APPENDIX D

PUBLIC, AGENCY, AND TRIBAL COORDINATION

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, TULSA DISTRICT
2488 EAST 81ST STREET
TULSA, OKLAHOMA 74137-4290

October 28, 2020

PUBLIC NOTICE

AFTER ACTION ENVIRONMENTAL ASSESSMENT FOR THE WEBBERS POOL AND ROBERT S. KERR POOL EMERGENCY DREDGING AND PLACEMENT MUSKOGEE, SEQUOYAH, HASKELL, AND LE FLORE COUNTIES, OKLAHOMA

The Tulsa District, U.S. Army Corps of Engineers (USACE), is soliciting comments on the effects of the emergency dredging, the placement of dredge material, and the water drawdown that occurred during the spring and summer of 2019 on the Arkansas River, southeast of Tulsa, Oklahoma. The USACE has initiated an after-action Environmental Assessment (EA) for this activity that occurred in the Webbers Pool and Robert S. Kerr Pool in Oklahoma. This after-action EA is authorized in Section 216 of the River and Harbor Flood Control Act of 1970 and Section 1202 of the Water Infrastructure Improvements for the Nation Act of 2016. The EA will assess how the action affected the human environment to determine if the federal action was compliant with the National Environmental Policy Act (NEPA). Your comments will assist the USACE in this evaluation and in the development of this EA.

In May and June 2019 record rainfall fell in Southeastern Kansas and Northeastern Oklahoma which caused widespread flooding in the region. Approximately 15 USACE reservoirs in the Upper Arkansas River Basin, Verdigris River Basin, and Grand (Neosho) River Basin, all within Tulsa District, were flooded to the top of their capacity. The Tulsa District managed reservoir releases to balance the evacuation of flood waters from all pools. Unfortunately, catastrophic flooding was unavoidable due to the received rainfall. River flows, measured in cubic feet per second (CFS), were overwhelming within large portions of the river system. Below Keystone Dam just west of Tulsa, the rate of river flow approached 300,000 CFS at its maximum volume and was flowing at 600,000 CFS at W.D. Mayo Dam Lock and Dam 14.

The McLellan-Kerr Arkansas River Navigation System (MKARNS) downstream from the Arkansas River confluence with the Verdigris River and the Grand (Neosho) River sustained a volume of well over 600,000 CFS over a duration of more than a week. This increased river flow transported sediment from the three upstream feeder river basins and passed through upstream dams and into the Navigation System, where much of it was subsequently deposited. There were three miles of river channel clogged with an estimated 1,000,000 cubic yards of sediment as a result of this increase. This material had to be removed before the Navigation System could be reopened for navigable traffic and interstate commerce. Therefore, the Tulsa District made the decision to commence dredging and dredge spoil operations prior to NEPA review so economic impacts to the region would be reduced.

On May 23, 2019, during the flood event, two fully-loaded barges moored in the Muskogee area tore loose and were carried downstream, where they collided with the dam at Webbers Falls. The barges were forced against three of the structure's open gates. The two sunken barges impeded the operation of the gates and those gates could not be closed, resulting in the drawdown of the pools. Removal of the barges was dependent on the emergency dredging action, specifically the portion within the Robert S. Kerr pool.

Pursuant to Section 102 of the NEPA as implemented by the regulations promulgated by the Council on Environmental Quality (40 Code of Federal Regulations Parts 1500-1508 and USACE Engineering Regulation 200-2-2), an EA will be conducted to ensure compliance with the NEPA and appropriate environmental laws, regulations, agency policies and guidance, and executive orders, and to provide any necessary mitigation as a result of impacts from the Federal undertaking.

Our office would like to solicit any input you may have with respect to this after-action EA for the Webbers Pool and Robert S. Kerr Pool Emergency Dredging and Placement to assist us as we progress through the NEPA process. A brief presentation regarding this action is available, on the Tulsa District website: www.swt.usace.army.mil. An initial 30-day public scoping period occurred between 20 August and 20 September 2020. No comments from the public were received during this time. Although the initial comment period has concluded, additional comments will be accepted from your agency within 30 days of this Public Notice date (28 October to 27 November 2020).

Please address any comments, questions, or the need for further information by mail to Mr. Jeff Knack, Chief, Natural Resources and Recreation Branch, Tulsa District, U.S. Army Corps of Engineers, 2488 E 81st Street, Tulsa, Oklahoma 74137-4290, email at jeff.knack@usace.army.mil, or by telephone at (918) 669-7660.

Sincerely,

Amanda M. McGuire
Chief, Environmental Branch
Regional Planning and Environmental Center

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, TULSA DISTRICT
2488 EAST 81ST STREET
TULSA, OKLAHOMA 74137-4290

October 28, 2020

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Please address any comments, questions, or the need for further information by mail to Mr. Chris Davies, Cultural Resources Manager, Regional Planning and Environmental Center, U.S. Army Corps of Engineers, 7001 W Capitol, Little Rock, Arkansas 72201, email at Christopher.G.Davies@usace.army.mil, or by telephone at (501)324-7134.

Sincerely,

Amanda M. McGuire
Chief, Environmental Branch
Regional Planning and Environmental Center

MKARNS Study Corps of Engineers, Tulsa District

286 views • Aug 18, 2020

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Tulsa District, US Army Corps of Engineers
· August 20, 2020

Public Notice of after action environmental assessment of MKARNS dredging.

After Action Environmental Assessment for the Webbers Pool and Robert S. Kerr Pool Emergency Dredging and Placement

The Tulsa District, US Army Corps of Engineers, is soliciting comments from the public and agencies on the potential effects of the emergency dredge and placement of dredge spoils activity that occurred during the spring and summer of 2019, as well as, the effects of the water drawdown, impact to the mussel population that was affected as a result of the drawdown, and mitigation efforts, on the Arkansas River, southeast of Tulsa, Oklahoma. The Corps has initiated an after action Environmental Assessment (EA) for this activity that occurred at the Webbers Pool and Robert S. Kerr Pool in Oklahoma. The EA for this after action is authorized in Section 216 of the River and Harbor Flood Control Act of 1970 and Section 1202 of the Water Infrastructure Improvements for the Nation Act of 2016. The EA will assess how the action affected the human environment and to make the determination if the action was compliant with the National Environmental Policy Act (NEPA). Your comments will help the Corps in development of this EA.

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There was another complicating factor other than three miles of river channel being clogged with sedimentation. On May 23, 2019 two fully-loaded barges moored in the Muskogee area tore loose and were carried downstream, where they collided with the dam at Webbers Falls and sunk. The barges were forced against three of the structure's open gates. The two sunken barges impeded the operation of the gates and these gates could not be closed, resulting in the drawdown of the pools and subsequent negative impacts to mussel populations. Removal of these barges was dependent on the emergency dredging action, specifically the portion within the Robert S. Kerr pool.

Pursuant to Section 102 of the NEPA as implemented by the regulations promulgated by the Council on Environmental Quality (40

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Participation

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Participation

After action environmental assessment for the Webbers pool and Robert S. Kerr pool emergency dredging and placement

Published Aug. 25, 2020

The Tulsa District, U.S. Army Corps of Engineers, is soliciting comments from the public and agencies on the potential effects of the emergency dredging and placement of dredged spoils activity that occurred during the spring and summer of 2019, as well as, the effects of the water drawdown, impact to the mussel population that was affected as a result of the drawdown, and mitigation efforts, on the Arkansas River, southeast of Tulsa, Oklahoma.

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Pursuant to Section 102 of the NEPA as implemented by the regulations promulgated by the Council on Environmental Quality (40 Code of Federal Regulations Parts 1500-1508 and U.S. Army Corps of Engineers' Engineering Regulation 200-2-2), an Environmental Assessment will be conducted to ensure compliance with the NEPA and appropriate environmental laws, regulations, agency policies and guidance, and executive orders, and to provide any necessary mitigation as a result of impacts from the emergency dredging, discharge of dredged material, and draw down of the pool.

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public MKARNS river navigation

Public Notice RepCorrection: After action environmental assessment for the Webbers pool and Robert S. Kerr pool emergency dredging and placement

Published Nov. 17, 2020

Information included in the below public notice, which was published Aug 28, included a presentation with incorrect information. The information is in the summary of the article.

The video of the presentation was updated and provides corrected information. The public notice remains the same.

The Tulsa District, U.S. Army Corps of Engineers, is soliciting comments from the public and agencies on the potential effects of the emergency dredging and placement of dredged spoils activity that occurred during the spring and summer of 2019, as well as, the effects of the water drawdown, impact to the mussel population that was affected as a result of the drawdown, and mitigation efforts, on the Arkansas River, southeast of Tulsa, Oklahoma.

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, TULSA DISTRICT
2488 EAST 81ST STREET
TULSA, OKLAHOMA 74137-4290

AUGUST 30, 2021

PUBLIC NOTICE

Draft After-Action Environmental Assessment for the Webbers Falls Pool and Robert S. Kerr Pool Emergency Dredging and Open Water Disposal Rogers, Wagoner, Cherokee, Muskogee, Haskell, Sequoyah, and Le Flore Counties, Oklahoma

The public is hereby notified of the availability of the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) for the Webbers Falls Pool and Robert S. Kerr Pool Emergency Dredging and Open Water Disposal in Rogers, Wagoner, Cherokee, Muskogee, Haskell, Sequoyah, and Le Flore Counties, Oklahoma. The U.S. Army Corps of Engineers (USACE), Tulsa District prepared the Draft EA to identify, evaluate, and disclose all impacts that resulted from the implementation of the Emergency Action and the proposed plans to address environmental mitigation efforts.

The USACE is soliciting comments on the effects of the emergency dredging and the placement of dredge material that occurred during the spring and summer of 2019 on the Arkansas River, southeast of Tulsa, Oklahoma. The Draft EA has assessed how the selected action affected the human environment. Pursuant to Section 102 of the National Environmental Policy Act (NEPA) the Draft EA has been prepared in accordance with 33 Code of Federal Regulations (CFR) § 230 and the 1978 Council on Environmental Quality (CEQ) regulations 40 CFR § 1500-1508, as amended in 1986 and 2005, as reflected in the USACE Engineering Regulation (ER) 200-2-2. In fulfillment of these and all other legal, regulatory, and policy requirements, this Draft EA describes the purpose and need for the action, the range of alternatives considered, and discloses the environmental impacts of the Federal undertaking.

A 30-day public comment period begins on Monday, August 30, 2021 and ends Wednesday, September 29, 2021. The Draft EA and appendices will be available on the Tulsa District website starting, August 30, 2021 at www.swt.usace.army.mil. Please address any comments by mail to Ms. Justyss Watson, Compliance Section, Environmental Branch, Regional Planning and Environmental Center, U.S. Army Corps of Engineers, 819 Taylor Street, P.O. Box 17300, Room 3A12, Fort Worth, Texas 76102-0300, or by email at justyss.a.watson@usace.army.mil.

Sincerely,

Amanda McGuire

Amanda M. McGuire
Chief, Environmental Branch
Regional Planning and Environmental Center

NEWS RELEASE

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT

BUILDING STRONG®

FOR IMMEDIATE Release
August 30, 2021

Contact: Justyss Watson
Justyss.a.watson@usace.army.mil

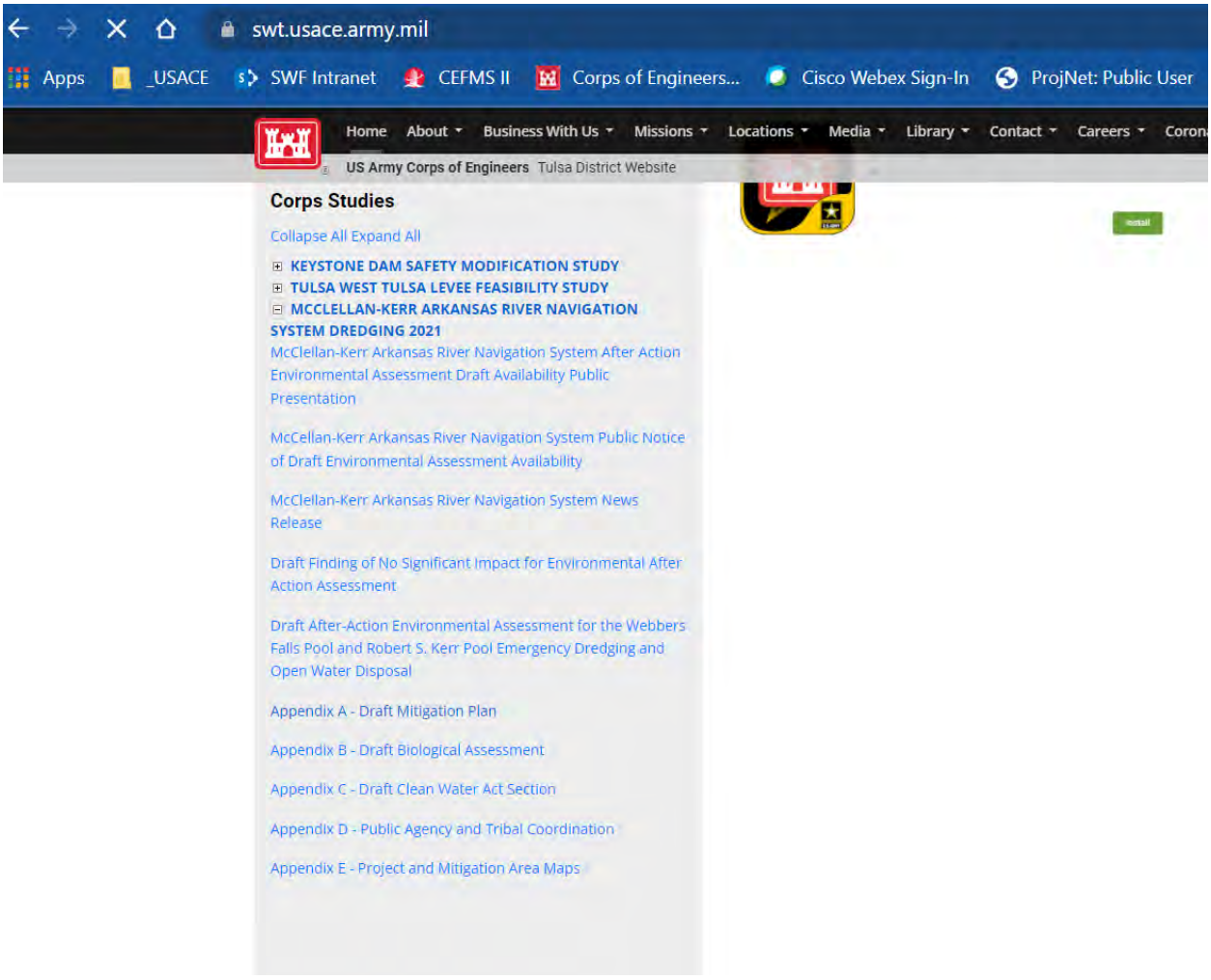
Draft after-action Environmental Assessment for MKARNS

TULSA, Okla. — The U.S. Army Corps of Engineers (USACE), Tulsa District (SWT), hereby informs the public of the release of the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) for the Webbers Falls Pool and Robert S. Kerr Pool Emergency Dredging and Open Water Disposal in Rogers, Wagoner, Cherokee, Muskogee, Haskell, Sequoyah, and Le Flore Counties, Okla. The Draft EA identifies, evaluates, and discloses all impacts caused by the implementation of the emergency action and the proposed plans to address environmental mitigation efforts.

The USACE is soliciting comments on the effects of the emergency dredging and the placement of dredge material that occurred during the spring and summer of 2019 on the Arkansas River, southeast of Tulsa, Okla. The Draft EA assessed how the selected action affected the human environment. Pursuant to Section 102 of the National Environmental Policy Act (NEPA) the Draft EA has been prepared in accordance with 33 Code of Federal Regulations (CFR) § 230 and the 1978 Council on Environmental Quality (CEQ) regulations 40 CFR § 1500-1508, as amended in 1986 and 2005, as reflected in the USACE Engineering Regulation (ER) 200-2-2. In fulfillment of these and all other legal, regulatory, and policy requirements, this Draft EA describes the purpose and need for the action, the range of alternatives considered, and discloses the environmental impacts of the Federal undertaking.

A 30-day public comment period begins on Monday, Aug. 30, 2021 and ends Wednesday, Sept. 29, 2021. The Draft EA and appendices will be available on the Tulsa District website Aug. 30, 2021 at www.swt.usace.army.mil. Please address any comments by mail to Ms. Justyss Watson, Compliance Section, Environmental Branch, Regional Planning and Environmental Center, U.S. Army Corps of Engineers, 819 Taylor Street, P.O. Box 17300, Room 3A12, Fort Worth, Texas 76102-0300, or by email at justyss.a.watson@usace.army.mil.

-30-


swt.usace.army.mil
Apps
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Corps of Engineers...
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About
Business With Us
Missions
Locations
Media
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Careers
US Army Corps of Engineers Tulsa District Website
Corps Studies
Collapse All Expand All
KEYSTONE DAM SAFETY MODIFICATION STUDY
TULSA WEST TULSA LEVEE FEASIBILITY STUDY
MCCLELLAN-KERR ARKANSAS RIVER NAVIGATION SYSTEM DREDGING 2021
McClellan-Kerr Arkansas River Navigation System After Action Environmental Assessment Draft Availability Public Presentation
McClellan-Kerr Arkansas River Navigation System Public Notice of Draft Environmental Assessment Availability
McClellan-Kerr Arkansas River Navigation System News Release
Draft Finding of No Significant Impact for Environmental After Action Assessment
Draft After-Action Environmental Assessment for the Webbers Falls Pool and Robert S. Kerr Pool Emergency Dredging and Open Water Disposal
Appendix A - Draft Mitigation Plan
Appendix B - Draft Biological Assessment
Appendix C - Draft Clean Water Act Section
Appendix D - Public Agency and Tribal Coordination
Appendix E - Project and Mitigation Area Maps

From:	Davies, Christopher G CIV USARMY CESWF (USA)
To:	Watson, Justyss A CIV USARMY CESWF (USA); Shingleton, Kenneth L CIV USARMY CESWT (USA)
Cc:	Knack, Jeff A CIV USARMY CESWT (USA); Smith, Holly C CIV USARMY CESWT (USA)
Subject:	RE: MKARNS Draft Document Availability
Date:	Tuesday, August 31, 2021 8:46:23 AM

Copies were sent electronically to:

Alabama-Quassarte Tribal Town
Apache Tribe of Oklahoma
Caddo Nation of Oklahoma
Cherokee Nation
Cheyenne And Arapaho Tribes, Oklahoma
The Choctaw Nation of Oklahoma
Delaware Tribe of Indians
The Muscogee (Creek) Nation
The Osage Nation
Quapaw Nation
United Keetoowah Band of Cherokee Indians in Oklahoma
Wichita and Affiliated Tribes (Wichita, Keechi, Waco & Tawakonie)

Oklahoma State Historic Preservation Office
Oklahoma Archeological Survey

Respectfully,

Chris

Christopher G. Davies, RPA
Cultural Resources Manager
Regional Planning and Environmental Center
Office: (501) 324-7134
Mobile: (501) 258-9428

From: Watson, Justyss A CIV USARMY CESWF (USA) <Justyss.A.Watson@usace.army.mil>
Sent: Tuesday, August 31, 2021 8:25 AM
To: Davies, Christopher G CIV USARMY CESWF (USA) <Christopher.G.Davies@usace.army.mil>; Shingleton, Kenneth L CIV USARMY CESWT (USA) <Kenneth.L.Shingleton@usace.army.mil>
Cc: Knack, Jeff A CIV USARMY CESWT (USA) <Jeff.Knack@usace.army.mil>; Smith, Holly C CIV USARMY CESWT (USA) <Holly.C.Smith@usace.army.mil>
Subject: RE: MKARNS Draft Document Availability

From:	Boyett, Jake - NRCS, Claremore, OK
To:	Watson, Justyss A CIV USARMY CESWF (USA)
Cc:	Alspach, Steven - NRCS, Stillwater, OK; Bishop, Brandon - NRCS, Stillwater, OK
Subject:	[Non-DoD Source] RE: USACE - Farmland Conversion Impact Rating
Date:	Friday, September 3, 2021 8:46:10 AM
Attachments:	Muskogee mitigation_OK101.pdf

Dear Justyss Watson,

Please find the requested AD-1006 attached with the NRCS portions completed, the proposed site does not appear to effect any NRCS structures. In the future a shapefile of the project area or .kml would expedite the process. A soil map is not necessary since we moved to an ArcMap tool that clips the soils for me. If that is not feasible a location map at a general county level and site specific Thanks,

Jake Boyett
Resource Soil Scientist
Claremore Technical Office
918-283-7089

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

From: Best, Christopher - NRCS, Tulsa, OK <christopher.best@usda.gov>
Sent: Tuesday, August 31, 2021 10:58 PM
To: Boyett, Jake - NRCS, Claremore, OK <jake.boyett@usda.gov>
Subject: FW: USACE - Farmland Conversion Impact Rating

Jake
Could you please complete this one for Muskogee.
If more is needed please let me know.

Thanks

Chris Best
District Conservationist
USDA-NRCS
(405) 385-3032
(855) 421-7632 fax
Christopher.best@usda.gov
Rogers, Mayes, Tulsa, Wagoner
Muskogee, Okmulgee

From: Watson, Justyss A CIV USARMY CESWF (USA) <Justyss.A.Watson@usace.army.mil>

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 8/31/21
Name of Project After-Action Environmental Assessment	Federal Agency Involved U.S. Army Corps of Engineers
Proposed Land Use Mitigation	County and State Muskogee County, Oklahoma
PART II *(To be completed by NRCS)*	Date Request Received By NRCS 8/31/2021 / Person Completing Form: Jake Bovett

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES	NO	Acres Irrigated: 8,837 / Average Farm Size: 197

Major Crop(s): Corn, Small Grains	Farmable Land In Govt. Jurisdiction: Acres: 311,720 % 58	Amount of Farmland As Defined in FPPA: Acres: 320,963 % 60
Name of Land Evaluation System Used: NCCPI	Name of State or Local Site Assessment System: NONE	Date Land Evaluation Returned by NRCS: 9/3/21

PART III *(To be completed by Federal Agency)*	Alternative Site Rating: Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	77	30		
B. Total Acres To Be Converted Indirectly	0	0		
C. Total Acres In Site	77	30		
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	37	24		
B. Total Acres Statewide Important or Local Important Farmland	0	0		
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	0.0247	.0096		
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	38	18		
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	69	84		

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)				
2. Perimeter In Non-urban Use	(10)				
3. Percent Of Site Being Farmed	(20)				
4. Protection Provided By State and Local Government	(20)				
5. Distance From Urban Built-up Area	(15)				
6. Distance To Urban Support Services	(15)				
7. Size Of Present Farm Unit Compared To Average	(10)				
8. Creation Of Non-farmable Farmland	(10)				
9. Availability Of Farm Support Services	(5)				
10. On-Farm Investments	(20)				
11. Effects Of Conversion On Farm Support Services	(10)				
12. Compatibility With Existing Agricultural Use	(10)				
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	69	84	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	0	0	0	0
TOTAL POINTS ***(Total of above 2 lines)***	260	69	84	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☑

Reason For Selection:

Name of Federal agency representative completing this form:	Date:

(See Instructions on reverse side) **Form AD-1006 (03-02)**

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.

Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s)of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map**,** or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)

Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.

Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

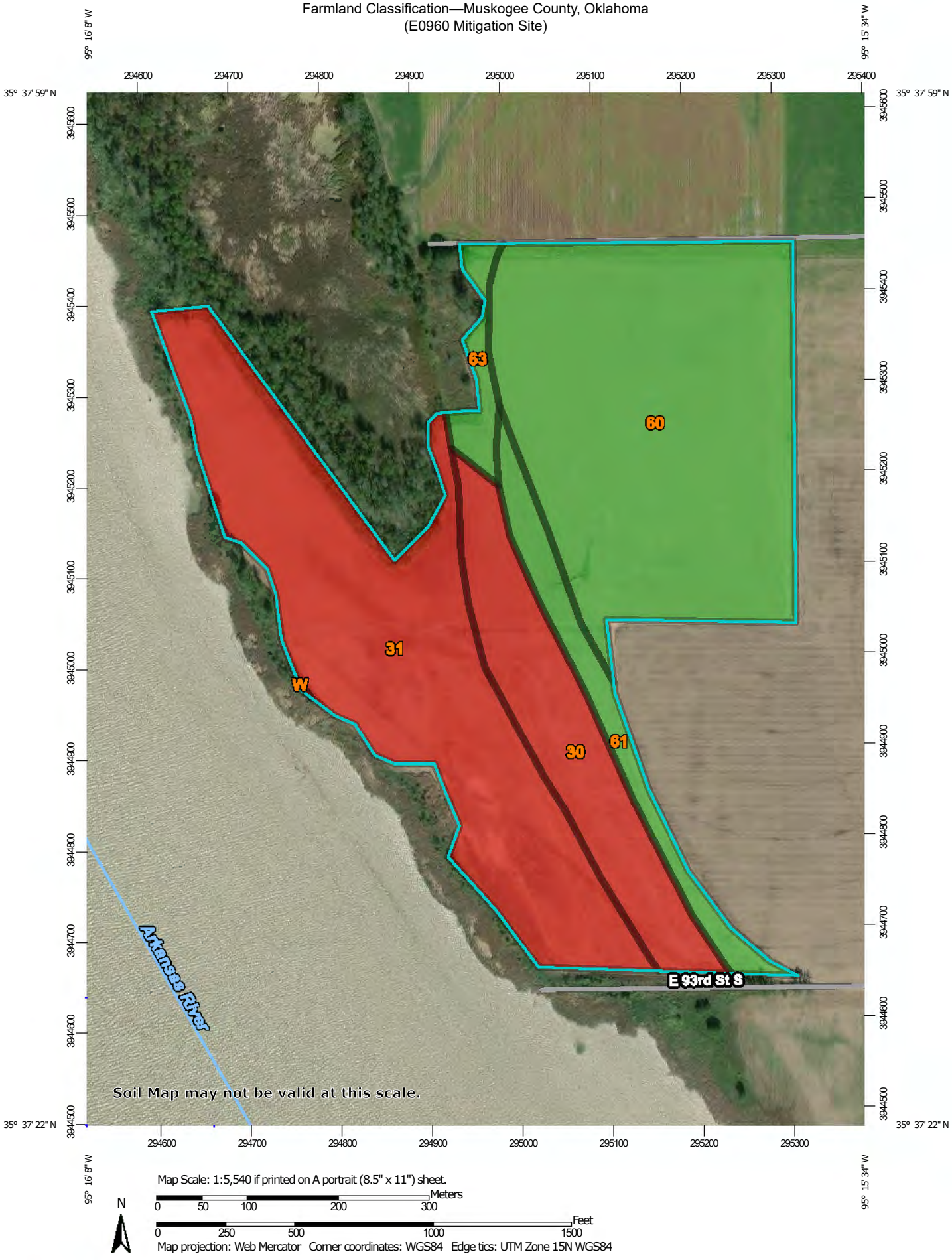
Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \text{ X } 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

Farmland Classification—Muskogee County, Oklahoma
(E0960 Mitigation Site)



Map Scale: 1:5,540 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

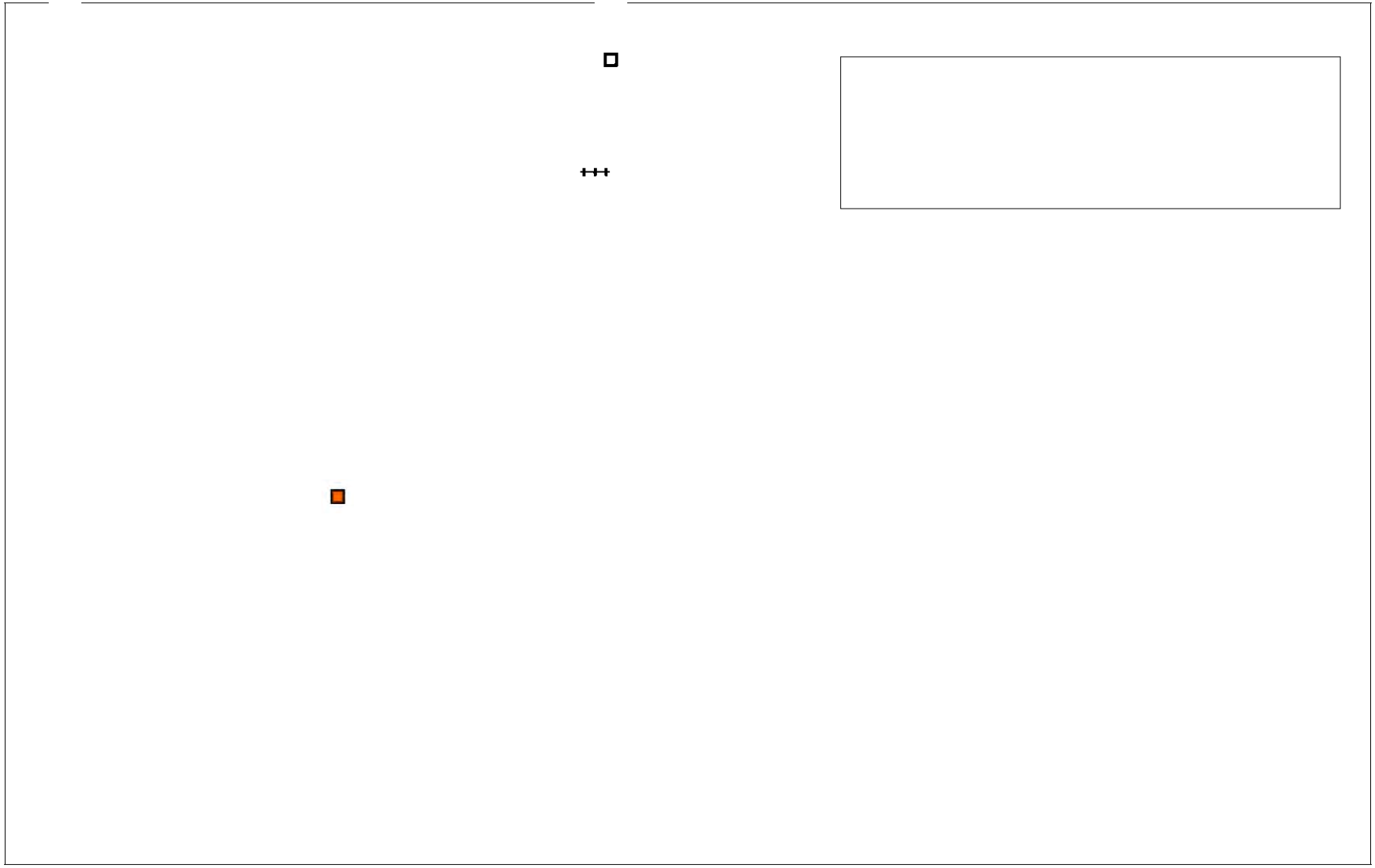
Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated



Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
30	Kiomatia fine sandy loam, 0 to 2 percent slopes, rarely flooded	Not prime farmland	10.7	13.9%
31	Kiomatia fine sandy loam, 0 to 2 percent slopes, frequently flooded	Not prime farmland	28.2	36.5%
60	Roxana very fine sandy loam, 0 to 1 percent slopes, rarely flooded	All areas are prime farmland	31.6	41.0%
61	Roxana very fine sandy loam, 1 to 3 percent slopes, rarely flooded	All areas are prime farmland	4.9	6.3%
63	Severn very fine sandy loam, 2 to 6 percent slopes, rarely flooded	All areas are prime farmland	1.8	2.3%
W	Water	Not prime farmland	0.0	0.0%
Totals for Area of Interest			**77.2**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

From:	Boyett, Jake - NRCS, Claremore, OK
To:	Watson, Justyss A CIV USARMY CESWF (USA)
Cc:	Alspach, Steven - NRCS, Stillwater, OK; Bishop, Brandon - NRCS, Stillwater, OK
Subject:	[Non-DoD Source] RE: USACE - Farmland Conversion Impact Rating
Date:	Friday, September 3, 2021 10:43:51 AM
Attachments:	Sequoyah mitigation_OK135.pdf

Dear Justyss Watson,

Please find the requested AD-1006 attached with the NRCS portions completed, the proposed site does not appear to effect any NRCS structures.
Thanks,

Jake Boyett
Resource Soil Scientist
Claremore Technical Office
918-283-7089

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

From: Watson, Justyss A CIV USARMY CESWF (USA) <Justyss.A.Watson@usace.army.mil>
Sent: Tuesday, August 31, 2021 10:18 AM
To: Boyett, Jake - NRCS, Claremore, OK <jake.boyett@usda.gov>
Subject: RE: USACE - Farmland Conversion Impact Rating

Jake,

Thank you for the information. I have attached the Farmland Conversion Impact Rating for our proposed mitigation in Sequoyah County.

Respectfully,

Justyss Watson (she/her)
Biologist, Compliance Section
Environmental Branch
Regional Planning and Environmental Center
U.S. Army Corps of Engineers
justyss.a.watson@usace.army.mil
Office: 817-886-1828

From: Boyett, Jake - NRCS, Claremore, OK <jake.boyett@usda.gov>
Sent: Thursday, August 26, 2021 12:33 PM
To: Watson, Justyss A CIV USARMY CESWF (USA) <Justyss.A.Watson@usace.army.mil>

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 8/31/21
Name of Project After-Action Environmental Assessment	Federal Agency Involved U.S. Army Corps of Engineers
Proposed Land Use Mitigation	County and State Sequoyah County, Oklahoma
PART II *(To be completed by NRCS)*	Date Request Received By NRCS 8/31/2021 / Person Completing Form: Jake Bovett

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES	NO	Acres Irrigated: 7,064 / Average Farm Size: 180
Major Crop(s)			Amount of Farmland As Defined in FPPA — Acres: 91,355 % 20
Name of Land Evaluation System Used: NCCPI	Name of State or Local Site Assessment System: NONE		Date Land Evaluation Returned by NRCS: 9/2/21

PART III *(To be completed by Federal Agency)*	Alternative Site Rating: Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	26			
B. Total Acres To Be Converted Indirectly	0			
C. Total Acres In Site	26			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	26			
B. Total Acres Statewide Important or Local Important Farmland	0			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	0.0120			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	5			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	89			

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)				
2. Perimeter In Non-urban Use	(10)				
3. Percent Of Site Being Farmed	(20)				
4. Protection Provided By State and Local Government	(20)				
5. Distance From Urban Built-up Area	(15)				
6. Distance To Urban Support Services	(15)				
7. Size Of Present Farm Unit Compared To Average	(10)				
8. Creation Of Non-farmable Farmland	(10)				
9. Availability Of Farm Support Services	(5)				
10. On-Farm Investments	(20)				
11. Effects Of Conversion On Farm Support Services	(10)				
12. Compatibility With Existing Agricultural Use	(10)				
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	89	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	0	0	0	0
TOTAL POINTS ***(Total of above 2 lines)***	260	89	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☑

Reason For Selection:

Name of Federal agency representative completing this form:	Date:

(See Instructions on reverse side) **Form AD-1006 (03-02)**

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.

Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s)of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map**,** or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)

Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.

Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \text{ X } 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

Map Scale: 1:3,550 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

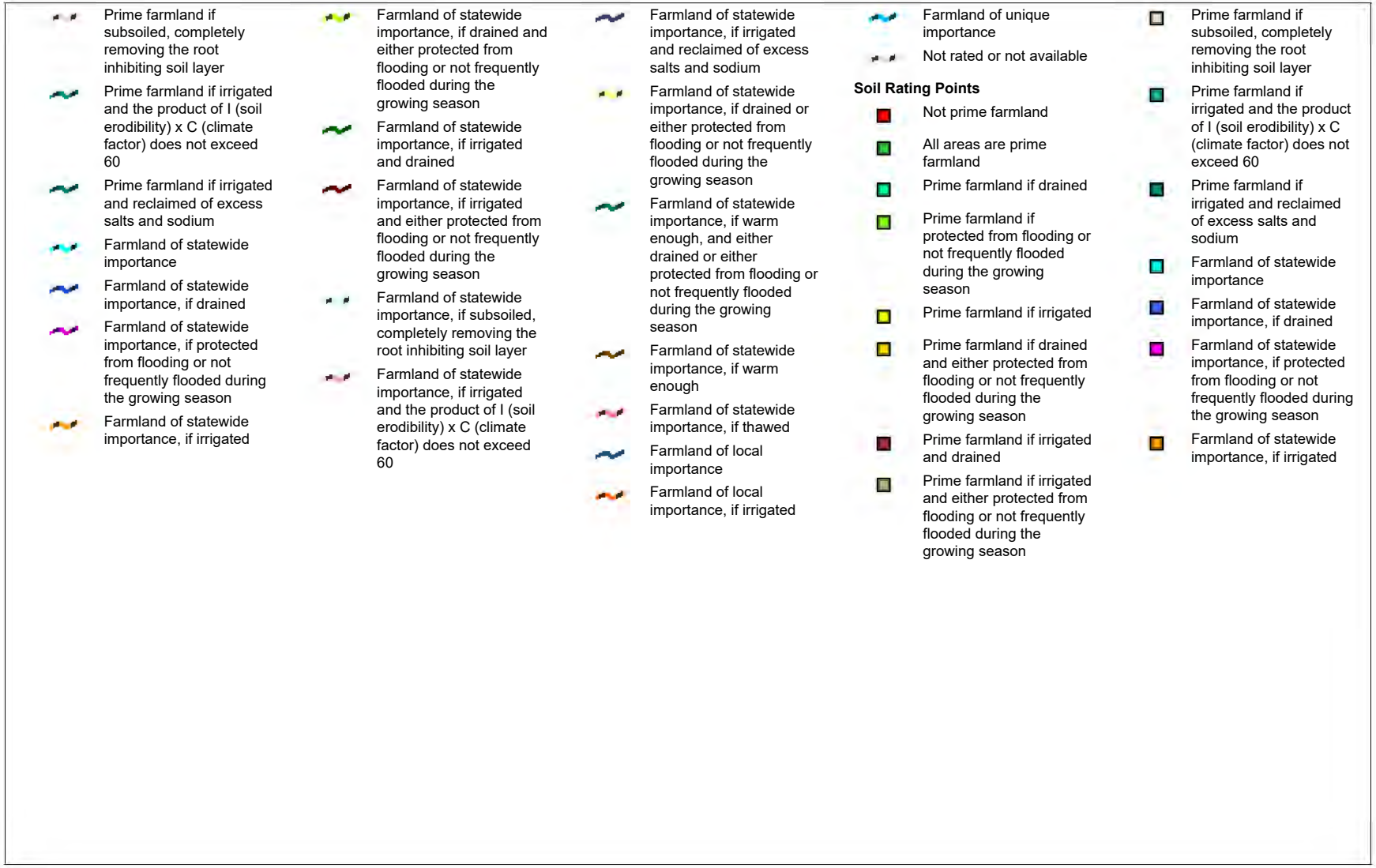
Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season


Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated
Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
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Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
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Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if warm enough
Farmland of statewide importance, if thawed
Farmland of local importance
Farmland of local importance, if irrigated
Farmland of unique importance
Not rated or not available
Soil Rating Points
Not prime farmland
All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated and drained
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
Prime farmland if subsoiled, completely removing the root inhibiting soil layer
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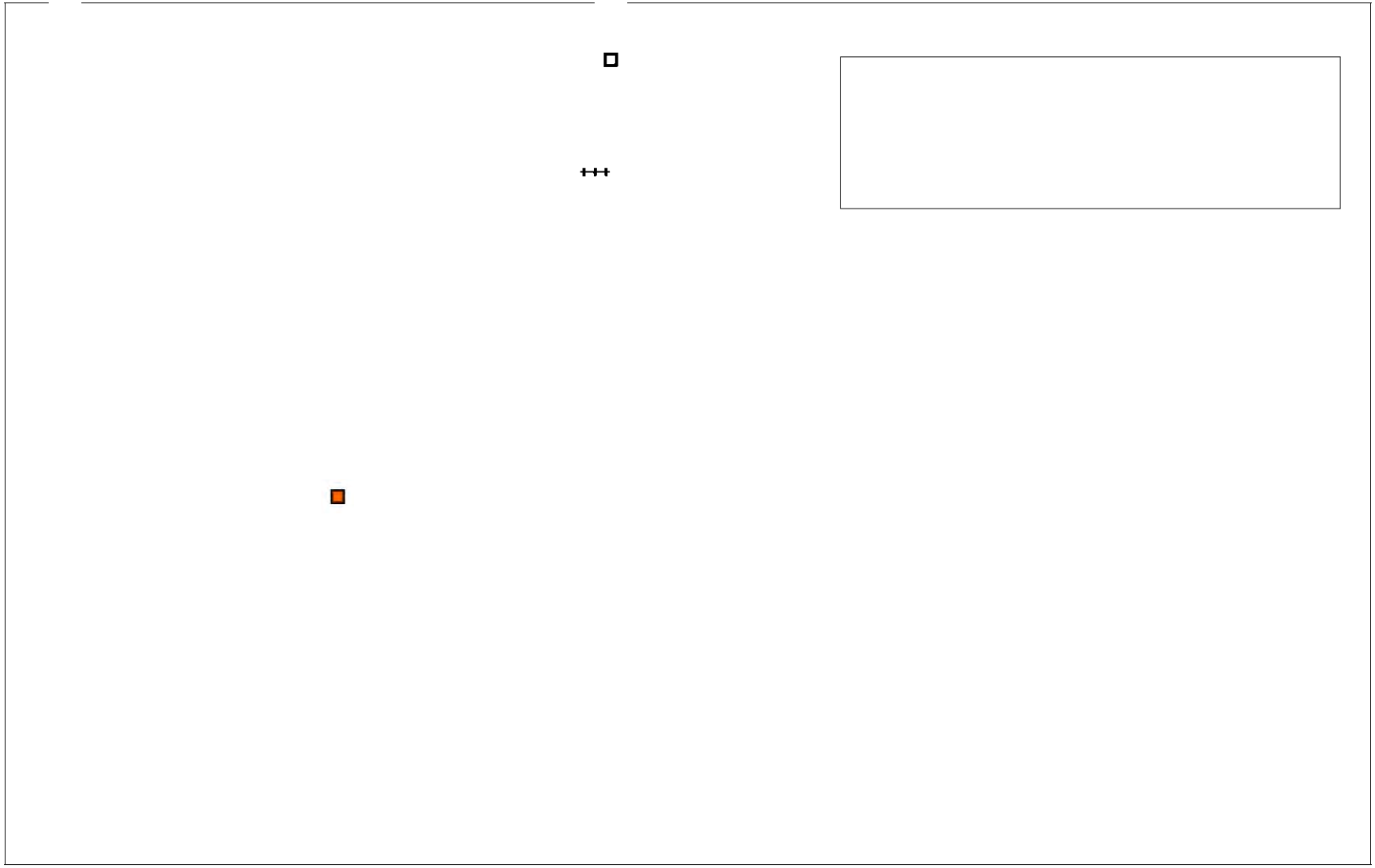
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated



Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
59	Roebuck clay, 0 to 1 percent slopes, frequently flooded	Not prime farmland	1.3	4.3%
60	Roxana very fine sandy loam, 0 to 1 percent slopes, rarely flooded	All areas are prime farmland	13.0	43.1%
61	Roxana very fine sandy loam, 1 to 3 percent slopes, rarely flooded	All areas are prime farmland	9.5	31.5%
63	Severn very fine sandy loam, 2 to 6 percent slopes, rarely flooded	All areas are prime farmland	2.2	7.2%
W	Water	Not prime farmland	4.2	13.9%
Totals for Area of Interest			**30.3**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
77	Verdigris silt loam, 0 to 1 percent slopes, frequently flooded	Not prime farmland	10.5	100.0%
Totals for Area of Interest			**10.5**	**100.0%**

Description

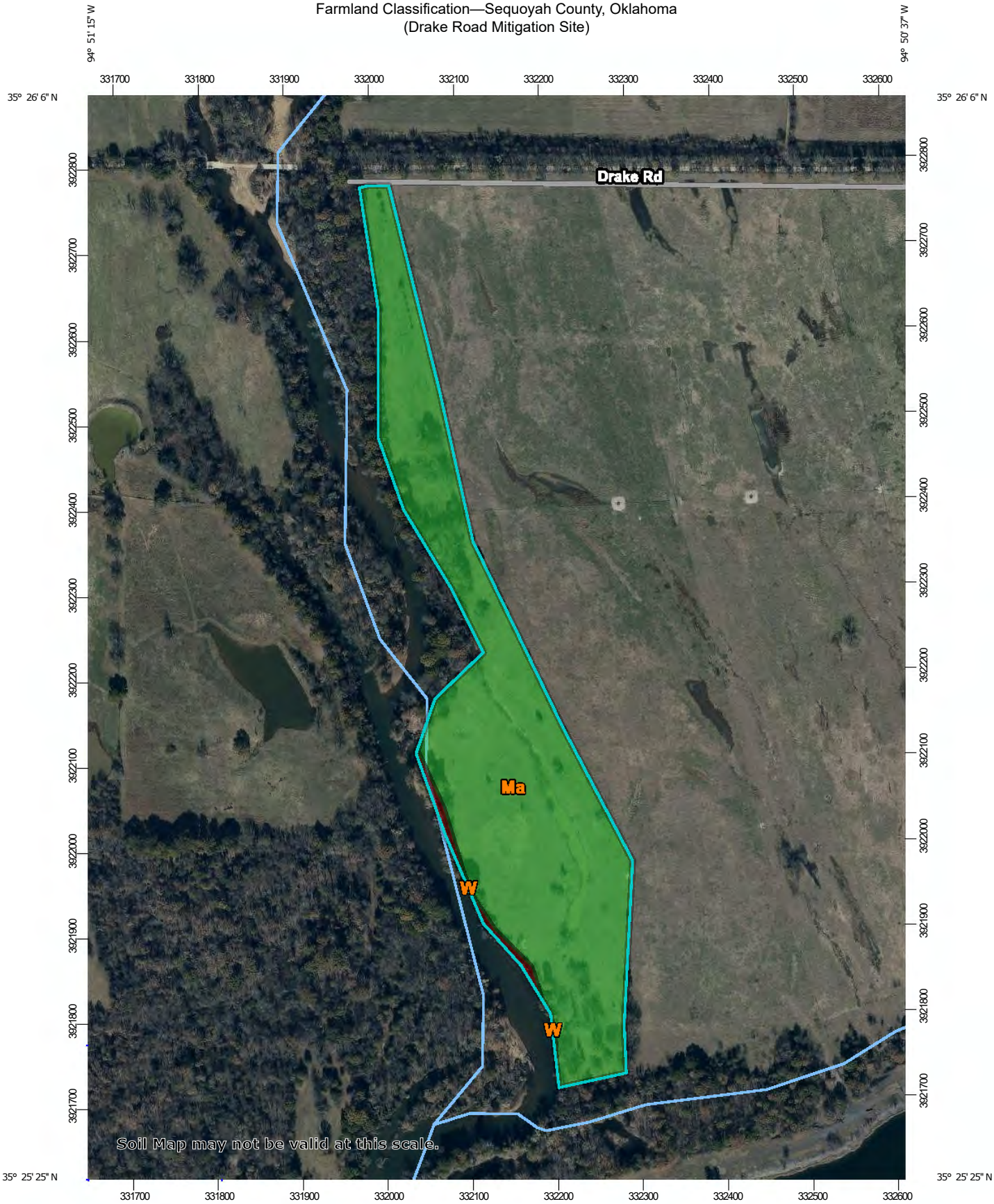
Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Farmland Classification—Sequoyah County, Oklahoma
(Drake Road Mitigation Site)



Map Scale: 1:6,190 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

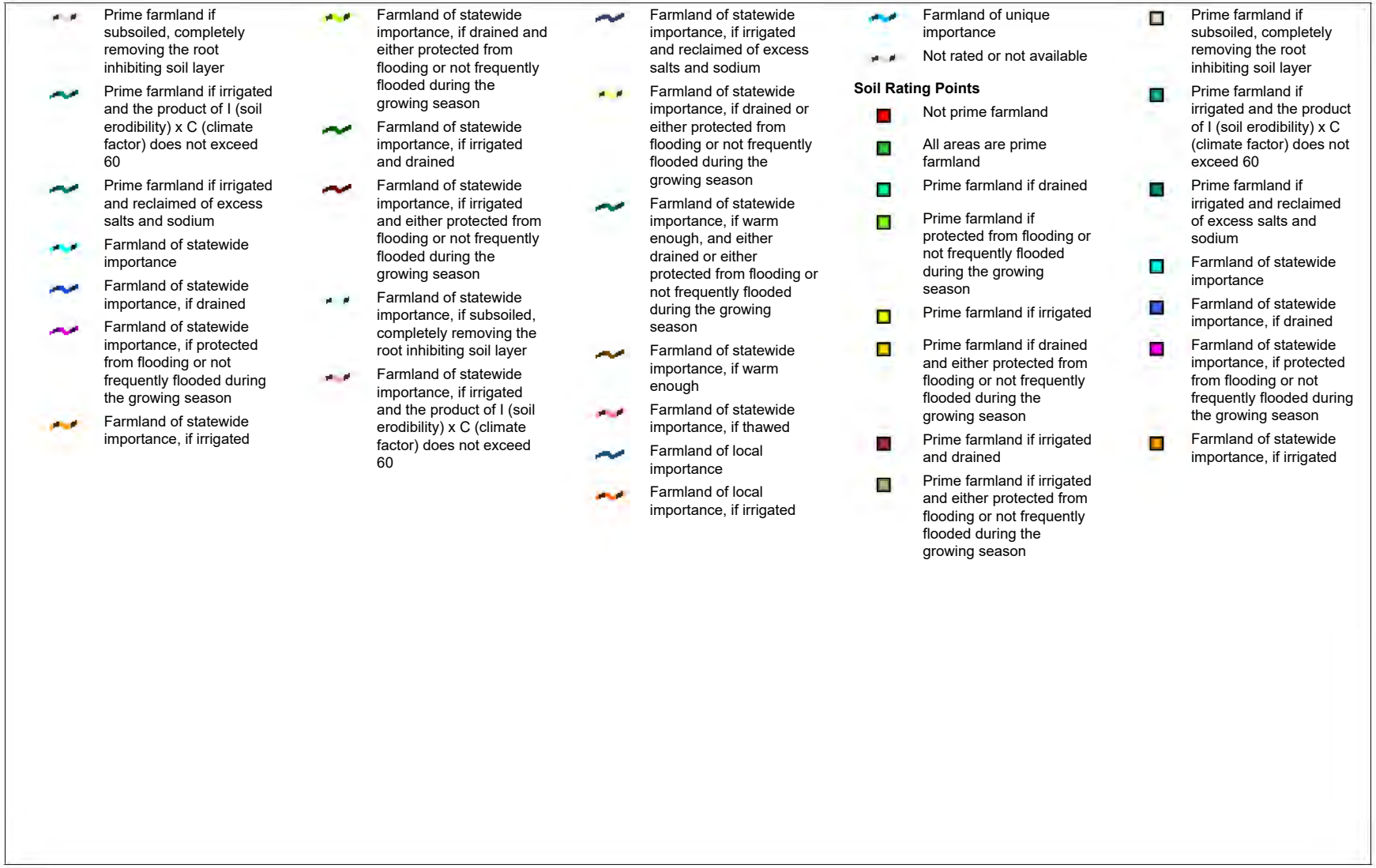
Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season


Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated
Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
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Farmland of statewide importance, if warm enough
Farmland of statewide importance, if thawed
Farmland of local importance
Farmland of local importance, if irrigated
Farmland of unique importance
Not rated or not available
Soil Rating Points
Not prime farmland
All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated and drained
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
Prime farmland if subsoiled, completely removing the root inhibiting soil layer
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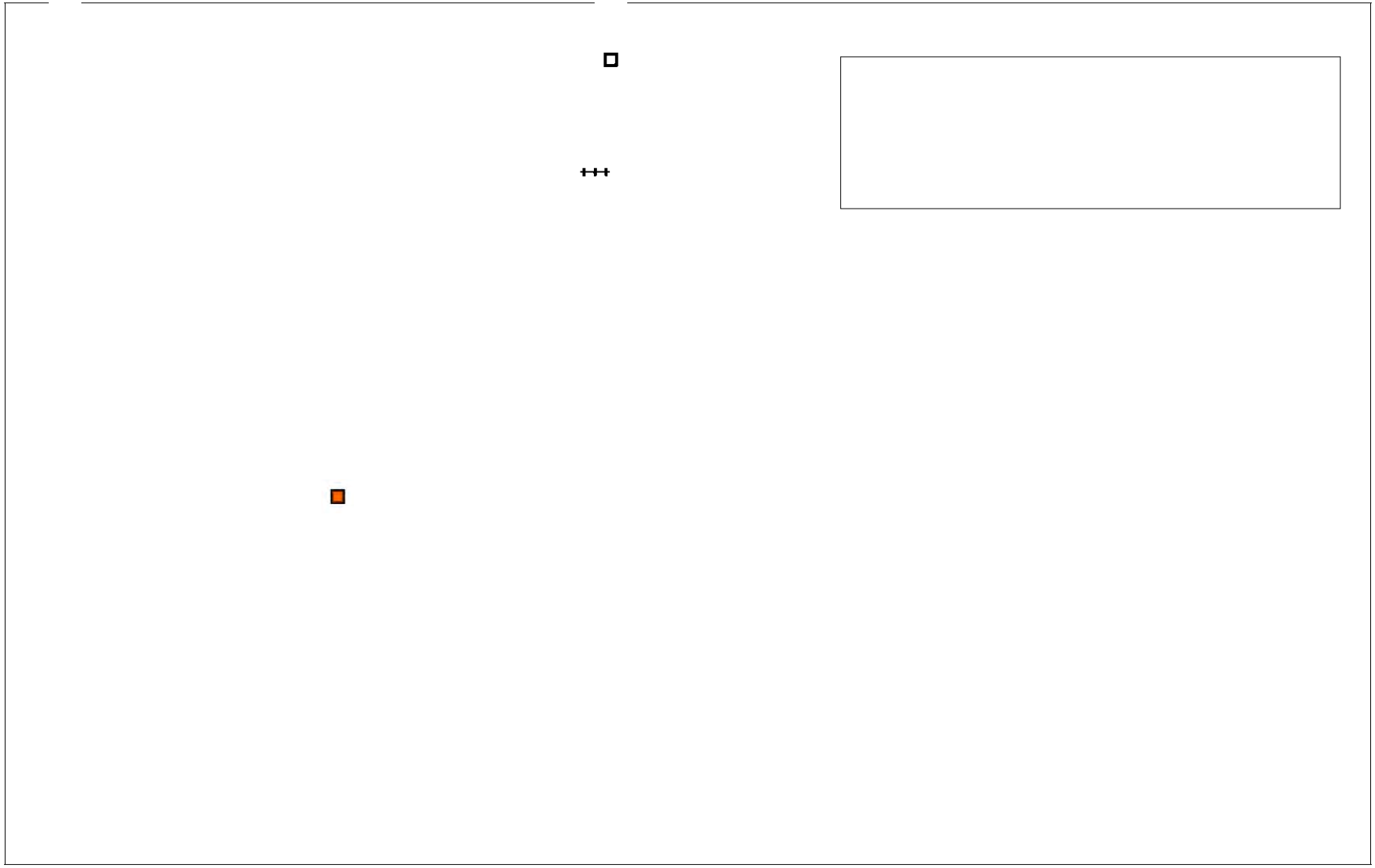
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated



Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Ma	Mason silt loam, 0 to 1 percent slopes, rarely flooded	All areas are prime farmland	25.9	98.5%
W	Water	Not prime farmland	0.4	1.5%
Totals for Area of Interest			**26.3**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

USDA
United States Department of Agriculture

Natural Resources Conservation Service, 16664 N. Butler Road, Pauls Valley, OK 73075 405-612-9452

February 17, 2022

Justyss Watson (she/her)
Biologist
NEPA and Natural Resource Section
Environmental Branch
Regional Planning and Environmental Center
U.S. Army Corps of Engineers

RE: Habitat Mitigation, Haskell County, Oklahoma.

Dear Ms. Watson:

In accordance with your request for environmental information on farmland soils we have completed and enclosed the AD-1006 (Farmland Conversion Impact Rating).

We see no adverse environmental impacts from this project. If you have any questions or need additional information, please do not hesitate contacting our office.

Sincerely,

Carl Woods

Carl Woods
Resource Soil Scientist
Pauls Valley Technical Service Office
Pauls Valley, OK 73075
405-612-9452

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 31 August 2021
Name of Project After-Action Environmental Assessment f	Federal Agency Involved U.S.Army Corps of Engineers
Proposed Land Use Mitigation	County and State Haskell County, Oklahoma
PART II *(To be completed by NRCS)*	Date Request Received By NRCS / Person Completing Form:

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES	NO	Acres Irrigated 340
Major Crop(s)			Amount of Farmland As Defined in FPPA Acres: 17090 % 19.4
Name of Land Evaluation System Used: CALES	Name of State or Local Site Assessment System: None		Date Land Evaluation Returned by NRCS: 2/17/2022

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	26	26.3	25.8	
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site				
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	23.7	20.8	17.1	
B. Total Acres Statewide Important or Local Important Farmland	0	0	0	
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	0.001	0.001	0.001	
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	22.5	22.5	22.5	
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	61	61	61	

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	15	15	15	
2. Perimeter In Non-urban Use	(10)	10	10	10	
3. Percent Of Site Being Farmed	(20)	0	0	0	
4. Protection Provided By State and Local Government	(20)	0	0	0	
5. Distance From Urban Built-up Area	(15)	5	5	5	
6. Distance To Urban Support Services	(15)	0	0	0	
7. Size Of Present Farm Unit Compared To Average	(10)	0	0	0	
8. Creation Of Non-farmable Farmland	(10)	10	10	10	
9. Availability Of Farm Support Services	(5)	5	5	5	
10. On-Farm Investments	(20)	5	5	5	
11. Effects Of Conversion On Farm Support Services	(10)	0	0	0	
12. Compatibility With Existing Agricultural Use	(10)	0	0	0	
TOTAL SITE ASSESSMENT POINTS	160	50	50	50	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	61	61	61	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	50	50	50	0
TOTAL POINTS ***(Total of above 2 lines)***	260	111	111	111	0

Site Selected: A, B, and C	Date Of Selection 05 July 2021	Was A Local Site Assessment Used? YES ☐ NO ☑

Reason For Selection:

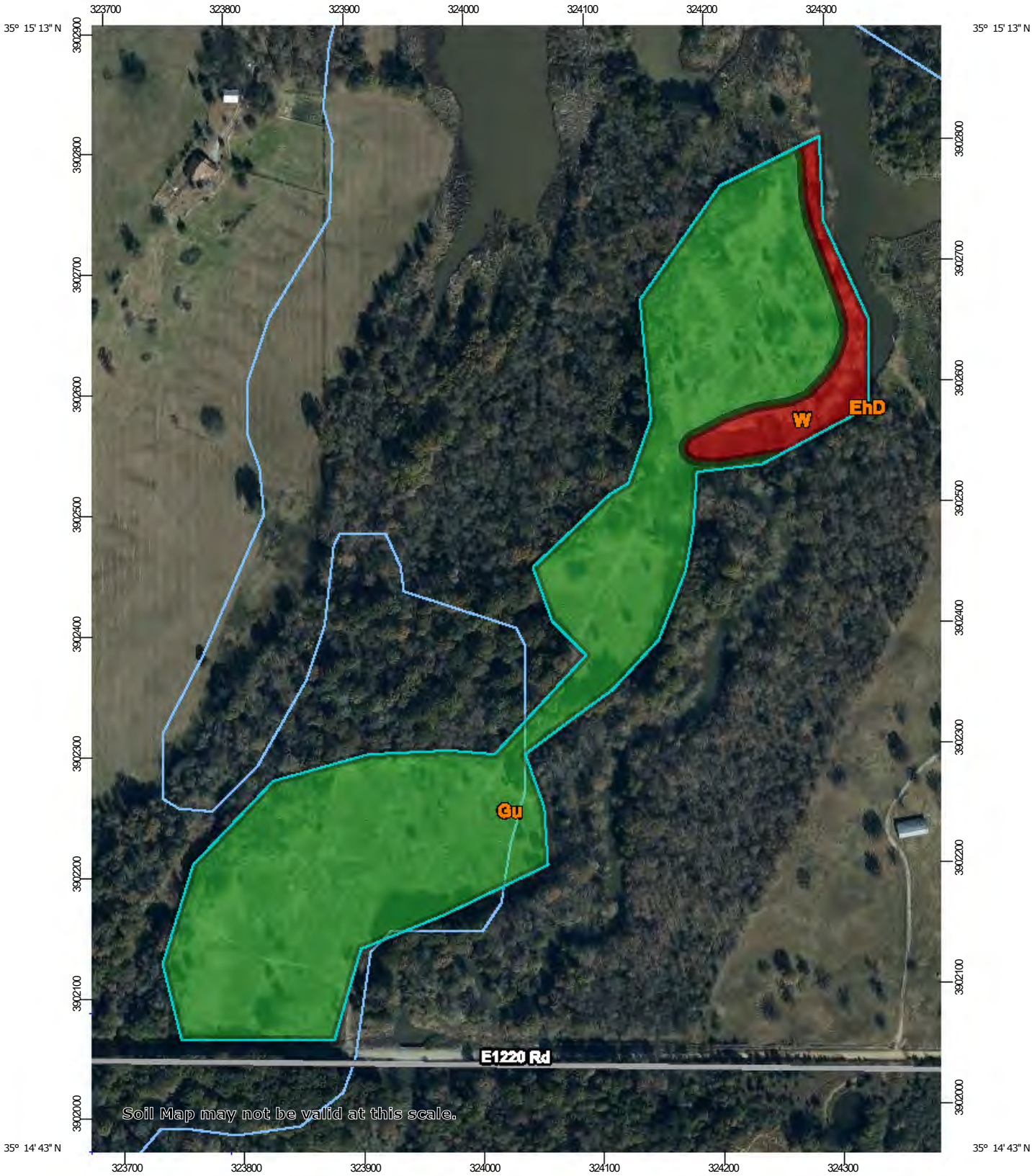
Sites have been selected to be used for the creation of wildlife habitat (bottomland hardwood forest, forested wetland, and emergent wetland).

Name of Federal agency representative completing this form: Justyss Watson	Date: 31 August 2021

(See Instructions on reverse side)

Form AD-1006 (03-02)

Farmland Classification—Haskell County, Oklahoma
(Missouri Pacific Railroad West Mitigation Site)



Map Scale: 1:4,560 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
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- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
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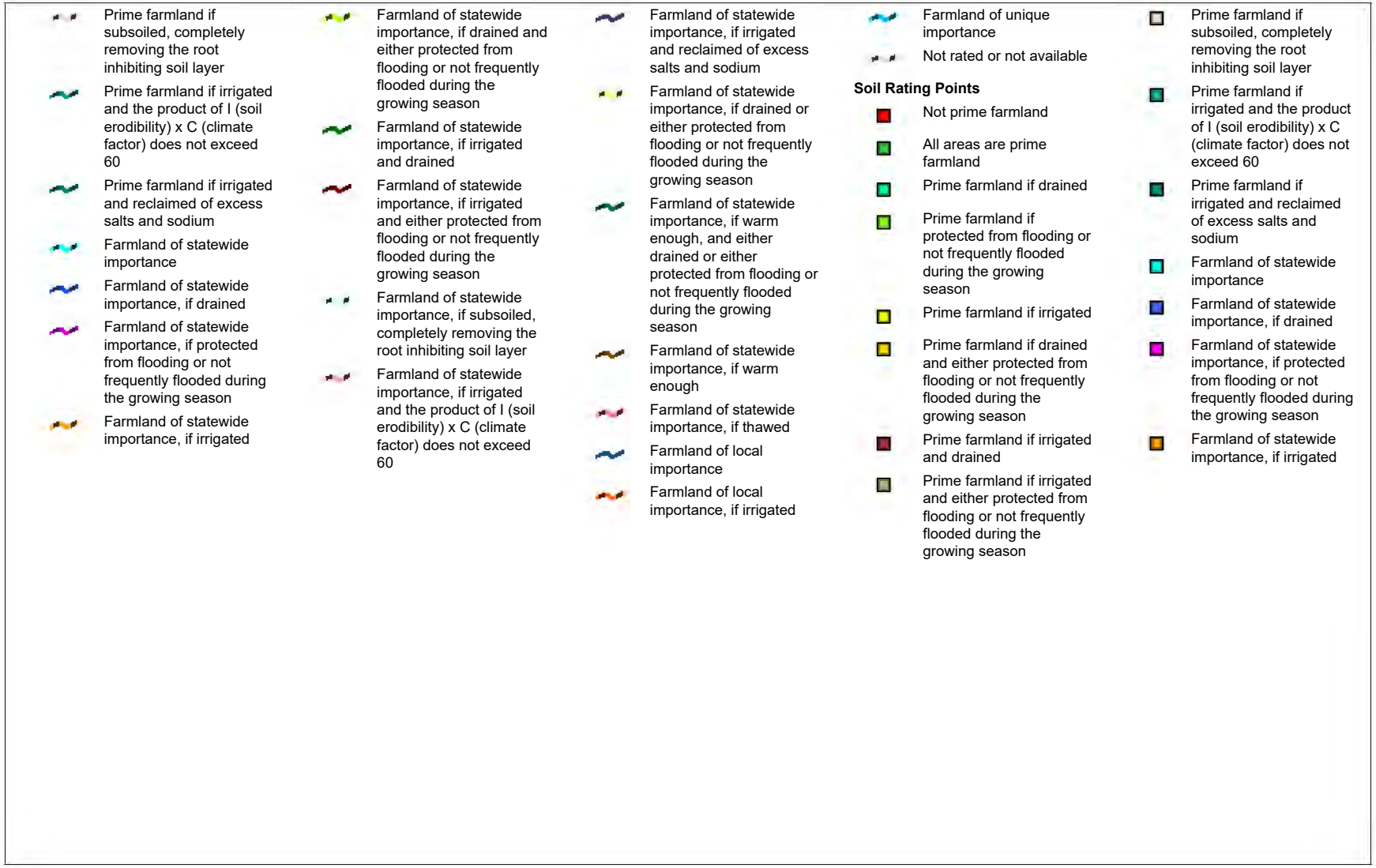
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Farmland of statewide importance, if drained
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Farmland of statewide importance, if warm enough
Farmland of statewide importance, if thawed
Farmland of local importance
Farmland of local importance, if irrigated
Farmland of unique importance
Not rated or not available
Soil Rating Points
Not prime farmland
All areas are prime farmland
Prime farmland if drained
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Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated

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- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
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- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Haskell County, Oklahoma
Survey Area Data: Version 16, May 27, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 16, 2018—Nov 21, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
EhD	Carnasaw-Bengal-Clebit complex, 3 to 15 percent slopes	Not prime farmland	0.0	0.0%
Gu	Cupco silt loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland	23.7	91.3%
W	Water	Not prime farmland	2.3	8.7%
Totals for Area of Interest			**26.0**	**100.0%**

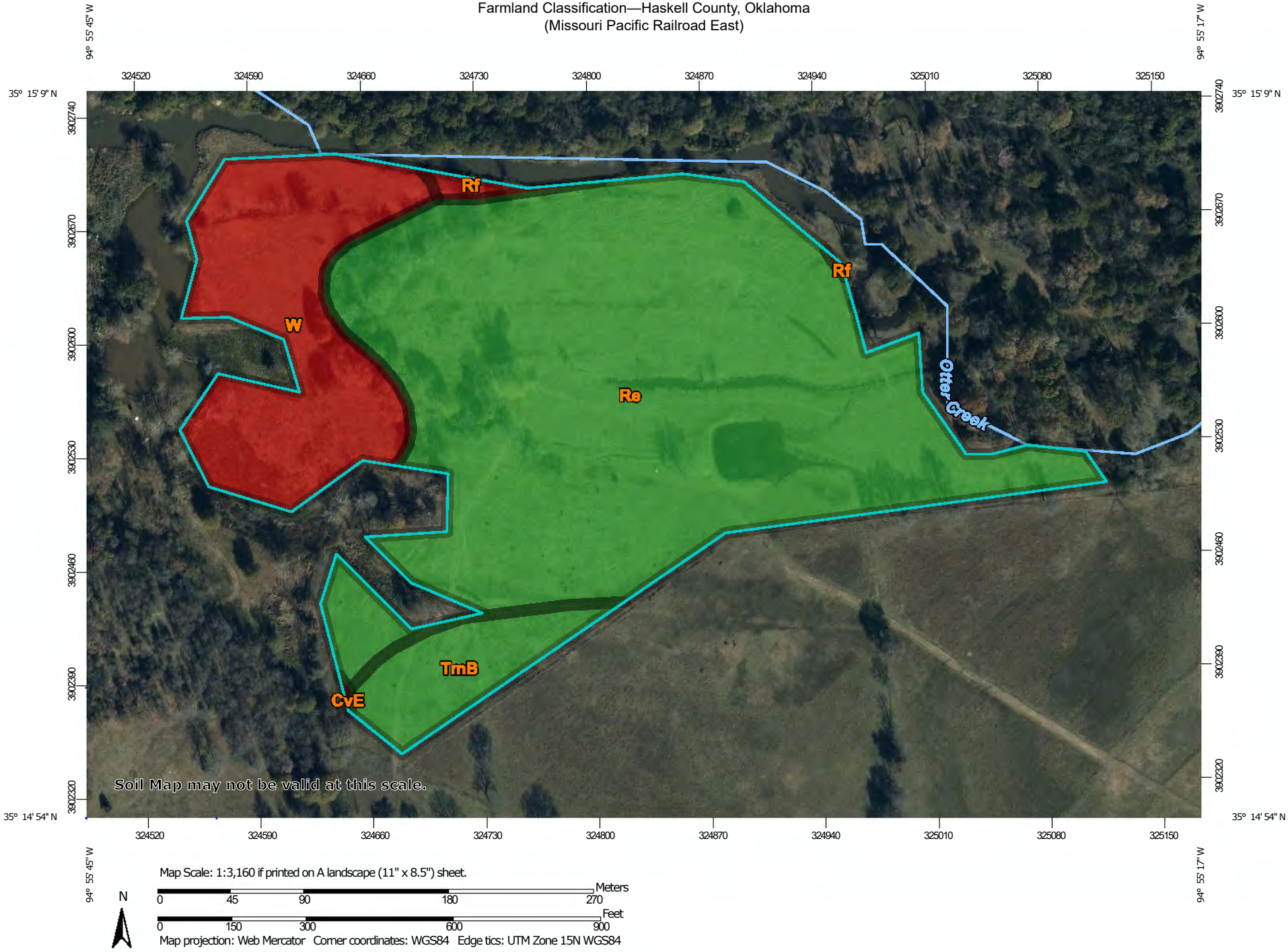
Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower



Map Scale: 1:3,160 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
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- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
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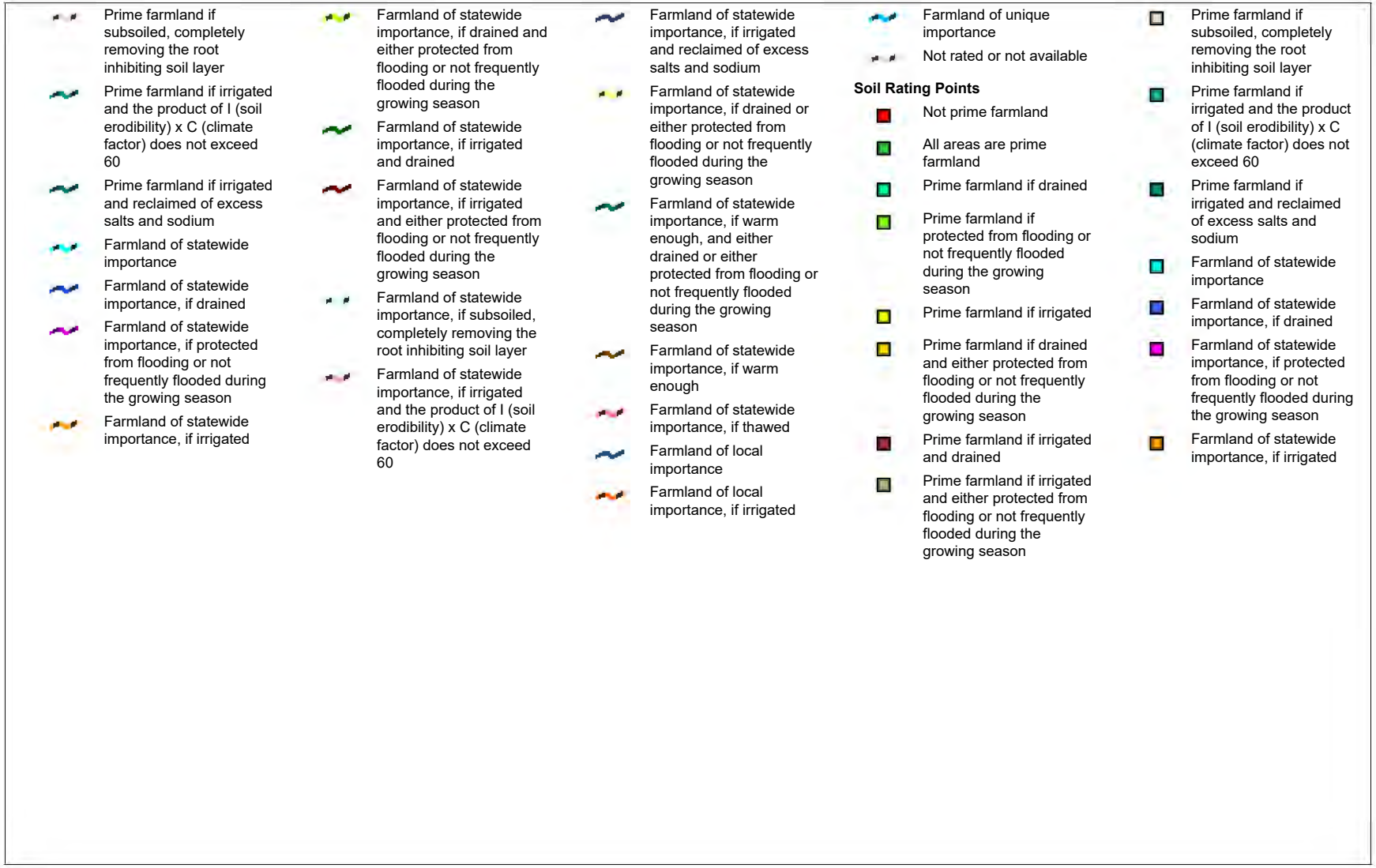
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Farmland of statewide importance, if warm enough
Farmland of statewide importance, if thawed
Farmland of local importance
Farmland of local importance, if irrigated
Farmland of unique importance
Not rated or not available
Soil Rating Points
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All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
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Prime farmland if irrigated and drained
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Prime farmland if subsoiled, completely removing the root inhibiting soil layer
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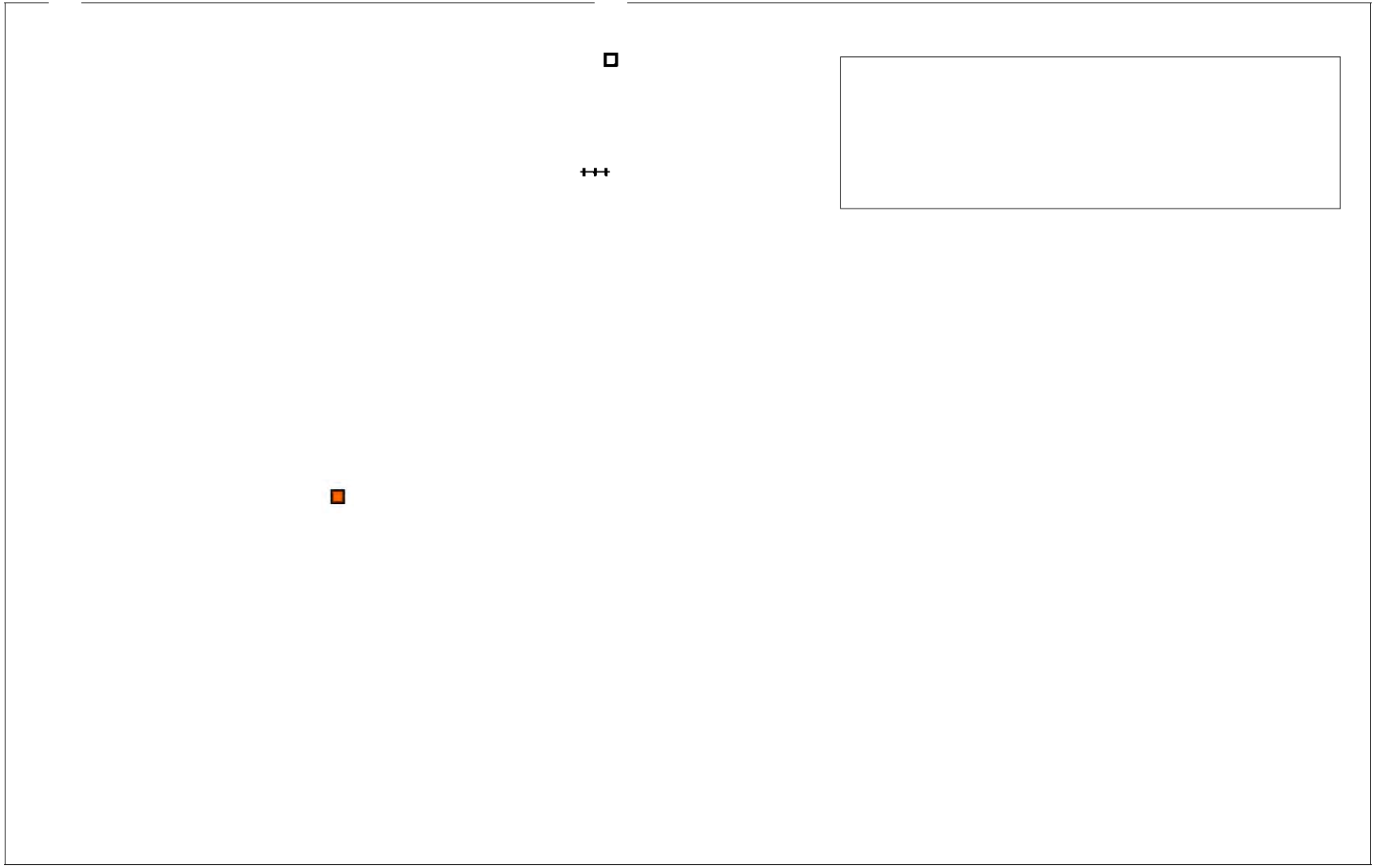
Farmland of statewide importance
Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated



Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CvE	Counts-Dela complex, 0 to 20 percent slopes	Not prime farmland	0.0	0.1%
Re	Rexor silt loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland	19.2	72.9%
Rf	Rexor silt loam, 0 to 3 percent slopes, frequently flooded	Not prime farmland	0.2	0.7%
TmB	Tamaha silt loam, 1 to 3 percent slopes	All areas are prime farmland	1.7	6.4%
W	Water	Not prime farmland	5.3	20.0%
Totals for Area of Interest			**26.3**	**100.0%**

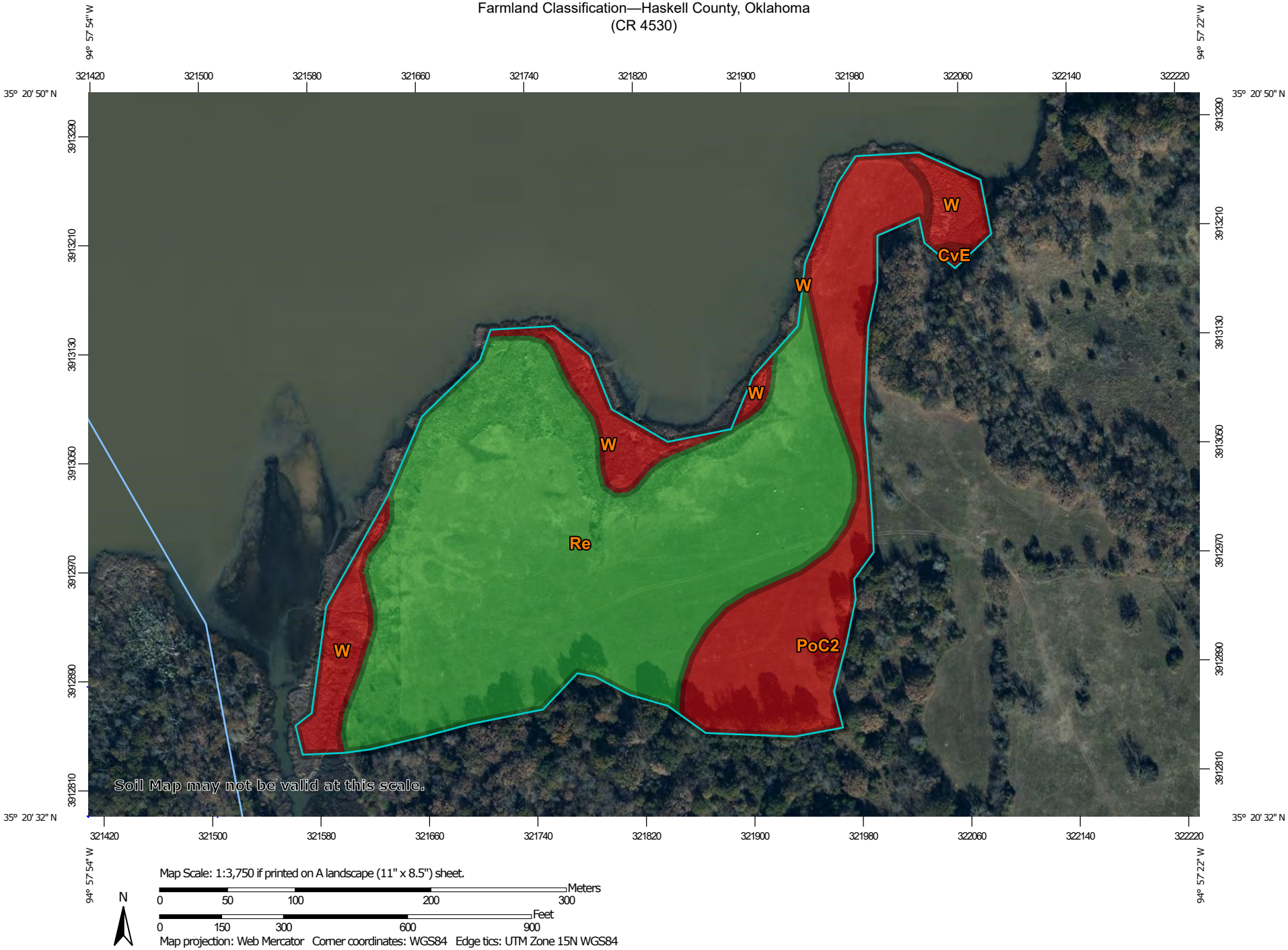
Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower


94° 57' 54" W
94° 57' 22" W
35° 20' 50" N
35° 20' 32" N
321420
321500
321580
321660
321740
321820
321900
321980
322060
322140
322220
3913290
3913210
3913130
3913050
3912970
3912890
3912810
W
CvE
Re
PoC2
Soil Map may not be valid at this scale.
Map Scale: 1:3,750 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 50 100 200 300
Feet
0 150 300 600 900
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

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- All areas are prime farmland
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- Farmland of statewide importance, if thawed
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- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

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- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Haskell County, Oklahoma
Survey Area Data: Version 16, May 27, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 16, 2018—Nov 21, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CvE	Counts-Dela complex, 0 to 20 percent slopes	Not prime farmland	0.1	0.2%
PoC2	Porum fine sandy loam, 3 to 5 percent slopes, eroded	Not prime farmland	5.7	22.1%
Re	Rexor silt loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland	17.1	66.2%
W	Water	Not prime farmland	3.0	11.5%
Totals for Area of Interest			**25.8**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

From:	Stubbs, Kevin
To:	Watson, Justyss A CIV USARMY CESWF (USA)
Cc:	Pinsky, Jeffrey F CIV USARMY CESWF (USA); Knack, Jeff A CIV USARMY CESWT (USA); Fenner, Daniel
Subject:	[Non-DoD Source] Re: [EXTERNAL] MKARNS After-Action Biological Assessment
Date:	Wednesday, December 29, 2021 8:41:27 PM

Justyss, We concur with your determinations of "May Affect, and is Likely to Adversely Affect" for the northern long-eared bat (Myotis septentrionalis) and American burying beetle (Nicrophorus americanus). A determination of "May Affect, but is Not Likely to Adversely Affect" for Indiana bat (Myotis sodalist) and interior least tern (Sterna antillarum). A determination of "No Effect" for gray bat (Myotis grisescens), Ozark big-eared bat (Corynorhinus (=Plecotus) townsendii ingens), piping plover (Charadrius melodus), red knot (Calidris canutus rufa), whooping crane (Grus americana), Ozark cave fish (Amblyopsis rosae), Neosho mucket (Lampsilis rafinesqueana), and rabbitsfoot (Quadrula cylindrica cylindrica). The adverse effects and any potential incidental take for the northern long-eared bat and American burying beetle are already addressed through the existing programmatic biological opinion with the Corps and SWPA and no additional formal consultation is necessary. Consultation and incidental take for both species could also be addressed through existing programmatic consultations for the northern long-eared bat and American burying beetle 4(d) rules if your agency chooses to use them.

I have revised the draft CAR for MKARNS Emergency Actions to reflect the concurrence and use of the programmatic BO for the NLEB and ABB incidental take. Let me know if you have any questions or comments.

Kevin
918-695-6769

Federally Listed Threatened and Endangered Species

A Biological Assessment has been prepared by USACE and they have made determinations for the species listed in Section 5.1.4. It was assumed by USACE that the Emergency Action would have "no effect" on:

- Gray bat,
- Ozark big-eared bat,
- Indiana bat,
- Piping plover,
- Red knot,
- Whooping crane,
- Neosho mucket,

- Rabbitsfoot, and
- Ozark cave fish.

It was determined by USACE and the Service has concurred that the Emergency Action "may affect, but is not likely to adversely affect" the following Federally listed species:

- ILT

A "may affect, likely to adversely affect" determination has been submitted for:

- ABB and
- NLEB

The NLEB was adversely impacted by the tree clearing conducted at Below Lock 16 that removed 10 acres of bottomland hardwood forest during the NLEB pup season (June 1 to July 31). Surveys were not completed for NLEB before the work was conducted at this site, so USACE is assuming an adverse impact. Given the mobility of ABB, it is assumed their habitat is present within the proposed mitigation areas due to construction (excavation, grading, heavy equipment use, etc.). A Programmatic Biological Opinion (BO) is in place for most USACE operations. All ABB and NLEB incidental take related to the Emergency Actions and related mitigation is addressed in the BO and will be reported in the annual reports to the Service as required.

From: Watson, Justyss A CIV USARMY CESWF (USA) <Justyss.A.Watson@usace.army.mil>
Sent: Wednesday, December 29, 2021 7:49 AM
To: Stubbs, Kevin <kevin_stubbs@fws.gov>
Cc: Pinsky, Jeffrey F CIV USARMY CESWF (USA) <Jeffrey.F.Pinsky@usace.army.mil>; Knack, Jeff A CIV USARMY CESWT (USA) <Jeff.Knack@usace.army.mil>
Subject: [EXTERNAL] MKARNS After-Action Biological Assessment

Good Morning Kevin!

I was checking in on the status on FWS' review of the MKARNS After-Action Biological Assessment. I submitted the Biological Assessment on August 30th, so I believe we are closing the 90-day timeframe for formal consultation. Can USACE expect a Concurrence Letter or will need to wait on a Biological Opinion?

I appreciate your time during this process, thank you.

Respectfully,

Justyss Watson (she/her)

Biologist
NEPA and Natural Resource Section
Environmental Branch
Regional Planning and Environmental Center
U.S. Army Corps of Engineers
justyss.a.watson@usace.army.mil
Office: 817-886-1828

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Ecological Services Program

Oklahoma Ecological Services Field Office
9014 East 21st Street
Tulsa, Oklahoma 74129
918/581-7458 / (FAX) 918/581-7467

In Reply Refer To:
FWS/R2/OKES/
02EKOK00-202

June 28, 2022

Kevin W. DaVee PG, PMP
Director, Regional Planning and Environmental Center
U.S. Army Corps of Engineers
Room 3A12
819 Taylor Street
Fort Worth, Texas 76102-0300

Dear Mr DaVee:

This letter provides the U.S. Fish and Wildlife Service's (Service) Final Coordination Act Report (Report) based on our review of the Corps of Engineers (Corps) emergency action for the Webbers Falls Pool and Robert S. Kerr Pool Emergency Dredging and Open Water Disposal Project. The purpose of the emergency action project was to remove the sediment impounded due to May and June 2019 floods within the McClellan-Kerr Arkansas River Navigation System (MKARNS), facilitate the passage of equipment to complete the removal of two sunken barges, and reopen the channel to navigation.

The Corps has prepared an Environmental Assessment to evaluate the impacts from the emergency dredging and disposal. The emergency actions and associated mitigation actions are in compliance with the Endangered Species Act of 1973, as amended, through an existing programmatic biological opinion with the Corps. Potential incidental take for the northern long-eared bat (*Myotis septentrionalis*) and American burying beetle (*Nicrophorus americanus*) is addressed in that formal consultation. No additional consultation is necessary unless new information or actions affect federally-listed species in a manner that is not addressed in the programmatic biological opinion.

The Service has provided information and participated throughout the project evaluation and mitigation process. The Service supports the proposed mitigation for the Webbers Falls Pool and Robert S. Kerr Pool and the Oklahoma Department of Wildlife Conservation has concurred with the Report, including the mitigation recommendations. The Oklahoma Department of Wildlife Conservation concurrence is provided in an appendix to the Report.

The proposed mitigation would restore wetland and bottomland hardwood forest functions at some Corps properties within the MKARNS. The proposed mitigation would increase the

amount of wetland and forested habitat for migratory birds, threatened and endangered species, and other wildlife over time. Any questions or comments should be referred to Mr. Kevin Stubbs at 918-695-6769 or kevin_stubbs@fws.gov.

Sincerely,

Kenneth Collins
Field Supervisor

Enclosure

Fish and Wildlife Coordination Act Report

on

Webbers Falls Pool and Robert S. Kerr Pool Emergency Dredging and Open Water Disposal

Prepared by:

Oklahoma Ecological Services Field Office

Tulsa, Oklahoma

Executive Summary

Study Description

The U.S. Army Corps of Engineers has prepared an Environmental Assessment (EA) to evaluate the impacts from the emergency dredging and disposal caused by the 2019 flooding in southeastern Kansas and northeastern Oklahoma. The flooding caused approximately 600,000 cubic feet per second of flow within the Arkansas River, leading to an enormous volume of sediment to pass through upstream dams and into the McClellan-Kerr Arkansas River Navigation System (MKARNS). In addition to the sediment, two barges moored in Muskogee, Oklahoma tore loose and were carried downstream, becoming lodged at the Webbers Falls Pool Lock and Dam 16.

Authority

The EA was prepared in accordance with 33 Code of Federal Regulations (CFR) Part 230 and the 1978 Council on Environmental Quality 40 CFR Parts 1500-1508, as amended in 1986 and 2005. In fulfillment with these and all other legal, regulatory, and policy requirements the EA describes the purpose and need for the action, the range of alternatives considered, and discloses the environmental impacts of the alternatives.

The Fish and Wildlife Coordination Act of March 10, 1934 (FWCA), authorizes the Secretaries of Agriculture and Commerce to aid and cooperate with Federal and State agencies to protect, rear, stock, and increase the supply of game and fur-bearing animals, as well as to study the effects of domestic sewage, trade wastes, and other polluting substances on wildlife. The amendments enacted in 1946 (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq*.) require consultation with the U.S. Fish and Wildlife Service (Service) and the fish and wildlife agencies of States where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified" by any agency under a Federal permit or license. This Coordination Act Report constitutes the report of the Secretary of Interior as required by Section 2(b) of the FWCA.

Study Purpose

The purpose of the Emergency Action was to remove the sediment impounded because of the May and June 2019 floods within the MKARNS; facilitate the passage of equipment to complete the removal of the two sunken barges; and reopen the channel to navigation.

Study Scope

The study has evaluated two alternatives, the No Action Alternative and the Emergency Action Alternative. It should be noted that all compliance has been completed after-the-fact, so the Emergency Action Alternative has already been implemented. The USACE has evaluated the effects of implementation of the action of resources within the study area and describes proposed mitigation efforts to compensate for natural resources lost.

Location

The study area geographically encompasses the MKARNS from the Port of Catoosa near Tulsa, Oklahoma to near the Arkansas state-boundary near Fort Smith.

Problems, Opportunities, and Objectives

Under normal conditions, the action would have undergone environmental compliance before implementation. The main problem with the Emergency Action is the disposal of sediment within viable significant habitat types. Because the Emergency Action was not studied ahead of time,

adequate disposal locations were not available for use near the dredging locations. This led to impacts to emergent wetland, forested wetland, bottomland hardwood forests, and open water habitat.

The objective of the Emergency Action was to remove the sediment impounded due to flooding; facilitate the passage of equipment to complete the removal of the two sunken barges; repair the damaged gates; and reopen the channel to navigation in a timely manner.

Alternatives

The After-Action EA focuses on three core actions 1) dredging of the MKARNS, 2) disposal of dredged sediment, and 3) the mitigation associated with loss of significant habitats due to sediment disposal. The MKARNS required dredging to facilitate removal of the barges from the Webbers Falls Pool Lock and Dam 16 gates and to restore two-way navigation for commerce within the channel. Disposal was necessary to continue dredging the channel. Related disposal sites were chosen based on proximity to the dredge locations and coordination with resource agencies. The subsequent impacts require compensatory mitigation, which will require restoration or conversion of terrestrial areas into appropriate wetland and upland habitats. The No Action Alternative would have led to a permanent drawdown of Webbers Fall Pool due to the sunken barges and inability to repair the gates at Lock and Dam 16. The MKARNS would have become unnavigable resulting in local, regional, and national losses of hundreds of millions of dollars because barges would not have been able to ascend or descend the system. In addition to economic losses, there would have been a loss of important fish and wildlife resources associated with open water and wetland habitats.

Because this is an after-action report, the plan selection process was limited to evaluating the need for either a No Action Alternative (Future-Without Project) and the Emergency Action Alternative. The Emergency Action was carried forward under the Tulsa District Commander's emergency declaration.

Major Findings and Conclusions

The Service has provided information and participated throughout the project evaluation and mitigation process. The Service supports the Emergency Action Alternative as some impacts were unavoidable due to the 2019 flooding. The Service supports the proposed mitigation for the Webbers Falls Pool and Robert S. Kerr Pool. The proposed mitigation would restore, to the extent practicable, the wetland and bottomland hardwood forest functions of some Corps properties within the MKARNS. The proposed mitigation would provide benefits to wildlife that require wetland features and would increase the amount of forested habitat for migratory birds, threatened and endangered species, and other wildlife over time.

Table of Contents

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1 Introduction

This draft Fish and Wildlife Coordination Act Report has been prepared in accordance with provisions of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C.661 *et seq*.) and other authorities. The purpose of the FWCA is to provide for equal consideration of fish and wildlife conservation with other features of federally funded or permitted water resource development projects. Once finalized, this report will fulfill the reporting requirements as set forth in Section 2(b) of the FWCA.

This report provides: 1) a description of the public fish and wildlife resources within the proposed study area; 2) a list of observed and potentially present federally-listed endangered, threatened, proposed and candidate species, as well as State-listed species and all sensitive flora and fauna within the proposed project area; 3) an analysis of the alternatives and the effects on biological resources of the refined project area; and 4) our recommendations regarding the Emergency Action.

An After-Action Environmental Assessment (EA) is being prepared by the U.S. Army Corps of Engineers (USACE) Tulsa District (SWT) for the emergency dredging and disposal of approximately 1.6 million cubic yards (cys) of sediment from the McClellan-Kerr Arkansas River Navigation System (MKARNS). In addition, the EA also will evaluate the impacts of sediment disposal on approximately 288.2 acres of open water, 31.4 acres of emergent wetland, 2.4 acres of forested wetland, and 10 acres of bottomland hardwood forest habitat and the proposed mitigation for each habitat type. The National Environmental Policy Act (NEPA) requirements for the emergency dredging and disposal were postponed because the actions were implemented under an emergency declaration, described further in Section 1.2. Recommendations in this report will be considered after completion of the emergency dredging and disposal; however, compensatory mitigation cannot be implemented until the completion of cultural resources investigations at the proposed mitigation sites. Additional mitigation is recommended to compensate for delays in implementation.

1.1 Purpose and Need

Record rainfall in May and June 2019 in southeastern Kansas and in northeastern Oklahoma caused approximately 15 USACE reservoirs in the Upper Arkansas River Basin, Verdigris River Basin, and Grand (Neosho) River Basin (all within Tulsa District), to reach or exceed the maximum extent of the flood pool elevation. While Tulsa District worked to lessen the effects of flooding downstream, significant and, in some cases, catastrophic flooding was unavoidable.

River flows, measured in cubic feet per second (cfs), were overwhelming within large portions of the river system. Below Keystone Dam, west of Tulsa, Oklahoma, the rate of river flow approached 300,000 cfs at its maximum volume. Approximately 50 miles southeast of Tulsa, Oklahoma on the Arkansas River below Muskogee, Oklahoma - downstream from the Arkansas River confluence with the Verdigris River and the Grand (Neosho) River at the location known locally as "Three Forks" - the flow eclipsed 600,000 cfs in volume.

The Arkansas River within the Webbers Falls Pool, at a sustained volume of over 600,000 cfs for more than a week, was carrying an enormous volume of sediment which was eroded from the three upstream feeder river basins and was passed through upstream dams and into the Navigation System, where much of it was subsequently deposited.

On May 23, 2019, two fully loaded barges moored in Muskogee, Oklahoma tore loose and were carried downstream, where they collided with Webbers Falls Pool Lock and Dam 16 and sunk. After sinking, the barges were forced against three of the structure's gates which had been fully open for the high river flow; because the two barges impeded the operation of the gates, those

gates could not be closed. The inability to control the gates impacted by the barges led to an uncontrolled pool drawdown in the Webbers Falls Pool upstream of the Webbers Falls Lock and Dam 16.

Removal of the barges/operation of the Webbers Falls gates was dependent on the emergency dredging action, specifically the dredging within the Robert S. Kerr Pool. Without appropriate action by the USACE, removal of the two barges at Webbers Falls Pool Lock and Dam 16 would have been delayed and the flood gates would have remained open. This would have led to operational issues and a permanent pool drawdown, creating significant impacts to the human and natural resources. The No Action Alternative would have led to a permanent drawdown of Webbers Fall Pool due to the sunken barges and inability to repair the gates at Lock and Dam 16.

A tow barge was required to perform the extraction of the barges at Webbers Falls Pool Lock and Dam 16, and the tow barge had to travel the channel upstream from Arkansas through the Robert S. Kerr Pool. The inability of vessels to safely navigate within the MKARNS also hampered the removal of the barges. The barges were removed in 2019, but the impacts of the unavoidable water drawdown resulting from their impact on the dam structure were significant. In addition, the cfs leaking at the two open gates put too much pressure on the barges to allow for removal, which required USACE to empty the pool more rapidly. This reduced the pressure off of the barges and allowed salvage equipment to begin removing the barges. In the opinion of the USACE, the unavoidable pool drawdown necessary to effect removal of the two barges, and the subsequent impacts of this rapid drawdown, were not a result of the Federal emergency actions. Therefore, any impacts resulting from the pool drawdown are not considered as an effect of the Emergency Action and will not be evaluated within the EA.

Deposited sediments prohibited the safe passage of barge and similar size draft vessels between Robert S. Kerr Pool Lock and Dam and Webbers Falls Pool Lock and Dam 16. The purpose of the Emergency Action was to remove the sediment deposited because of the May and June 2019 floods; facilitate the passage of equipment to complete the removal of the two sunken barges; and reopen the channel to navigation.

1.2 Project Authority

The emergency dredging and disposal, known hereafter as the Emergency Action, was conducted under the Council of Environmental Quality (CEQ) regulation 40 Code of Federal Regulations § 1506.12, which provides guidance for alternative arrangements for NEPA compliance in regard to emergency declarations. Immediate action by USACE was believed necessary to secure lives and safety of citizens and to protect valuable resources. The EA has been prepared to evaluate the potential adverse effects of the Emergency Action in accordance with 40 CFR § 1500-1508.

The Fish and Wildlife Coordination Act of March 10, 1934, authorizes the Secretaries of Agriculture and Commerce to aid and cooperate with Federal and State agencies to protect, rear, stock, and increase the supply of game and fur-bearing animals, as well as to study the effects of domestic sewage, trade wastes, and other polluting substances on wildlife. The amendments enacted in 1946 require consultation with the U.S. Fish and Wildlife Service (Service) and the fish and wildlife agencies of States where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified" by any agency under a Federal permit or license. Consultation is to be undertaken for the purpose of "preventing loss of and damage to wildlife resources." Coordination between USACE and the Service is required due to the enactment of the Emergency Action within the Arkansas River, including the Webbers Falls Pool and Robert S. Kerr Pool.

2 Description of the Study Area

The study area geographically encompasses the MKARNS from the Port of Catoosa near Tulsa, Oklahoma to the Arkansas state-boundary near Fort Smith while still staying within the limits of the state of Oklahoma (Figure 1). The study area has been used to describe the overall existing condition of natural resources.

Figure 1. The McClellan-Kerr Arkansas River Navigation System Study Area.

2.1 Refined Project Area

The study area was refined to specific project areas after completion of emergency dredging and disposal. Project Area or Areas is used to describe impacts relating to sediment dredging and disposal sites, as well as the proposed mitigation sites. All project areas occurred within the boundaries of USACE fee-owned property. Individual project areas are provided in Appendix A.

3 Fish and Wildlife Resource Concerns, Problems, Needs, and Planning Objectives

The aquatic ecosystem of the Arkansas River was degraded due to sediment disposal into emergent wetlands, forested wetlands, bottomland hardwood forest, and open water habitat. The sediment disposal, described in further detail in Section 6 below, significantly altered existing habitat types that cannot be restored to their original condition.

The objective of the Emergency Action was to:

- Remove the sediment impounded due to flooding;
- Facilitate the passage of equipment to complete the removal of the two sunken barges;
- Repair the damaged gates; and

- Reopen the channel to navigation in a timely manner.

Although the dredging and disposal has been completed, a need exists for USACE to share the impacts of the Emergency Action with the public; seek compliance with applicable laws and regulations, and mitigate the adverse impacts of sediment disposal. There were approximately 288.2 acres of open water disposal; however, the impact to open water habitat is assumed by USACE, to be self-mitigating due to the nature of the sediment placement adjacent to the dredge locations.

4 Evaluation Methodology

The SWT Regulatory Office (RO), in implementing USACE or permit applicant obligations under Section 404 of the Clean Water Act (CWA) or Section 10 of the Rivers and Harbors act, utilizes regulations under 33 Code of Federal Regulations (CFR) Part 332. The purpose of 33 CFR 332 is "to establish standards and criteria for the use of all types of compensatory mitigation, including on-site and off-site permittee-responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts to waters of the United States authorized through issuance of Department of the Army (DA) permits pursuant to section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344) and/or sections 9 or 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 401, 403)."

While Part 332 is written as a forward-looking mitigation planning tool, predicated on the idea that permit applicants will complete mitigation analysis as part of the 404-permit process, SWT RO regularly applies these regulations as part of the Section 404 CWA permit process. Application of part 332 through standard RO processes are in place to allow for determinations of appropriate mitigation strategies and requirements on an after-the-fact basis. Because the USACE project has been funded with supplemental Operations and Maintenance funding, the use of 33 CFR 332 is legally sufficient regarding mitigation. Therefore, mitigation ratios were applied to the compensatory mitigation needs. Note that these ratios were prepared for restoration and enhancement mitigation methods. The SWT Operations Division will implement creation of the impacted habitat types (bottomland hardwood forest, forested wetlands, and emergent wetlands) for all the proposed mitigation, resulting in a greater net increase as compared to restoration/enhancement methods. The ratios are as follows:

- Emergent Wetland – 2.5:1
- Forested Wetland – 4.5:1
- Bottomland Hardwood Forest – 1.5:1
- Open Water – 1:1

The ratio for bottomland hardwood forest was increased to 1.5:1 based on the Service's recommendation.

5 Description of Fish and Wildlife Resources

This section includes a description of the existing conditions, and a description of the future without-project (FWOP) conditions.

5.1 Existing

The MKARNS consists of a navigation channel with loose sand substrate, and channel borders that range from steep riprapped banks to extensive shallow mud flats. A diverse array of aquatic environments including major rivers and their tributaries, lakes, cutoffs, and wetlands that result

in diverse habitats supporting a variety of aquatic flora and fauna may be found within the MKARNS. Important riverine elements within the study area include the Arkansas River and its associated side channels, dikes, revetments, locks, dams, navigation pools, cutoffs, backwaters, and tributary mouths. Additionally, several major tributaries to the MKARNS have been impounded to create reservoirs that are managed to support recreational sport fish populations, as well as shallow water habitats for fish, migratory waterfowl, and other aquatic biota.

The Arkansas River maintains a continuous turbid appearance due to sand and suspended silt. The water is slightly saline due to presence of large, natural salt beds within the Arkansas River floodplain in Oklahoma and Kansas. After the completion of the MKARNS's impoundments, river flows stabilized and formed large pools, which increased the extent of surface water, deep water and backwater habitats. Consequently, the aquatic habitats of the system were altered from historic conditions that pre-dated these impoundments.

Most mussel (unionid) beds or patches in the MKARNS were primarily found in substrates consisting of a sand, silt, and clay mixture. Dominant species include the mapleleaf (*Quadrula quadrula*), threehorn wartyback (*Obliquaria reflexa*) and the pimpleback (*Quadrula pustulosa*). This substrate mixture typically occurrs as a transition zone between the clay, silt, or riprapped banks, islands, or dikes and the sand channel. These habitats were most frequently associated with a gently sloping shelf between two steeper slopes at depths of greater than 33 feet or gently sloping banks near islands, dikes, and riverbanks less than 3 feet deep.

5.1.1 Terrestrial Resources

The two primary forest communities in the study area are the bottomland hardwood forest community along the Arkansas River and the upland forest community. The bottomland hardwood forest community occurs within the floodplain of the Arkansas River or in riparian areas immediately adjacent to small streams. The dominant bottomland hardwood trees include cottonwood (*Populus deltoides*), sycamore (*Platanus occidentalis*), green ash (*Fraxinus pennsylvanica*), pecan (*Carya illinoensis*), box elder (*Acer negundo*), river birch (*Betula nigra*), black willow (*Salix nigra*), silver maple (*Acer saccharinum*), black walnut (*Juglans nigra*), sugarberry (*Celtis laevigata*), bur oak (Quercus macrocarpa), pin oak (Quercus palustris), shumard oak (Quercus shumardii), water oak (*Quercus nigra*), overcup oak (*Quercus lyrata*), and willow oak (*Quercus phellos*). Bald cypress (*Taxoidium distichum*) has been introduced in some locations but is uncommon.

The upland forest community in the study area exists on drier areas, usually the tops of high ridges, south facing slopes, and/or west facing slopes, and is characterized by generally slow growing species that are adapted to dry conditions and poor soils. This forest community, called the Cross Timbers, is a complex mosaic of upland forest, savanna, and glade habitats that form the broad ecotone between the eastern deciduous forests and the grasslands of the southern Great Plains. The pre-settlement Cross Timbers are believed to have covered over 30,000 square miles, extending from central Texas across Oklahoma into southeastern Kansas. The short, stout oaks of the Cross Timbers were not ideal for lumber production, so the original trees often survived on steep terrain that was unsuitable for farming. Thousands of ancient post oak can still be found in eastern Oklahoma, and the Cross Timbers is one of the least disturbed forest types left in the eastern United States.

Cross Timbers overstory species include post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), eastern red cedar (*Juniperus virginiana*), black hickory (*Carya texana*), pignut hickory (*Carya ovalis*), bitternut hickory (*Carya cordiformis*), and shortleaf pine (*Pinus echinata*). Carolina buckthorn (*Rhamnus caroliniana*), rusty blackhaw (*Viburnum rufidulum*), winged elm

(*Ulmus alata*), buckbrush (*Symphoricarpos orbiculatus*), and farkleberry (*Vaccinium arboreum*) are typical understory species adapted to dry conditions within the action area.

Fields that are not routinely maintained through mowing, burning, or disking are dominated by old field communities that consist of perennial grasses, forbs, and early successional woody species. Typical old field vegetation includes blackberry (*Rubus* spp*.),* Johnsongrass (*Sorghum halepense*), winged sumac (*Rhus copallina*), smooth sumac (*Rhus glabra*), eastern red cedar (*Juniperus virginiana*), winged elm, persimmon (*Diospyros virginiana*), mockernut hickory (*Carya tomentosa*), bitternut hickory (*Carya cordiformis*), sassafras (*Sassafras albidium*), and sweetgum (*Liquidambar styraciflua*). Frequently mowed areas are dominated by introduced cool season grasses such as tall fescue (*Festuca arundinacea*), and warm season grasses such as Bermuda grass (*Cynodon dactylon*).

5.1.2 Aquatic Resources

At lower river elevations, wetlands consist of emergent herbaceous wetlands and forested wetlands characterized by rooted, herbaceous hydrophytes that typically grow in flooded soils. Emergent wetlands are found along the edge of the Arkansas River. In poorly drained sites, sedges (*Carex spp*.), willows (*Salix spp*.) and buttonbush (*Cephalanthus occidentalis*) form thickets along wetland edges. These wetlands are typically found on the backside of broad stable flood plains. Sediment loading is limited to large flood events. Surface water accumulation is from both riverbank flooding and runoff from adjacent uplands.

Emergent wetlands provide food and shelter for fish and wildlife species, including larval fish, waterfowl and macroinvertebrates, which make up the foundation of the aquatic food chain, and habitat for various amphibians, reptiles, birds, mammals and insects. Frogs and salamanders use emergent wetlands for breeding and egg laying. Ducks and migratory birds use them for resting areas on migration routes and for nesting. Mammals like raccoons (*Procyon lotor*), and otters (*Lontra canadensis*) find food and shelter in the wetlands. Abundant aquatic insects provide a food source for fish, aquatic invertebrates, amphibians, reptiles, and birds, and break down organic material present in riverine and riparian wetland areas. Because these wetland communities are found in lower elevations, or are associated with more permanent open water habitats, they have been the most susceptible to disruptive and unnatural flow regimes resulting from the construction and operation of the lock and dam system within the MKARNS. Emergent wetland vegetative species within the project areas included cattail (*Typha spp*.), smartweed (*Polygonum spp*.), nutsedge (*Cyperus spp*.), soft rush (*Juncus effusus*), and other unidentified rushes.

Forested wetlands in the study area are open, occasionally flooded areas dominated by shrub and hardwood saplings mixed with emergent herbaceous vegetation. These wetland communities are found at elevations slightly above those of emergent wetland communities and are located adjacent to riverbanks where less frequent inundation by flows and reduced scour allows shrub and sapling strata to establish. Forested wetland tree species include American sycamore (*Platanus occidentalis*), elm (Ulmus spp.), green ash, and black willow. Emergent wetland vegetation within the forested wetland habitats included soft rush, and shrubby species like buttonbush.

Open water areas in the study area are characterized by deep water where light does not generally penetrate all the way to the bottom substrates. The productivity of this zone largely depends upon the organic content of the sediment, the amount of physical structure, and in some cases upon the rate of fish predation. Sandy substrates contain relatively little organic matter for organisms and poor protection from predatory fish. Higher plant growth is typically sparse in sandy sediment because the sand is unstable and nutrient deficient. Rocky substrates provide a high diversity of potential habitats offering protection (refuge) from predators,

substrate for attached algae, and pockets of organic "ooze" (food). A flat mucky bottom offers abundant food for benthic organisms but is less protected and may have a lower diversity of structural habitats unless it is colonized by higher plants. The euphotic zone is also found within this deep-water region and is the layer of water below the surface where sunlight is still sufficient for photosynthesis to occur

Wetlands present throughout the study area are primarily scattered across the floodplain of the Arkansas River valley. The USACE and U.S. Environmental Protection Agency (EPA) jointly define wetlands as: areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. A variety of wetland types are shown in Figure 2 and Figure 3. However, this mapping system is only an estimate and required field verification. On January 25th and 27th 2021, USACE personnel accessed the Emergency Action project areas to assess the impacts caused by the sediment disposal. The site visit confirmed that emergent wetlands, forested wetlands, and open water habitats were impacted by the Emergency Action.

The National Wetland Inventory (NWI) (2020) was primarily used to identify wetlands in the impacted project area as displayed in the figures below. The survey confirms and indicates a portion of the project areas are wetlands. The NWI maps convey a variety of riverine, lacustrine, and palustrine wetlands exist in the action area. The palustrine system includes forested, emergent, scrub-shrub, and aquatic bed classes. The riverine system includes lower perennial and intermittent subsystems as well as open water, streambed, unconsolidated bottom, and unconsolidated shore classes. The lacustrine system includes limnetic and littoral subsystems as well as open water, unconsolidated shore, unconsolidated bottom, and aquatic bed classes. Water regimes include temporarily flooded, seasonally flooded, semi-permanently flooded, intermittently exposed, and permanently flooded.

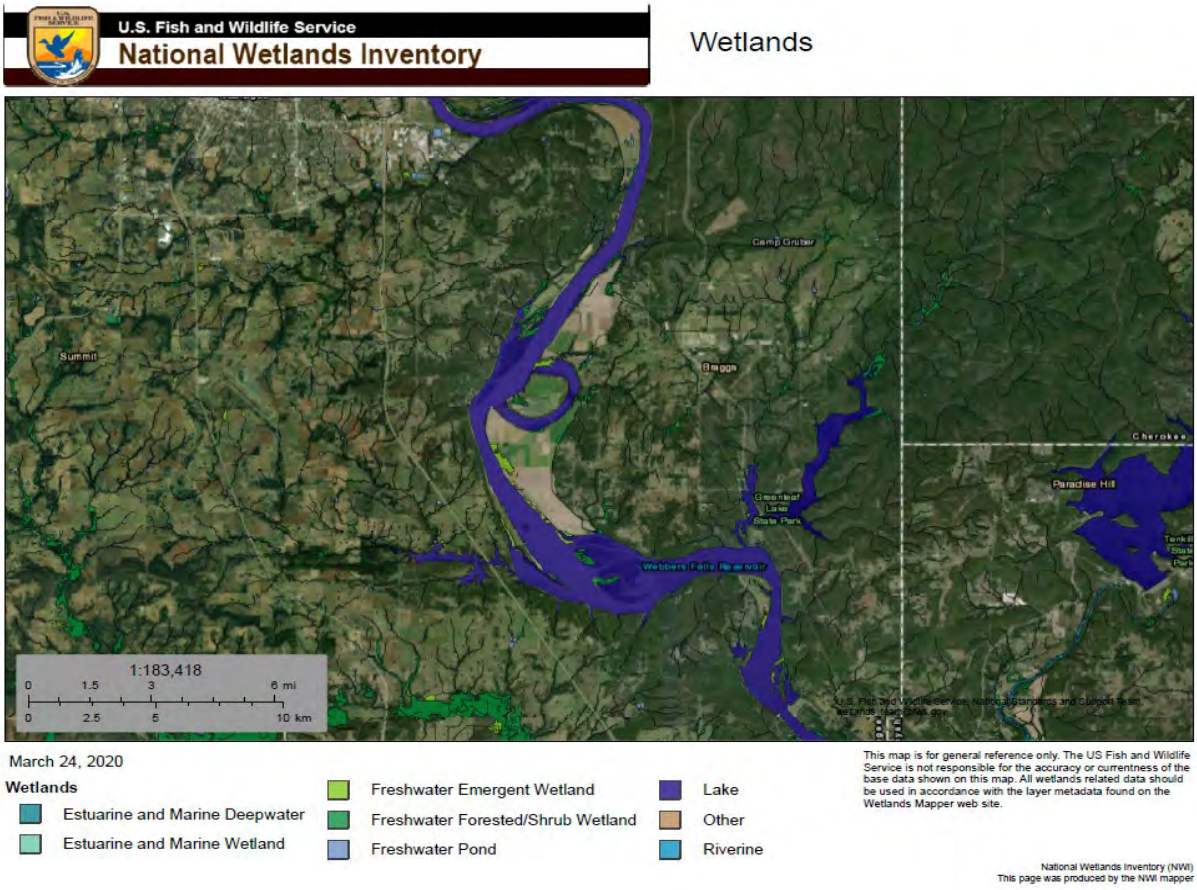

Figure 2. Wetland Types within the Action Area in the Vicinity of Webbers Falls Reservoir.

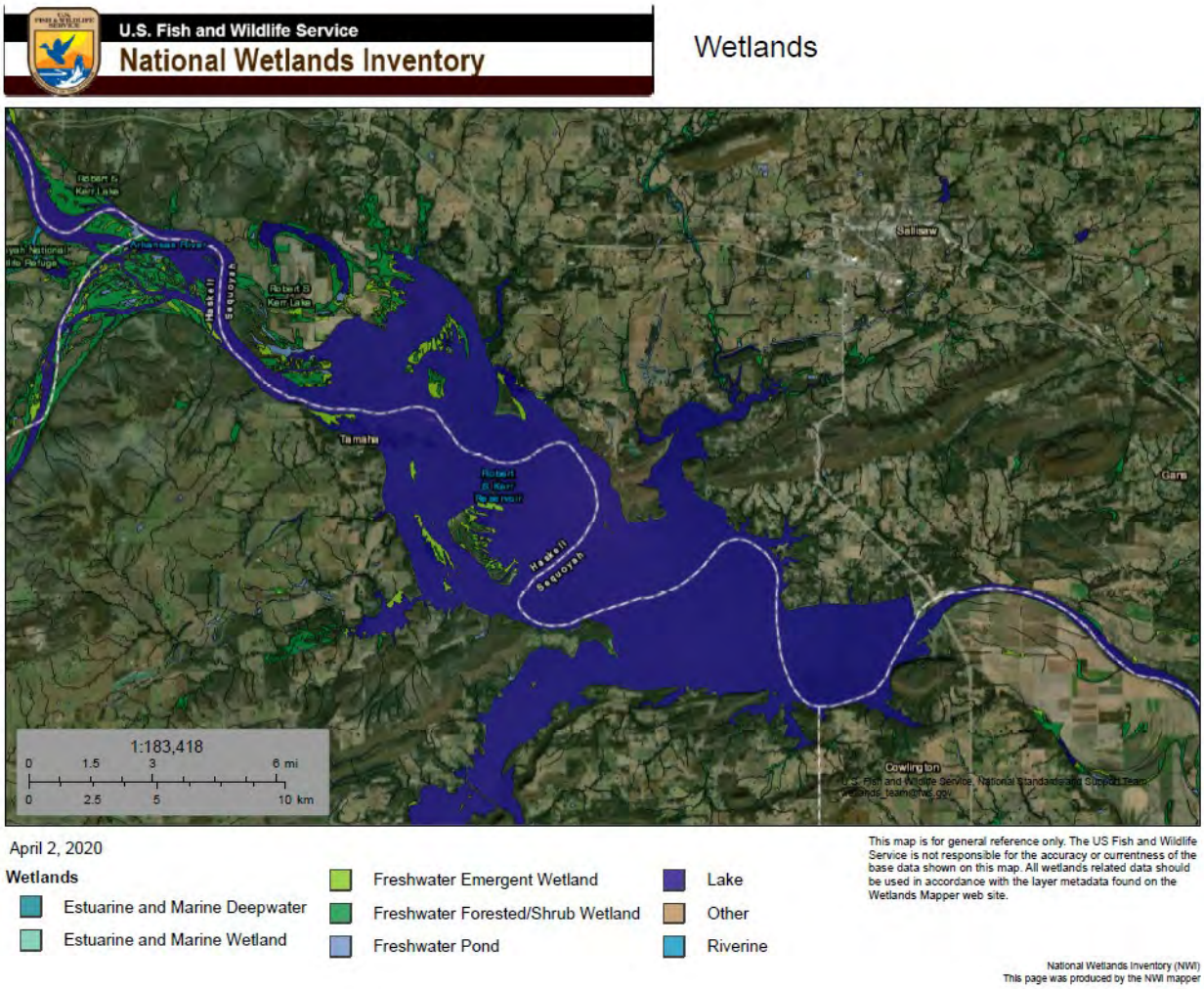

Figure 3. Wetland Types within the Action Area in the Vicinity of R.S. Kerr Reservoir.

5.1.3 Sequoyah National Wildlife Refuge

The Sequoyah National Wildlife Refuge is 20,800 acres of open water and bottomland hardwood habitat spread throughout USACE fee-owned property (Service, 2020) (Figure 4). Lands were designated for the refuge to replace wildlife habitat and waterfowl hunting opportunities lost due to the construction of the Robert S. Kerr Pool (USACE, 2015). The primary management practice within the Sequoyah National Wildlife Refuge is the establishment of large food plots within the refuge to attract large concentrations of migrating and wintering waterfowl. Another highly successful management practice within the refuge is the restoration of bottomland hardwoods and construction and maintenance of large, controlled water level marshes. These marshes can be drained during the growing season; managed for emergent vegetation or planted to crops; and then reflooded in the fall. Due to the relatively stable water levels of the navigation project, the crops on the refuge produce a good yield in most years.

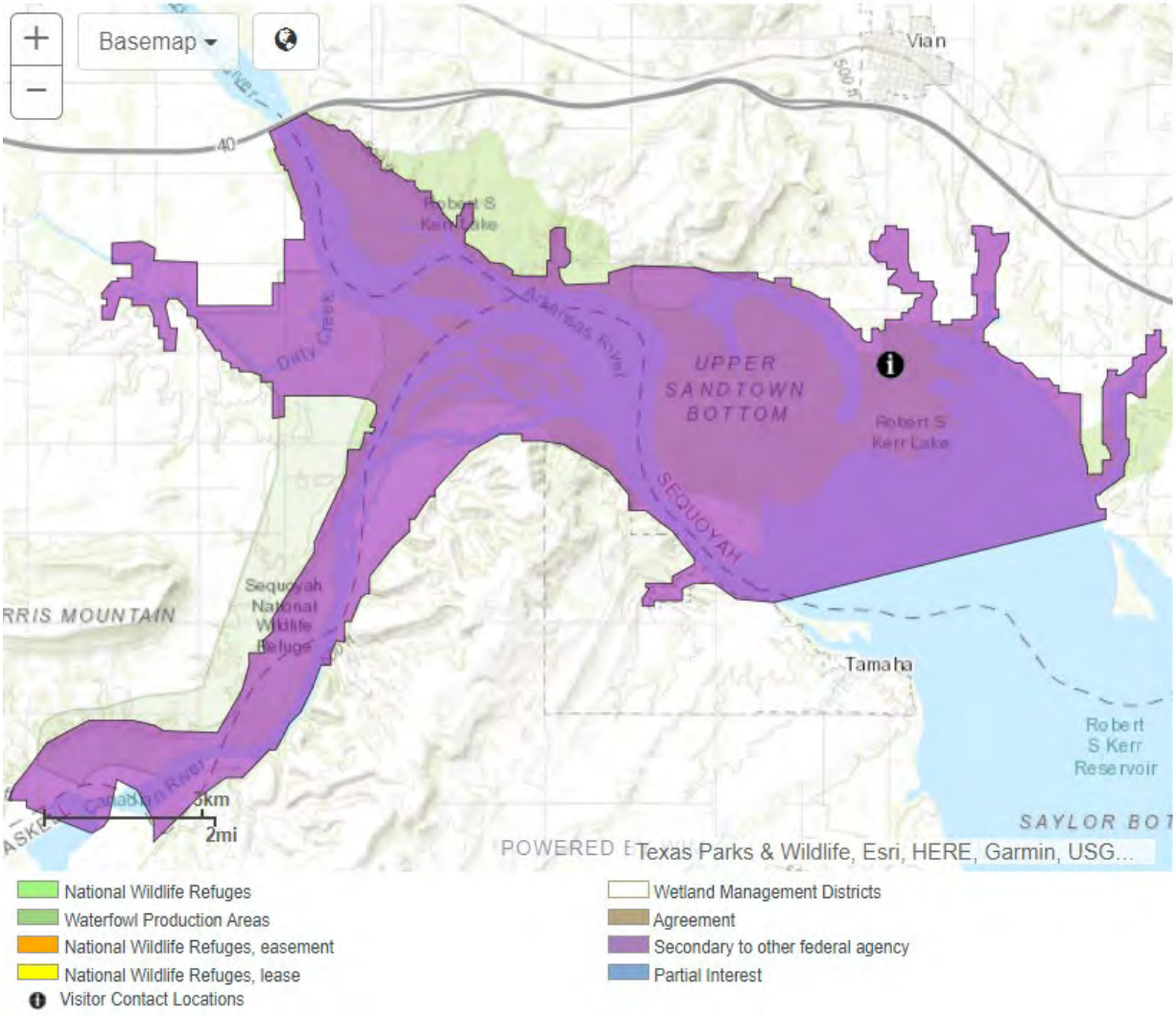

Figure 4. Sequoyah National Wildlife Refuge (Service, 2020).

Migrating birds, including waterfowl, shorebirds, and raptors regularly use the refuge as an important nesting and stopover destination. There are approximately 250-plus species of birds that are likely to use bottomland hardwood forests in eastern Oklahoma. The refuge is intensively managed for wading bird, shorebird, and waterfowl food production and are actively managed to provide an appropriate food source during winter months.

5.1.4 Federally-listed Threatened and Endangered Species

The Service's Information for Planning and Consultation (IPaC) database provides the threatened and endangered species that may occur within the project area (Table 1). Based on the habitat requirements of listed species, the likelihood of listed species occurring within the project area was evaluated based on existing habitat conditions. The Interior least tern (ILT) was a Federally- listed species during implementation of the Emergency Action but was delisted on January 13, 2021.

Table 1. Federally Listed Threatened and Endangered Species (Service, 2021)

Name	Scientific Name	Federal Listing	Likely to Occur in Project Area
Mammals			
Gray Bat	*Myotis grisescens*	Endangered	No
Indiana Bat	*Myotis sodalis*	Endangered	No
Northern Long-eared Bat	*Myotis septentrionalis*	Threatened	Yes
Ozark Big-eared Bat	*Corynorhinus (=Plecotus) townsendii ingens*	Endangered	No
Birds			
Piping Plover	*Charadrius melodus*	Threatened	No
Rufa Red Knot	*Calidris canutus rufa*	Threatened	No
Whooping Crane	*Grus americana*	Endangered	No
Interior Least Tern	*Sterna antillarum*	Endangered	Yes
Fishes			
Ozark Cavefish	*Amblyopsis rosae*	Threatened	No
Clams			
Neosho Mucket	*Lampsilis rafinesqueana*	Endangered	No
Rabbitsfoot	*Quadrula cylindrica cylindrica*	Threatened	No
Insects			
American Burying Beetle	*Nicrophorus americanus*	Threatened	Yes

5.2 Future-Without Project

5.2.1 Terrestrial Resources

Under the Future-Without Project scenario, terrestrial resources would respond in various ways. A permanent drawdown of Webbers Falls Pool would lead to reduced food, water, and cover that would typically be available along the water's edge. Seasonal water drawdowns have been known to have beneficial impacts on wildlife that rely on wetlands and other aquatic resources;

however, the effect of a large-scale permanent drawdown could adversely impact species intolerant of this type of alteration. Wetland areas that are conducive to habitat factors for various mammals, birds, amphibians, and reptiles would decrease in availability, but would increase dry-land space for species that may not require a wetland habitat for breeding or nesting. There would be an overall loss of microorganisms, invertebrates, fish, and other wildlife that would severely impact the ecosystem within the MKARNS.

5.2.2 Aquatic Resources

The Future-Without Project scenario would have potentially killed some native aquatic vegetation with less permanent and stable water levels. Emergent herbaceous communities dominate wetland habitats located within the active river channel. These communities are more prone to structural instability from rapid changes in the flow regime making their size and placement in the river corridor more transient. Wetland soils and emergent vegetation would be subject to habitat alteration caused by changes in river geomorphology. Frequent desiccation also reduces formation of wetland soils and selects for early successive invasive species, such as Johnsongrass, that impact vegetative communities. The permanent drawdown of the Future-Without Project would adversely impact some wetlands by drying vegetation for an extended period. Species inhabiting the littoral zone would be exposed to drying in the summer and freezing in the winter. The river fluctuation would have a drying effect on wetland habitats that serve as nurseries for juvenile fish and habitat for migrating waterfowl. Low flows would further affect the geomorphology of the MKARNS, producing increased streambank erosion and the less frequent inundation of riverine wetlands and oxbow habitats.

6 Summary of Plan Selection Process and Identification of Evaluated Alternatives

The After-Action EA focuses on three core actions 1) dredging of the MKARNS, 2) disposal of dredged sediment, and 3) the mitigation associated with loss of significant habitats due to sediment disposal. Dredging within the MKARNS was required to remove the barges from the Webbers Falls Pool Lock and Dam 16 gates and to restore two-way navigation for commerce within the channel. Disposal was necessary to continue dredging the channel. Related disposal sites were chosen based on proximity to the dredge locations and coordination with resource agencies. The subsequent impacts will require compensatory mitigation, which will result in the conversion of some terrestrial areas into wetland habitats.

Because this is an after-action report, the plan selection process was limited to evaluating the need for either a No Action Alternative (Future-Without Project) and the Emergency Action Alternative. As discussed in Section 1, the Emergency Action was carried forward under the SWT Commander’s emergency declaration.

6.1 No Action Alternative

The No Action Alternative or No Action, while it does not meet the purpose of, or need for, the Emergency Action, serves as a benchmark of existing conditions against which Federal actions can be evaluated. This alternative is included in the USACE evaluation pursuant to CEQ regulations 40 CFR § 1502.14(d).

Under the No Action Alternative, the USACE would not have dredged or disposed the sediment associated with the 2019 flooding. The USACE would have allowed the sediment impoundment to prohibit the safe passage of barge and similar size draft vessels between Robert S. Kerr Lock and Dam and Webbers Falls Pool Lock and Dam 16 along the MKARNS ship channel. The No Action Alternative would have led to the continued delay of the removal of the two barges at

Webbers Falls Pool Lock and Dam 16 and the dam flood gates would have remained open. This would have led to operational issues and a permanent pool drawdown, creating significant impacts to the human and natural resources.

6.2 Emergency Action Alternative

The Emergency Action incorporates the dredging and disposal of sediment impounded because of the May and June 2019 floods. It included extensive dredging in the locations noted in Table 2 for an approximate total of 1.6 million cys. The dredged material was placed in locations within 1,500 feet of dredging operations, with some variation depending on local conditions in the MKARNS and pools. The dredge and disposal areas are all located within USACE fee-owned property. Some disposal was in previously approved disposal sites but other emergency disposal was in areas that were not approved sites. The disposal areas have varying levels of environmental impact because they were placed in existing disposal sites, bottomland hardwood forest, emergent wetland, forested wetland, and open water habitats. The areas that were previously bottomland hardwood forest, emergent wetland, forested wetland, and open water habitat were not approved in any existing NEPA document for SWT (Table 2). Water quality certification through the state of Oklahoma is required for open water disposal, however, the Oklahoma Department of Environmental Quality waived water quality certification for the emergency sediment dredging and disposal.

The project used hydraulic dredging to remove loosely compacted sediment materials from the navigation channel. Hydraulic dredges remove and transport sediment in liquid slurry form. They are usually barge mounted and carry diesel or electric-powered centrifugal pumps with discharge pipes ranging from six to 48 inches in diameter. The pump produces a vacuum on its intake side, and atmospheric pressure forces water and sediments through the suction pipe. The slurry was transported by pipeline to a disposal area, as schematically depicted in Figure 5. Pipeline dredges are commonly used for open water disposal adjacent to channels. Material from this dredging operation consists of a slurry with solids concentration ranging from a few grams per liter to several hundred grams per liter (USACE, 2018).

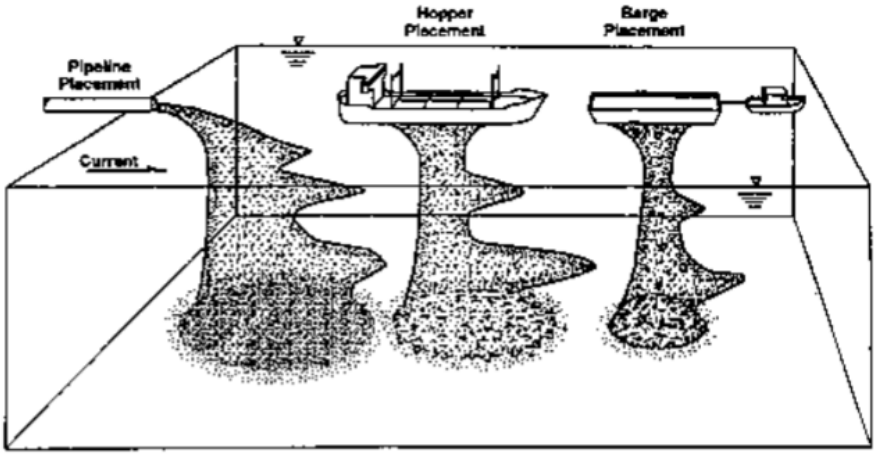

Figure 5. Plume Shape by Dredge Type

Table 2. Sediment Dredge and Disposal Locations.

Location	River Mile	Cubic Yards Dredged	Disposal Location	Acres Impacted by Disposal	NEPA Approved Disposal Location
Sandtown Bottom	346-349	778,330	Open Water	97.7	No
			Emergent Wetland	16.4	No
Below Lock 16	366	70,322	Bottomland Hardwood Forest	10	No
Spaniard Creek	375	110,635	Open Water	146	No
Salt Creek	380	259,322	Open Water	1.3	No
			Emergent Wetland	7.4	No
			Forested Wetland	2.4	No
Stoney Point	355	76,444	Open Water	4.9	No
			Emergent Wetland	7.6	No
San Bois Creek	6.5 - 8	161,639	Open Water	30	No
Kerr Lake (RM 343)	343	55,586	Open Water	8.3	No
Three Forks	394.5 – 395	23,578	Disposal Site 16B	14.6	Yes
RM 400	400	13,875	Disposal Site 16A-1	14	Yes
Below Lock 18	421	35,688	Disposal Site 17A	30.3	Yes
Above Lock 18	422 – 422.5	37,367	Disposal Site 18C	11.6	Yes
Catoosa	445	14,525	Disposal Site 18B	11.5	Yes
Below Lock 14	319	21,578	Disposal Site 13A	1.5	Yes

7 Description of Selected Plan and Evaluated Alternatives

The selected plan was the Emergency Action Alternative. This alternative incorporated the sediment dredge, sediment disposal, barge removal, and repair of Webbers Falls Pool Lock and Dam 16. Please refer to the After-Action Environmental Assessment for the Webbers Falls Pool and Robert S. Kerr Emergency Dredging and Open Water Disposal for a more thorough natural resources evaluation of the No Action and Emergency Action Alternatives.

8 Project Impacts

In total, there were 10 acres of bottomland hardwood forest, 2.4 acres of forested wetland, 31.4 acres of emergent wetland, and 288.2 acres of open water habitat impacted by the Emergency Action (Table 3). Because this action was used to address the sedimentation of the MKARNS, many adverse impacts were unavoidable.

Table 3. Habitat Type, Acres Impacted, Ratio, and Required Mitigation Acreage Associated with the Emergency Action

Habitat Type	Impacted Acres	Mitigation Ratio	Required Mitigation Acres	Mitigation Method
Bottomland Hardwood	10	1.5:1	15	Creation
Forested Wetland	2.4	4.5:1	10.8	Creation
Emergent Wetland	31.4	2.5:1	78.5	Creation
Open Water	288.2	1:1	288.2	Self-Mitigating

8.1 Federally Listed Threatened and Endangered Species

A Biological Assessment has been prepared by USACE and they have made determinations for the species listed in Section 5.1.4. The USACE determined that the Emergency Action would have “no effect” on:

- Gray bat,
- Ozark big-eared bat,
- Indiana bat,
- Piping plover,
- Red knot,
- Whooping crane,
- Neosho mucket,
- Rabbitsfoot, and
- Ozark cavefish.

The USACE determined, and the Service has concurred, that the Emergency Action “may affect, but is not likely to adversely affect” the following Federally-listed species:

- ILT - The Interior least tern (ILT) was a Federally- listed species during implementation of the Emergency Action but was delisted on January 13, 2021.

The USACE made a “may affect, likely to adversely affect” determination for the following species:

- American burying beetle (ABB) and
- Northern long-eared bat (NLEB)

The NLEB was adversely impacted by the tree clearing conducted at Below Lock 16 that removed 10 acres of bottomland hardwood forest during the NLEB pup season (June 1 to July 31). Surveys were not completed for NLEB before the work was conducted at this site, so USACE is assuming an adverse impact. Given the mobility of ABB, it is assumed their habitat is present within some of the disposal areas and the proposed mitigation areas. Potential adverse effects were and are likely due to being buried by sediment disposal and soil disturbance related to construction (excavation, grading, heavy equipment use, etc.). A Programmatic Biological Opinion (BO) is in place for most USACE operations (USFWS 2016). All ABB and NLEB incidental take related to the Emergency Actions and related mitigation is addressed in the BO and will be reported in the annual reports to the Service as required.

The monarch butterfly is a candidate for listing under the Endangered Species Act and development of a listing proposal is currently precluded by higher priority listing actions. The proposed mitigation construction activities have potential to adversely affect the monarch if disturbance of vegetation occurs when eggs or caterpillars may be present. Once implemented, the mitigation is likely to enhance monarch habitat, but the USACE should initiate consultation for any construction related impacts if the species is listed during construction timeframes and potential incidental take cannot be avoided.

9 Evaluation and Comparison of the Selected Plan and Evaluated Alternatives

The evaluation and comparison of the selected plan versus evaluated alternatives is limited to the No Action Alternative and the Emergency Action Alternative.

9.1 Evaluated Alternative

The No Action Alternative would have led to a permanent drawdown of Webbers Fall Pool due to the sunken barges and inability to repair the gates at Lock and Dam 16. The MKARNS would have become unnavigable resulting in local, regional, and national losses of hundreds of millions of dollars because barges would not have been able to ascend or descend the system. In addition to economic losses, there would have been a loss of natural resources such as open water habitat and wetlands.

9.2 Selected Plan

The selected plan or Emergency Action allowed dredging of the channel and associated dredged material disposal to occur, re-opening the MKARNS for navigation. This action potentially saved local, regional, and national commerce hundreds of millions of dollars. However, implementation of this action resulted in impacts to 2.4 acres of forested wetland, 31.4 acres of emergent wetland, 10 acres of bottomland hardwood forest, and 288.2 acres of open water habitat. As a result of the impacts, USACE is proposing 10.8 acres of forested wetland, 78.5 acres of emergent wetland, and 15 acres of bottomland hardwood forest mitigation.

Mitigation efforts will primarily entail restoration of habitat. Mitigation bank availability is limited in the region. Purchasing mitigation bank credits will be considered should mitigation requirements remain for this project after all practicable USACE fee-owned property has been utilized for mitigation purposes. The ecological mitigation work will be conducted in-house by USACE's Engineering Research and Design Center. Grading and permanent fence installation will be necessary to create the most-appropriate site conditions for emergent and forested wetlands. The proximity to agricultural properties is a risk to mitigation success; SWT appropriate fencing will be installed to protect the areas from cattle and adjacent land uses.

The mitigation sites will be designed to improve habitat by restoring native vegetation, managing exotic invasive or nuisance species, creating microtopography appropriate for wetlands, and diversifying vertical stratification through establishment of herbaceous vegetation, shrubs, and trees upon the conclusion of grading and fencing.

As more information is made available, USACE will complete the following efforts in coordination with the appropriate agencies and tribes during the planning phase:

- In accordance with Section 106 of the National Historic Preservation Act (as amended) (NHPA) and under an Archaeological Resources Protection Act (ARPA) permit issued by SWT, develop a Cultural Resources research design, conduct intensive surveys of all project components, and perform deep testing in areas where grading and contouring are proposed
- Develop haul route plan and haul schedule that avoids school zones and school bus stops during pickup and drop off periods. Identify areas for temporary traffic control, if needed; and
- Develop site security plans to secure construction, staging, and laydown areas so they do not create child or public safety concerns.

Upon completion of planning, additional mitigation efforts will be required to be complete prior to construction. Those efforts include:

- Ensure all construction staff are familiar with protected and natural resources to avoid unnecessary impacts;
- Develop avoidance and protection measures, as needed, based on results of cultural resources survey conducted during the planning phase, in coordination with the SHPO and Tribal Nations;
- Delineate areas to be avoided, including archaeological sites with surrounding buffer zones, such that construction equipment may not impact avoidance areas;
- Delineate construction areas with flagging, reflective tape, and fencing for child and public safety and to limit construction impacts, where appropriate;
- Ensure a Storm Water Pollution Prevention Plan (SWPPP) is prepared; and
- Submit a Notice of Intent to the Oklahoma Department of Environmental Quality and obtain authorization under OKR10, a construction stormwater permit.

During construction, ongoing efforts may be needed to avoid and limit adverse impacts. Those efforts include but are not limited to:

- Conduct cultural resources surveys of areas in which any changes to design or additional ground disturbance must occur to ensure no cultural resources will be adversely impacted.

- Ensure a cultural resources monitor will be onsite, if necessary, during ground disturbance activities, as determined necessary by USACE in consultation with the Oklahoma State Historic Preservation Office and Tribes;
- Revegetate all disturbed areas with native species, where appropriate;
- Ensure all environmental and cultural resource compliance efforts have been met;
- Ensure no insecticides or pesticides are used within or adjacent to natural areas;
- Limit herbicide use to only areas dominated by invasive species;
- Implement the SWPPP;
- Implement and follow all BMPs as directed under OKR10;
- Implement construction and staging site boundary marking and safety measures;
- Implement traffic flagging and haul route restrictions, where appropriate, to minimize safety concerns;
- Implement avoidance techniques where practicable for vegetation removal, if vegetation removal cannot be avoided it will occur outside of the migratory bird nesting and breeding season if surveys indicate presence; and

The mitigation sites shall be designed, to the maximum extent practicable, to be self-sustaining once performance standards have been achieved. The dependence on engineering features such as water control structures, pumps, stop-logs, and irrigation will be limited to ensure natural hydrology will support long-term sustainability. In addition, control of invasive species will be limited to the monitoring and adaptive management period. Upon establishment of native vegetation, invasive species propagation is expected to be limited, unless future unknown natural disturbances occur. Existing condition of the mitigation sites may be found in Attachment A – Project and Mitigation Area Photos of the Mitigation Plan (Appendix A).

9.2.1 Grading Plan

The objective of the grading plan is to adjust the topography of mitigation sites to accommodate emergent and forested wetland vegetation. Grading will establish the proper subgrade elevations associated with wetland communities. Some of the mitigation sites will require six inches to six feet of soil to be adjusted or moved to accommodate better hydrologic conditions for wetland plants. There are four proposed sites that will requiring grading:.

- West of Muskogee Turnpike,
- E0960 Road,
- Missouri Pacific Railroad East,
- Missouri Pacific Railroad West.

Once the soil has been contoured, the remaining topsoil will be spread on the graded areas to create a substrate for native vegetation seeding and planting

9.2.2 Desired Plant Community

A combination of species will be planted at each mitigation site. Because there are three habitat types that require mitigation due to the Emergency Action, varying wetland and bottomland hardwood forest species will be utilized. The bottomland hardwood forest species will function as a buffer for the emergent wetland and forested wetland habitats, protecting them from potential adjacent land use pollution and adverse stormwater runoff, as well as serving as the

need for mitigation. The vegetation list below (Table 4) represents the priority plants proposed to be used for USACE's mitigation efforts. This list is preliminary, and species may be adjusted, as needed, during design and implementation of the mitigation features.

Table 4. Desired Plant Community for the Mitigation Plan

Scientific name	Common name	Growth form	Habitat*
Aquatic, wetland, and grassland herbaceous			
Acmella oppositifolia var. repens	Oppositeleaf spotflower	Emergent	E
Andropogon glomeratus	Bushy bluestem	Graminoid	E
Asclepias sp.	Milkweeds	Herb/wildflower	E
Bacopa monnieri	Water hyssop	Emergent	E
Carex sp.	Sedges	Emergent	E, FW
Chasmanthium latifolium	Inland sea oats	Graminoid	E, BLH
Echinodorus berteroi	Tall burhead	Emergent	E, FW
Echinodorus subcordatum	Creeping burhead	Emergent	E, FW
Eleocharis acicularis	Slender spikerush	Emergent	E
Eleocharis macrostachya	Flatstem spikerush	Emergent	E
Eleocharis quadrangulata	Squarestem spikerush	Emergent	E
Equisetum	Horsetail	Emergent	E
Heteranthera dubia	Water stargrass	Submerged	E
Juncus spp.	Soft rush	Emergent	E
Justicia americana	Water willow	Emergent	E
Nymphaea mexicana	Mexican water lily	Floating-leaved	E
Nymphaea odorata	American water lily	Floating-leaved	E
Panicum virgatum	Switchgrass	Graminoid	E
Peltandra virginica	Arrow arum	Emergent	E, FW

Scientific name	Common name	Growth form	Habitat*
Phyla lanceolata	Lanceleaf frogfruit	Herb/wildflower	E, FW
Polygonum hydropiperoides	Water smartweed	Emergent	E, FW
Pontederia cordata	Pickerelweed	Emergent	E
Potamogeton illinoensis	Illinois pondweed	Submerged	E
Potamogeton nodosus	American pondweed	Submerged	E
Sagittaria platyphylla	Delta arrowhead	Emergent	E
Sagittaria latifolia	Arrowhead	Emergent	E, FW
Schoenoplectus californicus	Giant bulrush	Emergent	E
Schoenoplectus pungens	American bulrush	Emergent	E
Schoenoplectus tabernaemontani	Softstem bulrush	Emergent	E
Tripsacum dactyloides	Eastern gamagrass	Graminoid	E
Vallisneria americana	Wild celery	Submerged	E
Woody			
Acer negundo	Box elder	Tree	FW, BLH
Acer saccharinum	Silver maple	Tree	BLH
Betula nigra	River birch	Tree	FW, BLH
Callicarpa americana	American beautyberry	Shrub	BLH
Carya cordiformis	Bitternut hickory	Tree	BLH
Carya illinoinensis	Pecan	Tree	BLH
Carya ovata	Shagback hickory	Tree	BLH
Carya tomentosa	Mockernut hickory	Tree	BLH
Catalpa speciosa	Northern catalpa	Tree	BLH
Celtis laevigata	Sugarberry	Tree	FW, BLH

Scientific name	Common name	Growth form	Habitat*
Cephalanthus occidentalis	Buttonbush	Shrub	FW, BLH
Cercis canadensis	Eastern redbud	Tree	BLH
Cornus drummondii	Roughleaf dogwood	Shrub	FW, BLH
Crataegus spp.	Hawthorn	Tree	BLH
Diospyros virginiana	Common persimmon	Tree	FW, BLH
Fraxinus pennsylvanica	Green ash	Tree	FW, BLH
Ilex decidua	Deciduous holly	Tree	BLH
Juglans nigra	Black walnut	Tree	BLH
Maclura pomifera	Osage-orange	Tree	BLH
Morus rubra	Red Mulberry	Tree	FW, BLH
Nyssa sylvatica	Blackgum	Tree	FW, BLH
Platanus occidentalis	American sycamore	Tree	FW, BLH
*Populus deltoides***	Cottonwood	Tree	FW
Prunus mexicana	Mexican plum	Tree	BLH
Prunus serotina	Black cherry	Tree	BLH
Quercus macrocarpa	Bur oak	Tree	FW, BLH
Quercus palustris	Pin oak	Tree	BLH
Quercus nigra	Water oak	Tree	FW, BLH
Quercus phellos	Willow oak	Tree	FW, BLH
Quercus shumardii	Shumard oak	Tree	BLH
*Salix nigra***	Black willow	Tree	FW
Sambucus nigra	Elderberry	Shrub	FW, BLH
Sideroxylon lanuginosum	Gum bumelia	Tree	BLH

Scientific name	Common name	Growth form	Habitat*
Ulmus americana	American elm	Tree	BLH

**E = emergent wetland, FW = forested wetland, BLH = bottomland hardwood forest*

***Natural recruitment is expected and site will be monitored; transplanting may not be needed*

Any desirable plants or wildlife structures, such as snags, will be left in place where practical. A final review of the planting areas will occur after completion of contouring to ensure soil, topographic, and hydrologic conditions are appropriate.

The draft design of the plant community will be structured as provided below:

- Emergent Wetlands
    - Seeding in disturbed/graded/appropriate areas
        - Estimated 30 acres needed for seeding
    - Transplants estimated 10 - 15-foot centers at appropriate depths
    - One submerged aquatic vegetation founder colony installation per tract/site
- Forested Wetlands & Bottomland Hardwoods
    - 100 (one to two years old, 0.6 gallon) transplants per acre
    - Stakes/germinated-acorns/bare-root seedlings as appropriate
        - Estimated >50 per acre average

9.2.3 Control of Invasive Species

Prevalent invasive species at the mitigation sites include alligator weed (*Altemanthera philoxeroides*), callery pear (*Pyrus calleryana*), Chinese privet (*Ligustrum sinense*.), and multiflora rose (*Rosa multiflora*).

Alligator Weed

Alligator weed originated in South America. This plant can spread and reproduce rapidly through stems and leaf cuttings. It is difficult to eradicate because it can grow from the small portions left behind. It is normally found spread across bodies of water but can also be found in terrestrial areas around gardens or between row crops. Stems are pink and hollow and can reach lengths of three feet with opposite narrow elliptical leaves. The flowers are white in color, have thin petals, and are held on stems approximately four to five inches away from the main plant (Texas Invasive Species Institute [TISI], 2014a).

Alligator weed can be physically removed, but 100 percent success is not likely. There are currently no biological control methods to eradicate alligator weed. Chemical controls containing fluridone or imazapyr have been the most successful (TISI, 2014a).

Callery Pear

Callery pear is a resprouting invasive tree native to China and Vietnam. Seeds can remain viable for at least 11 years, indicating that a prominent seed bank might exist in invaded sites (Serota and Culley, 2019). Prescribed fire alone kills seeds and one-year-old seedlings, but only

top-kills trees two years and older which each resprout with three to four new stems following burning. Fire and cut and spray methods also may be effective (Warrix and Marshall, 2017). Recommended herbicides and treatment methods include triclopyr or a combination of triclopyr and aminopyralid for basal bark application, or glyphosate or imazapyr for foliar application (Vogt *et al*., 2020) In summary, a combination of prescribed fire, followed by mechanical treatment and herbicide, might be most effective where possible. Where prescribed fire is not a possibility, cutting and grinding down followed by a foliar glyphosate or imazapyr treatment after resprouting might be most effective, as well as monitoring and following up with repeat treatments as needed.

Chinese Privet

Chinese privet is an evergreen shrub with spreading branches. This species is often found near streams and in old fencerows. Leaves on the shrub are opposite with short petioles; blades up to two inches long, ovate to elliptic, normally rounded at the tip, tapering to the base, and with smooth margins. Flowers are white, fragrant and about 3/8th inches wide and up to four inches long. The flowers appear from March to May (TISI, 2014b).

Herbicide application is best from August to December. Leaves should be thoroughly wet with a water/ surfactant mix which can be glyphosate 3% solution (12 ounces per three-gallon mix) or Arsenal® Applicators Concentrate 1 percent solution (four ounces per three-gallon mix). Stems that are too tall for foliar sprays can be applied with Garlon 4® as a 20 percent solution in commercially available basal oil, diesel fuel, or kerosene (2.5 quarts per three-gallon mix) with a penetrant (check with herbicide distributor) to young bark as a basal spray. Large cut stems can be treated with Arsenal® Applicators Concentrate or Velpar® Liquid Herbicide as a 10 percent solution in water (one quart per three-gallon mix) with a surfactant. Safety to surrounding vegetation will be extremely important with implementation of the mitigation plan, so Chinese privet can immediately have stumps and cut stems with Garlon® 3A or a glyphosate herbicide as a 20 percent solution in water (2.5 quarts per three-gallon mix) with a surfactant (TISI, 2014b).

Multiflora Rose

Multiflora rose is an invasive shrub native to China, Japan, and Korea. Multiflora rose exhibits high seed production and good seed viability. Individual plants may produce as many as 500,000 seeds per year, and seeds stay viable in the soil bank for 10 to 20 years depending upon soil conditions (Munger, 2002). This plant also reproduces vegetatively, sprouting from broken stems and even rooting from stems if they have soil contact. Leaves emerge very early in the spring, and the plant holds onto its leaves longer than most native plants. It flowers May to June, and fruits in August. Fruits persist into the winter months. Timing of control measures is quite important, given the long fruiting/seed production period.

Smaller multiflora rose plants should be hand-pulled or dug up prior to August (fruit production). Plants that are hard to pull or dig may be cut to a one-inch stump, and glyphosate immediately applied to the stump, in July, August, or September. Alternatively, plant can be cut to six to 12 inches above the ground in the spring or early summer, allowed to resprout, and then cut again to one inch above the ground in July, August, or September and glyphosate applied. A first cutting earlier in the year allows the resprout to draw reserves away from the roots, making the cut-stump glyphosate application more effective. For very large, established plants or colonies of plants, foliar application of glyphosate from July to mid-September works best. A final recommended method is cold-weather stump application of glyphosate; when temperatures are 15.8 to 46.4 degrees Fahrenheit, the risk of contaminating non-target plants is apparently reduced.

10 Fish and Wildlife Conservation Measures

Environmental impacts are identified by habitat type, classified by Resource Category (46 FR 7656) and are characterized by their relative magnitude. A summary of mitigation measures is provided in Table 5. The first result of implementation of the mitigation measures proposed is, where possible, adverse impacts were avoided or minimized. When avoidance or minimization of impacts was not achievable, adverse impacts to the environment resulting from the Emergency Action will be mitigated through compensation. Determination of the required function and value of the impact and mitigation was performed through analytical and quantitative analysis. Implementation of the mitigation measures will compensate or rectify adverse impacts to the environment if the proposed mitigation is carried out. The SWT Operations Division will implement creation of the impacted habitat types (bottomland hardwood forest, forested wetlands, and emergent wetlands) for all the proposed mitigation, resulting in a greater net increase as compared to restoration/enhancement methods. To ensure the desired results of the mitigation measures are achieved, a long-term monitoring program and adaptive management plan has been developed to make modifications to measures when necessary to achieve the intended quality outputs. A more in-depth description of proposed mitigation can be found in Appendix A – Mitigation Plan of the Environmental Assessment prepared by USACE.

Table 5. Summary of Proposed Mitigation Measures

Habitat Type	Mitigation Category	Mitigation Description
Emergent Wetland	Compensation	The following mitigation measures on USACE fee-owned property converted from agricultural use to emergent wetland habitat: • Light grading to achieve natural contours, if necessary • Temporary erosion control and stabilization in bare areas (Best Management Practices; BMPs) • Native emergent and submergent vegetation planting • Control of exotic and invasive vegetation • Permanent fence installation and/or native riparian shrub and tree buffer
Forested Wetland	Compensation	The following mitigation measures on USACE fee-owned property converted from agricultural use to forested wetland habitat: • Light grading to achieve natural contours, if necessary

Habitat Type	Mitigation Category	Mitigation Description
		• Temporary erosion control and stabilization in bare areas (BMPs) • Native emergent and submergent vegetation, as well as native shrub and hardwood tree planting • Control of exotic and invasive vegetation • Permanent fence installation and/or native riparian shrub and tree buffer
Bottomland Hardwood Forest	Compensation	The following mitigation measures on USACE fee-owned property converted from agricultural use to bottomland hardwood habitat: • Temporary erosion control and stabilization in bare areas (BMPs) • Native shrub and tree planting • Control of exotic and invasive vegetation • Permanent fence installation
Open Water	Self-mitigating	Open water habitat impacts are self-mitigating through substitution of habitat due to the change in substrate elevations. This change can be considered a benefit to micro/macro invertebrates, fish, reptiles, waterbirds, waterfowl, and hydrophytic plants by providing new habitat in the aquatic system.

Overall, there are approximately 104 acres of habitat mitigation proposed for this project based on the areas impacted and the proposed mitigation ratios. However, the timing of impacts has been variable (from 2019-2021) and the timeframe for implementing the mitigation is uncertain. In many cases there is an anticipated 3-5 year delay from impacts to creation of mitigation wetlands. The Service recommends an increase in mitigated acres of at least 10 percent per year for delayed implementation of mitigation. Several years of no mitigation and delays in achieving mitigation for long-term restoration of forested wetlands and bottomland hardwoods, should require additional mitigation. The SWT Regulatory Office (RO), in implementing USACE or permit applicant obligations under Section 404 of the Clean Water Act (CWA) or Section 10

of the Rivers and Harbors act, utilizes regulations under 33 Code of Federal Regulations (CFR) Part 332. Under these regulations, mitigation is usually required to be concurrent with impacts and USACE Tulsa District MITIGATION AND MONITORING GUIDELINES (October 12, 2004) include increases in mitigation for each year of delay in implementation.

The appropriate use of Best Management Practices (BMPs) such as erosion control practices and tree protection devices at mitigation construction sites would protect existing high-quality trees and large blocks of high-quality vegetation/habitat adjacent to the construction areas. Temporary construction impacts to vegetation within staging areas should be avoided or minimized by staging in areas with very little vegetation and vegetative diversity. Native vegetation planting within the mitigation areas should provide connectivity for bottomland hardwood forest, forested wetland, and emergent wetland habitats, more closely mimicking historical conditions. Efforts to restore native bottomland hardwood forest and emergent wetland species through seeding, planting, and invasive species management will bring the environment closer to original conditions, in which case the vegetation structure and diversity is expected to increase in quality with the mitigation proposed.

As with any ground-disturbing activity, the probability of introducing, spreading, and/or establishing new populations of invasive, non-native species, particularly plant species, exists. Contractors and/or USACE personnel should be required to clean all equipment prior to entering the construction area to avoid the spread of invasive species into the project area. Executive Order (EO) 13112, Invasive Species, dated February 3, 1999, directs federal agencies to expand and coordinate their efforts to combat the introduction and spread of invasive species (*i.e*., noxious plants and animals not native to the U.S.). Implementation of BMPs such as cleaning equipment prior to entering restoration units and monitoring post construction for invasive species should prevent further spread of invasive species.

Areas that are expected to have high rates of erosion, are susceptible to invasive species establishment, or where recruitment of a monoculture is anticipated, should be re-vegetated with native species. Post-construction monitoring and additional plantings, if needed, in each mitigation unit should be implemented. Invasive species will be monitored and action taken to prevent establishment of any invasive species. Monitoring of trespass grazing, haying, and timber harvest should be conducted regularly and repairs and enforcement quickly implemented to discourage illegal uses. Some of the mitigation properties have evidence of prior illegal uses and these uses would continue to affect the wildlife habitat values unless they are controlled. Any impacts from illegal uses should be restored and additional mitigation may be required to compensate for impacts to mitigation lands.

11 Recommendations

The Service recommends implementation of the compensatory mitigation proposed by USACE as described in Appendix A, Section 9.2 and USACE's After-Action Environmental Assessment. The Service recommends an increase in mitigated acres of at least 10 percent per year for delayed implementation of mitigation. Because some of the mitigation sites have a history of illegal use, any impacts from future illegal uses should be restored and additional mitigation should be required to compensate for impacts to mitigation lands.

The responsibility of compensatory mitigation falls upon USACE which includes overall costs, reporting, construction, operation, and maintenance. The Federal Water Project Recreation Act (Public Law 89-72) declares the intent of Congress that recreation and fish and wildlife enhancement be given full consideration as purposes of Federal water development projects, specifically Federal entities bear all costs of operation, maintenance, and replacement. Because

the mitigation areas proposed are located on USACE fee-owned property, cost-sharing is not a requirement for implementation.

The funds necessary to carry out this mitigation plan will come from Maintenance and Operations funds allocated for the USACE SWT Operations Division. In total, an estimated $3,348,000 would be needed to complete the ecological aspects of the mitigation plan, see Table 6 below for line-item estimates.

Table 6. Mitigation Plan Costs

Task	**Cost ($)**
Planning, Design, and Initial Site Preparation	15,000
Propagule, Materials Acquisition, and Plant Production	648,000
Plantings	806,000
Monitoring	225,000
Adaptive Management	282,000
Reporting and Operations & Maintenance	96,000
Grading and Contouring	441,000
Security Fencing	1,425,000
Total	**3,938,000**

The Service provides a list of Nationwide Standard Conservation Measures that are utilized with the goal of reducing impacts to birds and their habitat; however, this list can be applied to this project's conservation measures. A partial list of effective measures is listed below. See Attachment D of Appendix A for a full list.

- Educate all employees, contractors, and/or site visitors of relevant rules and regulations that protect wildlife
- Report any incidental take of a migratory bird, to the local Service Office of Law Enforcement.
- Maximize use of disturbed land for all project activities (i.e., siting, lay-down areas, and construction).
- Implement standard soil erosion and dust control measures.
- Schedule all vegetation removal, trimming, and grading of vegetated areas outside of the peak bird breeding season (March 1 to August 31), to avoid impacts to breeding migratory birds unless the area has been investigated and no nesting birds are found present.
- Prepare a vegetation maintenance plan that outlines vegetation maintenance activities and schedules so that direct bird impacts do not occur.

- Prevent the introduction of invasive plants.
- Use only native and local (when possible) seed and plant stock for temporary and permanent habitat restoration/enhancement.
- Prevent increase in lighting of native habitats during the bird breeding season.
- Avoid contaminating natural aquatic and wetland systems with runoff by limiting all equipment maintenance, staging laydown, and dispensing of fuel, oil, etc., to designated upland areas.

12 Summary and the Service's Position

The Service has provided information and participated throughout the project evaluation and mitigation process. With implementation of our recommendations, the Service supports the Emergency Action Alternative as some impacts were unavoidable due to the 2019 flooding. The Service supports the recommended mitigation for the Webbers Falls Pool and Robert S. Kerr Pool. The Service's recommendations for mitigation would restore, to the extent practicable, the wetland and bottomland hardwood functions of the Arkansas River within the project area. The mitigation would provide benefits to wildlife that require wetland features and would increase the amount of forested habitat for migratory birds and some federally-listed species over time.

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Appendix A
Mitigation Plan and Site Photographs (see attached Document)

Appendix B
Oklahoma Department of Wildlife Conservation Concurrence (see attached Document)

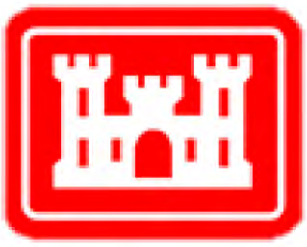
Appendix A
Mitigation Plan

Webbers Falls Pool and Robert S. Kerr Pool
Emergency Dredging and Open Water Disposal

Arkansas River Basin
Rogers, Wagoner, Cherokee, Muskogee, Haskell, Sequoyah, and Le Flore Counties,

Oklahoma

August 2021



Tulsa District

U.S. Army Corps of Engineers

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1 Introduction

This Compensatory Mitigation Plan has been prepared by the United States Army Corps of Engineers (USACE), Tulsa District (SWT) to assess and relay the mitigation, monitoring, and adaptive management requirements of the McClellan-Kerr Arkansas River Navigation System (MKARNS) Emergency Action. The Plan has been prepared as part of the after-action assessment of the work conducted by SWT to dredge and dispose of sediment from the MKARNS. Additional information about the work conducted for the Emergency Action can be found in the Draft Environmental Assessment.

The Emergency Action occurred in the Arkansas River Basin in Rogers, Wagoner, Cherokee, Muskogee, Haskell, Sequoyah, and Le Flore counties in Oklahoma (Figure 1).

This Plan describes the ecological objectives, the methods to accomplish the objectives, baseline and mitigation site information, performance standards associated with accomplishing the objectives, monitoring, adaptive management, and long-term maintenance.

Figure 1. McClellan-Kerr Arkansas River Navigation Study Area

Tulsa District Regulatory Office (RO), in implementing USACE or permit applicant obligations under Section 404 of the Clean Water Act (CWA) or Section 10 of the Rivers and Harbors act, utilizes regulations under 33 Code of Federal Regulations (CFR) Part 332. The purpose of 33 CFR 332 is “to establish standards and criteria for the use of all types of compensatory mitigation, including on-site and off-site permittee-responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts to waters of the United States authorized through issuance of Department of the Army (DA) permits pursuant to section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344) and/or sections 9 or 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 401, 403).”

While Part 332 is written as a forward looking mitigation planning tool, predicated on the idea that permit applicants will complete mitigation analysis as part of the 404 permit process, SWT RO regularly applies these regulations as part of the Section 404 CWA permit process. Application of part 332 through standard RO processes are in place to allow for determinations of appropriate mitigation strategies and requirements on an after-the-fact basis. Because this project is being funded with supplemental Operations and Maintenance funding, the use of 33 CFR 332 is legally sufficient regarding mitigation.

2 Objectives

The mitigation of the Emergency Action will require a multitude of actions to adequately compensate the ecosystem of the MKARNS. In coordination with SWT RO, Table 1 displays the ratio required to compensate the adverse impacts as well as the resulting acres required to mitigate the action.

There has been a major temporal loss associated with impacts to forested wetlands and the amount of time that the mitigation will take to fully develop, SWT RO recommended that the impacts to this habitat type should be higher than the normal 1.5:1 ratio minimum typically required based on the *Compensatory Mitigation for Losses of Aquatic Resources* [33 CFR 332]. For restoration or enhancement, a 4.5:1 ratio would result in a net gain of 8.4 acres of forested wetlands for a total of 10.8 acres. Preservation is not applicable to this habitat type because the area impacted was already preserved/protected as a State Wildlife Management Area (WMA) under ODWC.

The information above also applies to emergent wetlands. For restoration or enhancement, a minimum of 2.5:1 ratio would be appropriate. This ratio would result in a net gain of 47.1 acres of emergent wetland for a total of 78.5 acres. Preservation is not applicable to this habitat type because the areas associated with the adverse impact were located within a State WMA or the Sequoyah National Wildlife Refuge (NWR).

The SWT RO Mitigation and Monitoring Guidelines addresses “Lake Impacts” which will require a minimum mitigation ratio of 1:1 where the area of impact exceeds $1/10^{th}$ of an acre. Mitigation may be achieved through enhancements of existing lake areas, environs, water quality, or aquatic habitat function (creation of threatened and endangered species habitat, maintenance herbicide spraying, etc.). It is not necessary to physically manipulate the adjoining landscape to enlarge open water areas.

Although open water disposal did occur, the transport of this material was an unavoidable natural phenomenon and sediment was moved from one place within the MKARNS to another to allow continued navigation within the channel. This action created new interior least tern (*Sterna antillarum athalassos*) nesting habitat, replaced lost nesting sandbar islands, and increased the degree of aquatic habitat heterogeneity (e.g., water depths, shallow water habitat, flow refugia) relative to that present before the 2019 flood. The open water impacts as described are considered self-mitigation by the SWT Operations Division. The interior least tern was a listed species at the time of the flood and nesting habitat creation was a major focus of dredge disposal during the planning and mitigation phases of the emergency dredging. Therefore, open water mitigation will not occur as a result of the Emergency Action and will not be described in further detail.

In total, there were 10 acres of bottomland hardwood forest, 2.4 acres of forested wetland, 31.4 acres of emergent wetland, and 288.2 acres of open water habitat impacted by the Emergency Action. Because this action was used to address the sedimentation of the MKARNS, many adverse impacts were unavoidable.

Table 1. Habitat Type, Acres Impacted, Ratio, and Required Mitigation Acreage Associated with the Emergency Action

Habitat Type	Impacted Acres	Mitigation Ratio	Required Mitigation Acres	Mitigation Method
Bottomland Hardwood	10	1.5:1	15	Creation
Forested Wetland	2.4	4.5:1	10.8	Creation
Emergent Wetland	31.4	2.5:1	78.5	Creation
Open Water	288.2	1:1	288.2	Self-Mitigating

The objective of the bottomland hardwood and wetland mitigation is to create a minimum 15 acres of former bottomland hardwood forest, 10.8 acres of forested wetland, and 78.5 acres of emergent wetland in an area that would not be adversely impacted by creation of this habitat and would be self-sustaining upon completion of mandatory monitoring and adaptive management guidelines. The objectives of SWT Operations Division to compensate the loss of bottomland hardwood and wetland habitat are listed below.

- Establishment of native plant communities for wildlife.
    - Bottomland hardwood - Planting of herbaceous vegetation, shrubs, and trees
    - Forested Wetland - Planting of emergent wetland vegetation along with shrubs and trees
    - Emergent wetland - Planting of emergent wetland vegetation
- Develop and maintain hydrologic characteristics for created habitats

3 Impacted Habitat Types

Habitat types impacted by the Emergency Action include bottomland hardwood, forested wetlands, emergent wetlands, and open water. A description of each habitat type is discussed below.

The bottomland hardwood forest community occurs within the floodplain of the Arkansas River or in riparian areas immediately adjacent to small streams. The dominant bottomland hardwood trees include cottonwood (*Populus deltoides*), sycamore (*Platanus occidentalis*), green ash (*Fraxinus pennsylvanica*), pecan (*Carya illinoensis*), box elder (*Acer negundo*), river birch (*Betula nigra*), black willow (*Salix nigra*), silver maple (*Acer saccharinum*), black walnut (*Julgans nigra*), sugarberry (*Celtis laevigata*), water oak (*Quercus nigra*), overcup oak (*Quercus lyrata*), and willow oak (*Quercus phellos*). Bald cypress (*Taxoidium distichum*) is also common.

Emergent wetlands provide food and shelter for fish and wildlife species, including macroinvertebrates, which make up the foundation of the aquatic food chain, and habitat for various amphibians, reptiles, birds, and insects. Frogs and salamanders use emergent wetlands for breeding grounds and egg laying. Ducks and migratory birds use them for resting areas on migration routes and for nesting. Abundant aquatic insects provide a food source for fish, aquatic invertebrates, amphibians, reptiles, and birds, and break down organic material present in riverine and riparian wetland areas. Since these wetland communities are found in lower elevations, or are associated with more permanent open water habitats, they have been the

most susceptible to disruptive and unnatural flow regimes resulting from the construction and operation of the lock and dam system within the MKARNS. Emergent wetland vegetative species within the project areas included cattail (*Typha spp*.), smartweed (*Polygonum spp*.), nutsedge (*Cyperus spp*.), soft rush (*Juncus effusus*), and other unidentified rushes.

Forested wetlands are open, occasionally flooded areas dominated by shrub and hardwood saplings mixed with emergent herbaceous vegetation. Forested wetlands provide shelter, food, and nesting habitat for a variety of wildlife. These wetland communities are found at elevations slightly above emergent wetland communities and adjacent to riverbanks where less frequent inundation by flows and reduced scour allows shrub and sapling strata to establish. Forested wetland tree species included American sycamore, elm (*Ulmus spp*.), green ash, and black willow. Emergent wetland vegetation within the forested wetland habitats included soft rush, and shrubby species like buttonbush (*Cephalanthus occidentalis*).

Open water areas are characterized by deep water where light does not generally penetrate all the way to the bottom of the river or lake. The productivity of this zone largely depends upon the organic content of the sediment, the amount of physical structure, and in some cases upon the rate of fish predation. Sandy substrates contain relatively little organic matter (food) for organisms and poor protection from predatory fish. Higher plant growth is typically sparse in sandy sediment, because the sand is unstable and nutrient deficient. A rocky bottom has a high diversity of potential habitats offering protection (refuge) from predators, substrate for attached algae (periphyton on rocks), and pockets of organic "ooze" (food). A flat mucky bottom offers abundant food for benthic organisms but is less protected and may have a lower diversity of structural habitats, unless it is colonized by higher plants. The euphotic zone is also found within this deep-water region and is the layer of water below the surface where sunlight is still sufficient for photosynthesis to occur.

4 Site Selection and Baseline Information

Several rationales were considered while identifying potential sites for compensatory mitigation, which include:

- Site should be owned by USACE and available for bottomland hardwood and wetland mitigation.
- Site must be easily accessible by vehicle, all-terrain vehicle, or utility terrain vehicle.
- Site must either be large enough or be within close proximity to other mitigation sites.
- Site must be within the Arkansas River Watershed and be within close proximity to habitats adversely impacted by emergency dredging.
- Site must have appropriate soil characteristics, topography, and hydrologic conditions to achieve objectives for bottomland hardwood, forested wetland, and emergent wetland habitats.
- Site must be able to remain self-sufficient upon implementation of mitigation.

The proposed mitigation sites are within proximity of the bottomland hardwood and wetland impact areas, so replacement of lost habitat functions and values would occur locally. Photos of the impacted project areas and proposed mitigation areas can be found in Attachment A – Project and Mitigation Area Photos.

4.1 Preferred Mitigation Sites

The sites described below meet these conditions and were chosen for consideration for their suitability in meeting the rationales and needs of the compensatory mitigation. The field investigation into the mitigation sites provided awareness of the most appropriate habitat type for each area. As shown in Figure 2 through Figure 7, each site was segmented into one of the three habitat types based on the soil, existing vegetation, and topography.

- **West of Muskogee Turnpike** (Figure 2) – This site is west of the Muskogee Turnpike Toll Road or Highway 351 in Muskogee, Oklahoma. It can be accessed by North York Street and N4310. The site is located on USACE fee-owned property and is currently utilized by the general public for illegal haying activities. The site is a total of 11.2 acres. The site has Verdigris silt loam, 0 to 1 percent slopes, frequently flooded soils (California Soil Resource Lab [CSRL], 2008). The site is low-lying in elevation between approximately 496 feet (‘) mean sea level (msl) and 504’ msl. It borders the southern edge of a small tributary of the Arkansas River and is approximately 370’ from the Arkansas River.

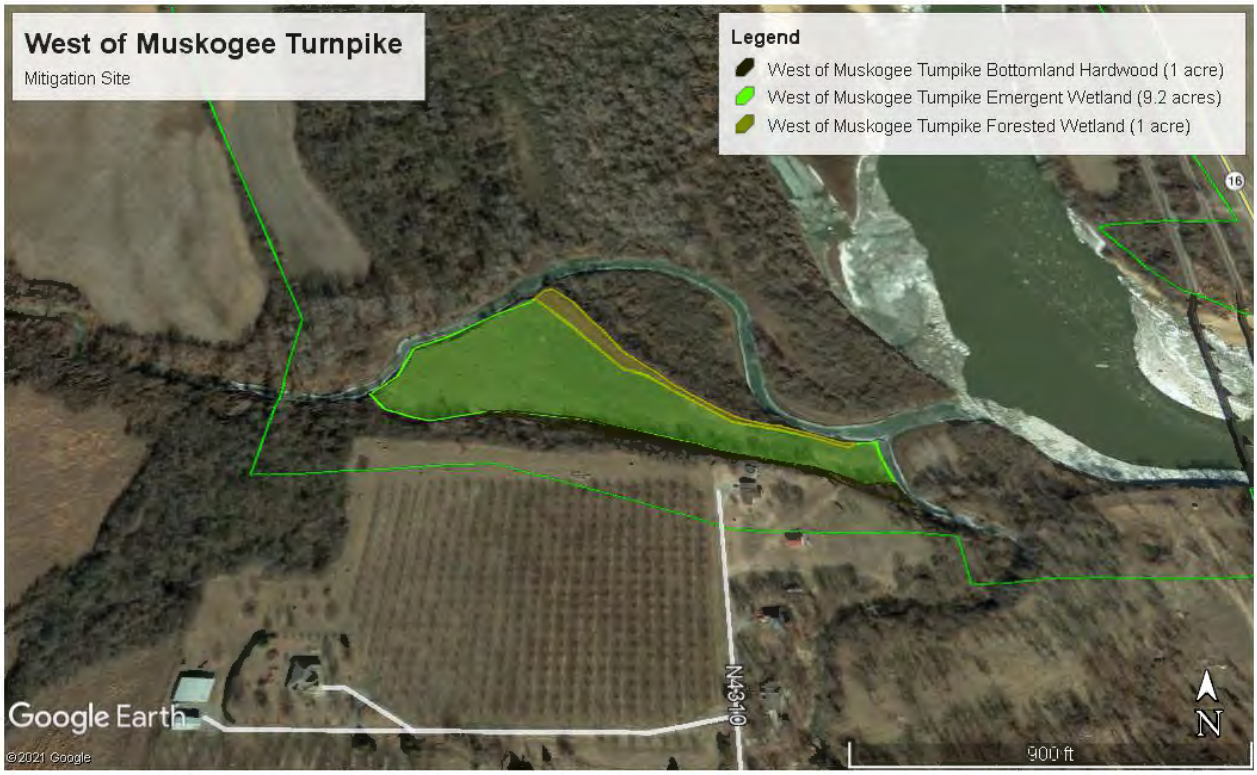

Figure 2. West of Muskogee Turnpike Mitigation Site

- **E0960** (Figure 3) – This site is west of U.S. Highway 10 and can be accessed by E0960 in River Bottom, Oklahoma. The site is located on USACE fee-owned property and is a total of 58.2 acres. Approximately half of the site has been maintained for agriculture use while the other half is still somewhat natural and undisturbed. The site has Kiomatia fine sandy loam, 0 to 2 percent slopes, frequently flooded; Kiomatia fine sandy loam, 0 to 2 percent slopes, rarely flooded; Roxana very fine sandy loam, 1 to 3 percent slopes, rarely flooded; Roxana very fine sandy loam, 0 to 1 percent slopes, rarely flooded; and Severn very fine sandy loam, 2 to 6 percent slopes, rarely flooded soils (CSRL, 2008). The site ranges in elevation from approximately 491’ msl to 502’ msl. The site is immediately adjacent to the Arkansas River on its eastern boundary.

Figure 3. E0960 Mitigation Site

- **North I40** (Figure 4) – This site is 0.3 miles north of Interstate Highway 40 and can be accessed by E1050 Road in Webbers Falls, Oklahoma. The site is located entirely on USACE fee-owned property but has been adversely impacted by illegal agricultural activities in the past. It is a total of 24.5 acres with some areas located within existing agricultural leases and another section located in a low-lying area with limited wetland vegetation. The site has Severn very fine sandy loam, 2 to 6 percent slopes, rarely flooded; Roxana very fine sandy loam, 1 to 3 percent slopes, rarely flooded; and Roebuck clay, 0 to 1 percent slopes, frequently flooded soils. The site is approximately 470’ msl to 474’ msl and is immediately southwest of the Arkansas River.

Figure 4. North I40 Mitigation Site

- **Drake Road** (Figure 5) – This site is 1.5 miles south of Interstate Highway 40 and can be accessed by South Kerr Boulevard to Drake Road near Salisaw, Oklahoma. It is about 18.9 acres and located on USACE fee-owned property. It is illegally grazed by the public and has been adversely effected by those actions. The proposed mitigation site has Mason silt loam, 0 to 1 percent slopes, rarely flooded soil. The entire site is approximately 467’ msl to 472’ msl and is adjacent to Salisaw Creek.

Figure 5. Drake Road Mitigation Site

- **Missouri Pacific Railroad East** (Figure 6) – This site is 0.10 miles south of U.S. Highway 9 in Keota, Oklahoma and can be accessed by N4550 Road. It is approximately 30.1 acres but has been adversely affected by illegal agriculture activities. The entire site is located on USACE fee-owned property. The site displays significant promise for emergent wetland vegetation. It is approximately 461’ msl to 467’ msl throughout the area. The soil types include Rexor silt loam, 0 to 1 percent slopes, occasionally flooded; Counts-Dela complex, 0 to 20 percent slopes; Rexor silt loam, 0 to 3 percent slopes, frequently flooded; and Water. This site is located off of San Bois Creek.

Figure 6. Missouri Pacific Railroad East Mitigation Site

- **Missouri Pacific Railroad West** (Figure 7) – This site is 0.3 miles southwest of U.S. Highway 9 in Keota, Oklahoma and can be accessed by East 1220 Road. It is approximately 17.3 acres and has also been adversely impacted by illegal agriculture activities. The site is fee-owned by USACE. The site ranges in elevation from approximately 463' msl to 466' msl. The soil type is Cupco silt loam, 0 to 1 percent slopes, occasionally flooded. This site is located off of San Bois Creek.

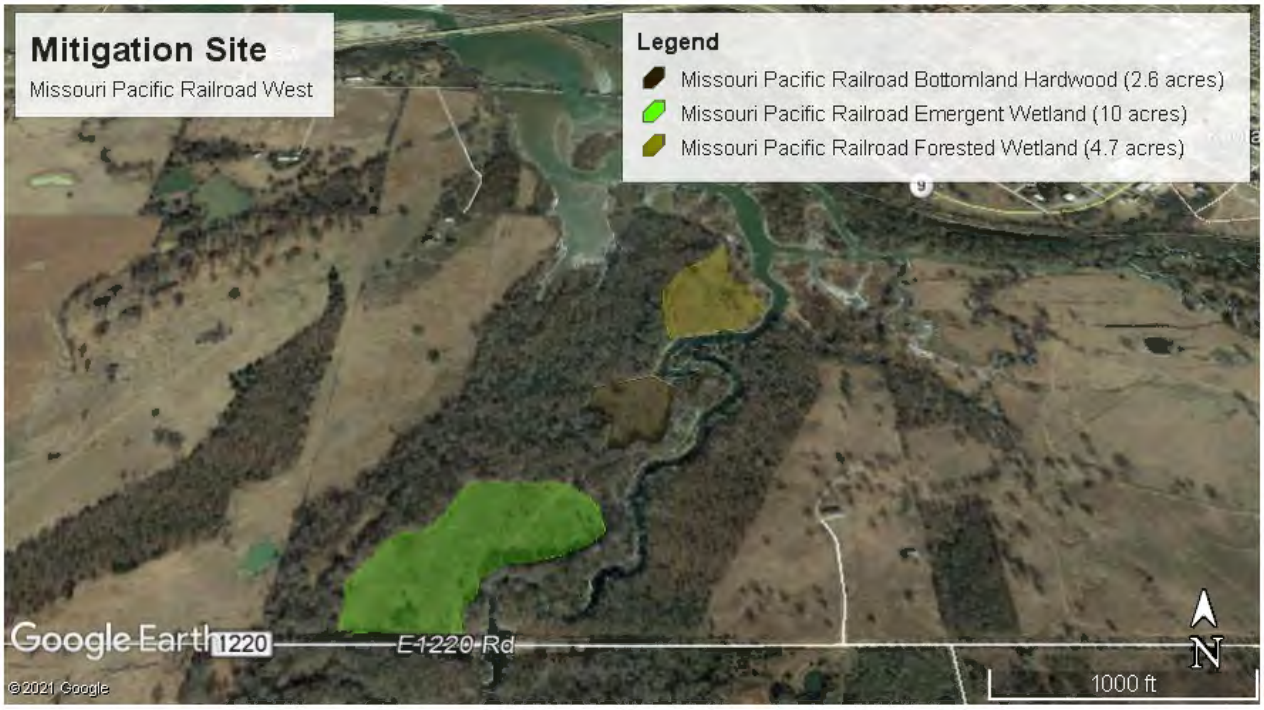

Figure 7. Missouri Pacific Railroad West Mitigation Site

4.2 Cultural Resources Effects and Standby Mitigation Sites

All potential mitigation sites will be completely investigated for cultural resources during the planning phase, and prior to any ground disturbing activity. Cultural resources that are identified will be avoided, either by establishing a sufficiently protective "buffer zone" around the cultural resources site boundary and monitoring for complete avoidance, or if necessary, by abandoning the proposed mitigation site (location) altogether. If mitigation sites must be abandoned or if they are otherwise significantly reduced in size because of the discovery of cultural resources, it is an option to utilize "Standby Mitigation Sites," which are alternative locations identified for this purpose. As a precaution, the areas described below were selected for standby mitigation to supplement emergent wetland mitigation if any preferred mitigation sites must be avoided to comply with Federal cultural resources laws and regulations. They meet the conditions described in Section 4 and were selected for consideration due to suitability in meeting the rationales and needs of the compensatory mitigation. All alternative locations will be included in the cultural resources investigations of all potential mitigation sites.

- **CR 4530** (Figure 8) – This site is 0.2 miles west of County Road 4530 and 0.7 miles north of County Road 1160 in Haskell County, Oklahoma. The site proposed is approximately 16.3 acres in size and is located on USACE fee-owned property. The site has Rexor silt loam, 0 to 1 percent slopes, occasionally flooded and Porum fine sandy loam, 3 to 5 percent slopes, eroded soils (CSRL, 2008). The site is low-lying in elevation as compared to the surrounding area 460' to 462' msl. It is located off of a small cove within the Robert S. Kerr Pool.

Figure 8. CR 4530 Standby Mitigation Site

- **Tract 1304** (Figure 9) – This site is one mile west of Highway 69 and 0.07 miles north of E0650 Road in Mayes County, Oklahoma. The site proposed is approximately 0.8 acres in size and is located on USACE fee-owned property. The site has Eram-Verdigris complex, 0 to 12 percent slopes (CSRL, 2008). The site is moderately low-lying in elevation as compared to the surrounding area at 584' to 587' msl.

Figure 9. Tract 1304 Standby Mitigation Site

4.3 Proposed Mitigation Site Protection

All of the proposed locations are owned and operated by SWT and will be protected in perpetuity by use of the existing deed. Restrictions on these sites will be coordinated with the SWT Real Estate Branch to ensure the mitigation restrictions are recorded and documentation is complete. Leases on these sites will no longer be provided to the public to protect the property from incompatible uses such as grazing, haying, clear cutting, mineral extraction, etc. Any changes to the real estate instrument or management plan must contain a provision requiring 60-day advance notification to the district engineer before any action is taken. If there are changes in statute, regulation, agency needs, or if mitigation results in an incompatible use, USACE will be responsible for providing alternative compensatory mitigation that is acceptable to the district engineer for any loss in functions resulting from the use.

4.4 Mitigation Work Plan

Mitigation efforts will primarily entail restoration of habitat. Mitigation bank availability is limited in the region. Purchasing mitigation bank credits will be considered should mitigation requirements remain for this project after all practicable USACE fee-owned property has been utilized for mitigation purposes. The ecological mitigation work will be done in-house by USACE's Engineering Research and Design Center. Grading and permanent fence installation will be necessary to create the most-appropriate site conditions for emergent and forested wetlands. The proximity to agricultural properties is a risk to mitigation success, so five-string barbed wire fence will be installed to protect the areas from cattle and adjacent land uses. A Grading Plan can be found in Attachment B while security fence specifications are shown in Attachment C.

The mitigation sites will be designed to improve habitat by introducing native vegetation, managing exotic invasive or nuisance species, creating microtopography appropriate for wetlands, and diversifying vertical stratification through herbaceous vegetation, shrubs, and trees upon the conclusion of grading and fencing.

As more information is made available, the following efforts will be completed, in coordination with the appropriate agencies and tribes during the planning phase:

- In accordance with Section 106 of the National Historic Preservation Act (as amended) (NHPA) and under an Archaeological Resources Protection Act (ARPA) permit issued by SWT, develop a Cultural Resources research design, conduct intensive surveys of all project components, and perform deep testing in areas where grading and contouring are proposed
- Develop haul route plan and haul schedule that avoids school zones and school bus stops during pickup and drop off periods. Identify areas for temporary traffic control, if needed; and
- Develop site security plans to secure construction, staging, and laydown areas so they do not create child or public safety concerns.

Upon completion of planning, additional mitigation efforts will be required to be complete prior to construction. Those efforts include:

- Ensure all construction staff are familiar with protected and natural resources to avoid unnecessary impacts;
- Develop avoidance and protection measures, as needed, based on results of cultural resources survey conducted during the planning phase, in coordination with the SHPO and Tribal Nations;
- Delineate areas to be avoided, including archaeological sites with surrounding buffer zones, such that construction equipment may not impact avoidance areas;
- Delineate construction areas with flagging, reflective tape, and fencing for child and public safety and to limit construction impacts, where appropriate;
- Ensure a Storm Water Pollution Prevention Plan (SWPPP) is prepared; and
- Submit a Notice of Intent to the Oklahoma Department of Environmental Quality and obtain authorization under OKR10.

During construction, ongoing efforts may be needed to avoid and limit adverse impacts. Those efforts include but are not limited to:

- Conduct cultural resources surveys of areas in which any changes to design or additional ground disturbance must occur to ensure no cultural resources will be adversely impacted.
- Ensure a cultural resources monitor will be onsite, if necessary, during ground disturbance activities, as determined necessary by USACE in consultation with the Oklahoma State Historic Preservation Office and Tribes;
- Revegetate all disturbed areas with native species, where appropriate;
- Ensure all environmental and cultural resource compliance efforts have been met;
- Ensure no insecticides or pesticides are used within or adjacent to natural areas;
- Limit herbicide use to only areas dominated by invasive species;
- Implement the SWPPP;
- Implement and follow all BMPs as directed under OKR10;
- Implement construction and staging site boundary marking and safety measures;
- Implement traffic flagging and haul route restrictions, where appropriate, to minimize safety concerns;
- Implement avoidance techniques where practicable for vegetation removal, if vegetation removal cannot be avoided it will occur outside of the migratory bird nesting and breeding season if surveys indicate presence; and
- Additional conservation measures can be found in Attachment D – Nationwide Standard Conservation Measures.

The mitigation sites shall be designed, to the maximum extent practicable, to be self-sustaining once performance standards have been achieved. The dependence on engineering features such as water control structures, pumps, stop-logs, and irrigation will be limited to ensure natural hydrology will support long-term sustainability. In addition, control of invasive species will be limited to the monitoring and adaptive management period. Upon establishment of native vegetation, invasive species propagation is expected to be limited, unless future unknown natural disturbances occur.

4.4.1 Grading Plan

The objective of the grading plan is to adjust the topography of mitigation sites to accommodate emergent and forested wetland vegetation. Grading will establish the proper subgrade elevations associated with wetland communities. Some of the mitigation sites will require six inches to six feet of soil to be adjusted or moved to accommodate better hydrologic conditions for wetland plants (Attachment A – Grading Plan). The proposed sites requiring grading are listed below. Once the soil has been contoured, the remaining topsoil will be spread on the graded areas to create a substrate for native vegetation seeding and planting.

- West of Muskogee Turnpike
- E0960
- Missouri Pacific Railroad East
- Missouri Pacific Railroad West

4.4.2 Desired Plant Community

A combination of species will be planted at each mitigation site. Because there are three habitat types that will have to be mitigated because of the Emergency Action, there will be varying wetland and bottomland hardwood forest species. The bottomland hardwood forest species will work as a buffer for the emergent wetland and forested wetland habitats, protecting them from potential adjacent land use pollution and adverse stormwater runoff, as well as serving as the need for mitigation. The vegetation list below represents the priority plants used for USACE's mitigation efforts. This list is preliminary, and species may be added or removed from it during design and implementation of the mitigation features.

Table 2. Desired Plant Community for the Mitigation Plan

Scientific name	Common name	Growth form	Habitat*
Aquatic, wetland, and grassland herbaceous			
Acmella oppositifolia var. repens	Oppositeleaf spotflower	Emergent	E
Andropogon glomeratus	Bushy bluestem	Graminoid	E
Asclepias sp.	Milkweeds	Herb/wildflower	E
Bacopa monnieri	Water hyssop	Emergent	E
Carex sp.	Sedges	Emergent	E, FW
Chasmanthium latifolium	Inland sea oats	Graminoid	E, BLH
Echinodorus berteroi	Tall burhead	Emergent	E, FW
Echinodorus subcordatum	Creeping burhead	Emergent	E, FW
Eleocharis acicularis	Slender spikerush	Emergent	E
Eleocharis macrostachya	Flatstem spikerush	Emergent	E
Eleocharis quadrangulata	Squarestem spikerush	Emergent	E
Equisetum	Horsetail	Emergent	E
Heteranthera dubia	Water stargrass	Submerged	E
Juncus spp.	Soft rush	Emergent	E
Justicia americana	Water willow	Emergent	E
Nymphaea mexicana	Mexican water lily	Floating-leaved	E
Nymphaea odorata	American water lily	Floating-leaved	E
Panicum virgatum	Switchgrass	Graminoid	E
Peltandra virginica	Arrow arum	Emergent	E, FW
Phyla lanceolata	Lanceleaf frogfruit	Herb/wildflower	E, FW
Polygonum hydropiperoides	Water smartweed	Emergent	E, FW
Pontederia cordata	Pickerelweed	Emergent	E
Potamogeton illinoensis	Illinois pondweed	Submerged	E
Potamogeton nodosus	American pondweed	Submerged	E
Sagittaria platyphylla	Delta arrowhead	Emergent	E
Sagittaria latifolia	Arrowhead	Emergent	E, FW
Schoenoplectus californicus	Giant bulrush	Emergent	E
Schoenoplectus pungens	American bulrush	Emergent	E
Schoenoplectus tabernaemontani	Softstem bulrush	Emergent	E
Tripsacum dactyloides	Eastern gamagrass	Graminoid	E

Scientific name	Common name	Growth form	Habitat*
Vallisneria americana	Wild celery	Submerged	E
	Woody		
Acer negundo	Box elder	Tree	FW, BLH
Acer saccharinum	Silver maple	Tree	BLH
Betula nigra	River birch	Tree	FW, BLH
Callicarpa americana	American beautyberry	Shrub	BLH
Carya cordiformis	Bitternut hickory	Tree	BLH
Carya illinoinensis	Pecan	Tree	BLH
Carya ovata	Shagback hickory	Tree	BLH
Carya tomentosa	Mockernut hickory	Tree	BLH
Catalpa speciosa	Northern catalpa	Tree	BLH
Celtis laevigata	Sugarberry	Tree	FW, BLH
Cephalanthus occidentalis	Buttonbush	Shrub	FW, BLH
Cercis canadensis	Eastern redbud	Tree	BLH
Cornus drummondii	Roughleaf dogwood	Shrub	FW, BLH
Crataegus spp.	Hawthorn	Tree	BLH
Diospyros virginiana	Common persimmon	Tree	FW, BLH
Fraxinus pennsylvanica	Green ash	Tree	FW, BLH
Ilex decidua	Deciduous holly	Tree	BLH
Juglans nigra	Black walnut	Tree	BLH
Maclura pomifera	Osage-orange	Tree	BLH
Morus rubra	Red Mulberry	Tree	FW, BLH
Nyssa sylvatica	Blackgum	Tree	FW, BLH
Platanus occidentalis	American sycamore	Tree	FW, BLH
*Populus deltoides***	Cottonwood	Tree	FW
Prunus mexicana	Mexican plum	Tree	BLH
Prunus serotina	Black cherry	Tree	BLH
Quercus macrocarpa	Bur oak	Tree	FW, BLH
Quercus muehlenbergii	Chinquapin oak	Tree	BLH
Quercus nigra	Water oak	Tree	FW, BLH
Quercus phellos	Willow oak	Tree	FW, BLH
Quercus shumardii	Shumard oak	Tree	BLH
*Salix nigra***	Black willow	Tree	FW
Sambucus nigra	Elderberry	Shrub	FW, BLH
Sideroxylon lanuginosum	Gum bumelia	Tree	BLH
Ulmus americana	American elm	Tree	BLH

**E = emergent wetland, FW = forested wetland, BLH = bottomland hardwood forest*

***Expecting recruitment and will monitor; may not transplant*

Any desirable plants or wildlife structures, such as snags, will be left in place where practical. A final review of the planting areas will occur after completion of contouring to ensure soil, topographic, and hydrologic conditions are appropriate.

The draft design of the plant community will be structured as shown below:

- Emergent Wetlands
  - Seeding in disturbed/graded/appropriate areas
    - Estimated 30 acres needed for seeding
  - Transplants estimated 10 - 15-foot centers at appropriate depths
  - One submerged aquatic vegetation founder colony installation per tract/site
- Forested Wetlands & Bottomland Hardwoods
  - 100 (one to two years old, 0.6 gallon) transplants per acre
  - Stakes/germinated-acorns/bare-root seedlings as appropriate
    - Estimated >50 per acre average

4.4.3 Control of Invasive Species

Prevalent invasive species at the mitigation sites include alligator weed (*Altemanthera philoxeroides*), callery pear (*Pyrus calleryana*), Chinese privet (*Ligustrum sinense*.), and multiflora rose (*Rosa multiflora*).

Alligator Weed

Alligator weed originated in South America. It is able to spread and reproduced rapidly through stems and leaf cuttings. It is difficult to eradicate because it can grow from the small portions left behind. It is normally found spread across bodies of water but can also be found in terrestrial areas around gardens or between row crops. Stems are pink and hollow and can reach lengths of one meter with opposite narrow elliptical leaves. The flowers are white in color, have thin petals, and are held on stems approximately four to five inches away from the main plant (Texas Invasive Species Institute [TISI], 2014a).

Alligator weed can be physically removed, but 100 percent success is not likely. There are currently no biological control methods to eradicate alligator weed. Chemical controls containing fluridone or imazapyr have been the most successful (TISI, 2014a).

Callery Pear

Callery pear is a resprouting invasive tree native to China and Vietnam. Seeds can remain viable for at least 11 years, indicating that a prominent seed bank might exist in invaded sites (Serota and Culley, 2019). Prescribed fire alone kills seeds and one-year-old seedlings, but only top-kills trees two years and older which each resprout with three to four new stems following burning. Fire and cut and spray methods may also be effective (Warrix and Marshall, 2018). Recommended herbicides and treatment methods include triclopyr or a combination of triclopyr and aminopyralid for basal bark application, or glyphosate or imazapyr for foliar application (Vogt et al., 2020) In summary, a combination of prescribed fire, followed by mechanical treatment and herbicide, might be most effective where possible. Where prescribed fire is not a possibility, cutting and grinding down followed by a foliar glyphosate or imazapyr treatment after resprouting might be most effective, as well as monitoring and following up with repeat treatments as needed.

Chinese Privet

Chinese privet is an evergreen shrub with spreading branches. It can be found near streams and in old fencerows. Leaves on the shrub are opposite with short petioles; blades up to two inches long, ovate to elliptic, normally rounded at the tip, tapering to the base, and with smooth margins. Flowers are white, fragrant and about 3/8th inches wide and up to four inches long. The flowers appear from March to May (TISI, 2014b).

Herbicide application is best from August to December. Leaves should be thoroughly wet in water with a surfactant which can be glyphosate 3% solution (12 ounces per three-gallon mix) or Arsenal Applicators Concentrate 1% solution (four ounces per three-gallon mix). Stems that are too tall for foliar sprays can be applied with Garlon 4 as a 20% solution in commercially available basal oil, diesel fuel, or kerosene (2.5 quarts per three-gallon mix) with a penetrant (check with herbicide distributor) to young bark as a basal spray. Large cut stems can be treated with Arsenal Applicators Concentrate or Velpar Liquid Herbicide as a 10% solution in water (one quart per three-gallon mix) with a surfactant. Safety to surrounding vegetation will be extremely important with implementation of the mitigation plan, so Chinese privet can immediately have stumps and cut stems with Garlon 3A or a glyphosate herbicide as a 20% solution in water (2.5 quarts per three-gallon mix) with a surfactant (TISI, 2014b).

Multiflora Rose

Multiflora rose is an invasive shrub native to China, Japan, and Korea. Multiflora rose exhibits high seed production and good seed viability. Individual plants may produce as many as 500,000 seeds per year, and seeds stay viable in the soil bank for 10 to 20 years depending upon soil conditions (Munger, 2002). It also reproduces vegetatively, sprouting from broken stems and even rooting from stems if they have soil contact. Leaves emerge very early in the spring, and the plant holds onto its leaves longer than most native plants. It flowers May to June, and fruits in August. Fruits persist into the winter months. Timing of control measures seems quite important, given the long fruiting/seed production period.

Smaller multiflora rose plants should be hand-pulled or dug up prior to August (fruit production). Hard to pull or dig plants can be cut to a one-inch stump, and glyphosate immediately applied to the stump, in July, August, or September. Alternatively, plant can be cut to six to 12 inches above the ground in the spring or early summer, allowed to resprout, and then cut again to one inch above the ground in July, August, or September and glyphosate applied. A first cutting earlier in the year allows the resprout to draw reserves away from the roots, making the cut-stump glyphosate application more effective. For very large, established plants or colonies of plants, foliar application of glyphosate works best, from July to mid-September. A final recommended method is cold-weather stump application of glyphosate; when temperatures are 15.8 to 46.4 degrees Farenheit, the risk of contaminating non-target plants is apparently reduced.

5 Maintenance Plan

The proposed mitigation sites have demonstrated that they are capable of naturally supporting wetlands as described in Section 4. Grading and contouring within some of the mitigation areas will provide a lower base elevation and create a minor impoundment. The slight modification of the areas will create hydrologic conditions on a larger scale and add to the duration of water inundation, as well as the establishment of native vegetation.

Upon completion of initial construction, the mitigation sites will be monitored as described in Section 7 of this plan. Corrective actions in addition to those described in the previously mentioned sections may be required and can include:

- Maintaining security fencing;
- Maintaining mitigation site information signs;
- Protecting mitigation sites from human disturbances, such as encroachments, illegal agriculture use, and vandalism; and
- Any other actions that may be triggered by the adaptive management plan described in Section 9.

6 Performance Standards

The following discussion outlines the performance standards associated with the monitoring plan that will support the MKARNS Emergency Action mitigation. The plan identifies performance measures along with desired outcomes and monitoring design in relation to specific objectives. A performance measure includes specific feature(s) to be monitored to determine project performance. Additional monitoring is identified as supporting information needs that will help further understand interrelationships of restoration features and external environmental variability and to corroborate project effects.

Such criteria, or decision-making triggers, are related to each performance measure and desired outcome and identify the need to discuss potential implementation of adaptive management actions.

Overall, monitoring results will be used to evaluate the progress of habitat mitigation toward meeting project objectives and to inform the need for adaptive management actions to ensure successful restoration is achieved.

Performance Measure 1: Establish 15 acres of bottomland hardwood habitat, 78.5 acres of emergent wetland habitat, and 10.8 acres of forested wetland habitat.

Success Criteria: One year following completion of final construction activities achieve 85% survival of planted woody species on 15 acres of bottomland hardwood habitat. The 85% survival criteria would continue to five years after construction.

One year following completion of final construction activities achieve 85% survival of planted emergent wetland species on 78.5 acres of emergent wetland habitat. The 85% survival criteria would continue to five years after construction.

One year following completion of final construction activities achieve 50% survival of bottomland hardwood forest species and 85% survival of emergent wetland species on 10.8 acres of emergent wetland habitat continuing 5 years after completion of project construction

Monitoring Design and Rationale: Planted woody and emergent wetland species will be assessed each year during site surveys to determine what percentage of each species the plants have survived. Sites will be evaluated annually from post-construction until success is determined. To determine the increase in acreage, satellite and aerial imagery will be used to identify change pre- and post-construction in years 1-5. Vegetated habitats should be classified using digital aerial imagery and field observation.

Performance Measure 2: Average cover of 75% of desired vegetation on mitigation sites at year 5 compared to pre-construction.

Success Criteria: One year following completion of final construction activities achieve a minimum average cover of 25%, comprised of native herbaceous species. Three years following construction, achieve a minimum average cover of 75% native emergent wetland, forested wetland, and bottomland hardwood species (according to appropriate site). Five years following construction, achieve a minimum average cover of 50% herbaceous species.

Monitoring Design and Rationale: Vegetation will be sampled annually, at the six mitigation sites. Permanent vegetation monitoring stations will be established for assessing the vegetation community at each site. Sites will be sampled annually post-construction until success is determined.

Performance Measure 3: Establish overall site biodiversity through increasing plant species taxa richness.

Success Criteria: One year following completion of final construction activities achieve a minimum of a 25% increase in plant species taxa richness depending on initial site conditions, comprised of native species. Five years following construction, maintain or increase level of taxa richness achieved during vegetation establishment efforts during construction phase, comprised of native species.

Monitoring Design and Rationale: The species composition of each site will be sampled annually at the permanent vegetation monitoring sites. Sites will be sampled annually post construction until success is determined. Diversity metrics may consist of species richness, species evenness, and/or other species diversity metrics such as the Shannon Weiner or Simpson Index.

Performance Measure 4: Manage non-native invasive vegetation within mitigation sites.

Success Criteria One year following completion of final construction activities achieve less than 25% average cover of non-native invasive species. Years 2 to 5 following completion of final construction activities achieve average cover of less than 5% non-native invasive species with no area greater than 0.25 acres in size with greater than 10% non-native invasive species.

Monitoring Design and Rationale: Vegetation will be sampled annually, at the mitigation site. Permanent vegetation monitoring stations will be established for assessing the vegetation community at each site. Sites will be sampled annually post-construction until success is determined. Initial control/removal of unwanted plants will be evaluated, and determinations made on an annual or semi-annual basis on whether additional action will be needed.

Vegetation: Vegetation sampling will occur annually within the mitigation unit for the duration of the monitoring period. Sampling will occur during spring months, at the peak of the growing season. Permanent 1/10th-acre, field monitoring plots will be located randomly within the mitigation plot. Monitoring will measure percent cover of native and non-native plant species and structural diversity. Photograph stations are also important for documenting vegetation conditions. All plots and photograph stations staked and will be documented via Global Positioning System (GPS) coordinates to reoccupy in each year of sampling.

General observations, such as fitness and health of plantings, survival, growth, soil moisture, precipitation, phenology, native plant species recruitment, and signs of drought stress should be noted during the surveys. Additionally, potential soil erosion, flood damage, vandalism and

intrusion, trampling, and pest problems would be qualitatively identified. Efficacy of invasive plant management will also be monitored.

A general inventory of all wildlife species observed and detected using the project area would be documented. Nesting sites, roosting sites, animal burrows, and other signs of wildlife use of the newly created habitat and habitat structures would be recorded. The notes would be important for early identification of species colonization patterns.

7 Monitoring

An effective monitoring program will be required to determine if the project outcomes are consistent with original project goals and objectives. The power of a monitoring program developed to support adaptive management lies in the establishment of feedback between continued project monitoring and corresponding project management. A carefully designed monitoring program is the central component of the project adaptive management program as it supplies the information to assess whether the project is functioning as planned.

Monitoring must be closely integrated with the adaptive management components because it is the key to the evaluation of adaptive management needs. Objectives must be considered to determine appropriate indicators to monitor. In order to be effective, monitoring must be able to distinguish between ecosystem responses that result from project implementation (i.e. management actions) and natural ecosystem variability.

In general, monitoring will be established for no less than five years after mitigation construction completion for emergent wetland habitats. A longer monitoring period must be required for aquatic resources with slow development rates, such as forested wetlands so the monitoring will be no less than 10 years for forested wetland and bottomland hardwood forest habitat. However, following project implementation, the district engineer may reduce or waive the remaining monitoring requirements upon a determination that compensatory mitigation has achieved its performance standards. Annual monitoring reports will be submitted to the district engineer by USACE SWT Operations Division.

The USACE SWT Operations Division is the responsible party for ensuring monitoring is conducted. The USACE SWT Operations Division will delegate monitoring and adaptive management to the USACE Lewisville Aquatic Ecosystem Restoration Facility (LAERF) upon repositioning of funding but USACE SWT Operations Division will remain the responsible party for achieving compensatory mitigation requirements.

Monitoring reports must include the progress of the compensatory mitigation and can include plans, maps, and photographs to illustrate site conditions at the time of the report. They may also include the results of functional, condition, or other assessments used to provide quantitative or qualitative measures of the functions provided by the compensatory mitigation site. Permanent locations for photographic documentation will be established to provide a visual record of habitat development over time. The locations of photo points will be identified in the pre-construction monitoring report. Photographs taken at each photo point will be included in monitoring reports. Any reports submitted to the district engineer must be provided to Federal, Tribal, state, and local resource agencies, and the public, upon request.

Any Cultural Resources that are avoided within a selected mitigation site must be monitored for compliance with Federal cultural resources laws and regulations. The USACE SWT Operations Division is the responsible party for ensuring monitoring is conducted and reported annually for no less than 10 years, after which the sites will be monitored as part of regular SWT cultural resources management activities. Site condition assessments, including detailed documentation of any impacts to cultural resources, including but not limited to inadvertent project impacts,

natural impacts, or vandalism/looting must be included in cultural resources monitoring reports. Photographs must be taken, and photo points and direction documented. Cultural Resources monitoring reports should not be included in any report provided to the public, per the Archaeological Resources Protection Act (ARPA). Distribution of Cultural Resources monitoring reports will be determined by USACE SWT Operations Division cultural resources personnel, and may include distribution to Federal, Tribal, and state agencies.

8 Long-term Management Plan

The party responsible for ownership and all long-term management of the compensatory mitigation project is USACE SWT Operations Division. The funding for long-term maintenance will be identified by USACE SWT Operations Division as needs are identified and appropriated by Congress each fiscal year. The funding for maintenance is established by the fiscal year and will be dependent on the extent of any future needs. Intensive long-term management is not anticipated beyond the required monitoring and maintenance period because all mitigation associated with the MKARNS Emergency Action is designed for self-sustainment. The MKARNS Emergency Action mitigation plan does not include long-term diversion of water, wetland cell pumps, stop-logs, or any other common water control structures. Impacts to the mitigation site as a result of public disturbance can be addressed under USACE's Title 36 – Parks, Forests, and Public Property. The rules and regulations govern the public use of water resources development projects administered by the Chief of Engineers and all visitors are bound by these Title 36 regulations.

Impacts to Cultural Resources within mitigation sites will be addressed under the appropriate legislation, regulations, and executive orders, including, but not limited to the National Historic Preservation Act (NHPA) of 1966, as amended, the ARPA of 1979 (as amended), and the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (as amended) and their implementing regulations. The ARPA compels federal land-holding agencies to protect archaeological sites and artifacts on government land from looting, vandalism, and trafficking, impose and enforce penalties, both Civil and Criminal, against violators of the Act, and better manage archeological sites on public land. The NAGPRA directs federal land-holding agencies to protect Native American burials and burial sites on federal fee lands.

Any wetlands created as an act of compensatory mitigation will fall under regulatory jurisdiction of Section 404 of the Clean Water Act.

9 Adaptive Management Plan

Results of monitoring will be assessed in comparison to project objectives and decision-making triggers to evaluate whether the project is functioning as planned and whether adaptive management actions are needed to achieve project objectives. The results of the monitoring will be provided to the USACE SWT Operations Division and SWT RO, who will evaluate and compare data to project objectives and decision-making triggers. The USACE will use the monitoring results to assess habitat responses to management, evaluate overall project performance, and make recommendations for adaptive management actions as appropriate. If monitoring results, as compared to desired outcomes and decision-making triggers show that project objectives are not being met, USACE will evaluate causes of failure and recommend adaptive management actions to remedy the underlying problems.

Decision criteria, also referred to as adaptive management triggers, are used to determine if and when adaptive management should be implemented. They can be qualitative or quantitative based on the nature of the performance measure and the level of information necessary to

make a decision. Desired outcomes can be based on reference sites, predicted values, or comparison to historic conditions. Several potential decision criteria are identified below, based on the project objectives and performance measures. More specific decision criteria, possibly based on other parameters such as hydrology, geomorphology, and vegetation dynamics.

If assessments show that any of these triggers are met, USACE would decide whether an adaptive management action is warranted, and if so, what that action will entail. Investigations may be required to determine the cause of need for action to inform the type of adaptive management response that should be implemented, if needed. Additionally, prior to enacting any adaptive management measures, USACE would assess whether supplemental environmental analyses (including Cultural Resources review) are required.

Performance Measure 1: Establish 15 acres of bottomland hardwood habitat, 78.5 acres of emergent wetland habitat, and 10.8 acres of forested wetland habitat.

Success Criteria: One year following completion of final construction activities achieve 85% survival of planted woody species on 15 acres of bottomland hardwood habitat. The 85% survival criteria would continue to five years after construction.

One year following completion of final construction activities achieve 85% survival of planted emergent wetland species on 78.5 acres of emergent wetland habitat. The 85% survival criteria would continue to five years after construction.

One year following completion of final construction activities achieve 50% survival of bottomland hardwood species and 85% survival of emergent wetland species on 10.8 acres of emergent wetland habitat continuing 5 years after completion of project construction

Monitoring Design and Rationale: Planted woody and emergent wetland species will be assessed each year during site surveys to determine what percentage of each species the plants have survived. Sites will be evaluated annually from post-construction until success is determined. To determine the increase in acreage, satellite and aerial imagery will be used to identify change pre- and post-construction in years 1-5. The same requirements for wood species will be required in years 6-10. Vegetated habitats should be classified using digital aerial imagery and field observation.

Trigger: By year 1, the number of surviving woody and emergent plant species is below 85% for bottomland hardwood and emergent wetland habitats. By year 1, the number of surviving woody species is below 50% and surviving emergent wetland species are below 85% for forested wetland habitats. Volunteer plant species may replace unsuccessful planting, but only if the species is consistent with the species diversity goals and is not a dominant component of the restoration target composition.

Possible Causes for Not Meeting Success Criteria Potential: Failure mechanisms for the successful establishment for the habitats mentioned above may include drought or extreme storm events, predators (invertebrates and vertebrates), incompatible plant species selection, wetland design errors/flaws resulting in inadequate hydrology, and/or reinfestation of non-native invasive and native noxious species.

Potential Adaptive Management Measures: Adaptive management measure would include irrigation or soil amendments during drought conditions; predator control (i.e., enclosures) to ensure the vitality and survival of the plantings; changing the target plant species to those be more tolerant of site specific abiotic conditions; and modifying the active ingredient/surfactant or application rates of herbicides, changing the treatment methodology (chemical, mechanical, or biocontrol), reinitiating grading, and/or the

refinement of the integrated pest management strategy to manage invasive and noxious plant species in the restoration areas. Prior to initiation of adaptive management measures, review by SWT Operations Division Cultural Resources personnel must be conducted to ensure that avoided cultural resources are not impacted, and that required measures are consistent with the level of cultural resources investigations previously conducted.

Performance Measure 2: Average cover of 75% of desired vegetation on mitigation sites at year 5 compared to pre-construction.

Success Criteria: One year following completion of final construction activities achieve a minimum average cover of 25%, comprised of native herbaceous species. Three years following construction, achieve a minimum average cover of 75% native emergent wetland, forested wetland, and bottomland hardwood species (according to appropriate site). Five years following construction, achieve a minimum average cover of 50% herbaceous species.

Monitoring Design and Rationale: Vegetation will be sampled annually, at the six mitigation sites. Permanent vegetation monitoring stations will be established for assessing the vegetation community at each site. Sites will be sampled annually post-construction until success is determined.

Trigger: The percent canopy cover of native herbaceous species is less than 50% after one year, 75% after two years, or 85% after three years.

Possible Causes for Not Meeting Success Criteria Potential: Failure mechanisms for the successful establishment of mitigation sites may include drought, predators (invertebrates and vertebrates), incompatible plant species selection, wetland design errors/flaws resulting in inadequate hydrology, and/or reinfestation of non-native invasive and native noxious species.

Potential Adaptive Management Measures: Adaptive management measures would include irrigation or soil amendments during drought conditions; predator control (i.e., enclosures) to ensure the vitality and survival of the plantings; changing the target plant species to those be more tolerant of site specific abiotic conditions; and modifying the active ingredient/surfactant or application rates of herbicides, changing the treatment methodology (chemical, mechanical, or biocontrol), reinitiating grading, and/or the refinement of the integrated pest management strategy to manage invasive and noxious plant species in the restoration areas Prior to initiation of adaptive management measures, review by SWT Operations Division Cultural Resources personnel must be conducted to ensure that avoided cultural resources are not impacted, and that required measures are consistent with the level of cultural resources investigations previously conducted.

Performance Measure 3: Establish overall site biodiversity through increasing plant species taxa richness.

Success Criteria: One year following completion of final construction activities achieve a minimum of a 25% increase in plant species taxa richness depending on initial site conditions, comprised of native species. Five years following construction, maintain or increase level of taxa richness achieved during vegetation establishment efforts during construction phase, comprised of native species.

Monitoring Design and Rationale: The species composition of each site will be sampled annually at the permanent vegetation monitoring sites. Sites will be sampled annually

post construction until success is determined. Diversity metrics may consist of species richness, species evenness, and/or other species diversity metrics such as the Shannon Weiner or Simpson Index.

Trigger: The target increase in species diversity is not achieved within one year of construction.

Possible Causes for Not Meeting Success Criteria Potential: Failure mechanisms associated with meeting the species diversity performance measure includes those listed above for performance measures 1 and 2.

Potential Adaptive Management Measures: Potential adaptive management measures include those listed above for performance measures 1-2; however, modifying the plant species used to replace unsuccessful plantings would be the most likely adaptive management measures. This is especially the case when survival of a species is significantly lower than other species planted in the restoration area. Prior to initiation of adaptive management measures, review by SWT Operations Division Cultural Resources personnel must be conducted to ensure that avoided cultural resources are not impacted, and that required measures are consistent with the level of cultural resources investigations previously conducted.

Performance Measure 4: Manage non-native invasive vegetation within mitigation sites.

Success Criteria One year following completion of final construction activities achieve less than 25% average cover of non-native invasive species. Years 2 to 5 following completion of final construction activities achieve average cover of less than 5% non-native invasive species with no area greater than 0.25 acres in size with greater than 10% non-native invasive species.

Monitoring Design and Rationale: Vegetation will be sampled annually, at the mitigation site. Permanent vegetation monitoring stations will be established for assessing the vegetation community at each site. Sites will be sampled annually post-construction until success is determined. Initial control/removal of unwanted plants will be evaluated, and determinations made on an annual or semi-annual basis on whether additional action will be needed.

Trigger: Non-native invasive species percent cover exceeds 25% after one year, 15% after two years, and/or 10% after 3 years.

Possible Causes for Not Meeting Success Criteria Possible: Failure modes for invasive species management include ineffective treatment of the invasive species, root sprouting of the invasive plant, reestablishment of invasive species from the seed bank in the restoration areas, or immigration of invasive species seeds from animals or floodwaters.

Potential Adaptive Management Measures: Adaptive management measures to address failures in invasive species control include modifying the active ingredient/surfactant or application rates of herbicides, changing the treatment methodology (chemical, mechanical, or biocontrol), or modifying the integrated pest management strategy. Should ground disturbing methods be selected, review by SWT Operations Division Cultural Resources personnel must be conducted prior to implementation to ensure that avoided cultural resources are not impacted, and that required measures are consistent with the level of cultural resources investigations previously conducted.

This mitigation plan involves active manipulation (as needed) to sustain project goals and objectives, primarily by applying an iterative process of assessing and learning from the results of management actions. The application of adaptive management principals in this project will provide decision support tools to address site changes that may occur as the project progresses, as well as integrate additional project resources or technologies as needed. In some cases additional resources may be needed to address issues that occur (such as management of new infestations of invasive species), but in most cases reallocation of resources (e.g., modifying planting lists/species selection based upon successes and failure of earlier plantings) can be used to meet or exceed project goals as defined by tree, shrub, vine, and herbaceous plant establishment combined with nuisance plant control.

In contrast, periodic monitoring of performance criteria which contain trigger values informs the iterative process of implementing specified adaptive management measures to help achieve ecological success. However, the project area is susceptible to several uncertainties that could significantly impact the ecological success of constructed restoration features as described.

Decisions on the implementation of adaptive management actions are informed by the assessment of monitoring results. The information generated by the monitoring plan will be used by USACE to guide decisions on adaptive management that may be needed to ensure that the mitigation achieves success.

10 Financial Assurances

The funds necessary to carry out this mitigation plan will come from Maintenance and Operations (M&O) funds allocated for the USACE SWT Operations Division. In total, an estimated $3,348,000 would be needed to complete the mitigation plan, see Table 3 below for line item estimates.

Table 3. Mitigation Plan Costs

Task	**Cost ($)**
Planning, Design, and Initial Site Preparation	15,000
Propagule, Materials Acquisition, and Plant Production	648,000
Plantings	806,000
Monitoring	225,000
Adaptive Management	282,000
Reporting and Operations & Maintenance	96,000
Task	**Cost ($)**
Grading and Contouring	441,000
Security Fencing	1,425,000
Total	**3,938,000**

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12 List of Preparers

Justyss Watson – Biologist, Regional Planning and Environmental Center; 6 years USACE experience.

Attachment A

PROJECT AREA PHOTOS

North – Below Lock 16

East – Below Lock 16

South – Below Lock 16

West – Below Lock 16

North – Salt Creek

East – Salt Creek

South – Salt Creek

West – Salt Creek

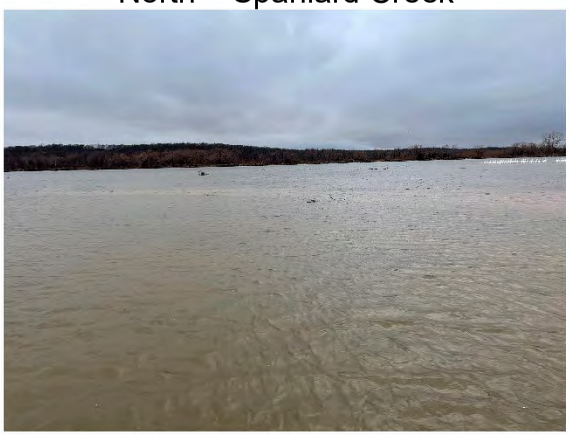
North – Sandtown Bottom

East – Sandtown Bottom

South – Sandtown Bottom

West – Sandtown Bottom

North – Spaniard Creek



South – Spaniard Creek

West – Spaniard Creek

North – Kerr Lake (RM 343)

East – Kerr Lake (RM 343)

South – Kerr Lake (RM 343)

North – Stoney Point

East – Stoney Point

South – Stoney Point

West – Stoney Point

San Bois Creek

San Bois Creek

San Bois Creek

San Bois Creek

PROPOSED MITIGATION AREA PHOTOS

West of Muskogee Turnpike

West of Muskogee Turnpike

West of Muskogee Turnpike

West of Muskogee Turnpike

E0960

E0960

E0960

E0960

North of I40

North of I40

North of I40

North of I40

Drake Road

Drake Road

Drake Road

Drake Road

Missouri Pacific Railroad East

Missouri Pacific Railroad East

Missouri Pacific Railroad East

Missouri Pacific Railroad East

Missouri Pacific Railroad West

Missouri Pacific Railroad West

Missouri Pacific Railroad West

Missouri Pacific Railroad West

CR4530

CR4530

CR4530

CR4530

Tract 1304

Tract 1304

Tract 1304

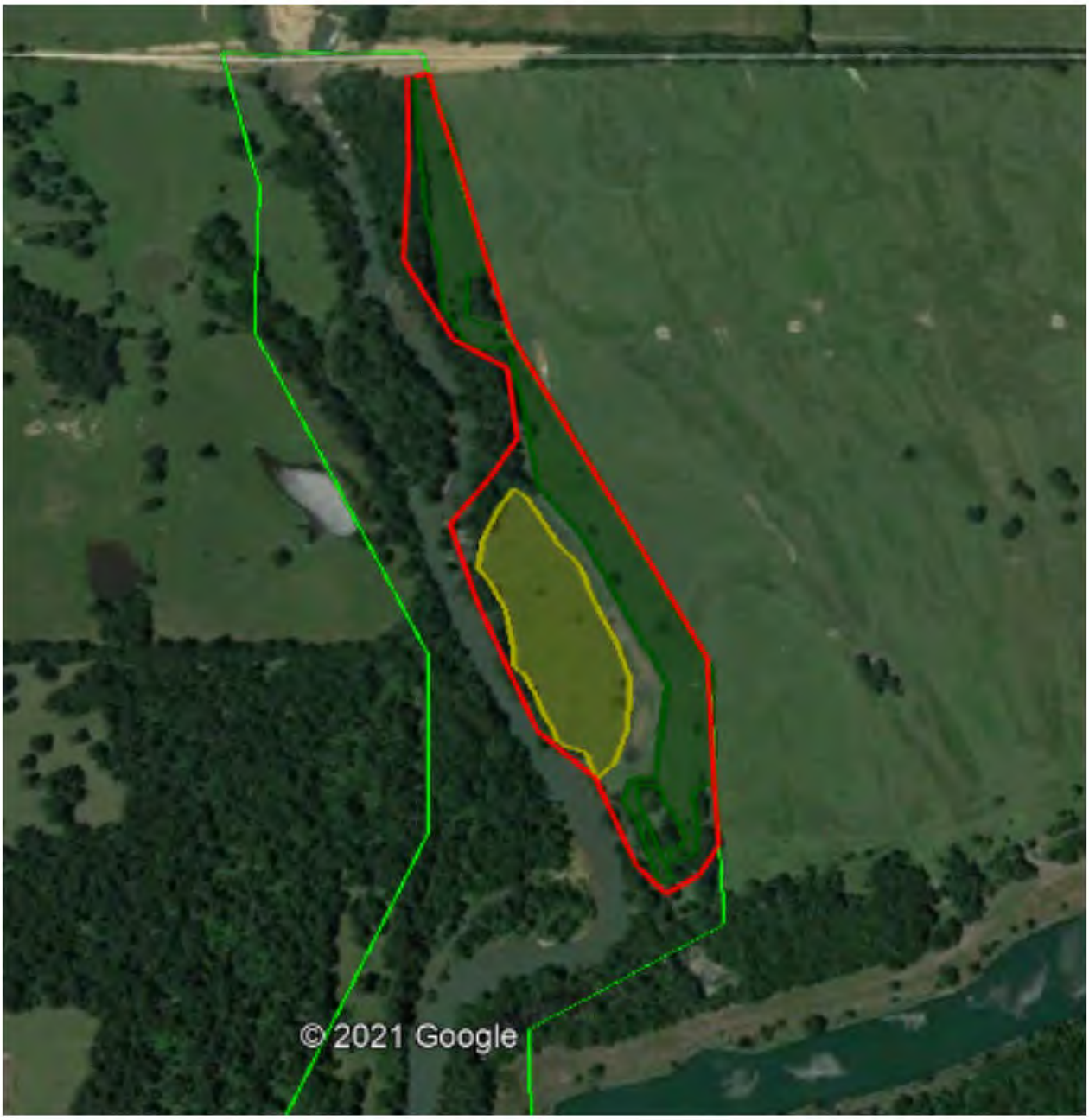
Tract 1304

Attachment B

West Muskogee Turnpike: This site will need minor grading around the edges of the neon green polygon. There is a slight increase in elevation ~3 feet.

E0960: Grading in the area within the blue circle to match the rest of the green polygon. Approximate change in elevation between 4 to 9 feet. Approximately 1.0 miles of fencing.

North I40: No grading required.

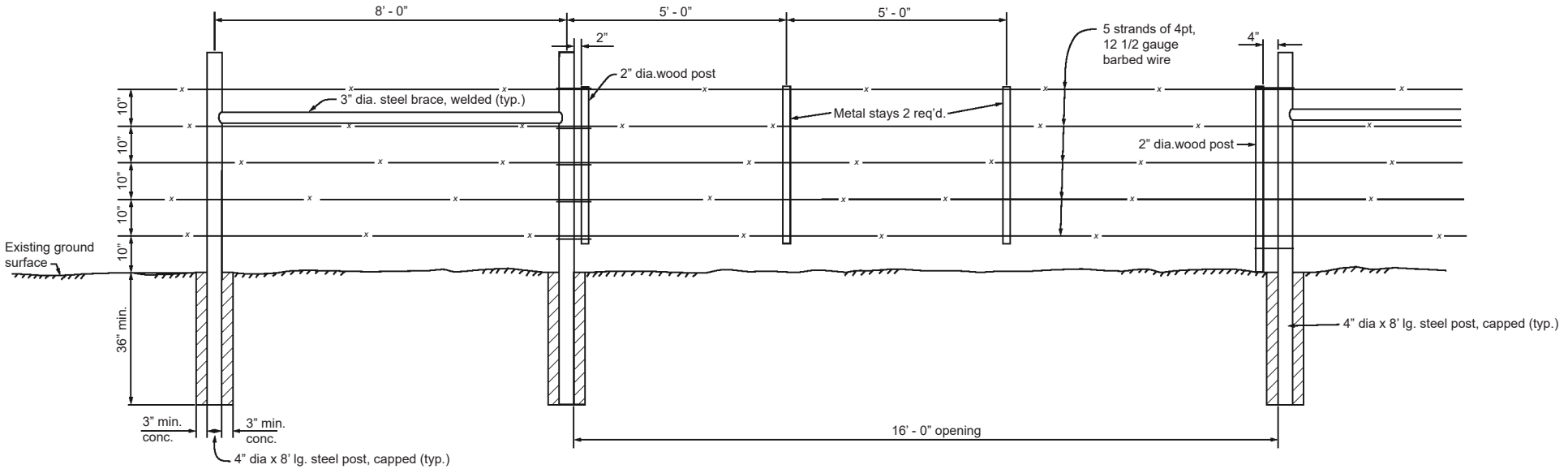


Drake Road: No grading required.

Missouri Pacific Railroad East: Light pockets of grading within neon green and yellowish polygon. No steep slopes, only enough to create minor sumps or depressions.

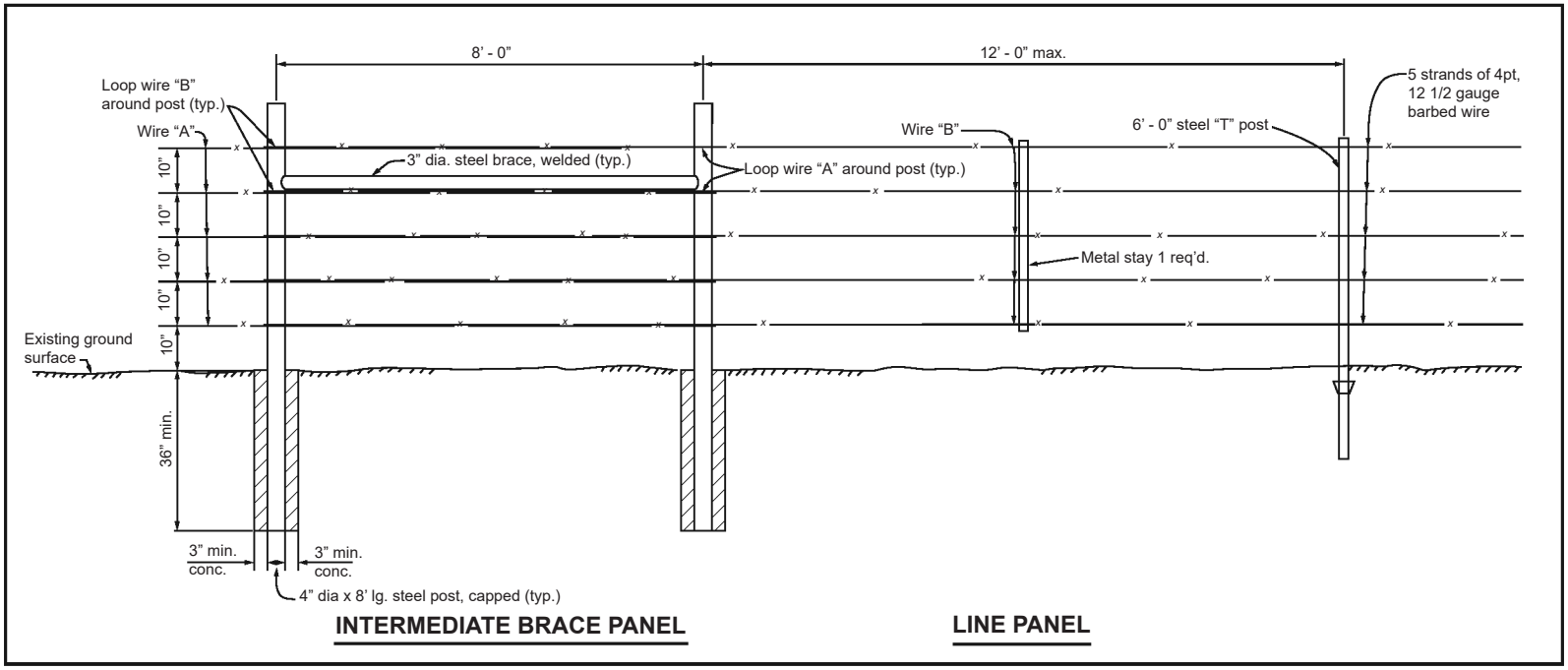
Missouri Pacific Railroad West: Minor grading, perhaps 10’x10’ or 20’x20 to allow for better drainage to the rest of the site.

Attachment C



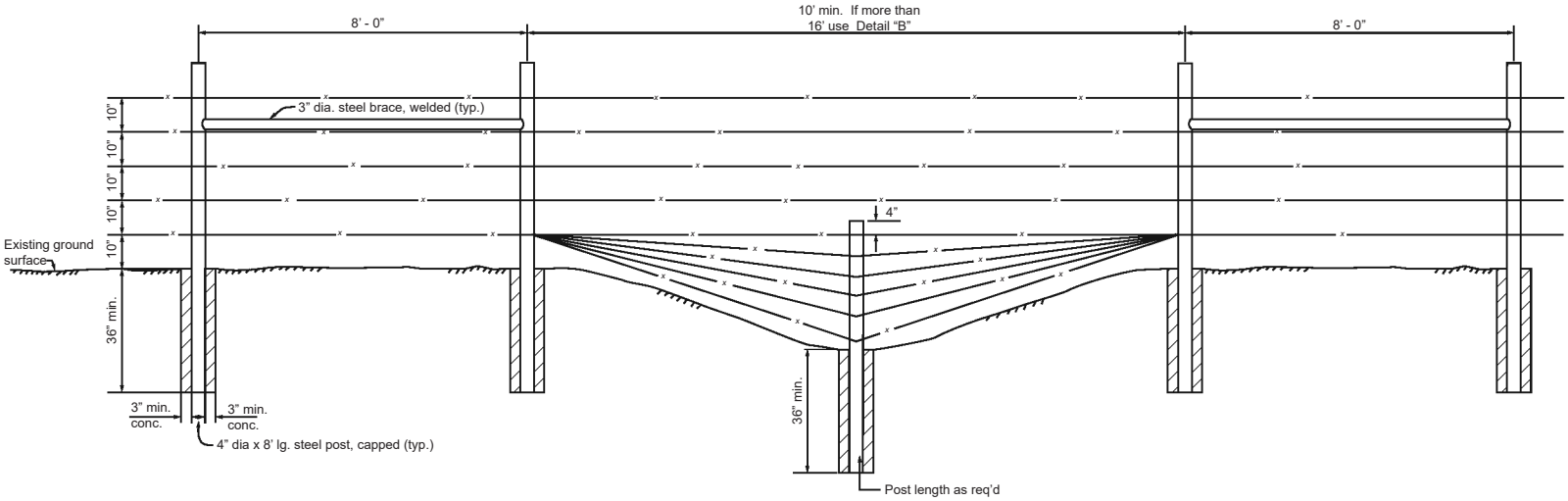
END (GATE) BRACE PANEL

FIELD GATE

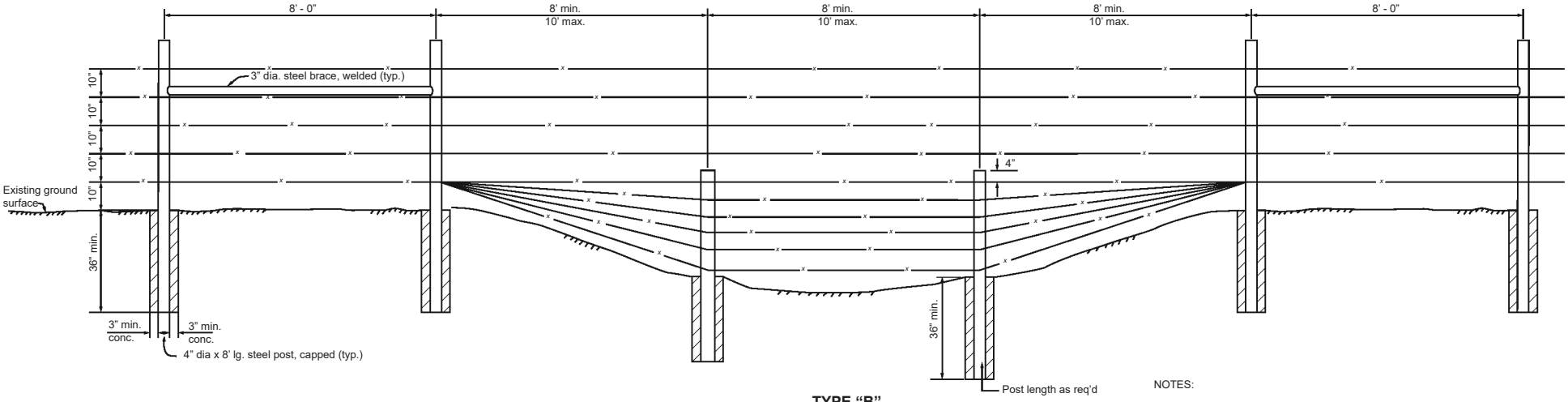


INTERMEDIATE BRACE PANEL

LINE PANEL



TYPE "A"

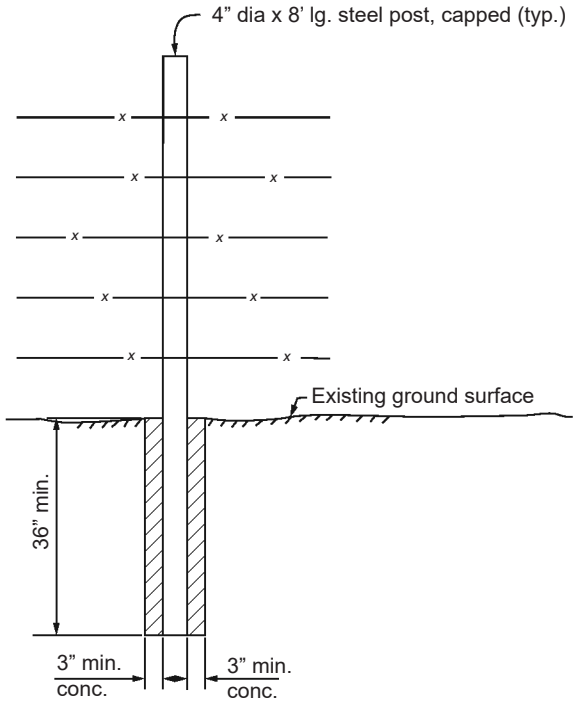


TYPE "B"

WATER GAP DETAILS

NOTES:

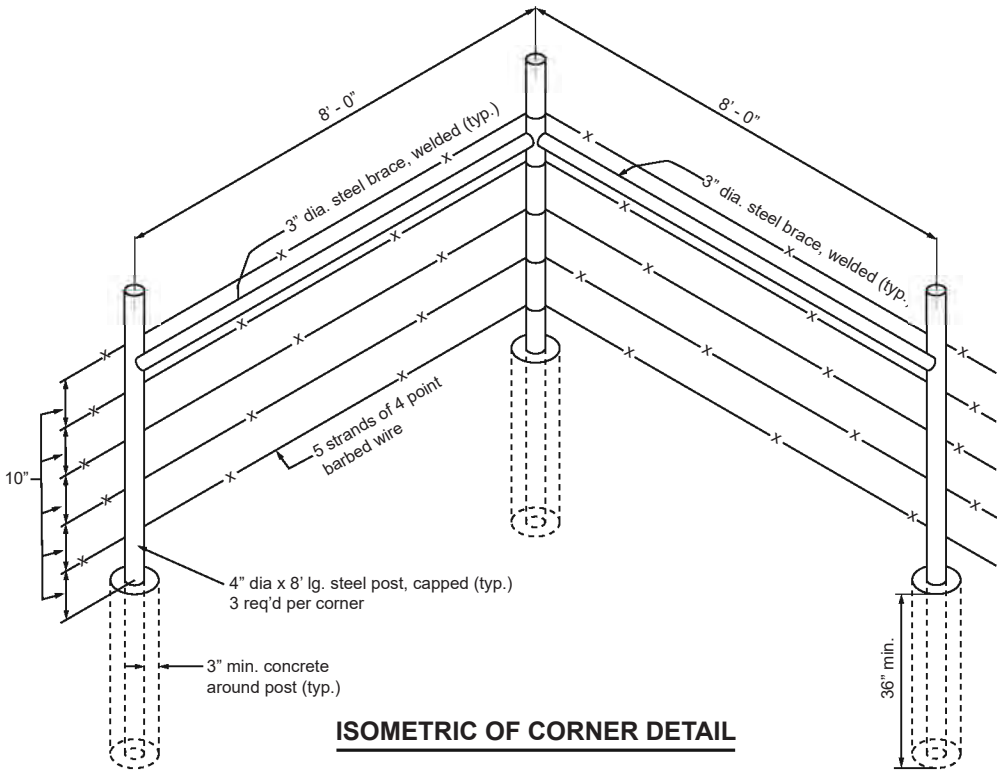
1. Used where fence alignment changes are 5 degrees or greater, but less than 10 degrees.
2. Used at bottom of sharp vertical breaks to prevent uplift from removing normally set post.



ANCHOR POST

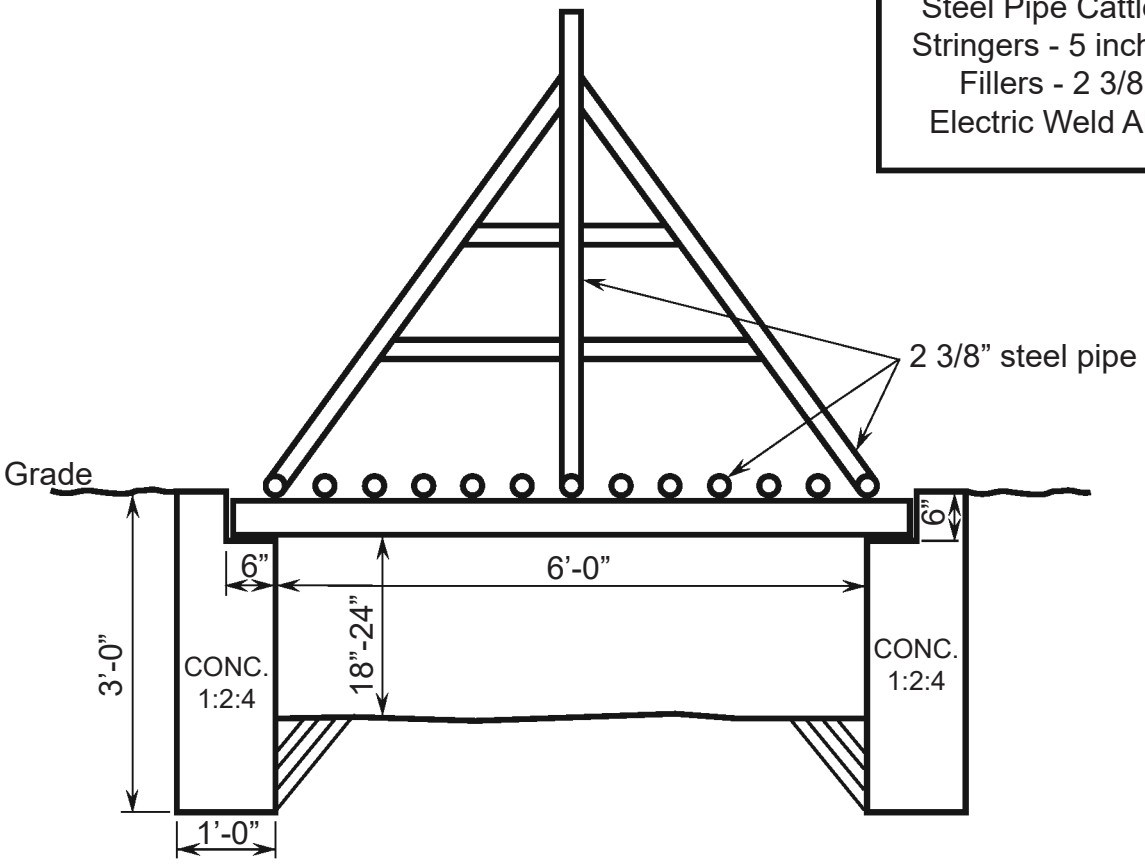
NOTES:

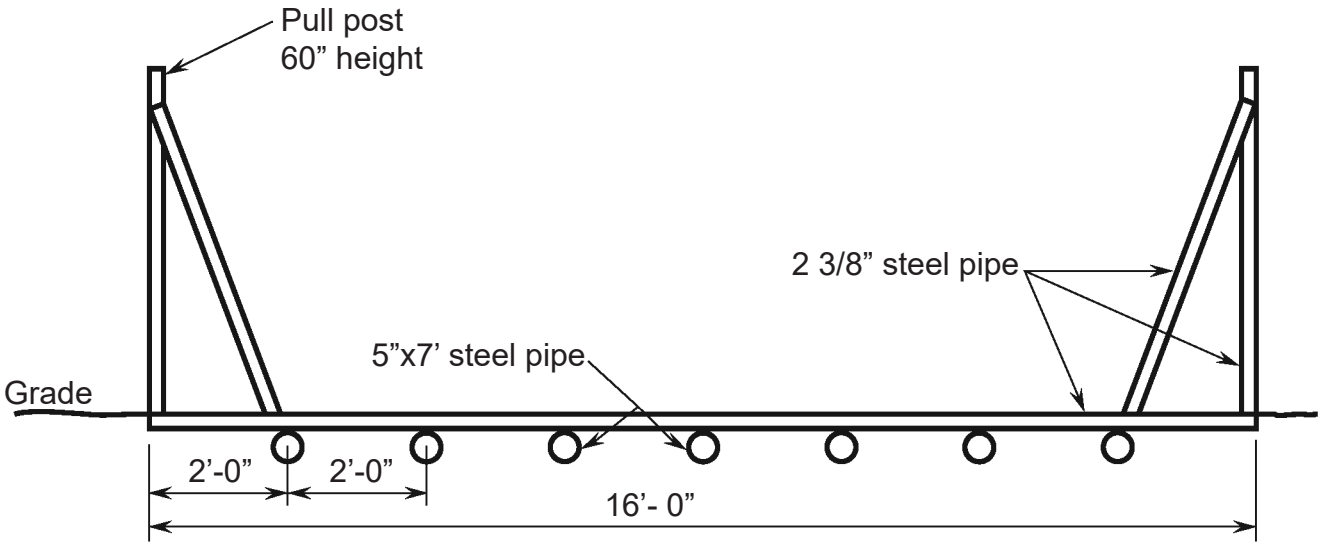
1. Used where fence alignment changes are 5 degrees or greater, but less than 10 degrees.
2. Used at bottom of sharp vertical breaks to prevent uplift from removing normally set post.



ISOMETRIC OF CORNER DETAIL

SPECIFICATIONS
Steel Pipe Cattle Guard
Stringers - 5 inch x 7 foot
Fillers - 2 3/8 inch
Electric Weld All Joints





Attachment D

NATIONWIDE STANDARD CONSERVATION MEASURES

Listed below are effective measures that should be employed at all project development sites nationwide with the goal of reducing impacts to birds and their habitats. These measures are grouped into three categories: General, Habitat Protection, and Stressor Management. These measures may be updated through time. We recommend checking the Conservation Measures website regularly for the most up-to-date list.

1. **General Measures**

a. Educate all employees, contractors, and/or site visitors of relevant rules and regulations that protect wildlife. See the Service webpage on Regulations and Policies for more information on regulations that protect migratory birds.

b. Prior to removal of an inactive nest, ensure that the nest is not protected under the Endangered Species Act (ESA) or the Bald and Golden Eagle Protection Act (BGEPA). Nests protected under ESA or BGEPA cannot be removed without a valid permit. i. See the Service Nest Destruction Policy

c. Do not collect birds (live or dead) or their parts (e.g., feathers) or nests without a valid permit. Please visit the Service permits page for more information on permits and permit applications.

d. Provide enclosed solid waste receptacles at all project areas. Non-hazardous solid waste (trash) would be collected and deposited in the on-site receptacles. Solid waste would be collected and disposed of by a local waste disposal contractor. For more information about solid waste and how to properly dispose of it, see the EPA Non-Hazardous Waste website.

e. Report any incidental take of a migratory bird, to the local Service Office of Law Enforcement.

f. Consult and follow applicable Service industry guidance.

2. **Habitat Protection**

a. Minimize project creep by clearly delineating and maintaining project boundaries (including staging areas).

b. Consult all local, State, and Federal regulations for the development of an appropriate buffer distance between development site and any wetland or waterway. For more information on wetland protection regulations see the Clean Water Act sections 401 and 404.

c. Maximize use of disturbed land for all project activities (i.e., siting, lay-down areas, and construction).

d. Implement standard soil erosion and dust control measures. For example: i. Establish vegetation cover to stabilize soil ii. Use erosion blankets to prevent soil loss iii. Water bare soil to prevent wind erosion and dust issues

3. Stressor Management

Stressor: Vegetation Removal

Conservation Goal: Avoid direct take of adults, chicks, or eggs.

Conservation Measure 1: Schedule all vegetation removal, trimming, and grading of vegetated areas outside of the peak bird breeding season to the maximum extent practicable. Use available resources, such as internet-based tools (e.g., the FWS's Information, Planning and Conservation system and Avian Knowledge Network) to identify peak breeding months for local

bird species; or, contact local Service Migratory Bird Program Office for breeding bird information.

Conservation Measure 2: When project activities cannot occur outside the bird nesting season, conduct surveys prior to scheduled activity to determine if active nests are present within the area of impact and buffer any nesting locations found during surveys.

1) Generally, the surveys should be conducted no more than five days prior to scheduled activity.

2) Timing and dimensions of the area to be surveyed vary and will depend on the nature of the project, location, and expected level of vegetation disturbance.

3) If active nests or breeding behavior (e.g., courtship, nest building, territorial defense, etc.) are detected during these surveys, no vegetation removal activities should be conducted until nestlings have fledged or the nest fails or breeding behaviors are no longer observed. If the activity must occur, establish a buffer zone around the nest and no activities will occur within that zone until nestlings have fledged and left the nest area. The dimension of the buffer zone will depend on the proposed activity, habitat type, and species present and should be coordinated with the local or regional Service office.

4) When establishing a buffer zone, construct a barrier (e.g., plastic fencing) to protect the area. If the fence is knocked down or destroyed, work will suspend wholly, or in part, until the fence is satisfactorily repaired.

5) When establishing a buffer zone, a qualified biologist will be present onsite to serve as a biological monitor during vegetation clearing and grading activities to ensure no take of migratory birds occurs. Prior to vegetation clearing, the monitor will ensure that the limits of construction have been properly staked and are readily identifiable. Any associated project activities that are inconsistent with the applicable conservation measures, and activities that may result in the take of migratory birds will be immediately halted and reported to the appropriate Service office within 24 hours.

6) If establishing a buffer zone is not feasible, contact the Service for guidance to minimize impacts to migratory birds associated with the proposed project or removal of an active nest. Active nests may only be removed if you receive a permit from your local Migratory Bird Permit Office. A permit may authorize active nest removal by a qualified biologist with bird handling experience or by a permitted bird rehabilitator.

Conservation Measure 3: Prepare a vegetation maintenance plan that outlines vegetation maintenance activities and schedules so that direct bird impacts do not occur.

Stressor: Invasive Species Introduction

Conservation Goal: Prevent the introduction of invasive plants.

Conservation Measure 1: Prepare a weed abatement plan that outlines the areas where weed abatement is required and the schedule and method of activities to ensure bird impacts are avoided.

Conservation Measure 2: For temporary and permanent habitat restoration/enhancement, use only native and local (when possible) seed and plant stock.

Conservation Measure 3: Consider creating vehicle wash stations prior to entering sensitive habitat areas to prevent accidental introduction of non-native plants.

Conservation Measure 4: Remove invasive/exotic species that pose an attractive nuisance to migratory birds.

Stressor: Artificial Lighting

Conservation Goal: Prevent increase in lighting of native habitats during the bird breeding season.

Conservation Measure 1: To the maximum extent practicable, limit construction activities to the time between dawn and dusk to avoid the illumination of adjacent habitat areas.

Conservation Measure 2: If construction activity time restrictions are not possible, use down shielding or directional lighting to avoid light trespass into bird habitat (i.e., use a 'Cobra' style light rather than an omnidirectional light system to direct light down to the roadbed). To the maximum extent practicable, while allowing for public safety, low intensity energy saving lighting (e.g. low pressure sodium lamps) will be used.

Conservation Measure 3: Minimize illumination of lighting on associated construction or operation structures by using motion sensors or heat sensors.

Conservation Measure 4: Bright white light, such as metal halide, halogen, fluorescent, mercury vapor and incandescent lamps should not be used.

Stressor: Human Disturbance

Conservation Goal: Minimize prolonged human presence near nesting birds during construction and maintenance actions.

Conservation Measure 1: Restrict unauthorized access to natural areas adjacent to the project site by erecting a barrier and/or avoidance buffers (e.g., gate, fence, wall) to minimize foot traffic and off-road vehicle uses.

Stressor: Collision

Conservation Goal: Minimize collision risk with project infrastructure and vehicles.

Conservation Measure 1: Minimize collision risk with project infrastructure (e.g., temporary and permanent) by increasing visibility through appropriate marking and design features (e.g., lighting, wire marking, etc.).

Conservation Measure 2: On bridge crossing areas with adjacent riparian, beach, estuary, or other bird habitat, use fencing or metal bridge poles (Sebastian Poles) that extend to the height of the tallest vehicles that will use the structure.

Conservation Measure 3: Install wildlife friendly culverts so rodents and small mammals can travel under any new roadways instead of over them. This may help reduce raptor deaths associated with being struck while tracking prey or scavenging road kill on the roadway.

Conservation Measure 4: Remove road-kill carcasses regularly to prevent scavenging and bird congregations along roadways.

Conservation Measure 5: Avoid planting “desirable” fruited or preferred nesting vegetation in medians or Rights of Way.

Conservation Measure 6: Eliminate use of steady burning lights on tall structures (e.g., >200 ft).

Stressor: Entrapment

Conservation Goal: Prevent birds from becoming trapped in project structures or perching and nesting in project areas that may endanger them.

Conservation Measure 1: Minimize entrapment and entanglement hazards through project design measures that may include:

1. Installing anti-perching devices on facilities/equipment where birds may commonly nest or perch

2. Covering or enclosing all potential nesting surfaces on the structure with mesh netting, chicken wire fencing, or other suitable exclusion material prior to the nesting season to prevent birds from establishing new nests. The netting, fencing, or other material must have no opening or mesh size greater than 19 mm and must be maintained until the structure is removed.

3. Cap pipes and cover/seal all small dark spaces where birds may enter and become trapped.

Conservation Measure 2: Use the appropriate deterrents to prevent birds from nesting on structures where they cause conflicts, may endanger themselves, or create a human health and safety hazard.

1. During the time that the birds are trying to build or occupy their nests (generally , between April and August, depending on the geographic location), potential nesting 5 surfaces should be monitored at least once every three days for any nesting activity, especially where bird use of structures is likely to cause take. It is permissible to remove non-active nests (without birds or eggs), partially completed nests, or new nests as they are built (prior to occupation). If birds have started to build any nests, the nests shall be removed before they are completed. Water shall not be used to remove the nests if nests are located within 50 feet of any surface waters.

2. If an active nest becomes established (i.e., there are eggs or young in the nest), all work that could result in abandonment or destruction of the nest shall be avoided until the young have fledged or the nest is unoccupied. Construction activities that may displace birds after they have laid their eggs and before the young have fledged should not be permitted. If the project continues into the following spring, this cycle shall be repeated. When work on the structure is complete, all netting shall be removed and properly disposed of.

Stressor: Noise

Conservation Goal: Prevent the increase in noise above ambient levels during the nesting bird breeding season.

Conservation Measure 1: Minimize an increase in noise above ambient levels during project construction by installing temporary structural barriers such as sand bags

Conservation Measure 2: Avoid permanent additions to ambient noise levels from the proposed project by using baffle boxes or sound walls.

Stressor: Chemical Contamination

Conservation Goal: Prevent the introduction of chemicals contaminants into the environment.

Conservation Measure 1: Avoid chemical contamination of the project area by implementing a Hazardous Materials Plan. For more information on hazardous waste and how to properly manage hazardous waste, see the EPA Hazardous Waste website.

Conservation Measure 2: Avoid soil contamination by using drip pans underneath equipment and containment zones at construction sites and when refueling vehicles or equipment.

Conservation Measure 3: Avoid contaminating natural aquatic and wetland systems with runoff by limiting all equipment maintenance, staging laydown, and dispensing of fuel, oil, etc., to designated upland areas.

Conservation Measure 4: Any use of pesticides or rodenticides shall comply with the applicable Federal and State laws.

1. Choose non-chemical alternatives when appropriate

2. Pesticides shall be used only in accordance with their registered uses and in accordance with the manufacturer's instructions to limit access to non-target species.

3. For general measures to reducing wildlife exposure to pesticides, see EPA's Pesticides: Environmental Effects website.

Stressor: Fire

Conservation Goal: Minimize fire potential from project-related activities.

Conservation Measure 1: Reduce fire hazards from vehicles and human activities (e.g., use spark arrestors on power equipment, avoid driving vehicles off road).

Conservation Measure 2: Consider fire potential when developing vegetation management plans by planting temporary impact areas with a palate of low-growing, sparse, fire resistant native species that meet with the approval of the County Fire Department and local FWS Office.

Appendix B

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Tue 6/21/2022 11:25 AM

To:

- Stubbs, Kevin

Kevin,

The Oklahoma Department of Wildlife concurs with the mitigation recommendations in the Coordination Act Report.

Mike Plunkett
NE Regional Supervisor
Oklahoma Department of Wildlife