Appendix N. County CS Interchange USACE Stream Features Worksheet

GEI Consultants

Consulting Engineers and Scientists

May 16, 2024
Project 2201696

VIA EMAIL: BrianF.Taylor@dot.wi.gov

Brian Taylor
Environmental Coordinator
2101 Wright Street
Madison, WI 53704

Re: USACE Stream Features Worksheet
IH39/90/94 CS Interchange
Columbia County, Wisconsin

Introduction

GEI Consultants, Inc. (GEI) was contracted by Wisconsin Department of Transportation (WisDOT) to conduct a US Army Core of Engineers stream features assessment for different portions of the CS interchange. These assessments will aid in Section 404 permitting.

Table 1 – Assessment Area Locations

Label	Latitude	Longitude
Assessment Area 1	43.391999	-89.464586
Assessment Area 2	43.386563	-89.464876
Assessment Area 3	43.381214	-89.462548
Assessment Area 4	43.378293	-89.461559

Methods

Please see page 31-33 of the Saint Paul Stream Mitigation Procedures for methods: https://www.mvp.usace.army.mil/Portals/57/docs/regulatory/Mitigation/MVP_Stream_Mitigation_Procedures_version_1.pdf?ver=mV5VYSnslcFh2RvRNq50Ew%3d%3d

Results

Water Regime: NOTE: Antecedent Precipitation on 5/14/2024 was normal (See Appendix F)

- **Assessment Area 1:** Ephemeral, no connection to groundwater.
- **Assessment Area 2:** None. This area has been constructed as a stormwater conveyance feature. Soil probe hit rock refusal at 8 inches with no groundwater present.
- **Assessment Area 3:** Ephemeral, no connection to groundwater. Soil probe hit rock refusal at 10 inches with no groundwater present.
- **Assessment Area 4:** None. This area has been constructed as a stormwater conveyance feature.

Ordinary High Water Mark Criteria:

- **Assessment Area 1:** Sediment sorting, presence of litter or debris
- **Assessment Area 2:** No OHWM was able to be determined and therefore was considered to be absent. Area was reconstructed as a stormwater conveyance feature (Photo 3, 4).
- **Assessment Area 3:** Vegetation matted down, bent, or absent, sediment deposition, sediment sorting, presence of litter or debris, leaf litter disturbed or washed away (Photo 6, 7).
- **Assessment Area 4:** No OHWM was able to be determined and therefore was considered to be absent. Area was reconstructed as a stormwater conveyance feature (Photo 15-18).

Unique Features:
- **Assessment Area 1:** Bridge/culvert (North of photo 1).
- **Assessment Area 2:** None (Photo 3, 4).
- **Assessment Area 3:** Bridge/culvert, Erosion, large woody debris, undercut banks (Photo 8, 10).
- **Assessment Area 4:** Bridge/culvert (Photo 13).

Bed Material Characteristics:
- **Assessment Area 1:** Clay/silt (100%).
- **Assessment Area 2:** Sand (70%), Cobble (30%).
- **Assessment Area 3:** Clay/silt (95%), Sand (5%).
- **Assessment Area 4:** Sand (100%).

Vegetation:
- **Assessment Area 1:** Herb Strata (Reed Canary Grass-85%, Garlic Mustard-5%, Wood Nettle-5%, Angelica-3%) (Photo 1). Tree and Shrub Stratum were not included due to recent clearing in that area.
- **Assessment Area 2:** Herb strata (Annual Rye 60%, Red Clover-5%) (Photo 6, 7)
- **Assessment Area 3:** Tree Strata (Basswood-60%, American Elm-5%, Box Elder-5% Red Oak-3%, Hackberry- 3%), Shrub Strata (Common Buckthorn-10%, Basswood-2%, American Elm-3%, Nannyberry-3%), Herb Strata (Garlic Mustard-25%, Common Violet-20%, Wood Sorrel-10%, Reed Canary Grass-5%, Yellow Avens-5%, Orange Jewelweed-2%, Wild Geranium 1%, Virginia Creeper-1%) (Photo 9).
- **Assessment Area 4:** Herb Strata (Kentucky Bluegrass-75%, Crown Vetch-5%, Wild Parsnip-3%, Bull Thistle-3%, Birds Foot Trefoil-3%, Wild Carrot-1%) (Photo 14).

Riparian Area Width:
- **Assessment Area 1:** Approximately 14-23 feet (Figure 5).
- **Assessment Area 2:** N/A. Area is incised and disconnected to a floodplain (Photo 3, 4).
- **Assessment Area 3:** Approximately 80 feet (Figure 5).
- **Assessment Area 4:** N/A. Area is incised and disconnected to a floodplain (Photo 15)

Recommendations

It is GEI's professional opinion, that based on the site conditions observed on 5/14/24, that the feature at Assessment Area 1 is an ephemeral stream. This feature is approximately 1,063 feet in length. Site conditions at Assessment Area 2 were not observed to have the morphology present to be classified as a stream and appeared to be in line with a stormwater conveyance feature due

to the lack of ordinary high water mark criteria and unique features. This conveyance feature was approximately 2,012 feet in length and continued generally southward within the interstate median. Conditions at Assessment Area 3 appeared to revert back to an ephemeral stream where a bed and bank, sediment deposition, water staining on leaves, large woody debris, and erosion were observed. This stream feature was approximately 1,162 feet in length before again transitioning back to a stormwater conveyance feature at Assessment Area 4 (approximately 1,692 feet in length) where similar conditions to Assessment 2 were documented.

Sincerely,

GEI CONSULTANTS, INC.

Gabe Heindel
Environmental Scientist

Eric Englund
Senior Project Manager

Attachments:
Figure 1 – Site Location Map
Figure 2 – Contour Map
Figure 3 – Wisconsin Wetland Inventory, Wetland Indicators, and 24K Hydrography
Figure 4 – USDA NRCS Soils Map
Figure 5 – Assessment Areas Map
Figure 6 – Aerial Imagery Review
Appendix A – Photo Log
Appendix B – Stream Features Worksheet – Assessment Area 1
Appendix C – Stream Features Worksheet – Assessment Area 2
Appendix D – Stream Features Worksheet – Assessment Area 3
Appendix E – Stream Features Worksheet – Assessment Area 4

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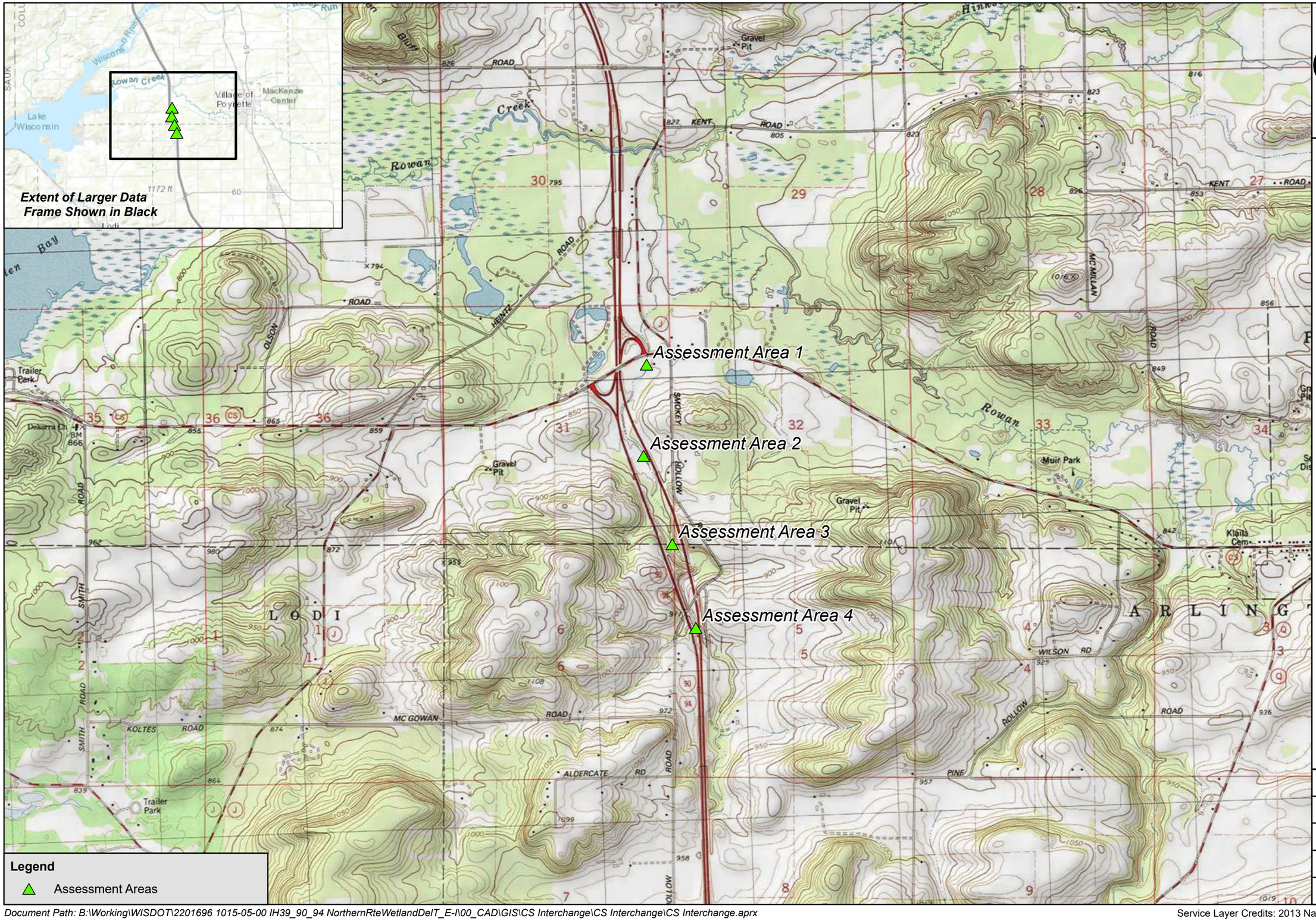

FIGURE 1
SITE LOCATION AND USGS TOPOGRAPHIC MAP

WISCONSIN DEPARTMENT OF TRANSPORTATION
WISDOT PROJECT ID: 1015-05-00
WETLAND DELINEATION - IH-39/90/94
GREATER MADISON AREA
DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

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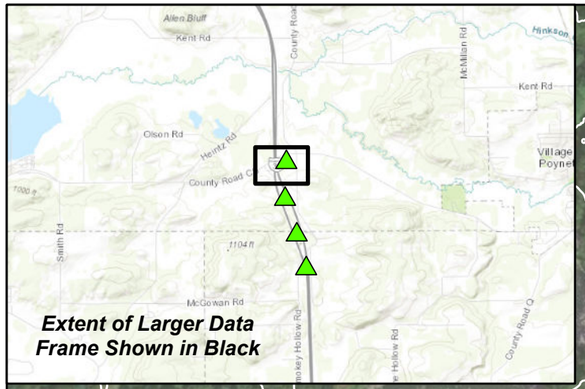
Service Layer Credits: 2013 National Geographic Society,Esri



Assessment Area 1

Legend

- Assessment Areas
- 2-Foot Contours

N

0 190 380 Feet

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FIGURE 2
2-FOOT CONTOUR MAP

WISCONSIN DEPARTMENT OF TRANSPORTATION
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GREATER MADISON AREA
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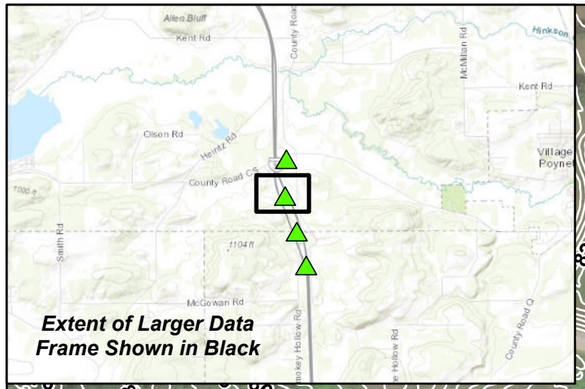
Source Credits: 2011 Columbia County Contours, 2010 Juneau County Contours, 2017 Dane County Contours, and ESRI World Imagery Map Service



Extent of Larger Data Frame Shown in Black

Assessment Area 2

Legend

- Assessment Areas
- 2-Foot Contours

N

0 190 380 Feet

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FIGURE 2
2-FOOT CONTOUR MAP

WISCONSIN DEPARTMENT OF TRANSPORTATION
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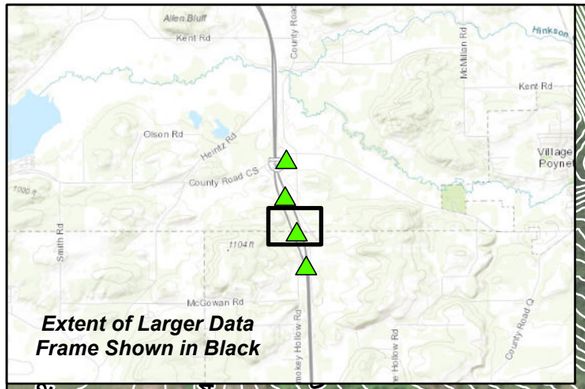

Assessment Area 3

Legend

- Assessment Areas
- 2-Foot Contours

N

0 190 380 Feet

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FIGURE 2
2-FOOT CONTOUR MAP

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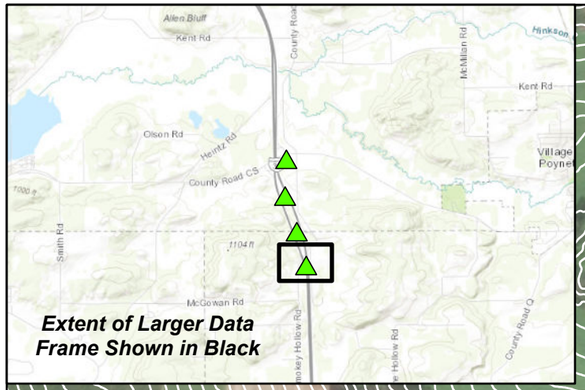

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Assessment Area 4

Legend

- Assessment Areas
- 2-Foot Contours

N

0 190 380 Feet

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FIGURE 2
2-FOOT CONTOUR MAP

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FIGURE 3
WISCONSIN WETLAND INVENTORY, WETLAND INDICATORS, AND 24K HYDROGRAPHY MAP
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Source Credits: WDNR WWI (Dec. 3, 2019), WDNR Wetland Indicators, WDNR 24K Hydrography (Jan., 24, 2018), USDA NRCS Gridded Soil Survey Geographic (gSSURGO) (Dec. 9, 2019), ESRI World Imagery Map Service

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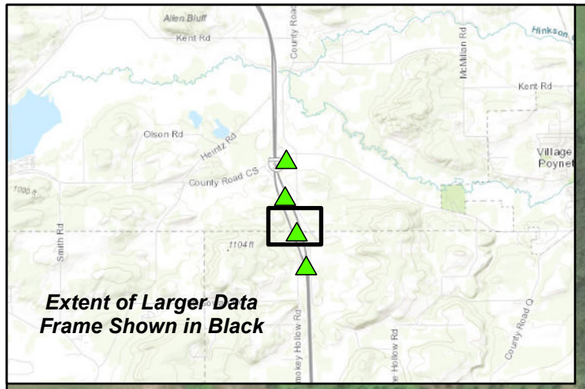

Legend

- Assessment Areas

Wetland Indicators

- NRCS Wet Spot
- Wetland Class Areas
- Maximum Extent Wetland Indicators

WDNR 24K Hydrography

- Streams and Rivers
- Lakes and Open Waters

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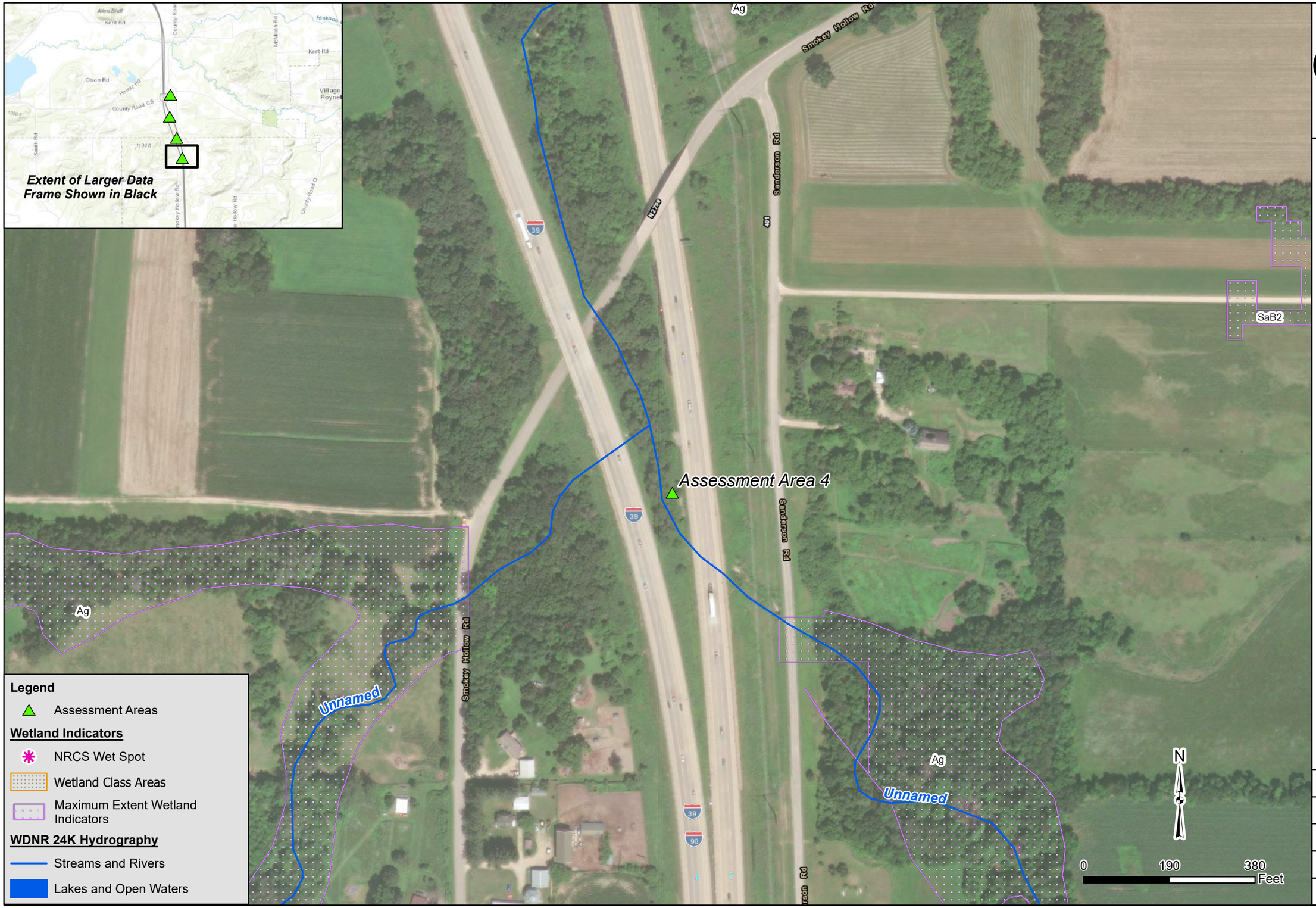

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FIGURE 4
USDA NRCS SOILS MAP

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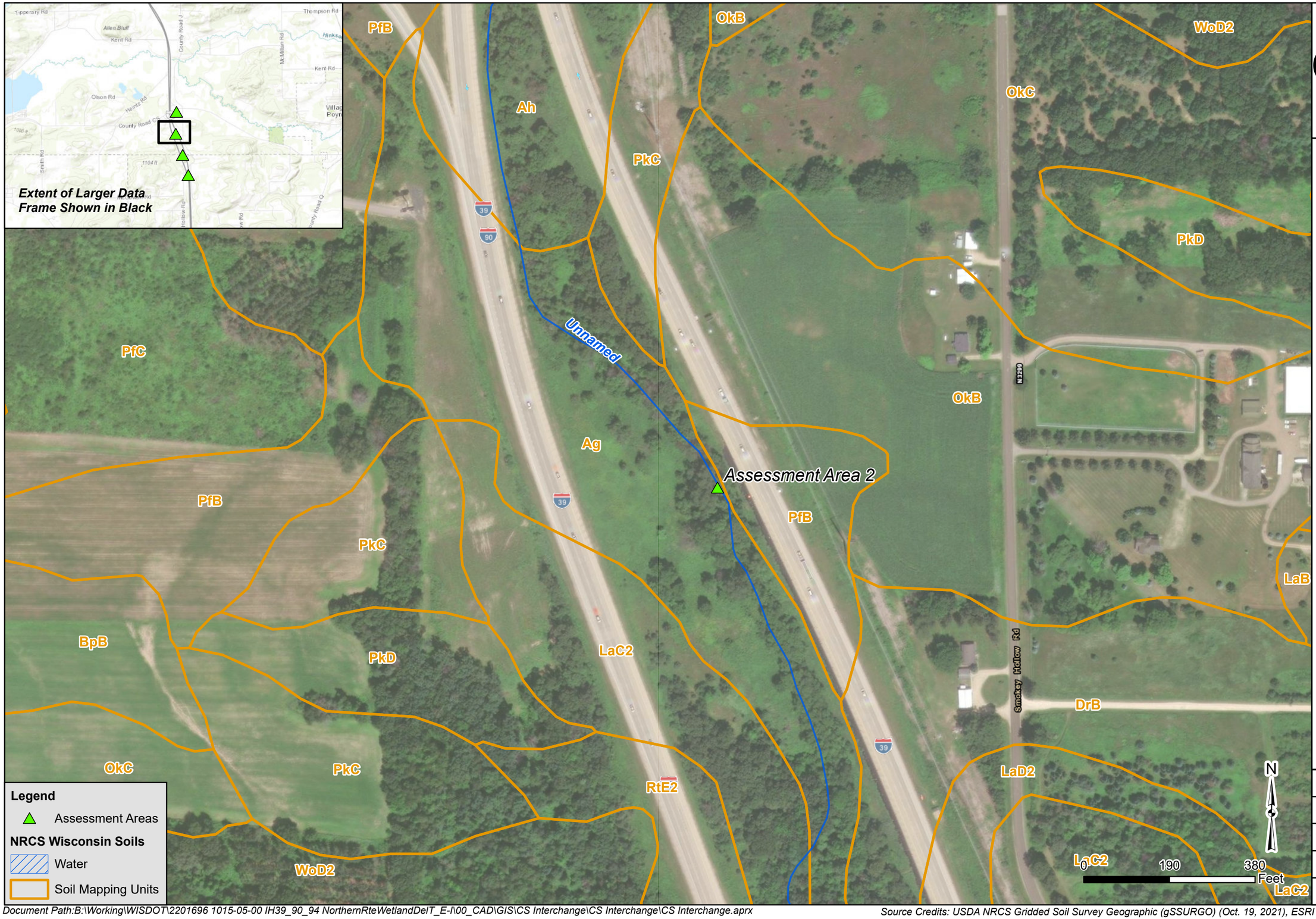

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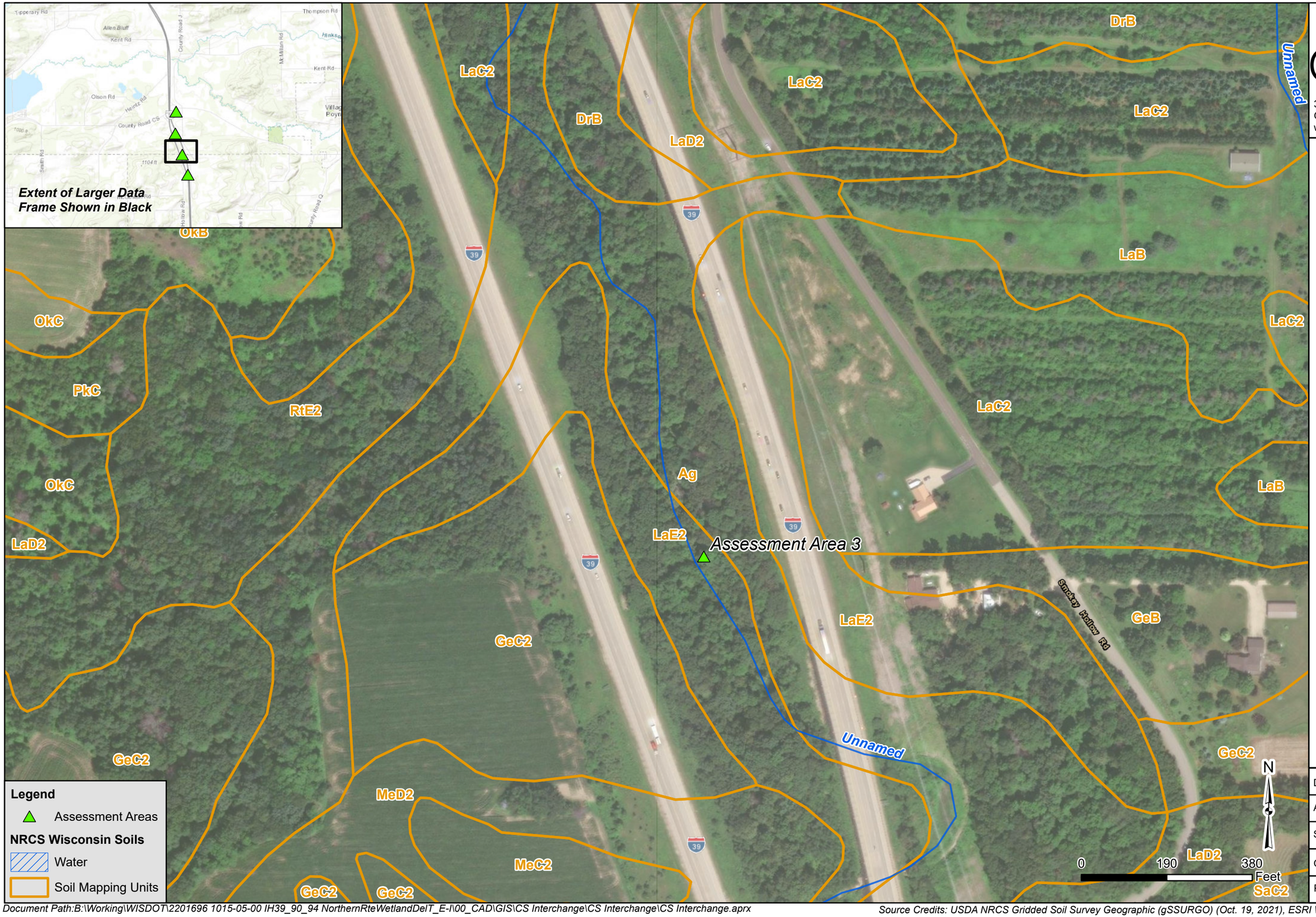

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FIGURE 5
ASSESSMENT AREAS

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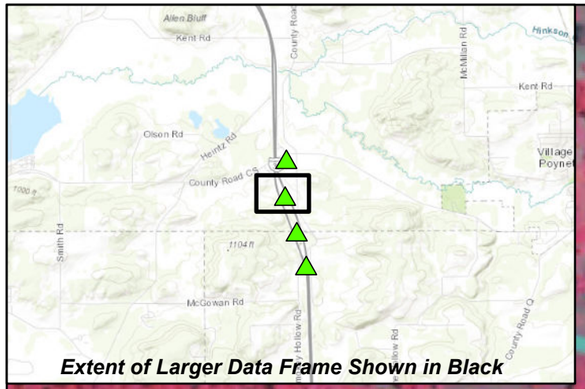

Extent of Larger Data Frame Shown in Black

Unnamed

39

39

Assessment Area 2

Smokey Hollow Rd

Smokey Hollow Rd

Legend

- Assessment Areas
- Approximate Ordinary High Water Mark Points
- Culvert-Pipe
- Delineated Waterways
- Delineated Waterways
- Box Culvert Span
- Stormwater Conveyance Feature
- Wetland Boundary
- Flow Direction

WDNR 24K Hydrography

- Streams and Rivers
- Lakes and Open Waters

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FIGURE 5
ASSESSMENT AREAS

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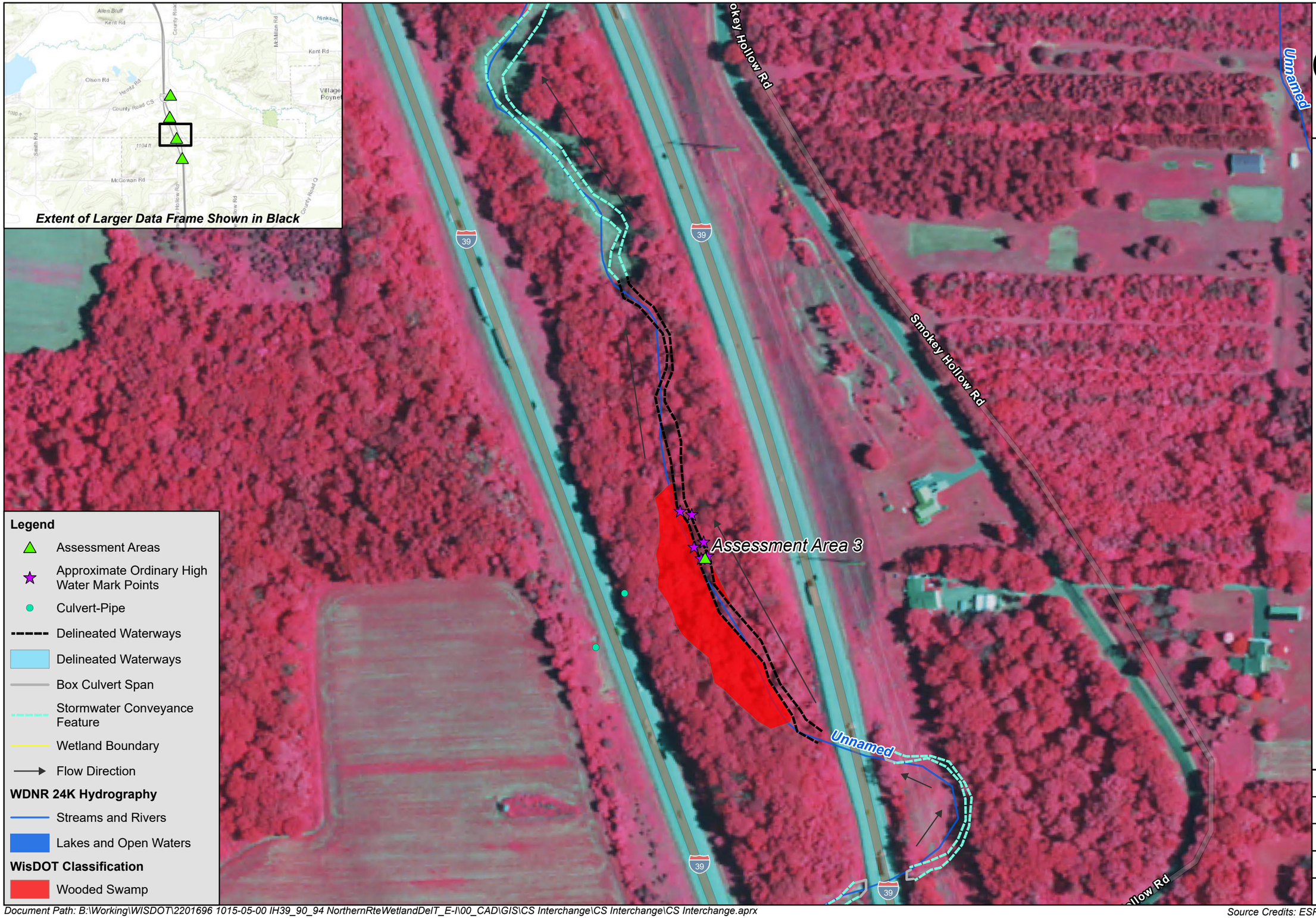

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FIGURE 5
ASSESSMENT AREAS

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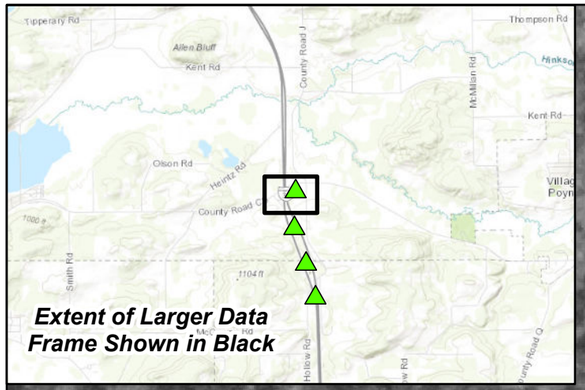
Source Credits: ESRI World Imagery Map Service



1937

Assessment Area 1

Legend

Assessment Areas

N

0 190 380 Feet

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FIGURE 6
Aerial Imagery review

WISCONSIN DEPARTMENT OF TRANSPORTATION
WISDOT PROJECT ID: 1015-05-00
WETLAND DELINEATION - IH-39/90/94
GREATER MADISON AREA
DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

Drawn: GTH 5/15/2024
Approved: EEE 5/15/2024
Scale: As Shown
GEI Project No: 2201696
Figure 6

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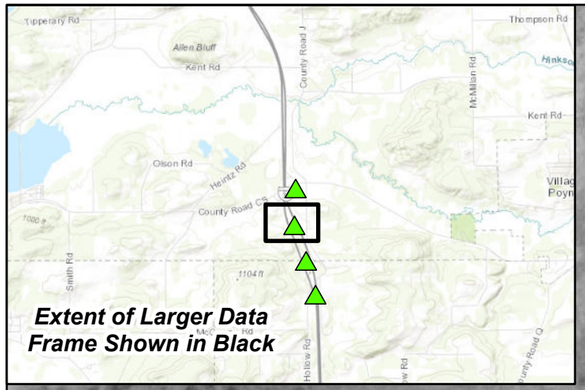

1937

Assessment Area 2

Legend

Assessment Areas

N

0 190 380 Feet

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FIGURE 6
Aerial Imagery review

WISCONSIN DEPARTMENT OF TRANSPORTATION
WISDOT PROJECT ID: 1015-05-00
WETLAND DELINEATION - IH-39/90/94
GREATER MADISON AREA
DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

Drawn: GTH 5/15/2024
Approved: EEE 5/15/2024
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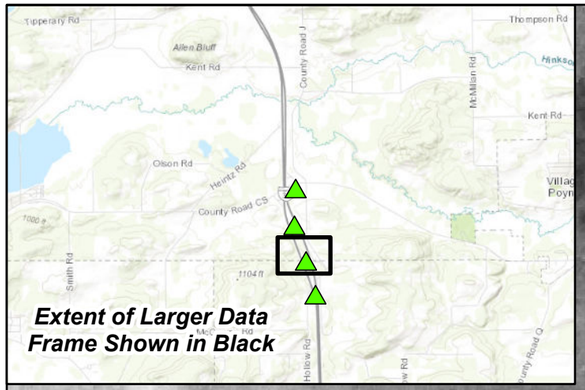

1937

Assessment Area 3

Legend

Assessment Areas

N

0 190 380 Feet

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FIGURE 6
Aerial Imagery review

WISCONSIN DEPARTMENT OF TRANSPORTATION
WISDOT PROJECT ID: 1015-05-00
WETLAND DELINEATION - IH-39/90/94
GREATER MADISON AREA
DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

Drawn: GTH 5/15/2024
Approved: EEE 5/15/2024
Scale: As Shown
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Figure 6

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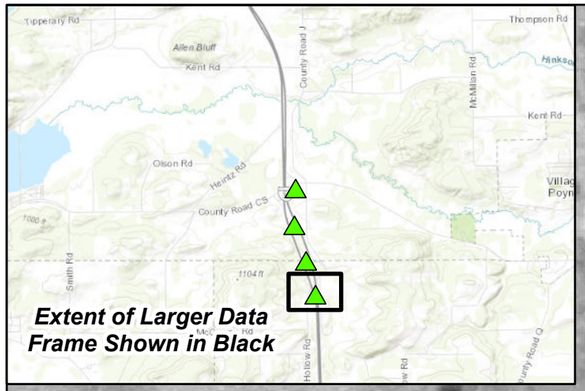

1937

Assessment Area 4

Legend

Assessment Areas

N

0 190 380 Feet

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FIGURE 6
Aerial Imagery review

WISCONSIN DEPARTMENT OF TRANSPORTATION
WISDOT PROJECT ID: 1015-05-00
WETLAND DELINEATION - IH-39/90/94
GREATER MADISON AREA
DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

Drawn: GTH 5/15/2024
Approved: EEE 5/15/2024
Scale: As Shown
GEI Project No: 2201696
Figure 6

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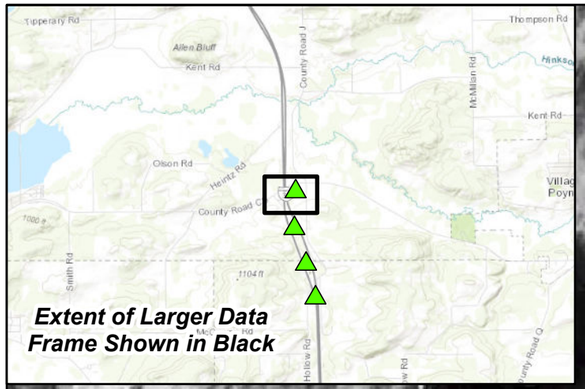

1995

Assessment Area 1

Legend

Assessment Areas

N

0 190 380 Feet

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FIGURE 6
Aerial Imagery revised per agency review

WISCONSIN DEPARTMENT OF TRANSPORTATION
WISDOT PROJECT ID: 1015-05-00
WETLAND DELINEATION - IH-39/90/94
GREATER MADISON AREA
DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

Drawn: GTH 5/15/2024
Approved: EEE 5/15/2024
Scale: As Shown
GEI Project No: 2201696
Figure 6

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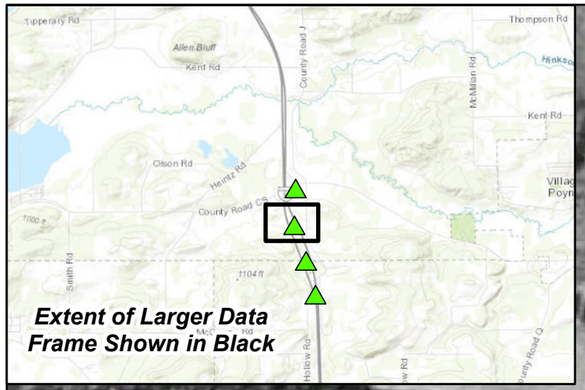

1995

Assessment Area 2

Legend

Assessment Areas

N

0 190 380 Feet

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FIGURE 6
Aerial Imagery review

WISCONSIN DEPARTMENT OF TRANSPORTATION
WISDOT PROJECT ID: 1015-05-00
WETLAND DELINEATION - IH-39/90/94
GREATER MADISON AREA
DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

Drawn: GTH 5/15/2024
Approved: EEE 5/15/2024
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GEI Project No: 2201696
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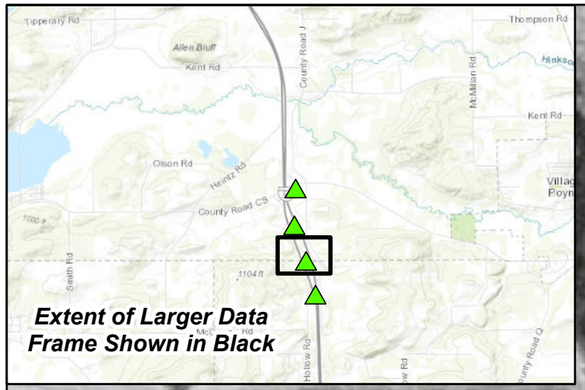

1995

Assessment Area 3

Legend

Assessment Areas

N

0 190 380 Feet

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FIGURE 6
Aerial Imagery review

WISCONSIN DEPARTMENT OF TRANSPORTATION
WISDOT PROJECT ID: 1015-05-00
WETLAND DELINEATION - IH-39/90/94
GREATER MADISON AREA
DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

Drawn: GTH 5/15/2024
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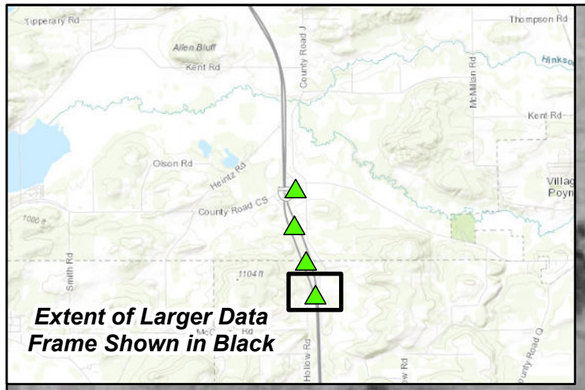

1995

Assessment Area 4

Legend

Assessment Areas

N

0 190 380 Feet

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FIGURE 6
Aerial Imagery review

WISCONSIN DEPARTMENT OF TRANSPORTATION
WISDOT PROJECT ID: 1015-05-00
WETLAND DELINEATION - IH-39/90/94
GREATER MADISON AREA
DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

Drawn: GTH 5/15/2024
Approved: EEE 5/15/2024
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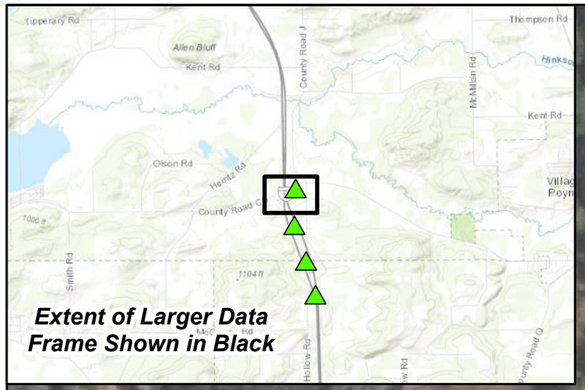

2005

Assessment Area 1

Legend

Assessment Areas

N

0 190 380 Feet

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FIGURE 6
Aerial Imagery review

WISCONSIN DEPARTMENT OF TRANSPORTATION
WISDOT PROJECT ID: 1015-05-00
WETLAND DELINEATION - IH-39/90/94
GREATER MADISON AREA
DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

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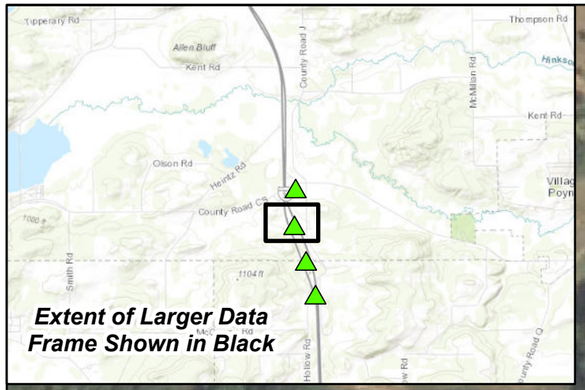

2005

Assessment Area 2

Legend

Assessment Areas

N

0 190 380 Feet

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FIGURE 6
Aerial Imagery review

WISCONSIN DEPARTMENT OF TRANSPORTATION
WISDOT PROJECT ID: 1015-05-00
WETLAND DELINEATION - IH-39/90/94
GREATER MADISON AREA
DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

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FIGURE 6
Aerial Imagery review

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WETLAND DELINEATION - IH-39/90/94
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DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

Drawn: GTH 5/15/2024
Approved: EEE 5/15/2024
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GEI Project No: 2201696
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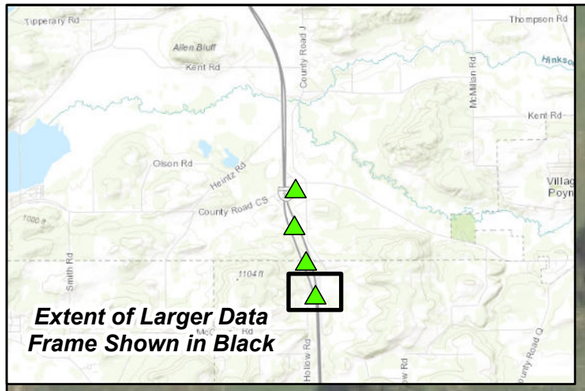

2005

Assessment Area 4

Legend

Assessment Areas

N

0 190 380 Feet

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FIGURE 6
Aerial Imagery review

WISCONSIN DEPARTMENT OF TRANSPORTATION
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WETLAND DELINEATION - IH-39/90/94
GREATER MADISON AREA
DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

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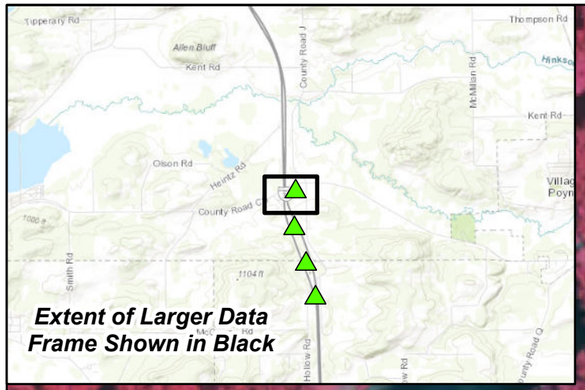

2022

Assessment Area 1

Legend

Assessment Areas

N

0 190 380 Feet

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FIGURE 6
Aerial Imagery review

WISCONSIN DEPARTMENT OF TRANSPORTATION
WISDOT PROJECT ID: 1015-05-00
WETLAND DELINEATION - IH-39/90/94
GREATER MADISON AREA
DANE, COLUMBIA, SAUK, JUNEAU COUNTIES, WISCONSIN

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Approved: EEE 5/15/2024
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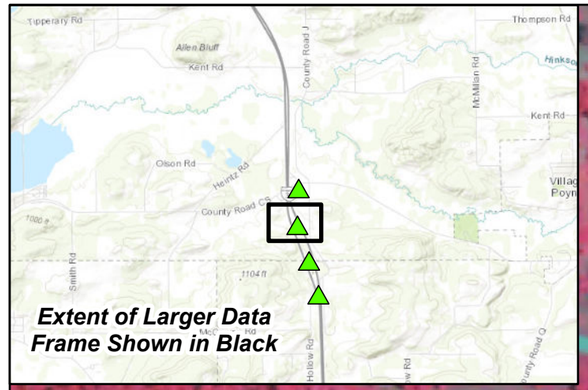

2022

Assessment Area 2

Legend

Assessment Areas

N

0 190 380 Feet

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FIGURE 6
Aerial Imagery review

WISCONSIN DEPARTMENT OF TRANSPORTATION
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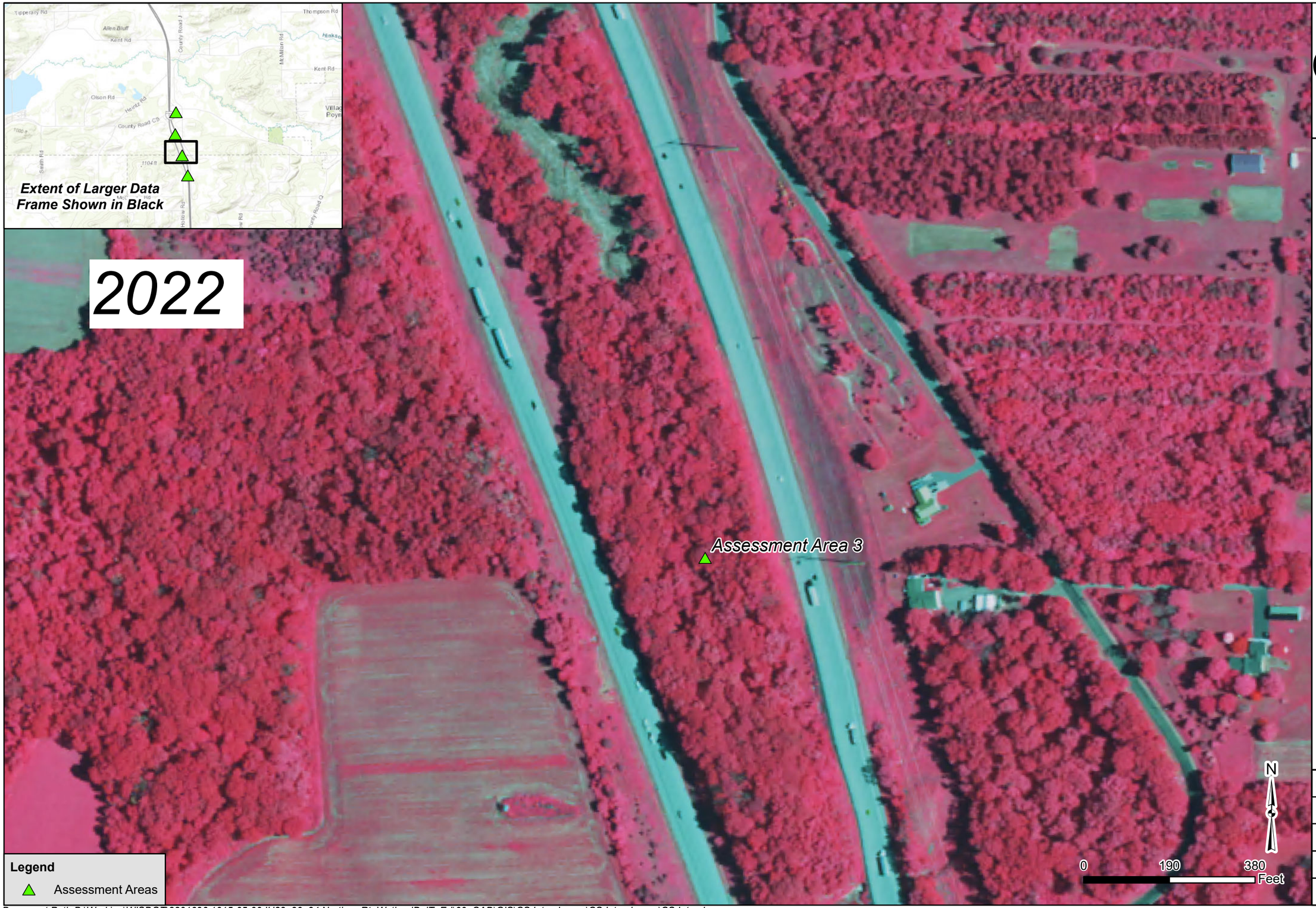

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FIGURE 6
Aerial Imagery review

WISCONSIN DEPARTMENT OF TRANSPORTATION
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GREATER MADISON AREA
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FIGURE 6
Aerial Imagery review

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Photographic Log

Project Name: IH 39/90/94 Intersection with USH 12/18 to Intersection with Dees Rd.

Client: Wisconsin Department of Transportation **GEI Project No.** 2201696

PHOTOGRAPH NO: 1	**DATE:** July 13,2022 07:32 AM	**LATITUDE:** 43.39210099	**LONGITUDE:** -89.46458358
DIRECTION: South	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 1: Unnamed ephemeral stream crossing through a riparian wooded (degraded) wetland. Waterway observations include sediment sorting and sorting of debris. **PHOTO BY:** **GTH**			

PHOTOGRAPH NO: 2	**DATE:** July 13, 2022	**LATITUDE:** 43.38970409	**LONGITUDE:** -89.46642098
DIRECTION: West	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 2: Stormwater conveyance feature. **PHOTO BY:** **GTH**			

Photographic Log

Project Name: IH 39/90/94 Intersection with USH 12/18 to Intersection with Dees Rd

Client: Wisconsin Department of Transportation **GEI Proposal No.** 2201696

PHOTOGRAPH NO: 3	**DATE:** May 14, 2024	**LATITUDE:** 43.387831	**LONGITUDE:** -89.46638
DIRECTION: North	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 2: Stormwater conveyance feature.			
PHOTO BY: **GTH**			

PHOTOGRAPH NO: 4	**DATE:** May 14, 2024	**LATITUDE:** 43.386689	**LONGITUDE:** -89.464966
DIRECTION: North-east	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 2: Stormwater conveyance feature.			
PHOTO BY: **GTH**			

Photographic Log

Project Name: IH 39/90/94 Intersection with USH 12/18 to Intersection with Dees Rd

Client: Wisconsin Department of Transportation **GEI Proposal No.** 2201696

PHOTOGRAPH NO: 5	**DATE:** May 14, 2024	**LATITUDE:** 43.384853	**LONGITUDE:** -89.463913
DIRECTION: North	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 2: Stormwater conveyance feature.			
PHOTO BY: **GTH**			

PHOTOGRAPH NO: 6	**DATE:** May 14, 2024	**LATITUDE:** 43.382778	**LONGITUDE:** -89.463091
DIRECTION: North-west	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 3: Unnamed ephemeral stream. Evidence of sediment deposition.			
PHOTO BY: **GTH**			

Photographic Log

Project Name: IH 39/90/94 Intersection with USH 12/18 to Intersection with Dees Rd

Client: Wisconsin Department of Transportation **GEI Proposal No.** 2201696

PHOTOGRAPH NO: 7	**DATE:** May 14, 2024	**LATITUDE:** 43.382434	**LONGITUDE:** -89.462807
DIRECTION: North	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 3: Unnamed ephemeral stream. Evidence of erosion and defined bed and bank.			
PHOTO BY: **GTH**			

PHOTOGRAPH NO: 8	**DATE:** May 14, 2024	**LATITUDE:** 43.381756	**LONGITUDE:** -89.462807
DIRECTION: North	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 3: Unnamed ephemeral stream. Presence of large woody debris.			
PHOTO BY: **GTH**			

Photographic Log

Project Name: IH 39/90/94 Intersection with USH 12/18 to Intersection with Dees Rd

Client: Wisconsin Department of Transportation **GEI Proposal No.** 2201696

PHOTOGRAPH NO: 9	**DATE:** May 14, 2024	**LATITUDE:** 43.381173	**LONGITUDE:** -89.462502
DIRECTION: South	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 3: Unnamed ephemeral stream with approximate ordinary high-water level and waterway centerline.			
PHOTO BY: **GTH**			

PHOTOGRAPH NO: 10	**DATE:** May 14, 2024	**LATITUDE:** 43.380139	**LONGITUDE:** -89.461641
DIRECTION: East	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 3: Unnamed ephemeral stream with erosion around box culvert.			
PHOTO BY: **GTH**			

Photographic Log

Project Name: IH 39/90/94 Intersection with USH 12/18 to Intersection with Dees Rd

Client: Wisconsin Department of Transportation **GEI Proposal No.** 2201696

PHOTOGRAPH NO: 11	**DATE:** May 14, 2024	**LATITUDE:** 43.3801	**LONGITUDE:** -89.461755
DIRECTION: North	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 3: Unnamed ephemeral waterway. Presence of large woody debris and litter piling up, as well as scouring under tree roots.			
PHOTO BY: **GTH**			

PHOTOGRAPH NO: 12	**DATE:** May 14, 2024	**LATITUDE:** 43.379778	**LONGITUDE:** -89.460352
DIRECTION: West	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 4: Stormwater conveyance feature.			
PHOTO BY: **GTH**			

Photographic Log

Project Name: IH 39/90/94 Intersection with USH 12/18 to Intersection with Dees Rd

Client: Wisconsin Department of Transportation **GEI Proposal No.** 2201696

PHOTOGRAPH NO: 13	**DATE:** May 14, 2024	**LATITUDE:** 43.379189	**LONGITUDE:** -89.461274
DIRECTION: East	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 4: Stormwater conveyance feature extending from culvert.			
PHOTO BY: **GTH**			

PHOTOGRAPH NO: 14	**DATE:** May 14, 2024	**LATITUDE:** 43.378725	**LONGITUDE:** -89.461741
DIRECTION: South	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 4: Stormwater conveyance feature.			
PHOTO BY: **GTH**			

Photographic Log

Project Name: IH 39/90/94 Intersection with USH 12/18 to Intersection with Dees Rd

Client: Wisconsin Department of Transportation **GEI Proposal No.** 2201696

PHOTOGRAPH NO: 15	**DATE:** May 14, 2024	**LATITUDE:** 43.377781	**LONGITUDE:** -89.461396
DIRECTION: Northwest	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 4: Stormwater conveyance feature.			
PHOTO BY: **GTH**			

PHOTOGRAPH NO: 16	**DATE:** July 12, 2022 11:10 AM	**LATITUDE:** 43.37606263	**LONGITUDE:** -89.46063945
DIRECTION: North	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 4: Stormwater conveyance feature.			
PHOTO BY: **GTH**			

Photographic Log

Project Name: IH 39/90/94 Intersection with USH 12/18 to Intersection with Dees Rd

Client: Wisconsin Department of Transportation **GEI Proposal No.** 2201696

PHOTOGRAPH NO: 17	**DATE:** July 12, 2022	**LATITUDE:** 43.37866966	**LONGITUDE:** -89.46172182
DIRECTION: South	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 4: Stormwater conveyance feature.			
PHOTO BY: **GTH**			

PHOTOGRAPH NO: 18	**DATE:** July 12, 2022	**LATITUDE:** 43.37801309	**LONGITUDE:** -89.46139848
DIRECTION: North	**SITE LOCATION:** COLUMBIA COUNTY		
DESCRIPTION: Assessment Area 4: Stormwater conveyance feature.			
PHOTO BY: **GTH**			

Description of Stream Features Worksheet

The Corps encourages applicants to complete this worksheet to aid in the identification of streams within a project area. Provide representative photographs of the stream features outlined in this form in a separate attached document.

Project ID Number:	2201696	**Latitude (DD):**	43.391999
Feature ID:	Assessment 1	**Longitude (DD):**	-89.464586
Waterbody Name*:	Unnamed (WBIC 5032242)	**Length of Reach (ft):**	+/-1,063 feet
Investigator (s):	Gabe Heindel, Connor Bell	**Top of Bank Width (ft):**	+/-6.1 feet
Inspection Date:	May 14, 2024	**OHWM Elevation:**	+/-806-808 feet above mean sea level
County/State:	Columbia County, WI	**Special Designations:**	None

Site Description and Site History*: Based on an air photo review, the section of IH39-90, from County CS to just south of the Smokey Hollow Rd. overpass has historically been surrounded by forested and agriculture based land-uses since at least 1937. The Unnamed waterway is evident on aerial imagery from 1937; tree cover along the waterway appears to increase between 1937 and 1995, likely due to the placement of the highway, cutting off accessibility of farms to adjacent areas along the waterway.

Associated Wetland(s)? *If yes, provide a brief description below and attach figures of locations*

Riparian Wooded (Degraded) Community Type: (+/-11,374.25 sq.ft.)
Riparian Emergent (Degraded) Community Type: (+/-2156.08 sq.ft.)
Wooded Swamp (Degraded) Community Type: (+/-5433.97 sq.ft.)
*Refer to Figure 5 for additional details.

*Include Historic Aerial photographs and Topographic Maps (historic and current) of stream when appropriate (see instructions).

Water Regime (check all that apply):

☐ **Perennial** ☐ **Intermittent** ☐ **Ephemeral**

Explain Reasoning *(attach all supporting data):*

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Other Evidence: *List/describe an additional field evidence and/or lines of reasoning used to support your delineation*

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Ordinary High Water Mark (OHWM) Criteria:

*Check all that apply and provide representative photographs** of each checked criteria in an attachment.*

☐ Clear, natural line impressed on bank
☐ Vegetation matted down, bent or absent
☐ Leaf litter disturbed or washed away
☐ Abrupt change in plant community
☐ Destruction of terrestrial vegetation
☐ Changes in soil characteristics
☐ Sediment deposition
☐ Sediment sorting
☐ Presence of litter or debris
☐ Shelving
☐ Evidence of scouring
☐ Water staining on leaf debris/tree trunks

List of Photo ID Numbers:

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Unique Features:

Check all that apply and provide representative photographs of each checked criteria in an attachment.

☐ Unstable Banks
☐ Rock Outcrop
☐ Riffles/Runs
☐ Bridge/culvert
☐ Steep Sideslopes
☐ Headcutting
☐ Gravel Bars/Islands
☐ Riprap
☐ Diversion/Intake
☐ Buildings
☐ Erosion
☐ Channelization
☐ Seeps
☐ Dams
☐ Pools
☐ Large Woody Debris
☐ Concentrated Flow Points (e.g. Tile)
☐ Aquatic fauna (macroinvertebrates, fish etc.)
☐ Submergent Aquatic Vegetation
☐ Undercut Banks

List of Photo ID Numbers:

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Bed Material Characterization:

Estimate percentages to describe the general sediment texture of the channel, provide representative photographs when conditions allow.

	Clay/Silt <0.05mm	Sand 0.05- 2mm	Gravel 2mm- 1cm	Cobbles 1-10cm	Boulders >10cm
Bed Material					

Notes/Description and Photo ID Numbers:

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Vegetation:

Check boxes of the strata that are present in the reach and provide a brief description of the general vegetation characteristics. List the dominant species of each strata and describe which strata is dominant. Provide representative photographs of vegetation, including riparian buffer.

☐ **Tree** ☐**Shrub** ☐ **Herbaceous** ☐**Bare**

Notes/Description and Photo ID Numbers:

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Riparian Area Width:

Provide a general estimate in feet of the width of the riparian corridor that currently contains riparian vegetation and is free from any soil-disturbing land uses (MNSQT, 2019).

Notes/Description and Photo ID Numbers:

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Notes:

Provide any additional information below, all photographs and maps should be provided in an attached appendix.

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Description of Stream Features Instructions

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How to Use: Fill out one worksheet for each tributary, or if there is significant variation in characteristics within the segment of the proposed impact then fill out a single worksheet per reach. Additional worksheets will be required if there is drastic erosion in parts of the stream channel, or if the proposed impact will affect another stream reach. Attach all photographs and maps in an Appendix to the worksheet.

Photos: Photos should include the following

- Location of each photo point (see instructions for providing maps)
- Label photos with what they are representative of (e.g. large woody debris)
- Photo points should match the observation point, a single photo can serve to demonstrate multiple features.
- Label the photo with the cardinal direction it was taken in (e.g. N, S, E, W)
- Photos should be taken upstream, downstream, and across the channel. They should encompass all unique features of a reach.
- Photos should be representative. For example, if vegetation is homogeneous throughout the reach only a few photographs are needed. If vegetation is dynamic, multiple photographs should be provided to document these shifts.

Maps:

- *Topographic maps*: this includes historic topographic maps that show any significant change in the channel over time, as well as updated topographic map or LiDAR elevation maps when available. Indicate source (e.g. USGS).
- *Historic Aerial Photographs*: Indicate year, ideally multiple historic aerials will be provided. In cases where there have been significant changes to the stream channel location and size, historic aerials would ideally demonstrate the extent and duration of these events.
- *Location Map:* location of the stream reach within the larger watershed.
- *Other Maps:* NWI, Soils, boundary and land ownership surrounding the stream reach. For Wisconsin all information from the Soil and Water Data Viewer.
- *Maps should include:*
    - Flow Direction
    - Elevation changes
    - Boundaries of associated delineated wetlands and other aquatic resources.
    - Existing stream features and their location (e.g. location of a riffle pool complex).
    - Any existing public data (fish and macro datapoints in the stream, any long-term monitoring locations for the reach).

Additional Information on Worksheet Parameters:

1. **Feature ID**: Provide a unique identifier representative of the reach. For example, if there is too much variation in stream character throughout the impact segment, multiple Stream Features Worksheets may be required. In this case, each reach will require a unique Feature ID.
2. **Waterbody Name**: If waterbody name is unknown, include name of downstream tributary (i.e. unnamed tributary to __).
3. **Investigators**: The name(s) of the individuals collecting qualitative information provided on the form.
4. **Inspection Date**: The date(s) that the information on the form was collected.
5. **County/State**: County and State that the reach is within (i.e. Renville, MN).
6. **Lat/Long**: Latitude and Longitude should be provided in Decimal Degrees, typically at the center coordinates of the project site.
7. **Length of Reach**: Provide the length of the reach in Linear Feet.
8. **Top of Bank Width**: This section is intended to be a rapid measure of the average width throughout the reach. Top of Bank Width is not designed to be an accurate measure, but rather provide an approximate idea of the size of the channel. Other classifications, representative photographs, etc. that can identify size characteristics can be substituted when available.
9. **OHWM Elevation**: Has the OHWM been identified? Provide an average of the location of the OHWM indicators (See #14 below). Use RGL 05-05 (https://www.nap.usace.army.mil/Portals/39/docs/regulatory/rgls/rgl05-05.pdf) and the National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams: Interim Version (https://erdc-library.erdc.dren.mil/jspui/bitstream/11681/46102/1/ERDC-CRREL%20TR-22-26.pdf) for more information.
10. **Special Designations:** Is the reach within mapped, special designations (trout water, 303(d) listed, outstanding resource water, etc.)? If it is not known, provide state unknown. If it is not special designation then say “N/A.” Provide the special designation and any supporting data source. Consideration will be given to if the proposed design address any concerns from special designation streams (i.e. bottomless arch culvert placement for fish passage).
11. **Site Description and Site History**: An adequate description of the site will include a synopsis of the current and historic site use history, water source and surrounding land use. Notation of any large shifts in the stream channel, as well as supporting historic aerial imagery and topographic maps will aid in review. For example: “*This stream reach is an unnamed tributary to Bevins Creek, located within the Minnesota River Basin. The primary land use within the watershed is agriculture, bluffs and urban areas. The water source is a combination of surface water runoff, drain tile runoff and wetland outflow. The site has been farmed continuously since 1975, the treed buffer was removed in 1991 and portions of the channel were straightened. Historic topographic maps and aerial imagery*

showing the channel relocation and the removal of the riparian buffer are provided. A tile map demonstrating the extent of the concentrated flow points along the channel are attached as well."

12. **Associated Wetland(s):** Briefly describe wetlands associated with the reach, and for any relocations any associated wetlands to the relocated area. Wetland type, extent and available delineations when available are invaluable. Provide a map demonstrating the wetland boundaries in the attached materials.
13. **Water Regime:** Check all that apply, explain the reasoning behind the determination as well and the data source.
    a. *Perennial*: The term perennial means surface water flowing continuously year-round.
    b. *Intermittent*: The term intermittent means surface water flowing continuously during certain times of the year and more than in direct response to precipitation (e.g., seasonally when the groundwater table is elevated or when snowpack melts).
    c. *Ephemeral*: The term ephemeral means surface water flowing or pooling only in direct response to precipitation (e.g., rain or snow fall).
    d. *Explain Reasoning*: Provide information on the data source used in the determination (e.g. APT, USGS Stream Stats County Soil and Water District GIS Layer).
14. **Ordinary High Water Mark (OHWM) Criteria:** Check all that apply, explain the reasoning behind the determination and provide representative photographs of each checked criteria in an attachment. Provide a location map with where the unique feature was located within the stream reach.
15. **Unique Features:** Check all that apply, explain the reasoning behind the determination and provide representative photographs of each checked criteria in an attachment. Provide a location map with where the unique feature was located within the stream reach.
    a. Unstable Banks: Wearing of the banks of a stream.
    b. Riffles/Runs: Riffles are shallow features with fast flowing water, typically seen in gravel-bed channels with low-moderate channel slopes. Runs are slower bodies of water that run smoothly. These features are commonly seen with Pools (below).
    c. Pools: often formed after a geomorphic feature, the vertical force of the water creates a pool.
    d. Bridge/culvert: Provide photos and description (necessary in cases of replacement) in an attachment. Ensure that photographs of all features are provided.
    e. Steep Sideslopes: sharply sloped banks sometimes associated with more deeply incised channels or v-shaped channels.
    f. Headcutting: a distinct erosional feature with a abrupt vertical drop in the streambed.
    g. Gravel Bars/Islands: elevated areas of sediment deposited by stream flow.
    h. Hard armoring: Rip rap, concrete, gabion baskets etc.
    i. Diversion/Intake: e.g. invisible weirs pumps, isolated segments of stream, cofferdams etc.
    j. Buildings
    k. Erosion: All types of erosion should be noted.
    l. Channelization
    m. Springs
    n. Dams
    o. Large Woody Debris: Dead wood over 3.3 feet in Length and at least 3.9 inches in diameter at the largest end. Wood must be within the channel or touching the top of the streambank.
    p. Concentrated Flow Points (e.g. Tile): Anthropogenic causes of concentrated flow may include agricultural drainage ditches impervious surfaces, storm drains, and others. Concentrated flow

points are defined as erosional features, such as swales, gullies or other channels, that are created by anthropogenic impacts (MnSQT 2019).

q. Aquatic Fauna: Any observed macroinvertebrates, fish etc. If any other aquatic fauna are observed that may be of interest, please describe in an attachment.
r. Submergent Aquatic Vegetation
s. Undercut Banks

16. **Bed Material Characterization:** This is an estimate to describe the general sediment texture of the channel. Assign percentages based on how much of the channel is observable. In some cases, there will be a notable variation in bed material characteristics throughout the reach. The primary purpose of this metric is to gather a general idea of the bed material character. Provide descriptions of notable features such as of riffle pool complexes. If the bed material cannot be observed due to turbidity, access restrictions etc. then make note of such circumstances.
17. **Vegetation:** Check boxes of the strata that are present in the reach and provide a brief description of the general vegetation characteristics. If some of the strata are more dominant than others (e.g. herbaceous dominated) then make note in the description box. List the dominant species of each strata. Provide representative photographs of vegetation, including riparian buffer.
18. **Riparian Area Width**: This metric may be captured using a desktop method or in the field. If there is significant variation in the buffer width, then provide multiple photographs demonstrating the contraction and expansion of riparian vegetation. This is a general estimate (in feet) of the width of the riparian corridor running along the stream that is estimated perpendicular to the stream. This is the width of the total vegetated buffer that contains riparian vegetation and is free from any soil disturbing land use (e.g. farming, development, road). If vegetation is absent due to a soil-disturbing land use, document the land use in the description box.

Available Resources:

1. Wisconsin Surface Water Data Viewer: https://dnrmaps.wi.gov/H5/?viewer=SWDV
2. Minnesota Geospatial Information Office: https://www.mngeo.state.mn.us/chouse/water_rivers.html
3. USGS Surface-Water Data for the Nation: https://waterdata.usgs.gov/nwis/sw
4. USGS StreamStats: https://streamstats.usgs.gov/ss/
5. Wetland Plants and Plant Communities of Minnesota and Wisconsin (Eggers and Reed, Version 3.2, 2015): https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/2801/
6. St. Paul District Regulatory Website: https://www.mvp.usace.army.mil/Missions/Regulatory/Mitigation/
    a. This provides information on the SQT, user manuals, past presentations and workshops, etc.

Description of Stream Features Worksheet

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Project ID Number:	2201696	**Latitude (DD):**	43.3865627
Feature ID:	Assessment 2	**Longitude (DD):**	-89.4648757
Waterbody Name*:	Unnamed (WBIC 5032242)	**Length of Reach (ft):**	+/-2,0112 ft
Investigator (s):	Gabe Heindel, Connor Bell	**Top of Bank Width (ft):**	Unable to verify
Inspection Date:	May 14, 2024	**OHWM Elevation:**	NA- Did not appear present
County/State:	Columbia County, WI	**Special Designations:**	None

Site Description and Site History*: Based on an air photo review, the section of IH39-90, from County CS to just south of the Smokey Hollow Rd. overpass has historically been surrounded by forested and agriculture based land-uses since at least 1937. The Unnamed waterway is evident on aerial imagery from 1937; tree cover along the waterway appears to increase between 1937 and 1995, likely due to the placement of the highway, cutting off accessibility of farms to adjacent areas along the waterway.

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Available Resources:

1. Wisconsin Surface Water Data Viewer: https://dnrmaps.wi.gov/H5/?viewer=SWDV
2. Minnesota Geospatial Information Office: https://www.mngeo.state.mn.us/chouse/water_rivers.html
3. USGS Surface-Water Data for the Nation: https://waterdata.usgs.gov/nwis/sw
4. USGS StreamStats: https://streamstats.usgs.gov/ss/
5. Wetland Plants and Plant Communities of Minnesota and Wisconsin (Eggers and Reed, Version 3.2, 2015): https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/2801/
6. St. Paul District Regulatory Website: https://www.mvp.usace.army.mil/Missions/Regulatory/Mitigation/
    a. This provides information on the SQT, user manuals, past presentations and workshops, etc.

Description of Stream Features Worksheet

The Corps encourages applicants to complete this worksheet to aid in the identification of streams within a project area. Provide representative photographs of the stream features outlined in this form in a separate attached document.

Project ID Number:	2201696	**Latitude (DD):**	43.3812140
Feature ID:	Assessment 3	**Longitude (DD):**	-89.4625475
Waterbody Name*:	Unnamed (WBIC 5032242)	**Length of Reach (ft):**	+/-1,162 feet
Investigator (s):	Gabe Heindel, Connor Bell	**Top of Bank Width (ft):**	20.0 feet
Inspection Date:	May 14, 2024	**OHWM Elevation:**	+/-846-848 feet above mean sea level
County/State:	Columbia County, WI	**Special Designations:**	None

Site Description and Site History*: Based on an air photo review, the section of IH39-90, from County CS to just south of the Smokey Hollow Rd. overpass has historically been surrounded by forested and agriculture based land-uses since at least 1937. The Unnamed waterway is evident on aerial imagery from 1937; tree cover along the waterway appears to increase between 1937 and 1995, likely due to the placement of the highway, cutting off accessibility of farms to adjacent areas along the waterway.

Associated Wetland(s)? *If yes, provide a brief description below and attach figures of locations*

Wooded Swamp Community Type (+/- 51,411 sq.ft.)
*Refer to Figure 5 for more details

*Include Historic Aerial photographs and Topographic Maps (historic and current) of stream when appropriate (see instructions).

Water Regime (check all that apply):

☐ **Perennial** ☐ **Intermittent** ☐ **Ephemeral**

Explain Reasoning *(attach all supporting data):*

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Other Evidence: *List/describe an additional field evidence and/or lines of reasoning used to support your delineation*

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Ordinary High Water Mark (OHWM) Criteria:

*Check all that apply and provide representative photographs** of each checked criteria in an attachment.*

☐ Clear, natural line impressed on bank
☐ Vegetation matted down, bent or absent
☐ Leaf litter disturbed or washed away
☐ Abrupt change in plant community
☐ Destruction of terrestrial vegetation
☐ Changes in soil characteristics
☐ Sediment deposition
☐ Sediment sorting
☐ Presence of litter or debris
☐ Shelving
☐ Evidence of scouring
☐ Water staining on leaf debris/tree trunks

List of Photo ID Numbers:

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Unique Features:

Check all that apply and provide representative photographs of each checked criteria in an attachment.

☐ Unstable Banks
☐ Rock Outcrop
☐ Riffles/Runs
☐ Bridge/culvert
☐ Steep Sideslopes
☐ Headcutting
☐ Gravel Bars/Islands
☐ Riprap
☐ Diversion/Intake
☐ Buildings
☐ Erosion
☐ Channelization
☐ Seeps
☐ Dams
☐ Pools
☐ Large Woody Debris
☐ Concentrated Flow Points (e.g. Tile)
☐ Aquatic fauna (macroinvertebrates, fish etc.)
☐ Submergent Aquatic Vegetation
☐ Undercut Banks

List of Photo ID Numbers:

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Bed Material Characterization:

Estimate percentages to describe the general sediment texture of the channel, provide representative photographs when conditions allow.

	Clay/Silt <0.05mm	Sand 0.05- 2mm	Gravel 2mm- 1cm	Cobbles 1-10cm	Boulders >10cm
Bed Material					

Notes/Description and Photo ID Numbers:

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Vegetation:

Check boxes of the strata that are present in the reach and provide a brief description of the general vegetation characteristics. List the dominant species of each strata and describe which strata is dominant. Provide representative photographs of vegetation, including riparian buffer.

☐ **Tree** ☐**Shrub** ☐ **Herbaceous** ☐**Bare**

Notes/Description and Photo ID Numbers:

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Riparian Area Width:

Provide a general estimate in feet of the width of the riparian corridor that currently contains riparian vegetation and is free from any soil-disturbing land uses (MNSQT, 2019).

Notes/Description and Photo ID Numbers:

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Notes:

Provide any additional information below, all photographs and maps should be provided in an attached appendix.

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Description of Stream Features Instructions

The Corps encourages applicants to use this instruction sheet to correctly fill out the "Description of Stream Features Worksheet." This is designed to aid in the identification of streams within a project area. For questions on this worksheet, please contact St. Paul Regulatory Stream Team at StPaulSQT@usace.army.mil

How to Use: Fill out one worksheet for each tributary, or if there is significant variation in characteristics within the segment of the proposed impact then fill out a single worksheet per reach. Additional worksheets will be required if there is drastic erosion in parts of the stream channel, or if the proposed impact will affect another stream reach. Attach all photographs and maps in an Appendix to the worksheet.

Photos: Photos should include the following

- Location of each photo point (see instructions for providing maps)
- Label photos with what they are representative of (e.g. large woody debris)
- Photo points should match the observation point, a single photo can serve to demonstrate multiple features.
- Label the photo with the cardinal direction it was taken in (e.g. N, S, E, W)
- Photos should be taken upstream, downstream, and across the channel. They should encompass all unique features of a reach.
- Photos should be representative. For example, if vegetation is homogeneous throughout the reach only a few photographs are needed. If vegetation is dynamic, multiple photographs should be provided to document these shifts.

Maps:

- *Topographic maps*: this includes historic topographic maps that show any significant change in the channel over time, as well as updated topographic map or LiDAR elevation maps when available. Indicate source (e.g. USGS).
- *Historic Aerial Photographs*: Indicate year, ideally multiple historic aerials will be provided. In cases where there have been significant changes to the stream channel location and size, historic aerials would ideally demonstrate the extent and duration of these events.
- *Location Map:* location of the stream reach within the larger watershed.
- *Other Maps:* NWI, Soils, boundary and land ownership surrounding the stream reach. For Wisconsin all information from the Soil and Water Data Viewer.
- *Maps should include:*
    - Flow Direction
    - Elevation changes
    - Boundaries of associated delineated wetlands and other aquatic resources.
    - Existing stream features and their location (e.g. location of a riffle pool complex).
    - Any existing public data (fish and macro datapoints in the stream, any long-term monitoring locations for the reach).

Additional Information on Worksheet Parameters:

1. **Feature ID**: Provide a unique identifier representative of the reach. For example, if there is too much variation in stream character throughout the impact segment, multiple Stream Features Worksheets may be required. In this case, each reach will require a unique Feature ID.
2. **Waterbody Name**: If waterbody name is unknown, include name of downstream tributary (i.e. unnamed tributary to __).
3. **Investigators**: The name(s) of the individuals collecting qualitative information provided on the form.
4. **Inspection Date**: The date(s) that the information on the form was collected.
5. **County/State**: County and State that the reach is within (i.e. Renville, MN).
6. **Lat/Long**: Latitude and Longitude should be provided in Decimal Degrees, typically at the center coordinates of the project site.
7. **Length of Reach**: Provide the length of the reach in Linear Feet.
8. **Top of Bank Width**: This section is intended to be a rapid measure of the average width throughout the reach. Top of Bank Width is not designed to be an accurate measure, but rather provide an approximate idea of the size of the channel. Other classifications, representative photographs, etc. that can identify size characteristics can be substituted when available.
9. **OHWM Elevation**: Has the OHWM been identified? Provide an average of the location of the OHWM indicators (See #14 below). Use RGL 05-05 (https://www.nap.usace.army.mil/Portals/39/docs/regulatory/rgls/rgl05-05.pdf) and the National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams: Interim Version (https://erdc-library.erdc.dren.mil/jspui/bitstream/11681/46102/1/ERDC-CRREL%20TR-22-26.pdf) for more information.
10. **Special Designations:** Is the reach within mapped, special designations (trout water, 303(d) listed, outstanding resource water, etc.)? If it is not known, provide state unknown. If it is not special designation then say “N/A.” Provide the special designation and any supporting data source. Consideration will be given to if the proposed design address any concerns from special designation streams (i.e. bottomless arch culvert placement for fish passage).
11. **Site Description and Site History**: An adequate description of the site will include a synopsis of the current and historic site use history, water source and surrounding land use. Notation of any large shifts in the stream channel, as well as supporting historic aerial imagery and topographic maps will aid in review. For example: “*This stream reach is an unnamed tributary to Bevins Creek, located within the Minnesota River Basin. The primary land use within the watershed is agriculture, bluffs and urban areas. The water source is a combination of surface water runoff, drain tile runoff and wetland outflow. The site has been farmed continuously since 1975, the treed buffer was removed in 1991 and portions of the channel were straightened. Historic topographic maps and aerial imagery*

showing the channel relocation and the removal of the riparian buffer are provided. A tile map demonstrating the extent of the concentrated flow points along the channel are attached as well."

12. **Associated Wetland(s):** Briefly describe wetlands associated with the reach, and for any relocations any associated wetlands to the relocated area. Wetland type, extent and available delineations when available are invaluable. Provide a map demonstrating the wetland boundaries in the attached materials.
13. **Water Regime:** Check all that apply, explain the reasoning behind the determination as well and the data source.
    a. *Perennial*: The term perennial means surface water flowing continuously year-round.
    b. *Intermittent*: The term intermittent means surface water flowing continuously during certain times of the year and more than in direct response to precipitation (e.g., seasonally when the groundwater table is elevated or when snowpack melts).
    c. *Ephemeral*: The term ephemeral means surface water flowing or pooling only in direct response to precipitation (e.g., rain or snow fall).
    d. *Explain Reasoning*: Provide information on the data source used in the determination (e.g. APT, USGS Stream Stats County Soil and Water District GIS Layer).
14. **Ordinary High Water Mark (OHWM) Criteria:** Check all that apply, explain the reasoning behind the determination and provide representative photographs of each checked criteria in an attachment. Provide a location map with where the unique feature was located within the stream reach.
15. **Unique Features:** Check all that apply, explain the reasoning behind the determination and provide representative photographs of each checked criteria in an attachment. Provide a location map with where the unique feature was located within the stream reach.
    a. Unstable Banks: Wearing of the banks of a stream.
    b. Riffles/Runs: Riffles are shallow features with fast flowing water, typically seen in gravel-bed channels with low-moderate channel slopes. Runs are slower bodies of water that run smoothly. These features are commonly seen with Pools (below).
    c. Pools: often formed after a geomorphic feature, the vertical force of the water creates a pool.
    d. Bridge/culvert: Provide photos and description (necessary in cases of replacement) in an attachment. Ensure that photographs of all features are provided.
    e. Steep Sideslopes: sharply sloped banks sometimes associated with more deeply incised channels or v-shaped channels.
    f. Headcutting: a distinct erosional feature with a abrupt vertical drop in the streambed.
    g. Gravel Bars/Islands: elevated areas of sediment deposited by stream flow.
    h. Hard armoring: Rip rap, concrete, gabion baskets etc.
    i. Diversion/Intake: e.g. invisible weirs pumps, isolated segments of stream, cofferdams etc.
    j. Buildings
    k. Erosion: All types of erosion should be noted.
    l. Channelization
    m. Springs
    n. Dams
    o. Large Woody Debris: Dead wood over 3.3 feet in Length and at least 3.9 inches in diameter at the largest end. Wood must be within the channel or touching the top of the streambank.
    p. Concentrated Flow Points (e.g. Tile): Anthropogenic causes of concentrated flow may include agricultural drainage ditches impervious surfaces, storm drains, and others. Concentrated flow

points are defined as erosional features, such as swales, gullies or other channels, that are created by anthropogenic impacts (MnSQT 2019).

q. Aquatic Fauna: Any observed macroinvertebrates, fish etc. If any other aquatic fauna are observed that may be of interest, please describe in an attachment.
r. Submergent Aquatic Vegetation
s. Undercut Banks

16. **Bed Material Characterization:** This is an estimate to describe the general sediment texture of the channel. Assign percentages based on how much of the channel is observable. In some cases, there will be a notable variation in bed material characteristics throughout the reach. The primary purpose of this metric is to gather a general idea of the bed material character. Provide descriptions of notable features such as of riffle pool complexes. If the bed material cannot be observed due to turbidity, access restrictions etc. then make note of such circumstances.
17. **Vegetation:** Check boxes of the strata that are present in the reach and provide a brief description of the general vegetation characteristics. If some of the strata are more dominant than others (e.g. herbaceous dominated) then make note in the description box. List the dominant species of each strata. Provide representative photographs of vegetation, including riparian buffer.
18. **Riparian Area Width**: This metric may be captured using a desktop method or in the field. If there is significant variation in the buffer width, then provide multiple photographs demonstrating the contraction and expansion of riparian vegetation. This is a general estimate (in feet) of the width of the riparian corridor running along the stream that is estimated perpendicular to the stream. This is the width of the total vegetated buffer that contains riparian vegetation and is free from any soil disturbing land use (e.g. farming, development, road). If vegetation is absent due to a soil-disturbing land use, document the land use in the description box.

Available Resources:

1. Wisconsin Surface Water Data Viewer: https://dnrmaps.wi.gov/H5/?viewer=SWDV
2. Minnesota Geospatial Information Office: https://www.mngeo.state.mn.us/chouse/water_rivers.html
3. USGS Surface-Water Data for the Nation: https://waterdata.usgs.gov/nwis/sw
4. USGS StreamStats: https://streamstats.usgs.gov/ss/
5. Wetland Plants and Plant Communities of Minnesota and Wisconsin (Eggers and Reed, Version 3.2, 2015): https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/2801/
6. St. Paul District Regulatory Website: https://www.mvp.usace.army.mil/Missions/Regulatory/Mitigation/
    a. This provides information on the SQT, user manuals, past presentations and workshops, etc.

Description of Stream Features Worksheet

The Corps encourages applicants to complete this worksheet to aid in the identification of streams within a project area. Provide representative photographs of the stream features outlined in this form in a separate attached document.

Project ID Number:	2201696	**Latitude (DD):**	43.378293
Feature ID:	Assessment 4	**Longitude (DD):**	-89.461559
Waterbody Name*:	Unnamed (WBIC 5032242)	**Length of Reach (ft):**	+/-1,692 feet
Investigator (s):	Gabe Heindel, Connor Bell	**Top of Bank Width (ft):**	Unable to verify
Inspection Date:	May 14, 2024	**OHWM Elevation:**	NA - Did not appear present
County/State:	Columbia County, WI	**Special Designations:**	None

Site Description and Site History*: Based on an air photo review, the section of IH39-90, from County CS to just south of the Smokey Hollow Rd. overpass has historically been surrounded by forested and agriculture based land-uses since at least 1937. The Unnamed waterway is evident on aerial imagery from 1937; tree cover along the waterway appears to increase between 1937 and 1995, likely due to the placement of the highway, cutting off accessibility of farms to adjacent areas along the waterway.

Associated Wetland(s)? *If yes, provide a brief description below and attach figures of locations*

None

*Include Historic Aerial photographs and Topographic Maps (historic and current) of stream when appropriate (see instructions).

Water Regime (check all that apply):

☐ **Perennial** ☐ **Intermittent** ☐ **Ephemeral**

Explain Reasoning *(attach all supporting data):*

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Other Evidence: *List/describe an additional field evidence and/or lines of reasoning used to support your delineation*

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Ordinary High Water Mark (OHWM) Criteria:

*Check all that apply and provide representative photographs** of each checked criteria in an attachment.*

☐ Clear, natural line impressed on bank
☐ Vegetation matted down, bent or absent
☐ Leaf litter disturbed or washed away
☐ Abrupt change in plant community
☐ Destruction of terrestrial vegetation
☐ Changes in soil characteristics
☐ Sediment deposition
☐ Sediment sorting
☐ Presence of litter or debris
☐ Shelving
☐ Evidence of scouring
☐ Water staining on leaf debris/tree trunks

List of Photo ID Numbers:

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Unique Features:

Check all that apply and provide representative photographs of each checked criteria in an attachment.

☐ Unstable Banks
☐ Rock Outcrop
☐ Riffles/Runs
☐ Bridge/culvert
☐ Steep Sideslopes
☐ Headcutting
☐ Gravel Bars/Islands
☐ Riprap
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☐ Buildings
☐ Erosion
☐ Channelization
☐ Seeps
☐ Dams
☐ Pools
☐ Large Woody Debris
☐ Concentrated Flow Points (e.g. Tile)
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List of Photo ID Numbers:

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Bed Material					

Notes/Description and Photo ID Numbers:

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Vegetation:

Check boxes of the strata that are present in the reach and provide a brief description of the general vegetation characteristics. List the dominant species of each strata and describe which strata is dominant. Provide representative photographs of vegetation, including riparian buffer.

☐ **Tree** ☐**Shrub** ☐ **Herbaceous** ☐**Bare**

Notes/Description and Photo ID Numbers:

Please refer to the Memo: USACE Stream Features Worksheet, IH39/90/94 CS Interchange, Columbia County, WI for details.

Riparian Area Width:

Provide a general estimate in feet of the width of the riparian corridor that currently contains riparian vegetation and is free from any soil-disturbing land uses (MNSQT, 2019).

Notes/Description and Photo ID Numbers:

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- Location of each photo point (see instructions for providing maps)
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Maps:

- *Topographic maps*: this includes historic topographic maps that show any significant change in the channel over time, as well as updated topographic map or LiDAR elevation maps when available. Indicate source (e.g. USGS).
- *Historic Aerial Photographs*: Indicate year, ideally multiple historic aerials will be provided. In cases where there have been significant changes to the stream channel location and size, historic aerials would ideally demonstrate the extent and duration of these events.
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4. **Inspection Date**: The date(s) that the information on the form was collected.
5. **County/State**: County and State that the reach is within (i.e. Renville, MN).
6. **Lat/Long**: Latitude and Longitude should be provided in Decimal Degrees, typically at the center coordinates of the project site.
7. **Length of Reach**: Provide the length of the reach in Linear Feet.
8. **Top of Bank Width**: This section is intended to be a rapid measure of the average width throughout the reach. Top of Bank Width is not designed to be an accurate measure, but rather provide an approximate idea of the size of the channel. Other classifications, representative photographs, etc. that can identify size characteristics can be substituted when available.
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showing the channel relocation and the removal of the riparian buffer are provided. A tile map demonstrating the extent of the concentrated flow points along the channel are attached as well."

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    c. *Ephemeral*: The term ephemeral means surface water flowing or pooling only in direct response to precipitation (e.g., rain or snow fall).
    d. *Explain Reasoning*: Provide information on the data source used in the determination (e.g. APT, USGS Stream Stats County Soil and Water District GIS Layer).
14. **Ordinary High Water Mark (OHWM) Criteria:** Check all that apply, explain the reasoning behind the determination and provide representative photographs of each checked criteria in an attachment. Provide a location map with where the unique feature was located within the stream reach.
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    e. Steep Sideslopes: sharply sloped banks sometimes associated with more deeply incised channels or v-shaped channels.
    f. Headcutting: a distinct erosional feature with a abrupt vertical drop in the streambed.
    g. Gravel Bars/Islands: elevated areas of sediment deposited by stream flow.
    h. Hard armoring: Rip rap, concrete, gabion baskets etc.
    i. Diversion/Intake: e.g. invisible weirs pumps, isolated segments of stream, cofferdams etc.
    j. Buildings
    k. Erosion: All types of erosion should be noted.
    l. Channelization
    m. Springs
    n. Dams
    o. Large Woody Debris: Dead wood over 3.3 feet in Length and at least 3.9 inches in diameter at the largest end. Wood must be within the channel or touching the top of the streambank.
    p. Concentrated Flow Points (e.g. Tile): Anthropogenic causes of concentrated flow may include agricultural drainage ditches impervious surfaces, storm drains, and others. Concentrated flow

points are defined as erosional features, such as swales, gullies or other channels, that are created by anthropogenic impacts (MnSQT 2019).

q. Aquatic Fauna: Any observed macroinvertebrates, fish etc. If any other aquatic fauna are observed that may be of interest, please describe in an attachment.
r. Submergent Aquatic Vegetation
s. Undercut Banks

16. **Bed Material Characterization:** This is an estimate to describe the general sediment texture of the channel. Assign percentages based on how much of the channel is observable. In some cases, there will be a notable variation in bed material characteristics throughout the reach. The primary purpose of this metric is to gather a general idea of the bed material character. Provide descriptions of notable features such as of riffle pool complexes. If the bed material cannot be observed due to turbidity, access restrictions etc. then make note of such circumstances.
17. **Vegetation:** Check boxes of the strata that are present in the reach and provide a brief description of the general vegetation characteristics. If some of the strata are more dominant than others (e.g. herbaceous dominated) then make note in the description box. List the dominant species of each strata. Provide representative photographs of vegetation, including riparian buffer.
18. **Riparian Area Width**: This metric may be captured using a desktop method or in the field. If there is significant variation in the buffer width, then provide multiple photographs demonstrating the contraction and expansion of riparian vegetation. This is a general estimate (in feet) of the width of the riparian corridor running along the stream that is estimated perpendicular to the stream. This is the width of the total vegetated buffer that contains riparian vegetation and is free from any soil disturbing land use (e.g. farming, development, road). If vegetation is absent due to a soil-disturbing land use, document the land use in the description box.

Available Resources:

1. Wisconsin Surface Water Data Viewer: https://dnrmaps.wi.gov/H5/?viewer=SWDV
2. Minnesota Geospatial Information Office: https://www.mngeo.state.mn.us/chouse/water_rivers.html
3. USGS Surface-Water Data for the Nation: https://waterdata.usgs.gov/nwis/sw
4. USGS StreamStats: https://streamstats.usgs.gov/ss/
5. Wetland Plants and Plant Communities of Minnesota and Wisconsin (Eggers and Reed, Version 3.2, 2015): https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/2801/
6. St. Paul District Regulatory Website: https://www.mvp.usace.army.mil/Missions/Regulatory/Mitigation/
    a. This provides information on the SQT, user manuals, past presentations and workshops, etc.

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network

Coordinates	43.381284, -89.462653
Observation Date	2024-05-14
Elevation (ft)	850.033
Drought Index (PDSI)	Mild wetness (2024-04)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-05-14	3.061024	4.628347	3.177165	Normal	2	3	6
2024-04-14	1.844882	3.61378	3.122047	Normal	2	2	4
2024-03-15	1.061417	1.925197	1.866142	Normal	2	1	2
Result							Normal Conditions - 12

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Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ARLINGTON	43.3042, -89.3453	1051.837	7.946	201.804	5.179	10901	90
SUN PRAIRIE 3 W	43.1936, -89.2822	950.131	8.275	101.706	4.565	7	0
LODI WWTP	43.3217, -89.5311	803.15	9.419	248.687	6.581	127	0
MADISON DANE CO RGNL AP	43.1406, -89.3453	858.924	11.304	192.913	7.267	317	0