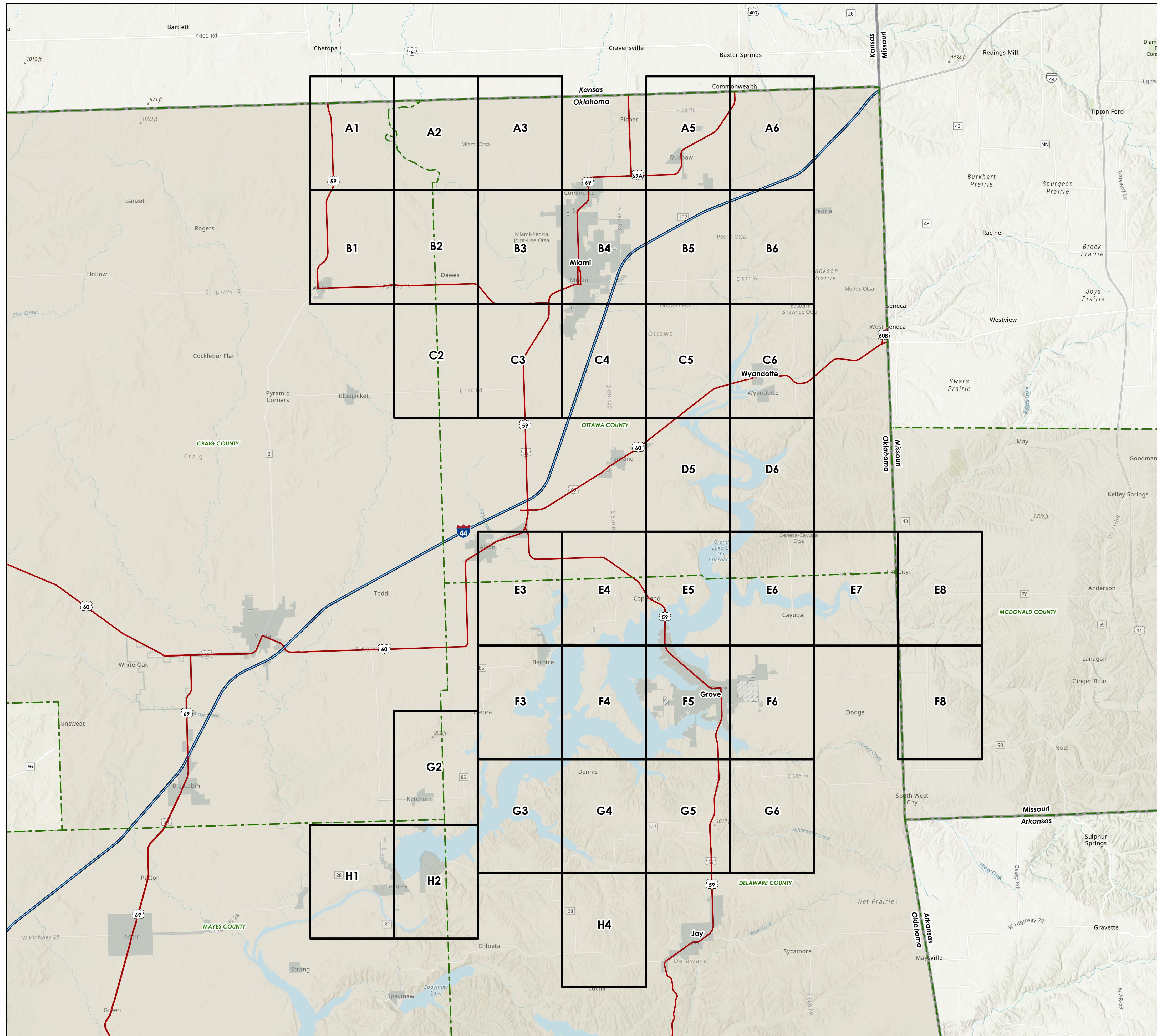


Wetland and Riparian Inundation Changes Overview Map

Pensacola Dam
 GRAND RIVER DAM AUTHORITY
 September 2022

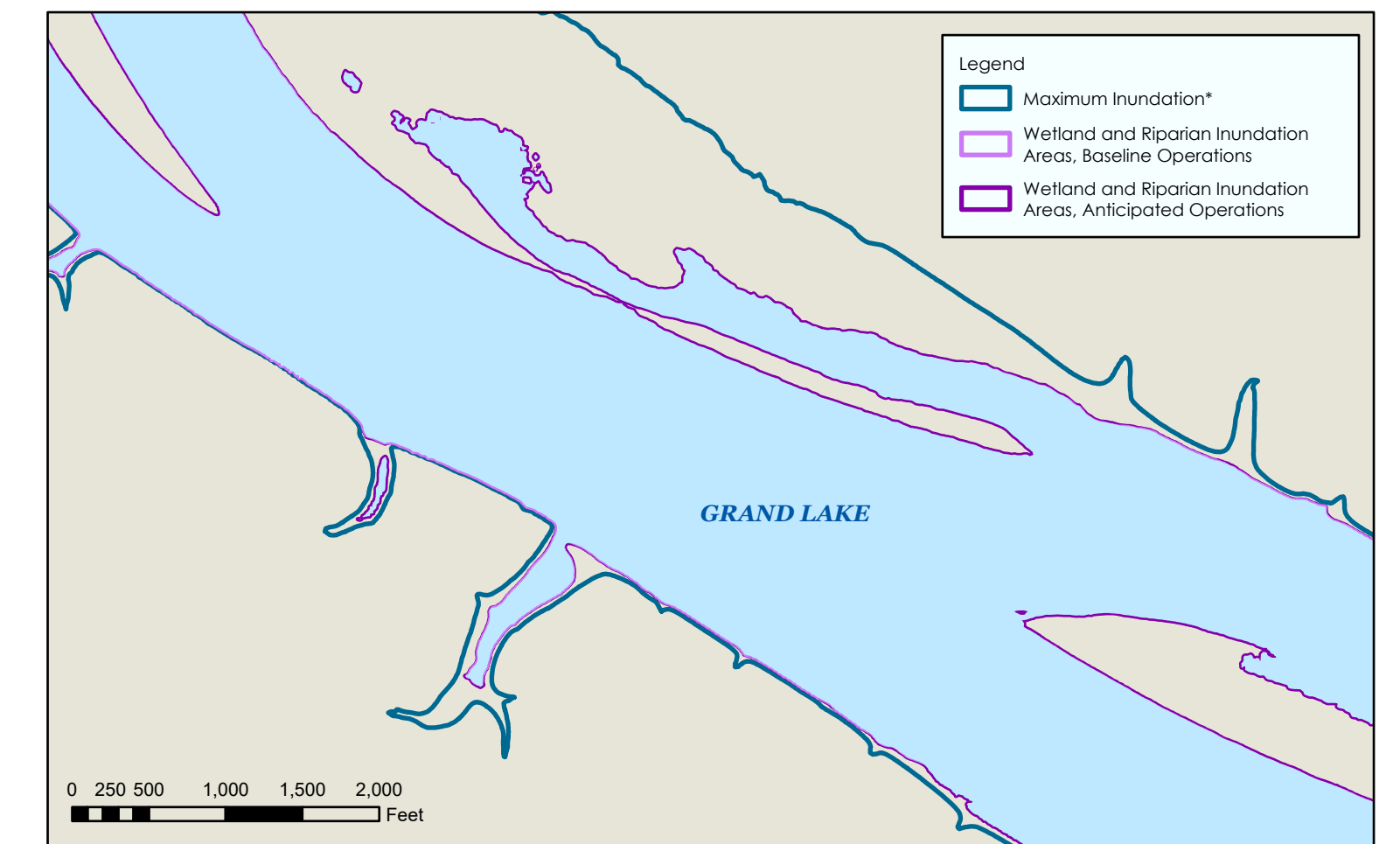


Overview Map Legend



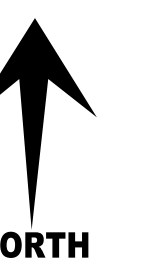
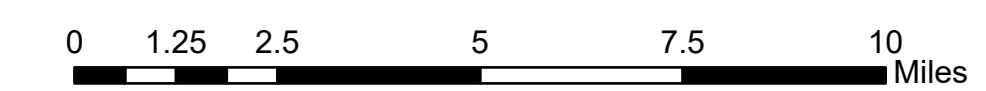
Wetland and Riparian Inundation Areas Mapping Explanation

Mapping shows the extent of inundation calculated using the H&H Study Operations Model and Upstream Hydraulic Model. Estimated inundation extent for normal (median) inflows and operations during the active wetland growing season.



* Maximum inundation extents for Baseline Operations and Anticipated Operations are nearly identical. Therefore, the Maximum inundation extent shown represents both conditions. Maximum inundation extent occurs when USACE is in flood control.

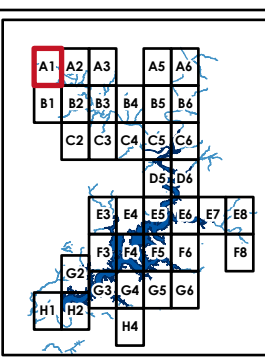
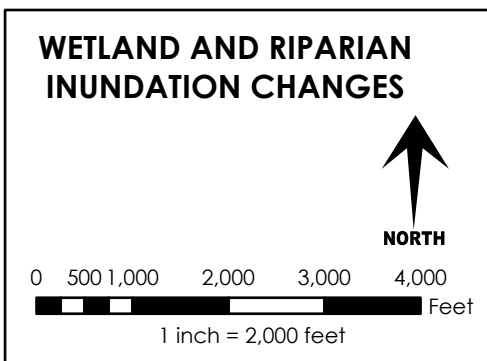
Disclaimer: These maps represent the work of the H&H Study and are not to be used as shown for resource analysis purposes.



Map Notes

Data Sources for Maps:

1. Base map images from https://gis.apfo.usda.gov/arcgis/services/NAIP/USDA_CONUS_PRIME/ImageServer, 2019
2. Transportation network (major roads, local roads, and railroads) and county boundaries obtained from the Oklahoma Office of Geographic Information (<http://okmaps.org/ogi/search.aspx>).



INUNDATION Maximum Inundation Wetland and Riparian Inundation Areas, Anticipated Operations Wetland and Riparian Inundation Areas, Baseline Operations		ROAD CLASS Interstate State Highway US Highway Major Collector Local Road Railroad		Legend Stream Project Boundary (2014) Wildlife Management Areas National Wetland Inventory Wetland USFWS Riparian Habitat	
MAP AND LEGEND NOTES					
1. Mapping shows the extent of inundation calculated using the H&H Study Operations Model and Upstream Hydraulic Model. These maps represent the work of the H&H Study and are not to be used as shown for resource analysis purposes. 2. Estimated inundation extent for normal (median) inflows and operations during the active wetland growing season. 3. See Overview Map for an explanation of the maximum inundation extent and notes on data sources.					

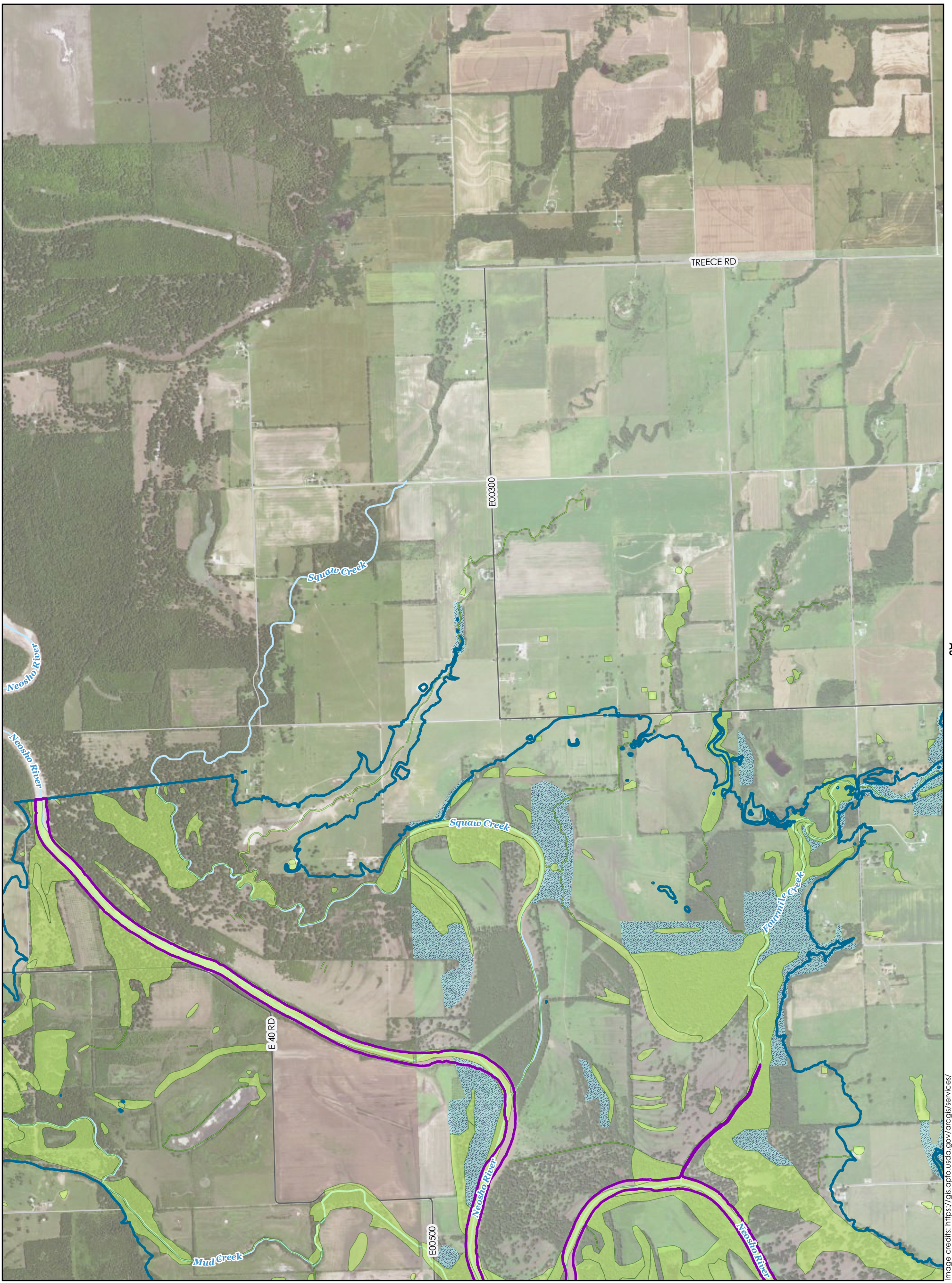
PENSACOLA DAM
 GRAND RIVER DAM AUTHORITY

MAP: A1

CRAIG, DELAWARE, MAYES, AND OTTAWA COUNTIES, OKLAHOMA

FERC No. 1494
 September 2022

Image credits: https://gis.dplbo.usda.gov/arcgis/services/NAIP/USDA_CONUS_PRIME/ImageServer, 2019

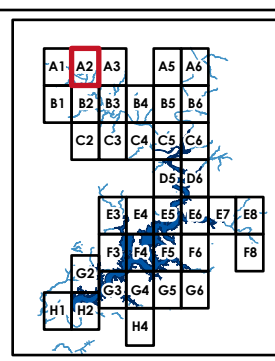


WETLAND AND RIPARIAN INUNDATION CHANGES

NORTH

0 500 1,000 2,000 3,000 4,000 Feet

1 inch = 2,000 feet



Legend

INUNDATION

- Maximum Inundation
- Wetland and Riparian Inundation Areas, Anticipated Operations
- Wetland and Riparian Inundation Areas, Baseline Operations

ROAD CLASS

- Interstate
- State Highway
- US Highway
- Major Collector
- Local Road
- Railroad

MAP AND LEGEND NOTES

PENSACOLA DAM
GRAND RIVER DAM AUTHORITY

MAP: A2

CRAIG, DELAWARE, MAYES, AND OTTAWA COUNTIES, OKLAHOMA

FERC No. 1494
 September 2022

1. Mapping shows the extent of inundation calculated using the H&H Study Operations Model and Upstream Hydraulic Model. **These maps represent the work of the H&H Study and are not to be used as shown for resource analysis purposes.**

2. Estimated inundation extent for normal (median) inflows and operations during the active wetland growing season.

3. See Overview Map for an explanation of the maximum inundation extent and notes on data sources.

Image credits: https://gis.dplp.usda.gov/arcgis/services/NAIP/USDA_CONUS_PRIME/ImageServer, 2019



A2

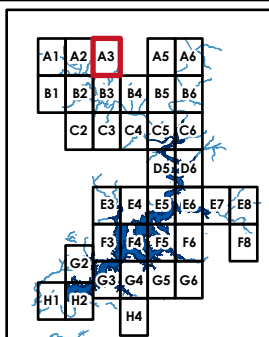
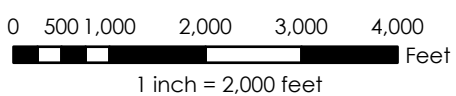
A4

B2

B3

B4

WETLAND AND RIPARIAN INUNDATION CHANGES



INUNDATION

- Maximum Inundation
- Wetland and Riparian Inundation Areas, Anticipated Operations
- Wetland and Riparian Inundation Areas, Baseline Operations

Legend

ROAD CLASS

- Interstate
- State Highway
- US Highway
- Major Collector
- Local Road
- Railroad

- Stream
- Project Boundary (2014)
- Wildlife Management Areas
- National Wetland Inventory Wetland
- USFWS Riparian Habitat

MAP AND LEGEND NOTES

1. Mapping shows the extent of inundation calculated using the H&H Study Operations Model and Upstream Hydraulic Model. **These maps represent the work of the H&H Study and are not to be used as shown for resource analysis purposes.**
2. Estimated inundation extent for normal (median) inflows and operations during the active wetland growing season.
3. See Overview Map for an explanation of the maximum inundation extent and notes on data sources.

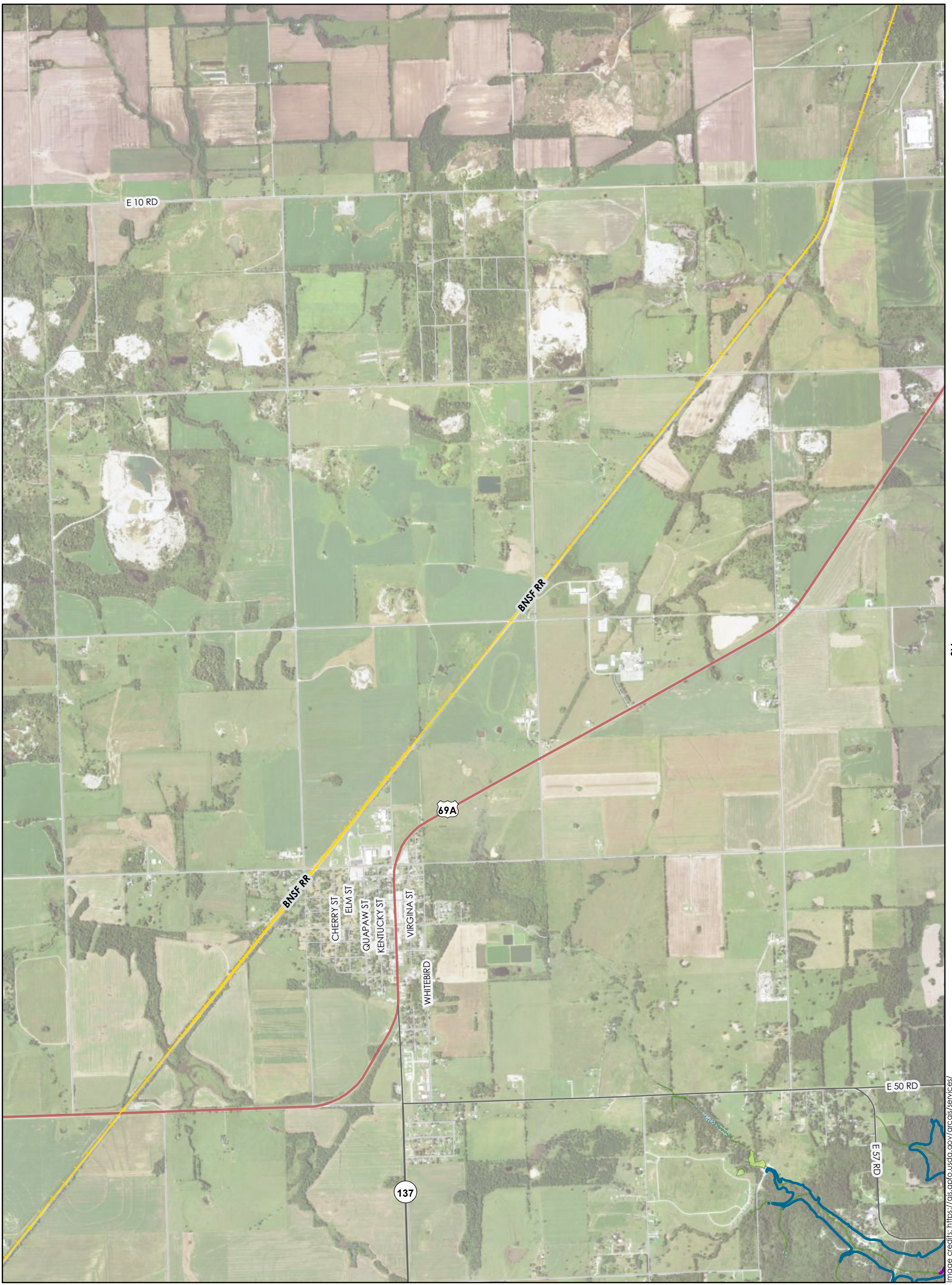
PENSACOLA DAM GRAND RIVER DAM AUTHORITY

MAP: A3

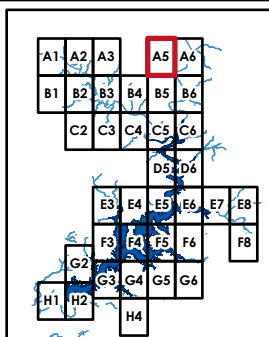
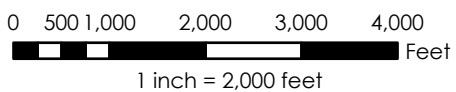
CRAIG, DELAWARE, MAYES, AND OTTAWA COUNTIES, OKLAHOMA

FERC No. 1494
September 2022

Image credits: https://gis.apfo.usda.gov/arcgis/services/NAIP/USDA_CONUS_PRIME/ImageServer, 2019



WETLAND AND RIPARIAN INUNDATION CHANGES



INUNDATION

- Maximum Inundation
- Wetland and Riparian Inundation Areas, Anticipated Operations
- Wetland and Riparian Inundation Areas, Baseline Operations

Legend

- #### ROAD CLASS
- Interstate
 - State Highway
 - US Highway
 - Major Collector
 - Local Road
 - Railroad

- Stream
- Project Boundary (2014)
- Wildlife Management Areas
- National Wetland Inventory Wetland
- USFWS Riparian Habitat

MAP AND LEGEND NOTES

1. Mapping shows the extent of inundation calculated using the H&H Study Operations Model and Upstream Hydraulic Model. **These maps represent the work of the H&H Study and are not to be used as shown for resource analysis purposes.**
2. Estimated inundation extent for normal (median) inflows and operations during the active wetland growing season.
3. See Overview Map for an explanation of the maximum inundation extent and notes on data sources.

PENSACOLA DAM GRAND RIVER DAM AUTHORITY

MAP: A5

CRAIG, DELAWARE, MAYES, AND OTTAWA COUNTIES, OKLAHOMA

FERC No. 1494
September 2022

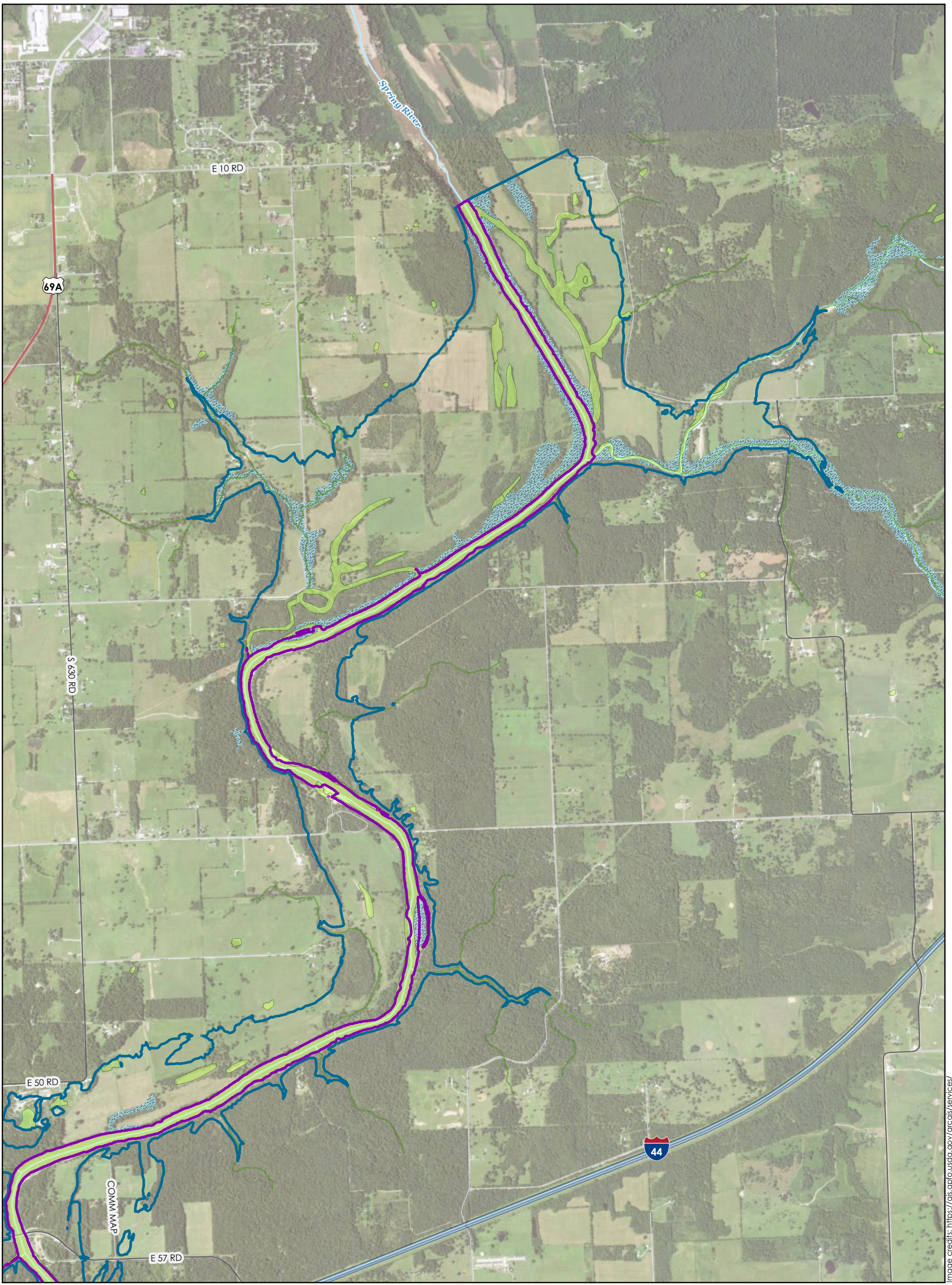
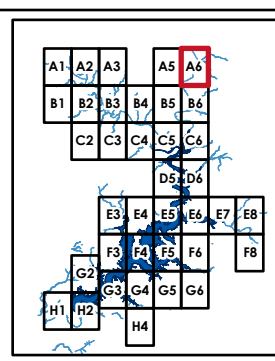


Image credits: https://gis.apfo.usda.gov/arcgis/services/NAIP/USDA_CONUS_PRIME/ImageServer, 2019

WETLAND AND RIPARIAN INUNDATION CHANGES

NORTH

0 500 1,000 2,000 3,000 4,000 Feet
1 inch = 2,000 feet



Legend

INUNDATION	ROAD CLASS
Maximum Inundation	Interstate
Wetland and Riparian Inundation Areas, Anticipated Operations	State Highway
Wetland and Riparian Inundation Areas, Baseline Operations	US Highway
	Major Collector
	Local Road
	Railroad

MAP AND LEGEND NOTES

PENSACOLA DAM GRAND RIVER DAM AUTHORITY

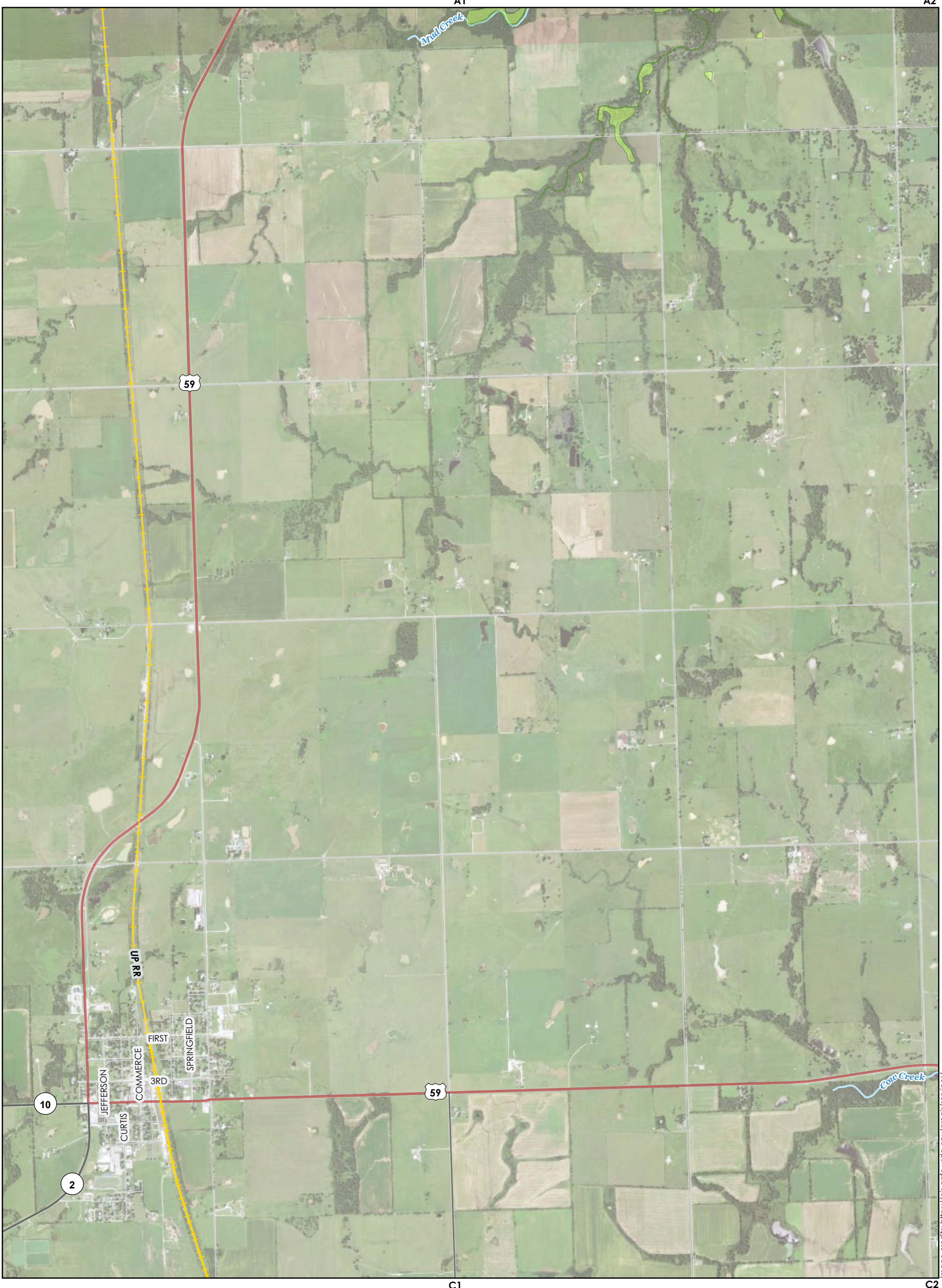
MAP: A6

CRAIG, DELAWARE, MAYES, AND OTTAWA COUNTIES, OKLAHOMA

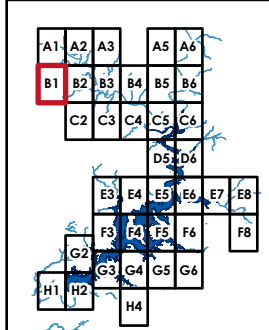
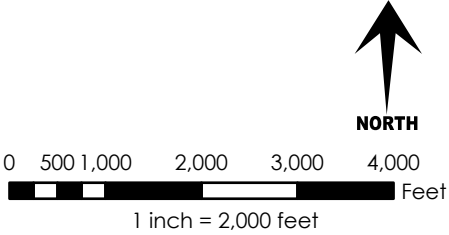
FERC No. 1494
September 2022

Stream
Project Boundary (2014)
Wildlife Management Areas
National Wetland Inventory Wetland
USFWS Riparian Habitat

1. Mapping shows the extent of inundation calculated using the H&H Study Operations Model and Upstream Hydraulic Model. **These maps represent the work of the H&H Study and are not to be used as shown for resource analysis purposes.**
2. Estimated inundation extent for normal (median) inflows and operations during the active wetland growing season.
3. See Overview Map for an explanation of the maximum inundation extent and notes on data sources.



WETLAND AND RIPARIAN INUNDATION CHANGES



INUNDATION

- Maximum Inundation
- Wetland and Riparian Inundation Areas, Anticipated Operations
- Wetland and Riparian Inundation Areas, Baseline Operations

Legend

ROAD CLASS

- Interstate
- State Highway
- US Highway
- Major Collector
- Local Road
- Railroad

- Stream
- Project Boundary (2014)
- Wildlife Management Areas
- National Wetland Inventory Wetland
- USFWS Riparian Habitat

MAP AND LEGEND NOTES

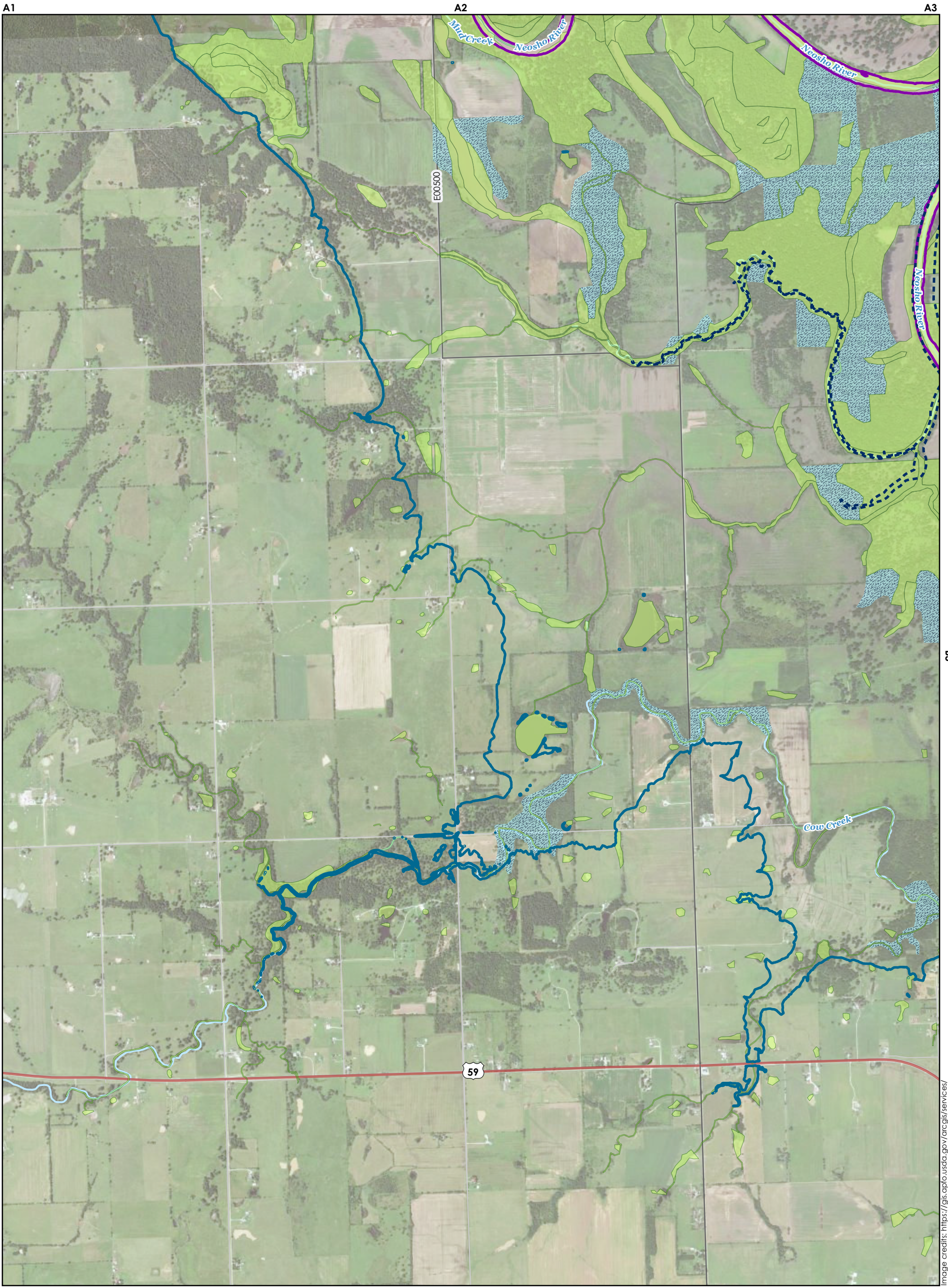
1. Mapping shows the extent of inundation calculated using the H&H Study Operations Model and Upstream Hydraulic Model. **These maps represent the work of the H&H Study and are not to be used as shown for resource analysis purposes.**
2. Estimated inundation extent for normal (median) inflows and operations during the active wetland growing season.
3. See Overview Map for an explanation of the maximum inundation extent and notes on data sources.

PENSACOLA DAM GRAND RIVER DAM AUTHORITY

MAP: B1

CRAIG, DELAWARE, MAYES, AND OTTAWA COUNTIES, OKLAHOMA
FERC No. 1494
 September 2022

Image credits: https://gis.dplfo.usda.gov/arcgis/services/NAIP/USDA_CONUS_PRIME/ImageServer, 2019



WETLAND AND RIPARIAN INUNDATION CHANGES

NORTH

0 500 1,000 2,000 3,000 4,000 Feet

1 inch = 2,000 feet

Legend

<h5>INUNDATION</h5> <ul style="list-style-type: none"> Maximum Inundation Wetland and Riparian Inundation Areas, Anticipated Operations Wetland and Riparian Inundation Areas, Baseline Operations 	<h5>ROAD CLASS</h5> <ul style="list-style-type: none"> Interstate State Highway US Highway Major Collector Local Road Railroad 	<ul style="list-style-type: none"> Stream Project Boundary (2014) Wildlife Management Areas National Wetland Inventory Wetland USFWS Riparian Habitat
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MAP AND LEGEND NOTES

1. Mapping shows the extent of inundation calculated using the H&H Study Operations Model and Upstream Hydraulic Model. **These maps represent the work of the H&H Study and are not to be used as shown for resource analysis purposes.**
2. Estimated inundation extent for normal (median) inflows and operations during the active wetland growing season.
3. See Overview Map for an explanation of the maximum inundation extent and notes on data sources.

PENSACOLA DAM

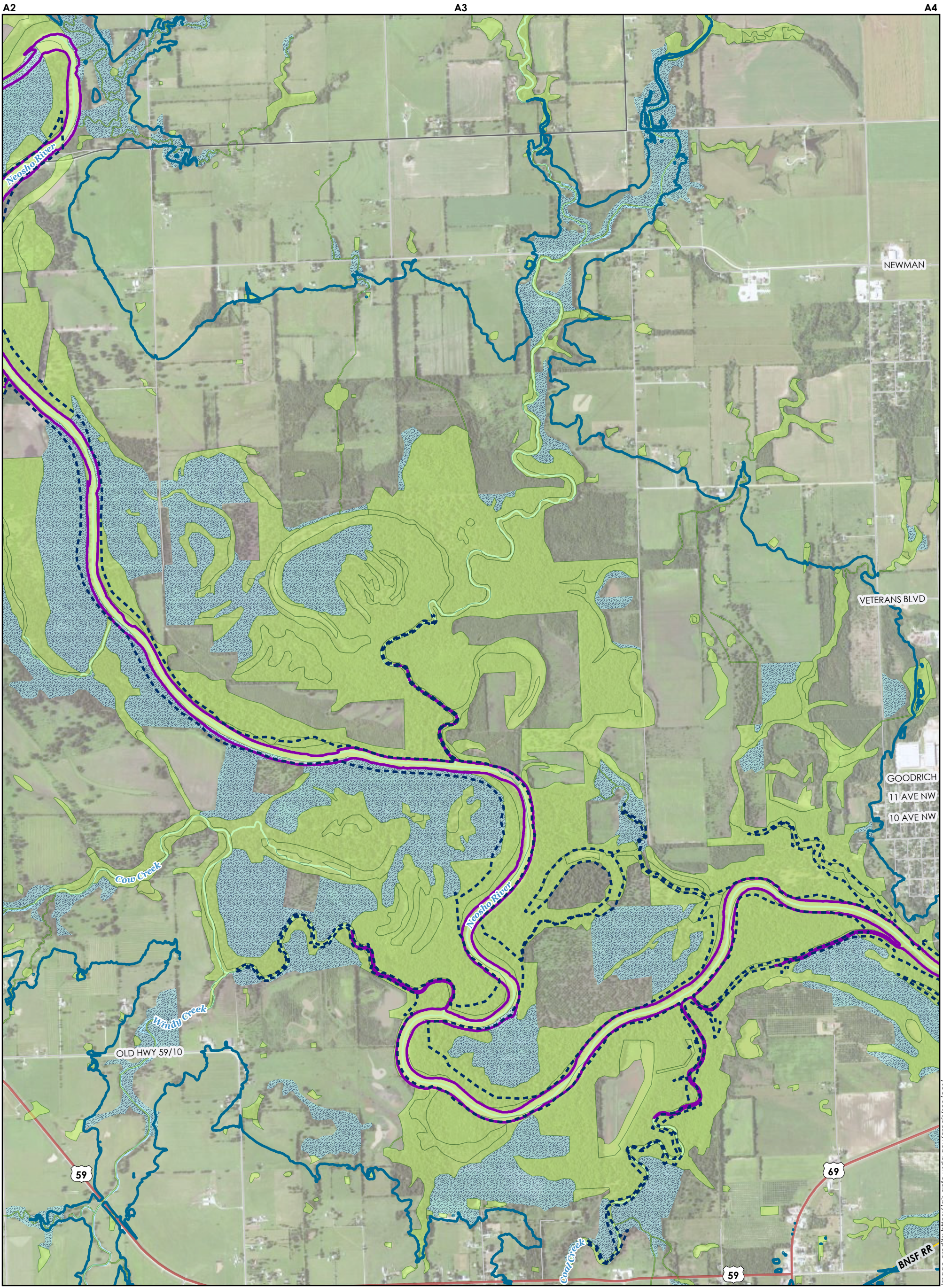
GRAND RIVER DAM AUTHORITY

MAP: B2

CRAIG, DELAWARE, MAYES, AND OTTAWA COUNTIES, OKLAHOMA

FERC No. 1494
September 2022

Image credits: https://gis.apfo.usda.gov/arcgis/services/NAIP/USDA_CONUS_PRIME/ImageServer, 2019

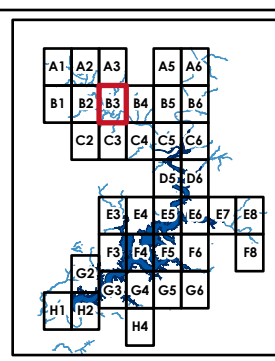


WETLAND AND RIPARIAN INUNDATION CHANGES

NORTH

0 500 1,000 2,000 3,000 4,000 Feet

1 inch = 2,000 feet



Legend

INUNDATION	ROAD CLASS
Maximum Inundation	Interstate
Wetland and Riparian Inundation Areas, Anticipated Operations	State Highway
Wetland and Riparian Inundation Areas, Baseline Operations	US Highway
	Major Collector
	Local Road
	Railroad

MAP AND LEGEND NOTES

Stream	Project Boundary (2014)
Wildlife Management Areas	National Wetland Inventory Wetland
USFWS Riparian Habitat	

PENSACOLA DAM
GRAND RIVER DAM AUTHORITY

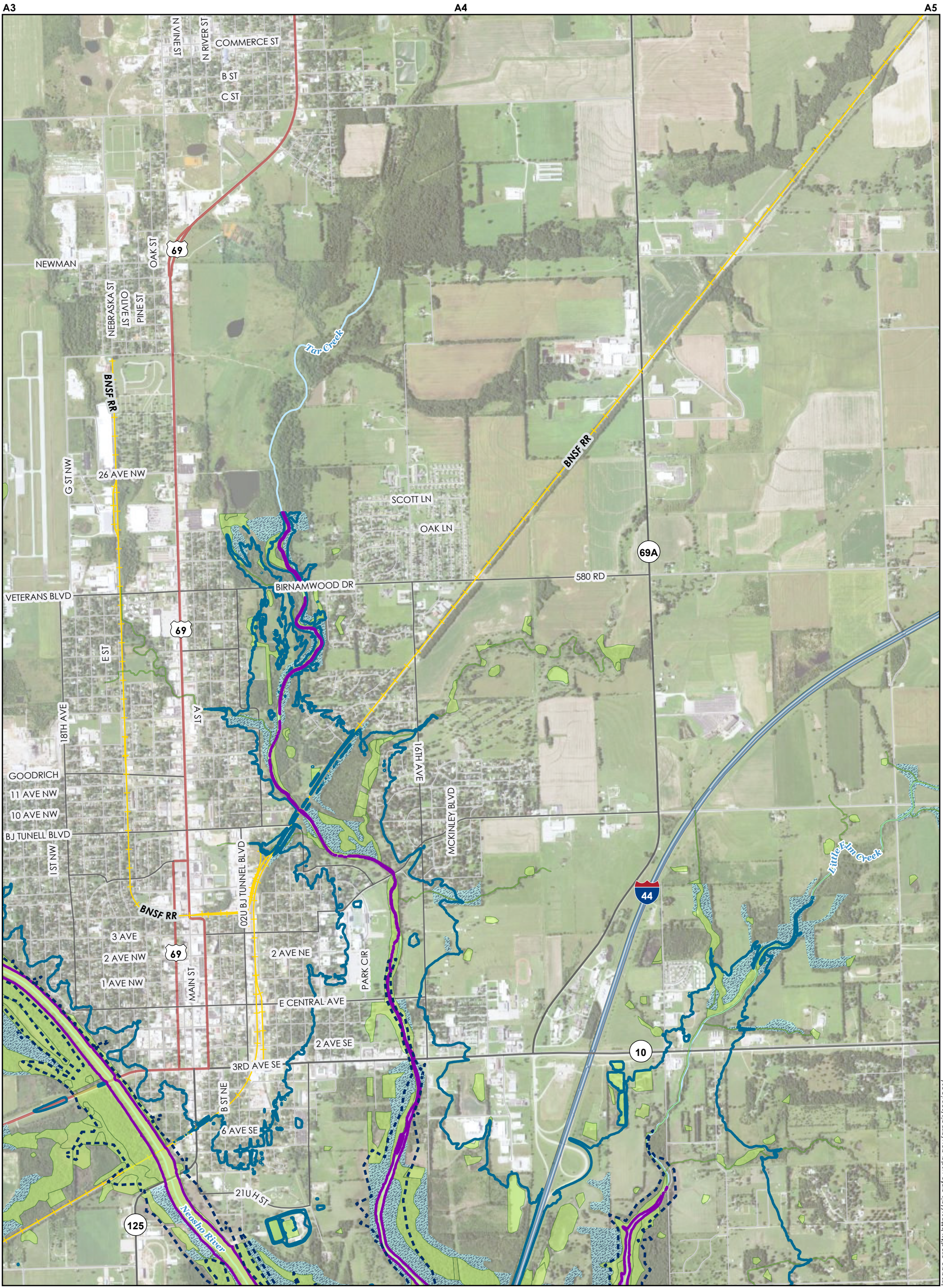
MAP: B3

CRAIG, DELAWARE, MAYES, AND OTTAWA COUNTIES, OKLAHOMA

FERC No. 1494
September 2022

1. Mapping shows the extent of inundation calculated using the H&H Study Operations Model and Upstream Hydraulic Model. **These maps represent the work of the H&H Study and are not to be used as shown for resource analysis purposes.**
 2. Estimated inundation extent for normal (median) inflows and operations during the active wetland growing season.
 3. See Overview Map for an explanation of the maximum inundation extent and notes on data sources.

Image credits: https://gis.apfo.usda.gov/arcgis/services/NAIP/USDA_CONUS_PRIME/ImageServer, 2019

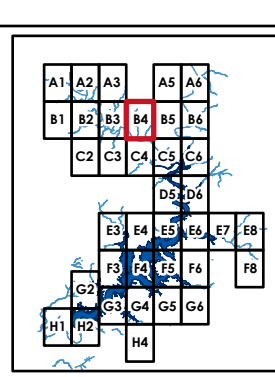


WETLAND AND RIPARIAN INUNDATION CHANGES

NORTH

0 500 1,000 2,000 3,000 4,000 Feet

1 inch = 2,000 feet



Legend

INUNDATION	ROAD CLASS
Maximum Inundation	Interstate
Wetland and Riparian Inundation Areas, Anticipated Operations	State Highway
Wetland and Riparian Inundation Areas, Baseline Operations	US Highway
	Major Collector
	Local Road
	Railroad

MAP AND LEGEND NOTES

- Mapping shows the extent of inundation calculated using the H&H Study Operations Model and Upstream Hydraulic Model. **These maps represent the work of the H&H Study and are not to be used as shown for resource analysis purposes.**
- Estimated inundation extent for normal (median) inflows and operations during the active wetland growing season.
- See Overview Map for an explanation of the maximum inundation extent and notes on data sources.

PENSACOLA DAM

GRAND RIVER DAM AUTHORITY

MAP: B4

CRAIG, DELAWARE, MAYES, AND OTTAWA COUNTIES, OKLAHOMA

FERC No. 1494
September 2022

Image credits: https://gis.apfo.usda.gov/arcgis/services/NAIP/USDA_CONUS_PRIME/ImageServer, 2019

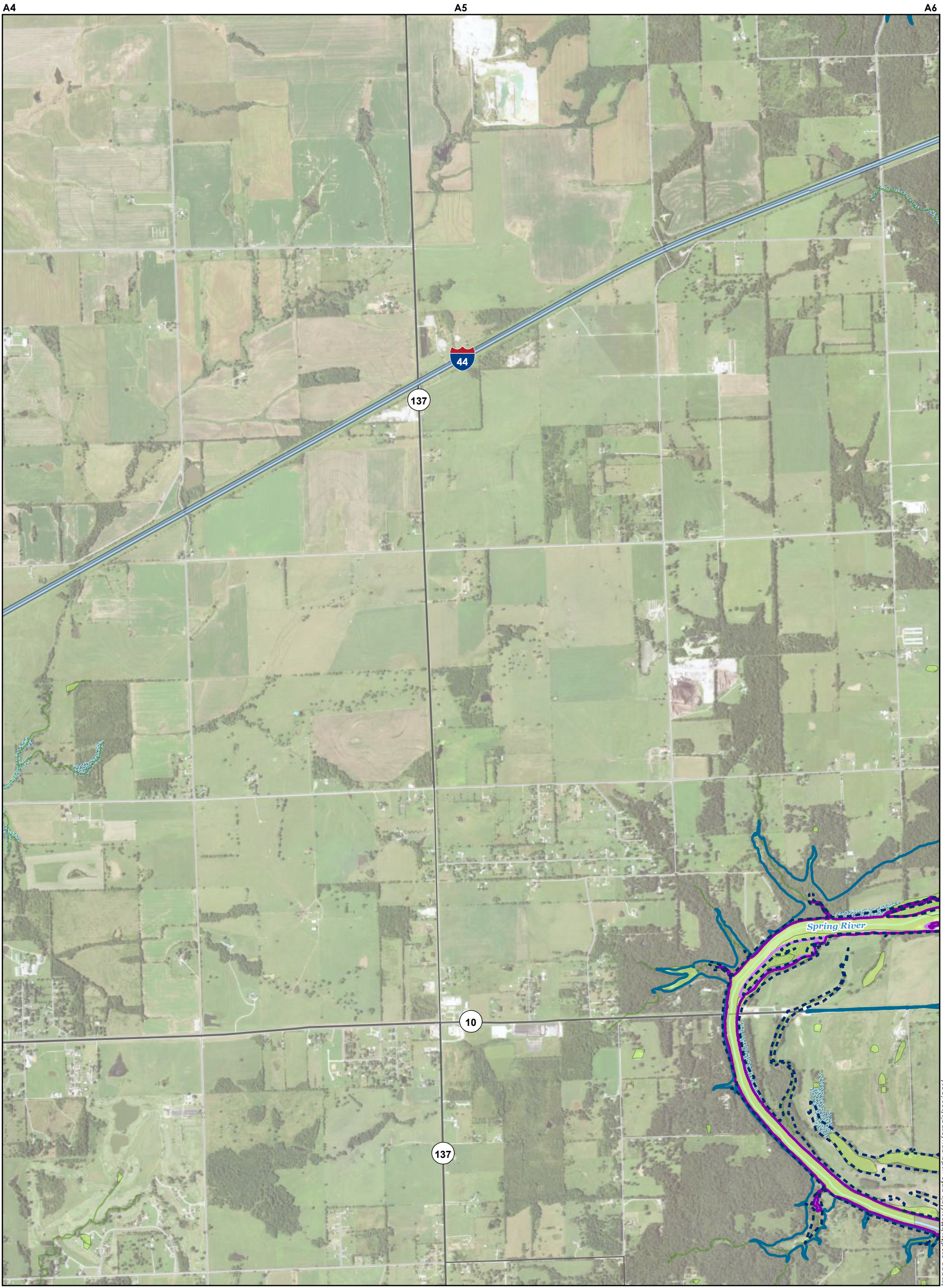
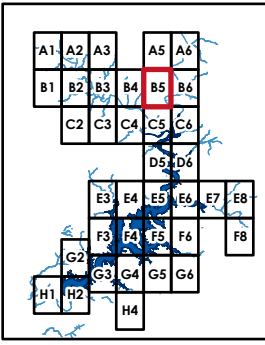
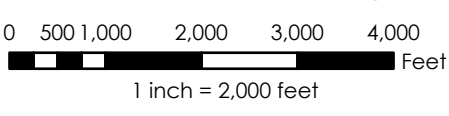


Image credits: https://gis.apfo.usda.gov/arcgis/services/NAIP/USDA_CONUS_PRIME/ImageServer, 2019

WETLAND AND RIPARIAN INUNDATION CHANGES



INUNDATION

- Maximum Inundation
- Wetland and Riparian Inundation Areas, Anticipated Operations
- Wetland and Riparian Inundation Areas, Baseline Operations

ROAD CLASS

- Interstate
- State Highway
- US Highway
- Major Collector
- Local Road
- Railroad

MAP AND LEGEND NOTES

1. Mapping shows the extent of inundation calculated using the H&H Study Operations Model and Upstream Hydraulic Model. **These maps represent the work of the H&H Study and are not to be used as shown for resource analysis purposes.**
2. Estimated inundation extent for normal (median) inflows and operations during the active wetland growing season.
3. See Overview Map for an explanation of the maximum inundation extent and notes on data sources.

Legend

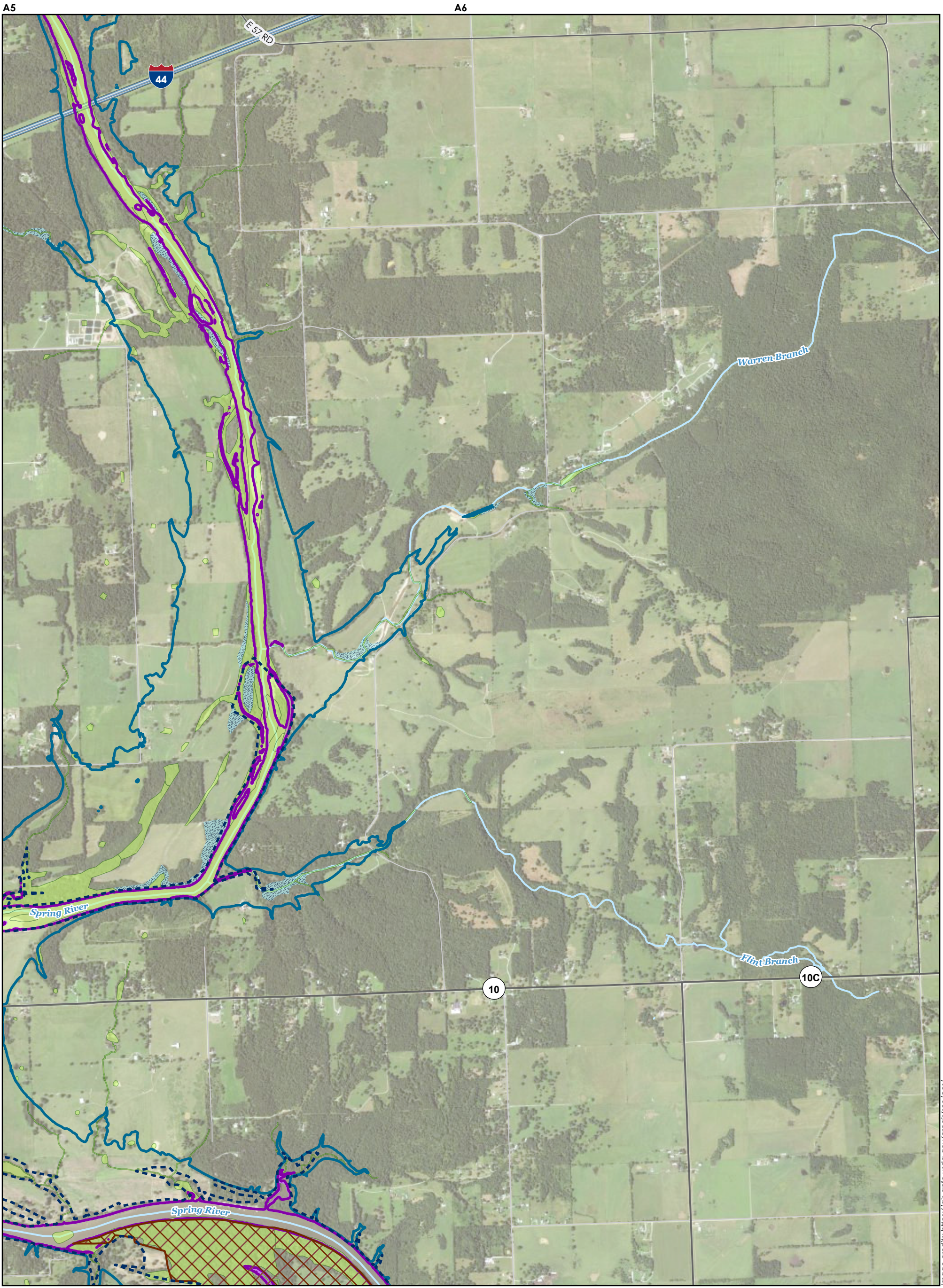
- Stream
- Project Boundary (2014)
- Wildlife Management Areas
- National Wetland Inventory Wetland
- USFWS Riparian Habitat

PENSACOLA DAM GRAND RIVER DAM AUTHORITY

MAP: B5

CRAIG, DELAWARE, MAYES, AND OTTAWA COUNTIES, OKLAHOMA

FERC No. 1494
September 2022

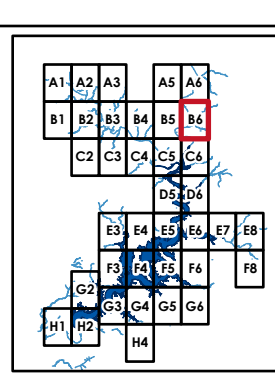


WETLAND AND RIPARIAN INUNDATION CHANGES

NORTH

0 500 1,000 2,000 3,000 4,000 Feet

1 inch = 2,000 feet



Legend

INUNDATION	ROAD CLASS	Stream
Maximum Inundation	Interstate	Project Boundary (2014)
Wetland and Riparian Inundation Areas, Anticipated Operations	State Highway	Wildlife Management Areas
Wetland and Riparian Inundation Areas, Baseline Operations	US Highway	National Wetland Inventory Wetland
	Major Collector	USFWS Riparian Habitat
	Local Road	
	Railroad	

MAP AND LEGEND NOTES

1. Mapping shows the extent of inundation calculated using the H&H Study Operations Model and Upstream Hydraulic Model. **These maps represent the work of the H&H Study and are not to be used as shown for resource analysis purposes.**
2. Estimated inundation extent for normal (median) inflows and operations during the active wetland growing season.
3. See Overview Map for an explanation of the maximum inundation extent and notes on data sources.

PENSACOLA DAM
GRAND RIVER DAM AUTHORITY

MAP: B6

CRAIG, DELAWARE, MAYES, AND OTTAWA COUNTIES, OKLAHOMA

FERC No. 1494
 September 2022

Image credits: https://gis.dplbo.usda.gov/arcgis/services/NAIP/USDA_CONUS_PRIME/ImageServer, 2019