  
Orchid Hill Natural Heritage Landmark  
Bluebreast Darter (*Etheostoma camurum*)  
Bluebreast Darter (*Etheostoma camurum*)  
Clubshell (*Pleurobema clava*)  
Fibrous-Rooted Sedge (*Carex communis*)  
Little Spectaclecase (*Villosa lienosa*)  
Northern Riffleshell (*Epioblasma torulosa rangiana*)  
Purple Wartyback (*Cyclonaias tuberculata*)  
Salamander Mussel (*Simpsonaias ambigua*)  
Wavy-Rayed Lampmussel (*Lampsilis fasciola*)  
Wavy-Rayed Lampmussel (*Lampsilis fasciola*)

### **Location**

The applicant is responsible for the accuracy of the location submitted for the project.

*County:* Vermilion

*Township, Range, Section:*

20N, 12W, 20

**IL Department of Natural Resources****Contact**

Impact Assessment Section

217-785-5500

Division of Ecosystems &amp; Environment

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**Disclaimer**

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.



## **APPENDIX G**



## **Planting and Maintenance Plan**

Middle Fork Vermilion River  
Erosion Mitigation and Riverbank  
Stabilization



Prepared for:  
Dynegy Midwest Generation, LLC

Prepared by:  
Stantec Consulting Services Inc.

June 27, 2018

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### APPENDIX A PLANTING DETAIL

## PLANTING AND MAINTENANCE PLAN

### 1.0 INTRODUCTION

This Planting and Maintenance Plan includes a description of the proposed seed mixtures and plantings and an outline of the basic procedures to be followed in order to promote the successful establishment of vegetation following construction of the Middle Fork Vermilion River Erosion Mitigation and Riverbank Stabilization Project.

As a result of Dynegy Midwest Generation, LLC's (DMG) commitment to this project, enhancements have been included in this Planting and Maintenance Plan to provide aesthetic improvements to the constructed project beyond those typically identified in similar design projects. These enhancements include:

1. Increased density of plantings. Plantings in similar designs are typically spaced on approximately 6 to 10-foot centers. Plantings in this plan are called for on approximately 4-foot centers, randomly spaced to reflect native recruitment.
2. Use of containerized plants. In addition to the use of live stakes and whips, containerized trees and shrubs are identified in the plans to supplement the stakes and whips. The intent of these are to provide more rapid revegetation of the riverbank.
3. Increased shrub plantings. The planting plan includes a heavier mix of shrubs than in typical similar designs. The intent of these shrubs is to aid in more rapid covering of exposed rock.
4. Maintenance schedule. DMG is committed to establishing a dense stand of vegetation along the project. The maintenance schedule identified in this plan includes more frequent inspections, and associated mitigation of identified planting deficiencies, than similar design projects.

### 2.0 PLANTING PLAN

Permanent planting and/or seeding will be required for all areas within the limits of disturbance. Only certified seed and nursery stock will be allowed. Conceptual planting plan details describing the vegetation design are located in **Appendix A**; however, exact types, sizes, and sources of propagules, as well as seed mixes and rates of application, will be further refined in the final design. Note that the drawing included in Appendix A is an enhanced version of Sheet 15 of the Permit Drawings. The Stone Toe Protection detail has been modified to clearly illustrate planting zones.

#### 2.1 LIVE STAKES AND LIVE BRUSH LAYERING

Proposed live staking and live brush layering (willow whips) plant material is shown in **Table 1**. All plant material will be harvested locally or purchased from a local source. All live stakes and willow whips will be dormant at time of acquisition and planting. Live stakes should be installed between November 1 and May 15. Typically, willow cuttings are installed after spring thaw but before bud break, or in autumn after leaves change color and/or fall.



## PLANTING AND MAINTENANCE PLAN

### 2.1.1 Live Stakes

Live stakes will be ½ - 2" in diameter and approximately 3 feet in length. During preparation, the basal ends of the live stakes will be cleanly cut at an angle to facilitate easy insertion into the soil, while the tops will be cut square or blunt for tamping. All limbs will be removed from the sides of the live cutting prior to installation.

Cuttings for live brush layers will be harvested in manner such that they are cut and planted immediately or within 24 hours. If plant material for live brush layers is sourced from offsite and cannot be planted on the same day as harvest, the willow whips should immediately be put into water, soaked for up to 5 days, and then planted as soon as possible. Cuttings will remain wet until they are planted. Outside storage locations should be continually shaded and protected from wind and direct sunlight.

Live stakes will primarily be used as joint planting along the face of the stone toe protection. Installation of the live stakes will need to occur concurrent with the finalized placement of stone toe protection and void filled riprap for sufficient coverage/penetration of the live stakes within the final grade (2/3 of the stake length within the ground). A minimum of 6" of soil will be placed around the buried portion of the stake prior to continuation of stone toe/void filled riprap placement.

Stakes will be spaced approximately 2 feet on center. Live stakes should be installed according to the configuration presented in the details of the plans. One or two inches will be cut cleanly off of the top of each live stake (with loppers) at an angle of approximately 15 degrees following installation. Any stakes that are split or damaged during installation will be removed and replaced.

Areas where live stakes have been installed will be watered on a daily basis, throughout the duration of construction (anticipated as 6 to 8 months), immediately following successful installation.

### 2.1.2 Live Brush Layering – Willow Whips

Willow whips, which are used for the live brush layering, will be ½ - 2" in diameter and 4 – 6 feet in length. During preparation, the basal ends of the whips will be cleanly cut, while the tops will remain uncut leaving the terminal end of the whip, as well as all lateral branches, intact.

Cuttings for live brush layers will be harvested in manner such that they are cut and planted immediately or within 24 hours. If plant material for live brush layers is sourced from offsite and cannot be planted on the same day as harvest, the basal ends of the willow whips (minimum 12 inches of basal end length) should immediately be put into water, soaked for up to 5 days, and then planted as soon as possible. Cuttings will remain wet until they are planted. Outside storage locations should be continually shaded and protected from wind and direct sunlight.

Willow whips will be placed in thin, overlapping layers between- and perpendicular-to soil wraps, with the tips of the willow whips oriented towards the river and slightly upward, while the cut ends are oriented downward toward the back of the soil lift. Brush layers will either be covered by additional soil lifts or covered with a minimum of 3" of soil.



## PLANTING AND MAINTENANCE PLAN

Stakes will be spaced evenly across the top of a soil lift at an approximate density of 2-4 stems per linear foot, such that any lateral branches overlap. Live brush layers should be installed according to the configuration presented in the details of the final plan sheets. Any willow whips that are damaged during installation will be removed and replaced.

Areas where live brush layers have been installed will be watered on daily basis, throughout the duration of construction (anticipated as 6 to 8 months), immediately following successful installation.

**Table 1. Live Stakes and Live Brush Layering Species**

Common Name	Scientific Name
Silky dogwood	<i>Cornus amomum</i>
Gray dogwood	<i>Cornus foemina</i>
Red-osier dogwood	<i>Cornus sericea</i>
Peachleaf willow	<i>Salix amigdyloides</i>
Pussy willow	<i>Salix discolor</i>
Sandbar willow	<i>Salix interior</i>
Black willow	<i>Salix nigra</i>
Elderberry	<i>Sambucus canadensis</i>
Nannyberry	<i>Viburnum lentago</i>

## 2.2 BANKFULL BENCH ZONE

Bankfull revegetation will consist of the planting of rooted cuttings, container-grown plants (**Table 2**) and broadcast seeding (**Table 3**). The installation of plants, seedlings can occur at any time of year, though no planting will occur when the temperature is below freezing. Seeding will immediately precede planting for a given restoration reach.

Soil that is compacted in the bankfull bench area of planting and seeding will be amended with compost at a rate of 403 yd<sup>3</sup>/acre (depth of 3"); deep-ripped and graded to contour. Fertilizer used for topdressing will be 10-10-10 (N-P-K) analysis and will be applied at the rate of 50 pounds per acre. The sub-grade should be loosened to a minimum depth of 8 inches and graded to a smooth even surface with a loose, fine texture. The areas to be planted and seeded are then to be rolled and raked to remove any ridges and fill depressions that are greater than +/-0.2 feet to meet finish grades. Prepared areas are to be moistened prior to seeding when soil is dry, but care will be taken not to create muddy conditions. Prepared areas are to be restored if eroded or otherwise disturbed after final grading and before planting.

Seed will be sown with a spreader or a seeding machine at a rate of 41 pounds per acre. Seed is not to be broadcast or dropped when wind velocity exceeds 5 mph and will be evenly sown. Wet seed or seed that is moldy or otherwise damaged in transit or storage is not to be used. After being sown, the seed will be raked into the top 1/4 inch of the topsoil, lightly rolled, and watered with fine spray. Seeded areas on riverbanks will be covered with weed-free straw mulch and protected/secured with staked coir fiber matting.

## PLANTING AND MAINTENANCE PLAN

Within one week of seeding the bankfull zone, woody species will be planted in the seeded areas. Trees and shrubs are to be planted 4 feet on center, random spacing, at approximately 2,700 stems per acre to emulate native regenerative patterns (~1 stem every 16 ft<sup>2</sup>, though actual spacing will be determined in the field to create a heterogenous irregularly-spaced mixture of species throughout the bankfull planting zone). The planting area should be cleared of straw mulch immediately prior to digging the planting hole, if necessary. The planting trench or hole will be deep and wide enough to permit roots to spread out and down without J-rooting, at least twice the diameter of the root ball. Topsoil and subsoil will be kept separate during excavation. The root ball will be placed on solid soil and not loose backfill. The plant stem will remain upright. Soil will be replaced around the transplanted vegetation and tamped around the tree firmly to eliminate air pockets. Mulching should be replaced in the area around the new planting.

**Table 2. Bankfull Zone Plantings**

Common Name	Scientific Name	Pot Size/Caliper	Life Form
Box elder	<i>Acer negundo</i>	5-Gallon / 1"	Tree
Red maple	<i>Acer rubrum</i>	5-Gallon / 1"	Tree
Hackberry	<i>Celtis occidentalis</i>	5-Gallon	Tree
Green ash	<i>Fraxinus pennsylvanica</i>	5-Gallon	Tree
Sweetgum	<i>Liquidambar styraciflua</i>	5 or 15-Gallon	Tree
Sycamore	<i>Platanus occidentalis</i>	5 or 15-Gallon/ 1-2"	Tree
Swamp white oak	<i>Quercus bicolor</i>	5 or 15-Gallon / 1-2"	Tree
Bur oak	<i>Quercus macrocarpa</i>	5 or 15-Gallon / 1-2"	Tree
American hazelnut	<i>Corylus americana</i>	2 or 5-Gallon	Shrub
Shrubby Cinquefoil	<i>Dasiphora fruticosa</i>	5-Gallon	Shrub
Shrubby St. John's-Wort	<i>Hypericum prolificum</i>	5-Gallon	Shrub
Ninebark	<i>Physocarpus opulifolius</i>	5-Gallon	Shrub
Climbing prairie rose	<i>Rosa setigera</i>	5-Gallon	Shrub
Bittersweet	<i>Celastrus scandens</i>	Plugs/bareroot	Vine
Virgin's-bower	<i>Clematis virginiana</i>	Plugs	Vine
Virginia creeper	<i>Parthenocissus quinquefolia</i>	Plugs	Vine

## PLANTING AND MAINTENANCE PLAN

**Table 3. Bankfull Zone Seed Mix**

Common Name	Scientific Name	Growth Form	Pounds per Acre
Blue joint grass	<i>Calamagrostis canadensis</i>	Grass	5
Nodding wild rye	<i>Elymus canadensis</i>	Grass	5
Virginia wild rye	<i>Elymus virginicus</i>	Grass	5
Fowl manna grass	<i>Glyceria striata</i>	Grass	5
Rice cut grass	<i>Leersia oryzoides</i>	Grass	5
Switchgrass	<i>Panicum virgatum</i>	Grass	5
Prairie cordgrass	<i>Spartina pectinata</i>	Grass	5
Common water plantain	<i>Alisma subcordatum</i>	Forb	0.25
Swamp milkweed	<i>Asclepias incarnata</i>	Forb	0.25
Tall tickseed	<i>Coreopsis tripteris</i>	Forb	0.25
Prairie mimosa	<i>Desmanthus illinoensis</i>	Forb	0.25
Boneset	<i>Eupatorium perfoliatum</i>	Forb	0.25
Queen-of-the-prairie	<i>Filipendula rubra</i>	Forb	0.25
Sneezeweed	<i>Helenium autumnale</i>	Forb	0.25
Sawtooth sunflower	<i>Helianthus grosseserratus</i>	Forb	0.25
Foxglove beardtongue	<i>Penstemon digitalis</i>	Forb	0.25
Common mountain-mint	<i>Pycnanthemum virginianum</i>	Forb	0.25
Brown-eyed Susan	<i>Rudbeckia triloba</i>	Forb	0.25
Prairie rosinweed	<i>Silphium terebinthinaceum</i>	Forb	0.25
Late goldenrod	<i>Solidago gigantea</i>	Forb	0.25
Riddell's goldenrod	<i>Solidago riddellii</i>	Forb	0.25
New England aster	<i>Symphyotrichum novae-angliae</i>	Forb	0.25
Purplestem aster	<i>Symphyotrichum puniceum</i>	Forb	0.25
Blue vervain	<i>Verbena hastata</i>	Forb	0.25
Blunt spike rush	<i>Eleocharis obtusa</i>	Rush	0.25
Creeping spike rush	<i>Eleocharis smallii</i>	Rush	0.25
Chairmaker's rush	<i>Scirpus americanus</i>	Rush	0.25
Willow sedge	<i>Carex lurida</i>	Sedge	0.5
Fox sedge	<i>Carex vulpinoidea</i>	Sedge	0.5

## 2.3 UPLANDS

Upland revegetation will consist of the planting of bare root seedlings, rooted cuttings, or container-grown plants (**Table 4**) as well as broadcast seeding and incorporation of upland seed mix within the soil lifts (**Table 5**). The upland soil lifts will utilize the live brush layering (discussed above) to create a robust bioengineered bank conducive for rapid revegetation and side slope stability.

The upland area beyond the soil lifts will include broadcast seed, which will be raked into the top 1/4 inch of the topsoil, lightly rolled, and watered with fine spray. Seeded areas are to be protected by spreading weed-free straw mulch uniformly to form a continuous blanket over seeded areas. Straw mulch is to be spread by hand, blower, or other suitable equipment. Fertilizer used for topdressing will be 10-10-10 (N-P-K) analysis and will be applied at the rate of 50 pounds per acre. Additionally, a mix of larger caliper (1-2") containerized trees will be planted with a 4' on center spacing to encourage more rapid revegetation.

**Table 4. Upland Zone Plantings**

Common Name	Scientific Name	Pot Size/Caliper	Life Form
Redbud	<i>Cercis canadensis</i>	5 or 15-Gallon/ 1-2"	Tree
American beech	<i>Fagus grandifolia</i>	5 or 15-Gallon/ 1-2"	Tree
Black walnut	<i>Juglans nigra</i>	5 or 15-Gallon/ 1-2"	Tree
Tulip tree	<i>Liriodendron tulipifera</i>	5 or 15-Gallon/ 1-2"	Tree
White oak	<i>Quercus alba</i>	5 or 15-Gallon/ 1-2"	Tree
Red oak	<i>Quercus rubra</i>	5 or 15-Gallon/ 1-2"	Tree
American hazelnut	<i>Corylus americana</i>	2 or 5-Gallon	Shrub
Shrubby cinquefoil	<i>Dasiphora fruticosa</i>	4 or 5-Gallon	Shrub
Shrubby St. John's-Wort	<i>Hypericum prolificum</i>	5 or 5-Gallon	Shrub
Ninebark	<i>Physocarpus opulifolius</i>	3 or 5-Gallon	Shrub
Climbing prairie rose	<i>Rosa setigera</i>	2 or 5-Gallon	Shrub
Virgin's-bower	<i>Clematis virginiana</i>	Plugs	Vine
Bittersweet	<i>Celastrus scandens</i>	Plugs/bareroot	Vine



## PLANTING AND MAINTENANCE PLAN

**Table 5. Upland Zone Seed Mix**

Common Name	Scientific Name	Growth Form	Pounds per Acre
Big bluestem	<i>Andropogon gerardii</i>	Grass	5
Indian grass	<i>Sorghastrum nutans</i>	Grass	5
Little bluestem	<i>Schizachyrium scoparium</i>	Grass	5
Switchgrass	<i>Panicum virgatum</i>	Grass	5
Wild river oats	<i>Chasmanthium latifolium</i>	Grass	5
Side-oats gramma	<i>Bouteloua curtipendula</i>	Grass	5
Blue false indigo	<i>Baptisia australis</i>	Forb	1
Brown-eyed Susan	<i>Rudbeckia hirta</i>	Forb	1
Common milkweed	<i>Asclepias syrica</i>	Forb	1
Dotted Horsemint	<i>Monarda punctata</i>	Forb	1
Golden Alexander	<i>Zizia aurea</i>	Forb	0.5
Hairy Woodmint	<i>Blephilia hirsuta</i>	Forb	0.5
Hoary vervain	<i>Verbena stricta</i>	Forb	0.5
Ohio Spiderwort	<i>Tradescantia ohiensis</i>	Forb	0.5
Partridge pea	<i>Chamaecrista fasciculata</i>	Forb	0.5
Prairie coneflower	<i>Ratibida pinnata</i>	Forb	0.5
Purple coneflower	<i>Echinacea purpurea</i>	Forb	0.5
Showy tick-trefoil	<i>Desmodium canadense</i>	Forb	0.5
Smooth oxeye	<i>Heliopsis helianthoides</i>	Forb	0.5
Tall Ironweed	<i>Vernonia gigantea</i>	Forb	0.5
Tall tickseed	<i>Coreopsis tripteris</i>	Forb	0.5
Wild bergamot	<i>Monarda fistulosa</i>	Forb	0.5

## 2.4 IRRIGATION

As each reach is planted following construction, workers will use a pump submersed in the channel to irrigate freshly planted and/or seeded areas. Irrigation will occur daily through construction (anticipated as 6 to 8 months) to help plants establish. Supplemental watering may be necessary on a periodic basis following construction completion if dry conditions occur.

## 3.0 SUCCESS CRITERIA

Success criteria for riparian vegetation include:

- 80% of the planted trees and shrubs are alive after Years 1 through 3, and 70% of the trees and shrubs, including native recruitment, survive through Years 4 and 5.
- Vegetation canopy cover of at least 40% after Year 3, as determined by a point-intercept quantitative cover method.

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- Weed cover not greater than 5% absolute cover, and no areas of 100 ft<sup>2</sup> or larger dominated by weed species.
- An herbaceous plant species diversity of at least 15 desirable native plants.

## 4.0 MONITORING

### 4.1 QUALITATIVE MONITORING

Following construction, the riverbank will be monitored throughout each growing season following seeding and planting for a minimum period of 5 years.

Monitoring will consist of: 1) inspection of leaf development, shoot elongation, and general survivability, 2) estimation of overall vegetated ground cover, 3) photo documentation at pre-determined permanent photo points.

Monthly monitoring will occur during the initial growing season (spring months) to assess the early establishment of the riparian and upland plantings. Additionally, during the first 12 months after project completion an inspection will occur following any storm event in excess of 4,500 cfs, recorded at the USGS Gage downstream. A minimum of 8 monthly site inspections annually (April – November) will be conducted for years 1 - 5 after planting.

### 4.2 QUANTITATIVE MONITORING

Annually, vegetation canopy cover will be quantified along 10-meter-long, permanently established transects within each of the 5 segments along the project reach. For each segment, transects will be established at two riparian/bankfull benches and two upland locations with permanent markers at each end, for a total of 20 transects. A photograph will be taken each monitoring year from each end of the transects. Vegetation canopy cover will be quantified using a point-intercept method (Mueller-Dombois and Ellenberg 1974). Twenty points will be sampled at one-meter intervals along each 10-meter transect. The sample point will be perpendicular to- and 0.50 meters from- the transect.

At each sample point, a pin flag will be lowered to ground-level, point down, first on the right and then on the left. If overstory vegetation is present, the pin will first be elevated vertically to record any overstory vegetation, and then directed downward to record vegetation in potential shrub and herbaceous canopies. Vegetation along the vertical profiles will be recorded as first, second, and third hits. If vegetation is not present along the vertical profile, litter, rock, soil, etc. will be recorded. All vegetation hits will be tallied by species.

For each cover transect, the absolute percent cover of vegetation, litter, rock, and soil will be calculated using only first hit data. The relative cover of each species will be calculated using all hit data. The data for all 20 transects will be summed to describe the entire community. Data on

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species richness (diversity) will be collected by identifying all plant species present in a two-meter-wide quadrat centered along the 10-meter cover transect.

Qualitative and quantitative monitoring results will be compiled in an annual report, to be submitted to DMG for the monitoring period covering the first 5 years. The annual report will include summary of findings, photographs, and recommendations for remedial actions to address any areas that are not meeting the success criteria.

### 5.0 MAINTENANCE ACTIVITIES

A qualified scientist, will conduct the quantitative monitoring described above, and will also note hydrological functioning, evaluate the success of the seeding and planting, and note any problems with erosion, or weeds. If any of the permanent transects are shown to not be meeting the success criteria, appropriate remedial action will be recommended. Additionally, if any of the following deficiencies are observed the following actions will be implemented.

- a. If the seed mix has not germinated in some areas, these areas will be reseeded.
- b. If shrubs or trees are not meeting the survivability and/or canopy cover criteria, additional containerized trees/shrubs will be planted.
- c. Weed control will be conducted throughout the monitoring period. If weed cover exceeds the success criteria, hand weeding or other weed control methods will be performed during monitoring to keep weeds from producing seeds and to control weed competition during the establishment period of native plants.
- d. If live stakes and/or live brush layering are not meeting the minimum survivability criteria

### 6.0 CLOSURE

This Planting and Maintenance Plan has been prepared to demonstrate DMG's commitment to implementing the project in a manner that will promote the successful establishment of dense native vegetation that screens the stone toe protection and provides scenery that is consistent with the riverbank upstream and downstream of the project site.

# **APPENDIX A PLANTING DETAIL**



