



Photograph 73. View of upland SP12, upslope from Wetland E, which was taken to document RSD3 and did not meet the wetland vegetation or hydrology criteria, looking north.



Photograph 74. View of SP12 within the concave roadway swale (RSD3) and dominated by tall fescue (*Schedonorus arundinaceus*) and smooth brome (*Bromus inermis*), looking south.





Photograph 75. View of the soil profile found at SP12 (RSD3) which met the Redox Dark Surface (F6) hydric soil indicator.



Photograph 76. View of the stormwater inlet basin within the US 41 median, north of SR 352 which captures hydrology from Wetland E.





Photograph 77. View US 41 median roadway swale, the stormwater inlet basin (yellow arrow) and Wetland E (SP11)-upland RSD3 (TP5) transition (red arrow), north of SR 352.

<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Midwest Region</b> See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-0024, Exp:11/30/2024</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: US41 & SR352 Intersection Improvement (DES#2100058) City/County: Benton County Sampling Date: 8/22/2023

Applicant/Owner: INDOT State: IN Sampling Point: SP1

Investigator(s): Ken Safranek, Rose Snyder; ASC Group, Inc. Section, Township, Range: S19 T24N R8W

Landform (hillside, terrace, etc.): Top Slope Terrace Local relief (concave, convex, none): None

Slope (%): 1-2 Lat: 40.521121 Long: -87.376611 Datum: WGS 84

Soil Map Unit Name: Odell silt loam, 0-2% slopes (OIA) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No      (If no, explain in Remarks.)

Are Vegetation     , Soil     , or Hydrology      significantly disturbed? Are "Normal Circumstances" present? Yes X No     

Are Vegetation     , Soil     , or Hydrology      naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>    </u> No <u>X</u> Hydric Soil Present? Yes <u>    </u> No <u>X</u> Wetland Hydrology Present? Yes <u>    </u> No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>    </u> No <u>X</u>
Remarks: The Sample Point describes the mowed and maintained lawnsapes at the top slope terraces across the investigation area.	

**VEGETATION – Use scientific names of plants.**

<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Tree Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>30</u> )</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: right;">=Total Cover</td> <td></td> <td></td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Sapling/Shrub Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>15</u> )</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: right;">=Total Cover</td> <td></td> <td></td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Herb Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>5</u> )</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td><u>Festuca rubra</u></td><td style="text-align: center;">50</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FACU</td></tr> <tr><td>2.</td><td><u>Lolium perenne</u></td><td style="text-align: center;">30</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FACU</td></tr> <tr><td>3.</td><td><u>Poa annua</u></td><td style="text-align: center;">18</td><td style="text-align: center;">No</td><td style="text-align: center;">FACU</td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr><td>8.</td><td></td><td></td><td></td><td></td></tr> <tr><td>9.</td><td></td><td></td><td></td><td></td></tr> <tr><td>10.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: right;">98 =Total Cover</td> <td></td> <td></td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Woody Vine Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>30</u> )</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: right;">=Total Cover</td> <td></td> <td></td> </tr> </table>	Tree Stratum	(Plot size: <u>30</u> )	Absolute % Cover	Dominant Species?	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Remarks: (Include photo numbers here or on a separate sheet.) Sample Point does not pass any test for hydrophytic indicators.																																																																																																																																																																							

# SOIL

Sampling Point: SP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 3/1	100					Loamy/Clayey	
4-12	2.5Y 4/2	70	10YR 3/1	30	C	M	Loamy/Clayey	Faint redox concentrations
12-18	2.5Y 5/2	80	10YR 3/1	20	C	M	Loamy/Clayey	Distinct redox concentrations

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

<b>Hydric Soil Indicators:</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) <input type="checkbox"/> Redox Depressions (F8)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> Coast Prairie Redox (A16) <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Red Parent Material (F21) <input type="checkbox"/> Very Shallow Dark Surface (F22) <input type="checkbox"/> Other (Explain in Remarks)  <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks:  
The Sample Point does not meet any hydric soil indicator.

# HYDROLOGY

<b>Wetland Hydrology Indicators:</b>			
<u>Primary Indicators (minimum of one is required; check all that apply)</u>		<u>Secondary Indicators (minimum of two required)</u>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?      Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?        Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
No wetland hydrology indicators were observed at the Sample Point.

<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Midwest Region</b> See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-0024, Exp:11/30/2024</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: <u>US41 &amp; SR352 Intersection Improvement (DES#2100058)</u>	City/County: <u>Benton County</u>	Sampling Date: <u>8/22/2023</u>
Applicant/Owner: <u>INDOT</u>	State: <u>IN</u>	Sampling Point: <u>SP2</u>
Investigator(s): <u>Ken Safranek, Rose Snyder; ASC Group, Inc.</u>		
Section, Township, Range: <u>S18 T24N R8W</u>		
Landform (hillside, terrace, etc.): <u>Depression</u>		
Local relief (concave, convex, none): <u>Concave</u>		
Slope (%): <u>3-6</u>	Lat: <u>40.521643</u>	Long: <u>-87.376306</u>
		Datum: <u>WGS84</u>
Soil Map Unit Name: <u>Odell silt loam, 0-2% slopes (OIA)</u>		
NW1 classification: <u>None</u>		
Are climatic / hydrologic conditions on the site typical for this time of year?    Yes <u>X</u> No <u>      </u> (If no, explain in Remarks.)		
Are Vegetation <u>      </u> , Soil <u>      </u> , or Hydrology <u>      </u> significantly disturbed?    Are "Normal Circumstances" present?    Yes <u>X</u> No <u>      </u>		
Are Vegetation <u>      </u> , Soil <u>      </u> , or Hydrology <u>      </u> naturally problematic?    (If needed, explain any answers in Remarks.)		

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?    Yes <u>X</u> No <u>      </u> Hydric Soil Present?                    Yes <u>X</u> No <u>      </u> Wetland Hydrology Present?          Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>      </u>
Remarks: The Sample Point represents Wetland A within the drainage swale west of US 41.	

**VEGETATION – Use scientific names of plants.**

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Remarks: (Include photo numbers here or on a separate sheet.) The Sample Point passes the Rapid Test, Dominance Test and Prevalence Index for hydrophytic vegetation.																																																																																																																																																																							

# SOIL

Sampling Point: SP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 2/1	100					Loamy/Clayey	
4-6	10YR 3/1	98	10YR 5/6	2	C	M	Loamy/Clayey	Prominent redox concentrations
6-18	10YR 5/1	75	10YR 5/6	15	C	M	Loamy/Clayey	
			10YR 6/1	10	D	M		

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10)	
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:  
The Sample Point passes the Depleted Below Dark Surface, A11, and Depleted Matrix, F3, hydric soil indicators.

# HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input checked="" type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>15</u> Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0</u> (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
Several primary and secondary indicators of wetland hydrology were observed at the Sample Point.

<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Midwest Region</b> See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-0024, Exp:11/30/2024</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: <u>US41 &amp; SR352 Intersection Improvement (DES#2100058)</u>	City/County: <u>Benton County</u>	Sampling Date: <u>8/22/2023</u>
Applicant/Owner: <u>INDOT</u>	State: <u>IN</u>	Sampling Point: <u>SP3</u>
Investigator(s): <u>Ken Safranek, Rose Snyder; ASC Group, Inc.</u>		
Section, Township, Range: <u>S18 T24N R8W</u>		
Landform (hillside, terrace, etc.): <u>Toe Slope</u>		
Local relief (concave, convex, none): <u>Concave</u>		
Slope (%): <u>4-6</u>	Lat: <u>40.523566</u>	Long: <u>-87.376478</u>
		Datum: <u>WGS84</u>
Soil Map Unit Name: <u>Chalmers silty clay loam (Ch)</u>		NWI classification: <u>None</u>
Are climatic / hydrologic conditions on the site typical for this time of year?    Yes <u>X</u> No <u>      </u> (If no, explain in Remarks.)		
Are Vegetation <u>      </u> , Soil <u>      </u> , or Hydrology <u>      </u> significantly disturbed?    Are "Normal Circumstances" present?    Yes <u>X</u> No <u>      </u>		
Are Vegetation <u>      </u> , Soil <u>      </u> , or Hydrology <u>      </u> naturally problematic?    (If needed, explain any answers in Remarks.)		

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?    Yes <u>      </u> No <u>X</u> Hydric Soil Present?    Yes <u>      </u> No <u>X</u> Wetland Hydrology Present?    Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>      </u> No <u>X</u>
Remarks: The Sample Point represents the maintained roadway slope upslope from Wetland A	

**VEGETATION – Use scientific names of plants.**

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## SOIL

Sampling Point: SP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-12	10YR 3/1	100					Loamy/Clayey	
12-18	10YR 3/1	90	10YR 2/1	10	C	M	Loamy/Clayey	Faint redox concentrations

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks:  
The Sample Point did not meet any hydric soil indicator.

## HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?      Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?        Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
Two secondary indicators of wetland hydrology

<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Midwest Region</b> See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-0024, Exp:11/30/2024</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: US41 & SR352 Intersection Improvement (DES#2100058) City/County: Benton County Sampling Date: 8/22/2023  
Applicant/Owner: INDOT State: IN Sampling Point: SP4  
Investigator(s): Ken Safranek, Rose Snyder; ASC Group, Inc. Section, Township, Range: S19 T24N R8W  
Landform (hillside, terrace, etc.): Toe Slope Local relief (concave, convex, none): Concave  
Slope (%): 4-6 Lat: 40.519223 Long: -87.376337 Datum: WGS84  
Soil Map Unit Name: Odell silt loam, 0-2% slopes (OIA) NWI classification: None  
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No      (If no, explain in Remarks.)  
Are Vegetation     , Soil     , or Hydrology      significantly disturbed? Are "Normal Circumstances" present? Yes X No       
Are Vegetation     , Soil     , or Hydrology      naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>    </u> No <u>X</u> Hydric Soil Present? Yes <u>X</u> No <u>    </u> Wetland Hydrology Present? Yes <u>    </u> No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>    </u> No <u>X</u>
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Remarks:  
The Sample Point represents the forested and shrub portion of the unmanaged landscape adjacent to the culvert inlet at the south terminus of Wetland A and the roadside ditch.

**VEGETATION – Use scientific names of plants.**

<b>Tree Stratum</b> (Plot size: <u>30</u> ) 1. <u>Morus alba</u> Absolute % Cover <u>60</u> Dominant Species? <u>Yes</u> Indicator Status <u>FAC</u> 2. <u>Juglans nigra</u> Absolute % Cover <u>20</u> Dominant Species? <u>Yes</u> Indicator Status <u>FACU</u> 3. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 4. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 5. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> <u>80</u> =Total Cover	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>42.9%</u> (A/B)
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15</u> ) 1. <u>Fraxinus americana</u> Absolute % Cover <u>20</u> Dominant Species? <u>Yes</u> Indicator Status <u>FACU</u> 2. <u>Acer negundo</u> Absolute % Cover <u>10</u> Dominant Species? <u>Yes</u> Indicator Status <u>FAC</u> 3. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 4. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 5. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> <u>30</u> =Total Cover	
<b>Herb Stratum</b> (Plot size: <u>5</u> ) 1. <u>Fraxinus americana</u> Absolute % Cover <u>15</u> Dominant Species? <u>Yes</u> Indicator Status <u>FACU</u> 2. <u>Toxicodendron radicans</u> Absolute % Cover <u>12</u> Dominant Species? <u>Yes</u> Indicator Status <u>FAC</u> 3. <u>Dactylis glomerata</u> Absolute % Cover <u>10</u> Dominant Species? <u>Yes</u> Indicator Status <u>FACU</u> 4. <u>Rumex crispus</u> Absolute % Cover <u>8</u> Dominant Species? <u>No</u> Indicator Status <u>FAC</u> 5. <u>Oxalis stricta</u> Absolute % Cover <u>5</u> Dominant Species? <u>No</u> Indicator Status <u>FACU</u> 6. <u>Ambrosia artemisiifolia</u> Absolute % Cover <u>5</u> Dominant Species? <u>No</u> Indicator Status <u>FACU</u> 7. <u>Geum canadense</u> Absolute % Cover <u>5</u> Dominant Species? <u>No</u> Indicator Status <u>FAC</u> 8. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 9. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 10. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> <u>60</u> =Total Cover	
<b>Woody Vine Stratum</b> (Plot size: <u>30</u> ) 1. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 2. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> <u>    </u> =Total Cover	<b>Prevalence Index worksheet:</b> Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>95</u> x 3 = <u>285</u> FACU species <u>75</u> x 4 = <u>300</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>170</u> (A) <u>585</u> (B) Prevalence Index = B/A = <u>3.44</u>
<b>Hydrophytic Vegetation Indicators:</b> <u>    </u> 1 - Rapid Test for Hydrophytic Vegetation <u>    </u> 2 - Dominance Test is >50% <u>    </u> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <u>    </u> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <u>    </u> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
<b>Hydrophytic Vegetation Present?</b> Yes <u>    </u> No <u>X</u>	

Remarks: (Include photo numbers here or on a separate sheet.)  
The Sample Point does not pass any test for hydrophytic vegetation.

# SOIL

Sampling Point: SP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	10YR 3/1	100					Loamy/Clayey	
3-6	10YR 3/1	97	10YR 5/2	3	D	M	Loamy/Clayey	
6-13	10YR 5/1	72	10YR 3/1	25	C	M	Loamy/Clayey	Faint redox concentrations
			10YR 5/6	3	C	M		Prominent redox concentrations
13-18	10YR 5/2	75	10YR 4/6	20	C	M	Loamy/Clayey	Prominent redox concentrations
			2.5YR 3/6	5	C	M		Prominent redox concentrations
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.					<sup>2</sup> Location: PL=Pore Lining, M=Matrix.			
<b>Hydric Soil Indicators:</b>						<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>		
<input type="checkbox"/> Histosol (A1)			<input type="checkbox"/> Sandy Gleyed Matrix (S4)			<input type="checkbox"/> Coast Prairie Redox (A16)		
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Sandy Redox (S5)			<input type="checkbox"/> Iron-Manganese Masses (F12)		
<input type="checkbox"/> Black Histic (A3)			<input type="checkbox"/> Stripped Matrix (S6)			<input type="checkbox"/> Red Parent Material (F21)		
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Dark Surface (S7)			<input type="checkbox"/> Very Shallow Dark Surface (F22)		
<input type="checkbox"/> Stratified Layers (A5)			<input type="checkbox"/> Loamy Mucky Mineral (F1)			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> 2 cm Muck (A10)			<input type="checkbox"/> Loamy Gleyed Matrix (F2)					
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)			<input checked="" type="checkbox"/> Depleted Matrix (F3)					
<input type="checkbox"/> Thick Dark Surface (A12)			<input type="checkbox"/> Redox Dark Surface (F6)			<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
<input type="checkbox"/> Sandy Mucky Mineral (S1)			<input type="checkbox"/> Depleted Dark Surface (F7)					
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			<input type="checkbox"/> Redox Depressions (F8)					
<b>Restrictive Layer (if observed):</b>								
Type: _____						<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Depth (inches): _____								
Remarks: The Sample Point passes the Depleted Below Dark Surface, A11, and Depleted Matrix, F3, hydric soil indicators.								

# HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		
<b>Field Observations:</b>			
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____		
Saturation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: No primary and one secondary wetland hydrology indicator was observed at the Sample Point. Not enough hydrology indicators were observed at the Sample Point to meet the hydrology criteria.			



<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Midwest Region</b> See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-0024, Exp:11/30/2024</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: US41 & SR352 Intersection Improvement (DES#2100058) City/County: Benton County Sampling Date: 8/22/2023  
Applicant/Owner: INDOT State: IN Sampling Point: SP5  
Investigator(s): Ken Safranek, Rose Snyder; ASC Group, Inc. Section, Township, Range: S19 T24N R8W  
Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): Convex  
Slope (%): 8-10 Lat: 40.519336 Long: -87.376203 Datum: WGS84  
Soil Map Unit Name: Odell silt loam, 0-2% slopes (OIA) NWI classification: None  
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No      (If no, explain in Remarks.)  
Are Vegetation     , Soil     , or Hydrology      significantly disturbed? Are "Normal Circumstances" present? Yes X No       
Are Vegetation     , Soil     , or Hydrology      naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>X</u> No <u>    </u> Hydric Soil Present? Yes <u>X</u> No <u>    </u> Wetland Hydrology Present? Yes <u>    </u> No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>    </u> No <u>X</u>
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Remarks:  
The Sample Point represents a minor terrace within the maintained roadway slope which contained hydrophytic vegetation adjacent to Wetland A.

**VEGETATION – Use scientific names of plants.**

<b>Tree Stratum</b> (Plot size: <u>30</u> ) 1. <u>Morus alba</u> Absolute % Cover <u>10</u> Dominant Species? <u>Yes</u> Indicator Status <u>FAC</u> 2. <u>    </u> <u>    </u> <u>    </u> 3. <u>    </u> <u>    </u> <u>    </u> 4. <u>    </u> <u>    </u> <u>    </u> 5. <u>    </u> <u>    </u> <u>    </u> <u>10</u> =Total Cover	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15</u> ) 1. <u>    </u> <u>    </u> <u>    </u> 2. <u>    </u> <u>    </u> <u>    </u> 3. <u>    </u> <u>    </u> <u>    </u> 4. <u>    </u> <u>    </u> <u>    </u> 5. <u>    </u> <u>    </u> <u>    </u> <u>    </u> =Total Cover	
<b>Herb Stratum</b> (Plot size: <u>5</u> ) 1. <u>Phalaris arundinacea</u> <u>60</u> <u>Yes</u> <u>FACW</u> 2. <u>Typha angustifolia</u> <u>30</u> <u>Yes</u> <u>OBL</u> 3. <u>    </u> <u>    </u> <u>    </u> 4. <u>    </u> <u>    </u> <u>    </u> 5. <u>    </u> <u>    </u> <u>    </u> 6. <u>    </u> <u>    </u> <u>    </u> 7. <u>    </u> <u>    </u> <u>    </u> 8. <u>    </u> <u>    </u> <u>    </u> 9. <u>    </u> <u>    </u> <u>    </u> 10. <u>    </u> <u>    </u> <u>    </u> <u>90</u> =Total Cover	
<b>Woody Vine Stratum</b> (Plot size: <u>30</u> ) 1. <u>    </u> <u>    </u> <u>    </u> 2. <u>    </u> <u>    </u> <u>    </u> <u>    </u> =Total Cover	<b>Prevalence Index worksheet:</b> Total % Cover of: Multiply by: OBL species <u>30</u> x 1 = <u>30</u> FACW species <u>60</u> x 2 = <u>120</u> FAC species <u>10</u> x 3 = <u>30</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>100</u> (A) <u>180</u> (B) Prevalence Index = B/A = <u>1.80</u>
<b>Hydrophytic Vegetation Indicators:</b> <u>    </u> 1 - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>    </u> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <u>    </u> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <u>    </u> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No <u>    </u>	

Remarks: (Include photo numbers here or on a separate sheet.)  
The Sample Point passes the Dominance Test for hydrophytic vegetation.

## SOIL

Sampling Point: SP5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-8	N 2.5/	95	5YR 4/6	5	C	M	Loamy/Clayey	Prominent redox concentrations
8-16	N 3/	80	N 2.5/	5	C	M	Loamy/Clayey	Faint redox concentrations
			5YR 4/6	10	C	M		Prominent redox concentrations
			10YR 5/2	5	D	M		

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input checked="" type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:  
The Sample Point passes the Redox Dark Surface, F6, hydric soil indicators. Coarse fragment refusal was encountered at 16-inches. Other attempts to bypass the refusal were all met with the same layer.

## HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?      Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?        Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
The Sample Point passes the FAC-Neutral Test, D5, secondary wetland hydrology indicator. However, not enough wetland indicators were observed at the sample point to meet the wetland hydrology criteria.

<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Midwest Region</b> See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-0024, Exp:11/30/2024</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: US41 & SR352 Intersection Improvement (DES#2100058) City/County: Benton County Sampling Date: 8/22/2023  
Applicant/Owner: INDOT State: IN Sampling Point: SP6  
Investigator(s): Ken Safraneck, Rose Snyder; ASC Group, Inc. Section, Township, Range: S19 T24N R8W  
Landform (hillside, terrace, etc.): Swale/Depression Local relief (concave, convex, none): Concave  
Slope (%): 1-3 Lat: 40.519462 Long: -87.375918 Datum: WGS84  
Soil Map Unit Name: Odell silt loam, 0-2% slopes (OIA) NWI classification: None  
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No      (If no, explain in Remarks.)  
Are Vegetation     , Soil     , or Hydrology      significantly disturbed? Are "Normal Circumstances" present? Yes X No       
Are Vegetation     , Soil     , or Hydrology      naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>    </u> No <u>X</u> Hydric Soil Present? Yes <u>    </u> No <u>X</u> Wetland Hydrology Present? Yes <u>X</u> No <u>    </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>    </u> No <u>X</u>
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Remarks:  
The Sample Point represents a swale within the grassed median which receives stormwater inputs from US 41 and terminates at a stormwater inlet basin.

**VEGETATION – Use scientific names of plants.**

<table><tr><td><u>Tree Stratum</u> (Plot size: <u>30</u> )</td><td>Absolute % Cover</td><td>Dominant Species?</td><td>Indicator Status</td></tr><tr><td>1. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td>2. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td>3. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td>4. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td>5. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td colspan="4"><u>    </u> =Total Cover</td></tr><tr><td><u>Sapling/Shrub Stratum</u> (Plot size: <u>15</u> )</td><td></td><td></td><td></td></tr><tr><td>1. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td>2. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td>3. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td>4. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td>5. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td colspan="4"><u>    </u> =Total Cover</td></tr><tr><td><u>Herb Stratum</u> (Plot size: <u>5</u> )</td><td></td><td></td><td></td></tr><tr><td>1. <u>Phalaris arundinacea</u></td><td><u>30</u></td><td><u>Yes</u></td><td><u>FACW</u></td></tr><tr><td>2. <u>Bromus inermis</u></td><td><u>20</u></td><td><u>Yes</u></td><td><u>FACU</u></td></tr><tr><td>3. <u>Schedonorus arundinaceus</u></td><td><u>20</u></td><td><u>Yes</u></td><td><u>FACU</u></td></tr><tr><td>4. <u>Asclepias verticillata</u></td><td><u>12</u></td><td><u>No</u></td><td><u>FACU</u></td></tr><tr><td>5. <u>Euphorbia maculata</u></td><td><u>5</u></td><td><u>No</u></td><td><u>FACU</u></td></tr><tr><td>6. <u>Securigera varia</u></td><td><u>3</u></td><td><u>No</u></td><td><u>UPL</u></td></tr><tr><td>7. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td>8. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td>9. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td>10. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td colspan="4"><u>90</u> =Total Cover</td></tr><tr><td><u>Woody Vine Stratum</u> (Plot size: <u>30</u> )</td><td></td><td></td><td></td></tr><tr><td>1. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td>2. <u>    </u></td><td><u>    </u></td><td><u>    </u></td><td><u>    </u></td></tr><tr><td colspan="4"><u>    </u> =Total Cover</td></tr></table>	<u>Tree Stratum</u> (Plot size: <u>30</u> )	Absolute % Cover	Dominant Species?	Indicator Status	1. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	2. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	3. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	4. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	5. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	<u>    </u> =Total Cover				<u>Sapling/Shrub Stratum</u> (Plot size: <u>15</u> )				1. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	2. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	3. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	4. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	5. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	<u>    </u> =Total Cover				<u>Herb Stratum</u> (Plot size: <u>5</u> )				1. <u>Phalaris arundinacea</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>	2. <u>Bromus inermis</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	3. <u>Schedonorus arundinaceus</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	4. <u>Asclepias verticillata</u>	<u>12</u>	<u>No</u>	<u>FACU</u>	5. <u>Euphorbia maculata</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	6. <u>Securigera varia</u>	<u>3</u>	<u>No</u>	<u>UPL</u>	7. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	8. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	9. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	10. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	<u>90</u> =Total Cover				<u>Woody Vine Stratum</u> (Plot size: <u>30</u> )				1. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	2. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	<u>    </u> =Total Cover				<p><b>Dominance Test worksheet:</b></p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>3</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33.3%</u> (A/B)</p> <p><b>Prevalence Index worksheet:</b></p> <table><tr><td>Total % Cover of:</td><td>Multiply by:</td></tr><tr><td>OBL species <u>0</u></td><td>x 1 = <u>0</u></td></tr><tr><td>FACW species <u>30</u></td><td>x 2 = <u>60</u></td></tr><tr><td>FAC species <u>0</u></td><td>x 3 = <u>0</u></td></tr><tr><td>FACU species <u>57</u></td><td>x 4 = <u>228</u></td></tr><tr><td>UPL species <u>3</u></td><td>x 5 = <u>15</u></td></tr><tr><td>Column Totals: <u>90</u> (A)</td><td><u>303</u> (B)</td></tr><tr><td colspan="2">Prevalence Index = B/A = <u>3.37</u></td></tr></table> <p><b>Hydrophytic Vegetation Indicators:</b></p> <p><u>    </u> 1 - Rapid Test for Hydrophytic Vegetation</p> <p><u>    </u> 2 - Dominance Test is &gt;50%</p> <p><u>    </u> 3 - Prevalence Index is ≤3.0<sup>1</sup></p> <p><u>    </u> 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)</p> <p><u>    </u> Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)</p> <p><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <p><b>Hydrophytic Vegetation Present?</b> Yes <u>    </u> No <u>X</u></p>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>30</u>	x 2 = <u>60</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>57</u>	x 4 = <u>228</u>	UPL species <u>3</u>	x 5 = <u>15</u>	Column Totals: <u>90</u> (A)	<u>303</u> (B)	Prevalence Index = B/A = <u>3.37</u>	
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Remarks: (Include photo numbers here or on a separate sheet.)  
The Sample Point does not pass any test for hydrophytic vegetation.



# SOIL

Sampling Point: SP6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 3/3	100					Loamy/Clayey	
6-12	10YR 3/1	90	10YR 4/2	10	D	M	Loamy/Clayey	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks:  
The Sample Point does not meet any hydric soil indicator. Coarse fragment refusal was encountered at 12-inches. Other attempts to bypass the refusal were all met with the same layer.

# HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
The Sample Point receives hydrology from stormwater runoff along adjacent road and median. Hydrology is captured by a stormwater inlet at the terminus of the swale.

<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Midwest Region</b> See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-0024, Exp:11/30/2024</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: US41 & SR352 Intersection Improvement (DES#2100058) City/County: Benton County Sampling Date: 8/22/2023  
Applicant/Owner: INDOT State: IN Sampling Point: SP7  
Investigator(s): Ken Safranek, Rose Snyder; ASC Group, Inc. Section, Township, Range: S19 T24N R8W  
Landform (hillside, terrace, etc.): Top Slope Terrace Local relief (concave, convex, none): Flat  
Slope (%): 1-3 Lat: 40.519236 Long: -87.375583 Datum: WGS84  
Soil Map Unit Name: Odell silt loam, 0-2% slopes (OIA) NWI classification: None  
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No      (If no, explain in Remarks.)  
Are Vegetation     , Soil     , or Hydrology      significantly disturbed? Are "Normal Circumstances" present? Yes X No       
Are Vegetation     , Soil     , or Hydrology      naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>X</u> No <u>    </u> Hydric Soil Present? Yes <u>    </u> No <u>X</u> Wetland Hydrology Present? Yes <u>    </u> No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>    </u> No <u>X</u>
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Remarks:  
The Sample Point represents a partially unmanaged top slope terrace above the eastern roadway swale where hydrophytic vegetation was observed.

**VEGETATION – Use scientific names of plants.**

<b>Tree Stratum</b> (Plot size: <u>30</u> ) 1. <u>Morus alba</u> Absolute % Cover <u>25</u> Dominant Species? <u>Yes</u> Indicator Status <u>FAC</u> 2. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 3. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 4. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 5. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> <u>25</u> =Total Cover	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15</u> ) 1. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 2. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 3. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 4. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 5. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> <u>    </u> =Total Cover	
<b>Herb Stratum</b> (Plot size: <u>5</u> ) 1. <u>Phalaris arundinacea</u> Absolute % Cover <u>90</u> Dominant Species? <u>Yes</u> Indicator Status <u>FACW</u> 2. <u>Schedonorus arundinaceus</u> Absolute % Cover <u>10</u> Dominant Species? <u>No</u> Indicator Status <u>FACU</u> 3. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 4. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 5. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 6. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 7. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 8. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 9. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 10. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> <u>100</u> =Total Cover	<b>Prevalence Index worksheet:</b> Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>90</u> x 2 = <u>180</u> FAC species <u>25</u> x 3 = <u>75</u> FACU species <u>10</u> x 4 = <u>40</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>125</u> (A) <u>295</u> (B) Prevalence Index = B/A = <u>2.36</u>
<b>Woody Vine Stratum</b> (Plot size: <u>30</u> ) 1. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> 2. <u>    </u> Absolute % Cover <u>    </u> Dominant Species? <u>    </u> Indicator Status <u>    </u> <u>    </u> =Total Cover	

Remarks: (Include photo numbers here or on a separate sheet.)  
The Sample Point passes the Dominance Test for hydrophytic vegetation.

# SOIL

Sampling Point: SP7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	10YR 3/2	100					Loamy/Clayey	
3-9	10YR 4/3	95	10YR 3/1	5	C	M	Loamy/Clayey	Distinct redox concentrations

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes _____ No <u>X</u>
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Remarks:  
The Sample Point does not meet any hydric soil indicator. Coarse fragment refusal was encountered at 9-inches. Other attempts to bypass the refusal were all met with the same layer.

# HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

<b>Field Observations:</b> Surface Water Present?    Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present?    Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present?    Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
Only one secondary indicator of wetland hydrology was observed at the Sample Point. However, not enough wetland indicators were observed at the sample point to meet the wetland hydrology criteria.



OMB Control #: 0710-0024, Exp:11/30/2024  
Requirement Control Symbol EXEMPT:  
(Authority: AR 335-15, paragraph 5-2a)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

**VEGETATION** – Use scientific names of plants.

Midwest – Version 2.0

# SOIL

Sampling Point: SP8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-2	10YR 3/3	100					Loamy/Clayey	
2-12	10YR 4/3	92	10YR 3/1	5	C	M	Loamy/Clayey	Distinct redox concentrations
			10YR 5/6	3	C	M		Distinct redox concentrations

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes _____ No <u>X</u>
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Remarks:  
The Sample Point does not meet any hydric soil indicator. Coarse fragment refusal was encountered at 12-inches. Other attempts to bypass the refusal were all met with the same layer.

# HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

<b>Field Observations:</b> Surface Water Present?    Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present?      Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present?        Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
No evidence of wetland hydrology was observed at the Sample Point.

<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Midwest Region</b> See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-0024, Exp:11/30/2024</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: US41 & SR352 Intersection Improvement (DES#2100058) City/County: Benton County Sampling Date: 8/22/2023

Applicant/Owner: INDOT State: IN Sampling Point: SP9

Investigator(s): Ken Safranek, Rose Snyder; ASC Group, Inc. Section, Township, Range: S18 T24N R8W

Landform (hillside, terrace, etc.): Swale/Depression Local relief (concave, convex, none): Concave

Slope (%): 1-3 Lat: 40.522227 Long: -87.375594 Datum: WGS84

Soil Map Unit Name: Chalmers silty clay loam (Ch) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No      (If no, explain in Remarks.)

Are Vegetation     , Soil     , or Hydrology      significantly disturbed? Are "Normal Circumstances" present? Yes X No     

Are Vegetation     , Soil     , or Hydrology      naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>X</u> No <u>    </u> Hydric Soil Present? Yes <u>X</u> No <u>    </u> Wetland Hydrology Present? Yes <u>X</u> No <u>    </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>    </u>
Remarks: The Sample Point represents Wetland B which was found in the roadway drainage swale east of US 41.	

**VEGETATION – Use scientific names of plants.**

Tree Stratum	(Plot size: <u>30</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b>  Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)  Total Number of Dominant Species Across All Strata: <u>2</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
1. <u>    </u>																					
2. <u>    </u>																					
3. <u>    </u>																					
4. <u>    </u>																					
5. <u>    </u>																					
		=Total Cover																			
Sapling/Shrub Stratum	(Plot size: <u>15</u> )				<b>Prevalence Index worksheet:</b>  <table style="width:100%; border-collapse: collapse;"> <tr> <th style="width:40%;">Total % Cover of:</th> <th style="width:60%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>10</u></td> <td>x 1 = <u>10</u></td> </tr> <tr> <td>FACW species <u>90</u></td> <td>x 2 = <u>180</u></td> </tr> <tr> <td>FAC species <u>10</u></td> <td>x 3 = <u>30</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>110</u> (A)</td> <td><u>220</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>2.00</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>10</u>	x 1 = <u>10</u>	FACW species <u>90</u>	x 2 = <u>180</u>	FAC species <u>10</u>	x 3 = <u>30</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>110</u> (A)	<u>220</u> (B)	Prevalence Index = B/A = <u>2.00</u>	
Total % Cover of:	Multiply by:																				
OBL species <u>10</u>	x 1 = <u>10</u>																				
FACW species <u>90</u>	x 2 = <u>180</u>																				
FAC species <u>10</u>	x 3 = <u>30</u>																				
FACU species <u>0</u>	x 4 = <u>0</u>																				
UPL species <u>0</u>	x 5 = <u>0</u>																				
Column Totals: <u>110</u> (A)	<u>220</u> (B)																				
Prevalence Index = B/A = <u>2.00</u>																					
1. <u>Cornus amomum</u>		<u>15</u>	<u>Yes</u>	<u>FACW</u>																	
2. <u>    </u>																					
3. <u>    </u>																					
4. <u>    </u>																					
5. <u>    </u>																					
		=Total Cover																			
Herb Stratum	(Plot size: <u>5</u> )				<b>Hydrophytic Vegetation Indicators:</b>  <u>    </u> 1 - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <u>    </u> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <u>    </u> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
1. <u>Phalaris arundinacea</u>		<u>60</u>	<u>Yes</u>	<u>FACW</u>																	
2. <u>Symphotrichum lateriflorum</u>		<u>15</u>	<u>No</u>	<u>FACW</u>																	
3. <u>Typha angustifolia</u>		<u>10</u>	<u>No</u>	<u>OBL</u>																	
4. <u>Acer negundo</u>		<u>5</u>	<u>No</u>	<u>FAC</u>																	
5. <u>Rumex crispus</u>		<u>5</u>	<u>No</u>	<u>FAC</u>																	
6. <u>    </u>																					
7. <u>    </u>																					
8. <u>    </u>																					
9. <u>    </u>																					
10. <u>    </u>																					
		=Total Cover																			
Woody Vine Stratum	(Plot size: <u>30</u> )				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No <u>    </u>																
1. <u>    </u>																					
2. <u>    </u>																					
		=Total Cover																			
Remarks: (Include photo numbers here or on a separate sheet.) The Sample Point passes the Dominance Test and Prevalence Index for hydrophytic vegetation.																					

# SOIL

Sampling Point: SP9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	10YR 3/2	96	10YR 4/2	4	D	M	Loamy/Clayey	
3-16	10YR 5/2	80	10YR 5/4	20	C	M	Loamy/Clayey	Distinct redox concentrations

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10)	
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:  
The Sample Point meets the Depleted Below Dark Surface, A11, and Depleted Matrix, F3, hydric soil indicators.

# HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?      Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?        Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
Several primary and secondary indicators of wetland hydrology were observed at the Sample Point. The primary hydrological input is stormwater runoff from US 41.



<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Midwest Region</b> See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-0024, Exp:11/30/2024</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: US41 & SR352 Intersection Improvement (DES#2100058) City/County: Benton County Sampling Date: 8/22/2023

Applicant/Owner: INDOT State: IN Sampling Point: SP10

Investigator(s): Ken Safranek, Rose Snyder; ASC Group, Inc. Section, Township, Range: S18 T24N R8W

Landform (hillside, terrace, etc.): Swale/Depression Local relief (concave, convex, none): Concave

Slope (%): 2-4 Lat: 40.522475 Long: -87.375573 Datum: WGS84

Soil Map Unit Name: Darroch silt loam, till substratum (Dp) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No      (If no, explain in Remarks.)

Are Vegetation     , Soil     , or Hydrology      significantly disturbed? Are "Normal Circumstances" present? Yes X No     

Are Vegetation     , Soil     , or Hydrology      naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>    </u> No <u>X</u> Hydric Soil Present? Yes <u>X</u> No <u>    </u> Wetland Hydrology Present? Yes <u>X</u> No <u>    </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>    </u> No <u>X</u>
Remarks: The Sample Point represents the roadway drainage swale east of US 41 and upslope from Wetland B.	

**VEGETATION – Use scientific names of plants.**

<table style="width:100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Tree Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>30</u> )</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: right;">=Total Cover</td> <td></td> <td></td> </tr> </table> <table style="width:100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Sapling/Shrub Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>15</u> )</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td><u>Cornus amomum</u></td><td style="text-align: center;">15</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FACW</td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: right;">15 =Total Cover</td> <td></td> <td></td> </tr> </table> <table style="width:100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Herb Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>5</u> )</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td><u>Schedonorus arundinaceus</u></td><td style="text-align: center;">30</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FACU</td></tr> <tr><td>2.</td><td><u>Echinochloa crus-galli</u></td><td style="text-align: center;">20</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FACW</td></tr> <tr><td>3.</td><td><u>Securigera varia</u></td><td style="text-align: center;">20</td><td style="text-align: center;">Yes</td><td style="text-align: center;">UPL</td></tr> <tr><td>4.</td><td><u>Elymus virginicus</u></td><td style="text-align: center;">15</td><td style="text-align: center;">No</td><td style="text-align: center;">FACW</td></tr> <tr><td>5.</td><td><u>Eleusine indica</u></td><td style="text-align: center;">8</td><td style="text-align: center;">No</td><td style="text-align: center;">FACU</td></tr> <tr><td>6.</td><td><u>Rumex crispus</u></td><td style="text-align: center;">5</td><td style="text-align: center;">No</td><td style="text-align: center;">FAC</td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr><td>8.</td><td></td><td></td><td></td><td></td></tr> <tr><td>9.</td><td></td><td></td><td></td><td></td></tr> <tr><td>10.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: right;">98 =Total Cover</td> <td></td> <td></td> </tr> </table> <table style="width:100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Woody Vine Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>30</u> )</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: right;">=Total Cover</td> <td></td> <td></td> </tr> </table>	Tree Stratum	(Plot size: <u>30</u> )	Absolute % Cover	Dominant Species?	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Remarks: (Include photo numbers here or on a separate sheet.) The Sample Point does not pass any test for hydrophytic vegetation.																																																																																																																																																																							

# SOIL

Sampling Point: SP10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	10YR 3/2	96	10YR 4/2	4	D	M	Loamy/Clayey	
3-14	10YR 5/2	70	10YR 5/4	20	C	M	Loamy/Clayey	Distinct redox concentrations

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10)	
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:  
The Sample Point meets the Depleted Below Dark Surface, A11, and Depleted Matrix, F3, hydric soil indicators.

# HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
Two secondary indicators of wetland hydrology were observed at the Sample Point. The primary hydrological input is stormwater runoff from US 41.

<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Midwest Region</b> See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-0024, Exp:11/30/2024</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: US41 & SR352 Intersection Improvement (DES#2100058) City/County: Benton County Sampling Date: 8/22/2023

Applicant/Owner: INDOT State: IN Sampling Point: SP11

Investigator(s): Ken Safranek, Rose Snyder; ASC Group, Inc. Section, Township, Range: S18 T24N R8W

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 1-3 Lat: 40.521595 Long: -87.375921 Datum: WGS84

Soil Map Unit Name: Chalmers silty clay loam (Ch) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No      (If no, explain in Remarks.)

Are Vegetation     , Soil     , or Hydrology      significantly disturbed? Are "Normal Circumstances" present? Yes X No     

Are Vegetation     , Soil     , or Hydrology      naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>X</u> No <u>    </u> Hydric Soil Present? Yes <u>X</u> No <u>    </u> Wetland Hydrology Present? Yes <u>X</u> No <u>    </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>    </u>
Remarks: The Sample Point represents Wetland C which was found in the grassed roadway median of US 41.	

**VEGETATION – Use scientific names of plants.**

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Remarks: (Include photo numbers here or on a separate sheet.) The Sample Point passes the Rapid Test, Dominance Test and Prevalence Index for hydrophytic vegetation.																																																																																																																																																																							

# SOIL

Sampling Point: SP11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 3/2	100					Loamy/Clayey	
4-15	10YR 3/2	65	10YR 5/4	20	C	M	Loamy/Clayey	Distinct redox concentrations
			10YR 5/2	10	D	M		
			10YR 5/8	5	C	M		Prominent redox concentrations

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input checked="" type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:  
The Sample Point meets the Redox Dark Surface, F6, hydric soil indicator.

# HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
Several primary and secondary indicators of wetland hydrology were observed at the Sample Point. The primary hydrological input is stormwater runoff from US 41.



<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Midwest Region</b> See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-0024, Exp:11/30/2024</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: US41 & SR352 Intersection Improvement (DES#2100058) City/County: Benton County Sampling Date: 8/22/2023

Applicant/Owner: INDOT State: IN Sampling Point: SP12

Investigator(s): Ken Safranek, Rose Snyder; ASC Group, Inc. Section, Township, Range: S18 T24N R8W

Landform (hillside, terrace, etc.): Swale/Depression Local relief (concave, convex, none): Concave

Slope (%): 1-3 Lat: 40.523242 Long: -87.376063 Datum: WGS84

Soil Map Unit Name: Chalmers silty clay loam (Ch) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No      (If no, explain in Remarks.)

Are Vegetation     , Soil     , or Hydrology      significantly disturbed? Are "Normal Circumstances" present? Yes X No     

Are Vegetation     , Soil     , or Hydrology      naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>    </u> No <u>X</u> Hydric Soil Present? Yes <u>X</u> No <u>    </u> Wetland Hydrology Present? Yes <u>    </u> No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>    </u> No <u>X</u>
Remarks: The Sample Point represents the grassed roadway median of US 41 upslope from Wetland C.	

**VEGETATION – Use scientific names of plants.**

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Remarks: (Include photo numbers here or on a separate sheet.) The Sample Point does not pass any test for hydrophytic vegetation.																																																																																																																																																																							

## SOIL

Sampling Point: SP12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-2	10YR 3/3	100					Loamy/Clayey	
2-4	10YR 3/1	100					Loamy/Clayey	
4-8	10YR 5/2	85	10YR 3/1	15	C	M	Loamy/Clayey	Faint redox concentrations
8-18	10YR 3/2	70	10YR 5/3	20	C	M	Loamy/Clayey	Faint redox concentrations
			10YR 5/6	10	C	M		Prominent redox concentrations

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input checked="" type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
---	---

Remarks:  
The Sample Point meets the Redox Dark Surface, F6, hydric soil indicator.

## HYDROLOGY

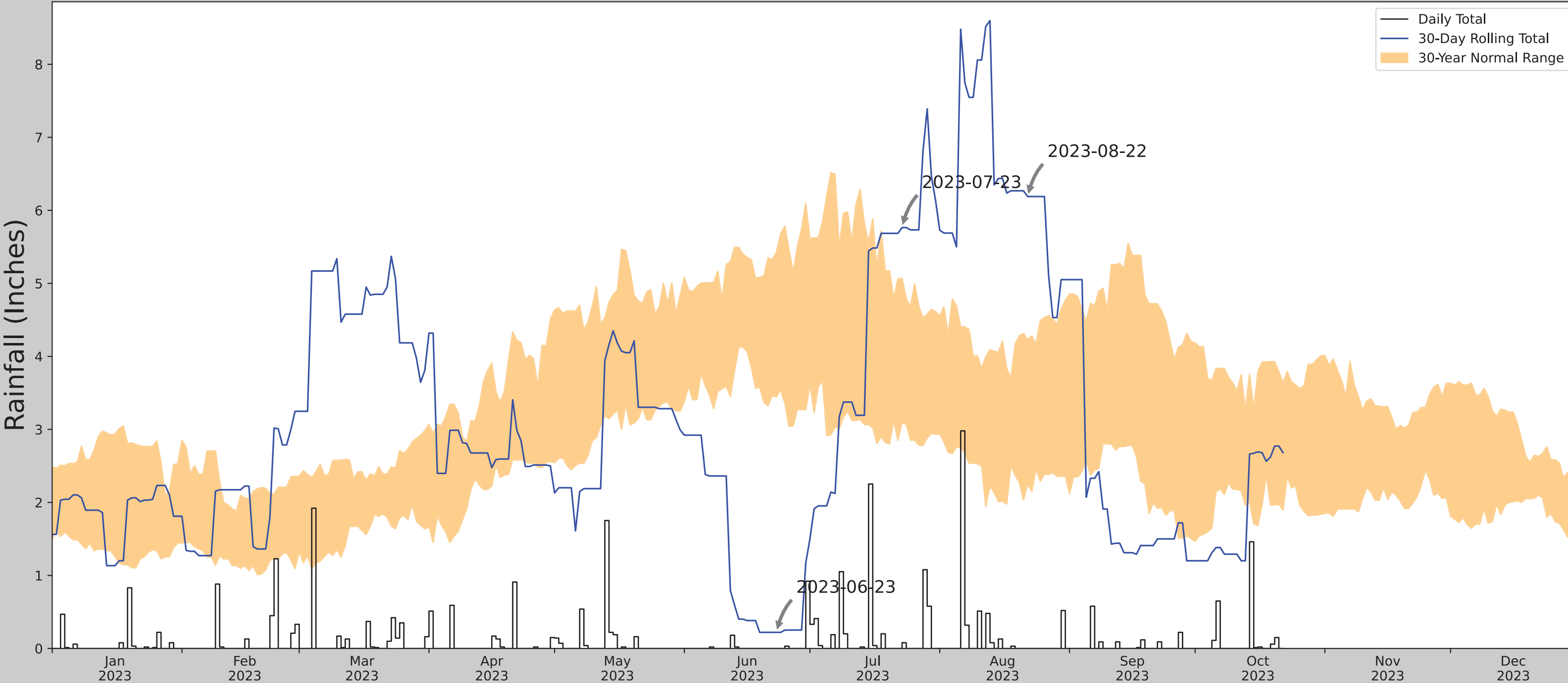
Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:


Remarks:  
The Sample Point was observed within a concave, depressional landform and meets the Geomorphic Position, D2, secondary wetland hydrology indicator. However, the Sample Point does not contain enough indicators to meet the wetland hydrology criteria.

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



Coordinates	40.521141, -87.375943
Observation Date	2023-08-22
Elevation (ft)	757.863
Drought Index (PDSI)	Mild drought
WebWIMP H <sub>2</sub> O Balance	Dry Season


30 Days Ending	30 <sup>th</sup> %ile (in)	70 <sup>th</sup> %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-08-22	2.246457	4.230709	6.188977	Wet	3	3	9
2023-07-23	3.09252	5.068504	5.76378	Wet	3	2	6
2023-06-23	3.446457	5.427953	0.220472	Dry	1	1	1
Result							Wetter than Normal - 16



**US Army Corps of Engineers®**

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



**ERDC**  
U.S. Army Corps of Engineers & U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
PENCE 1 SW	40.3522, -87.525	700.131	14.06	57.732	7.139	10458	89
ROSSVILLE 5.7 E	40.3884, -87.5608	708.99	3.132	8.859	1.437	94	0
ROSSVILLE 4.4 SSE	40.3199, -87.6482	683.071	6.862	17.06	3.205	83	0
HOOPESTON 4.6 E	40.4709, -87.5838	711.942	8.765	11.811	4.048	67	0
DANVILLE 7.6 N	40.2546, -87.6224	666.011	8.474	34.12	4.102	133	0
HENNING 3.4 SSE	40.2647, -87.6656	682.087	9.562	18.044	4.475	230	1
HOOPESTON F-87	40.4664, -87.685	709.974	11.538	9.843	5.306	288	0

## PRELIMINARY JURISDICTIONAL DETERMINATION (PJD)

### FORM BACKGROUND INFORMATION

**A. REPORT COMPLETION DATE FOR PJD: 3/4/2024**

**B. NAME AND ADDRESS OF PERSON REQUESTING PJD:** Len Mikles, 9376 Castlegate Drive,  
Indianapolis, IN 46256

**C. DISTRICT OFFICE, FILE NAME, AND NUMBER:**

#### **D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:**

The proposed project (INDOT Des. No. 2100058) is located at U.S. Route (US) 41 and State Road (SR) 352 in Grant Township, Benton County, Indiana (Figures 1–7). The project proposes to reconstruct the intersection as a restricted crossing U-Turn (RCUT). The purpose of this project is to increase the safety for vehicles crossing US 41 or turning left onto US 41 from SR 352. The need for this project is due to the intersection experiencing an above normal number of crashes and elevated crash severity for an unsignalized rural state intersection. The project may include pavement widening to accommodate added right turn lane, completely enclosing the unpaved median, and central island modifications with slotted northbound left turn lane on US 41 at SR 352. This project will not require the acquisition of temporary or permanent right-of-way (ROW).

#### **(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)**

State: IN

County/parish/borough: Benton

Township: Grant

Center coordinates of site (lat/long in degree decimal  
format):

Lat.: 40.521141

Long.: -87.375946

Universal Transverse Mercator: 16N

Name of nearest waterbody: Goose Creek

#### **E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**

☐

Office (Desk) Determination. Date:

☐

Field Determination. Date:



**TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH “MAY BE”  
SUBJECT TO REGULATORY JURISDICTION.**

<b>Site number</b>	<b>Latitude (decimal degrees)</b>	<b>Longitude (decimal degrees)</b>	<b>Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)</b>	<b>Type of aquatic resource (i.e., wetland vs. non- wetland waters)</b>	<b>Geographic authority to which the aquatic resource “may be” subject (i.e., Section 404 or Section 10/404)</b>
Wetland A	40.521634	-87.376330	0.048-acre	Wetland	Section 404
Wetland B	40.520131	-87.376305	0.110-acre	Wetland	Section 404
Wetland C	40.521684	-87.375592	0.058-acre	Wetland	Section 404
Wetland D	40.519964	-87.375559	0.094-acre	Wetland	Section 404
Wetland E	40.521421	-87.375942	0.010-acre	Wetland	Section 404

- 1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.
- 2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring “pre-construction notification” (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant’s acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there “*may be*” waters of the U.S. and/or that there “*may be*” navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

**SUPPORTING DATA. Data reviewed for PJD (check all that apply)**

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

☒ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:

**Map:** Aerials with Aquatic Resources and Photograph Key mapping included in the Waters of the U.S. Determination and Wetland Delineation Report for the US 41 and SR 352, Grant Township, Benton County, Indiana Intersection Improvement Project (INDOT Des. No. 2100058)

☒ Data sheets prepared/submitted by or on behalf of the PJD requestor.

☐ Office concurs with data sheets/delineation report.

☐ Office does not concur with data sheets/delineation report. Rationale: \_\_\_\_\_

☐ Data sheets prepared by the Corps: \_\_\_\_\_

☐ Corps navigable waters' study: \_\_\_\_\_

☒ U.S. Geological Survey Hydrologic Atlas: (USGS, NHD 2019)

☒ USGS NHD data.

☐ USGS 8 and 12 digit HUC maps.

☒ U.S. Geological Survey map(s). Cite scale & quad name: Boswell, IN quadrangle (USGS 7.5' topographic map)

☒ Natural Resources Conservation Service Soil Survey. Citation: Benton County (USDA, NRCS 2023)

☒ National wetlands inventory map(s). Cite name: U.S. Fish and Wildlife Service Wetlands Online Mapper website (USFWS 2023)

☐ State/local wetland inventory map(s): \_\_\_\_\_

☐ FEMA/FIRM maps \_\_\_\_\_

☐ 100-year Floodplain Elevation is:

☒ Photographs: ☒ Aerial (Name & Date): 2023 Aerial

or ☒ Other (Name & Date): August 22, 2023 Site Photographs

☐ Previous determination(s). File no. and date of response letter: \_\_\_\_\_

☒ Other information (please specify): IDNR Floodplain Maps (2023)

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.**

\_\_\_\_\_  
Signature and date of  
Regulatory staff member  
completing PJD

Len Mikles 3/4/2024  
Signature and date of person  
requesting PJD (REQUIRED,  
unless obtaining the signature  
is impracticable)<sup>1</sup>

<sup>1</sup> Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.



- Point of Interest
  - Base Flood Elevation Point
- FLD\_ZONE, SOURCE\_DNR,  
ZONE\_SUBTY
- Not Mapped

Long: -87.37592819366147  
Lat: 40.52121451603305

*The information provided below is based on the point of interest shown in the map above.*

County: **Benton**

Stream Name:  
**Goose Creek**

Approximate Ground Elevation: **757.8 feet (NAVD88)**

Base Flood Elevation: **737.5 Feet (NAVD88)**

Drainage Area: **Not Available**

Best Available Flood Hazard Zone: **Not Mapped**

National Flood Hazard Zone: **Not Mapped**

Is a Flood Control Act permit from the DNR needed for this location? **See following pages**

Is a local floodplain permit needed for this location? **Contact your local Floodplain Administrator-**

Floodplain Administrator: **No Floodplain Administrator Name Available**

Community Jurisdiction: **Benton County, County proper**

Phone: **No Phone Number Available**

Email: **No Email Address Available**

US Army Corps of Engineers District: **Louisville**

## **APPENDIX G: PUBLIC INVOLVEMENT (DRAFT)**

Notice of Survey Letter

Public Involvement Information - TBD



## Notice of Survey

Date: 01/06/2023

**SUBJECT: US 41 / SR 352**

**DES No. 2100058, Benton County, Indiana**

Dear Property Owner:

Our information indicates that you own or occupy property near the above referenced project. Our employees will be performing a survey of the project area in the near future. It may be necessary for them to come onto your property to complete this work. This is permitted by law per Indiana Code IC 8-23-7-26. They will show you their identification, if you are available, before coming onto your property. If you have sold this property, or it is occupied by someone else, please let us know the name and address of the new owner or current occupant so we can contact them about the survey.

At this stage, we generally do not know what effect, if any, our project may eventually have on your property. If we determine later that your property is involved, you will be contacted with additional information.

The survey work will include mapping the location of features such as trees, buildings, fences and drives, and obtaining ground elevations. The survey is needed for the proper planning and design of this project. Please be assured of our sincere desire to cause you as little inconvenience as possible during this survey. If any problems do occur, please contact our field crew or contact me at the telephone number or address shown above for our office. The Project Manager Adam Christenberry, is also available for questions concerning this project.

Sincerely,



Adam Christenberry, PS  
Senior Project Manager / Field Survey Manager

## **APPENDIX H: AIR QUALITY**

STIP Pages

Indiana Department of Transportation (INDOT)  
State Preservation and Local Initiated Projects FY 2024 - 2028

SPONSOR	CONTR ACT # / LEAD DES	STIP NAME	ROUTE	WORK TYPE	DISTRICT	MILES	FEDERAL CATEGORY	Total Cost of Project*	PROGRAM	PHASE	FEDERAL	MATCH	2024	2025	2026	2027	2028
Indiana Department of Transportation	43424 / 2001830	M 32	SR 71	HMA Overlay, Preventive Maintenance	Crawfordsville	10.537	STBG	\$5,361,979.00	Road ROW	RW	\$0.00	\$0.00	(\$200,000.00)	\$200,000.00			
									Road Construction	CN	\$3,493,263.20	\$873,315.80	(\$400,000.00)	\$400,000.00	\$4,366,579.00		
Performance Measure Impacted: Pavement Condition																	
Location: From SR 18 to US 24																	
Comments:move FY24 \$200,000 to FY25. move FY24 \$400,000 to FY25																	
Indiana Department of Transportation	43424 / 2001830	M 45	SR 71	HMA Overlay, Preventive Maintenance	Crawfordsville	10.537	STBG	\$5,361,979.00	Road ROW	RW	\$0.00	\$0.00		(\$200,000.00)	\$200,000.00		
Performance Measure Impacted: Pavement Condition																	
Location: From SR 18 to US 24																	
Comments:Move RW from FY 25 to FY 26																	
Indiana Department of Transportation	43453 / 2002000	Init.	SR 18	Bridge Replacement	Crawfordsville	0	STBG	\$2,159,000.00	Bridge Construction	CN	\$1,695,200.00	\$423,800.00	\$80,000.00	\$2,039,000.00			
Performance Measure Impacted: Bridge Condition																	
Location: 6.84 mi E of US 52; over Greenwood Ditch																	
Comments:Include DES 2002000																	
Indiana Department of Transportation	43688 / 2100187	Init.	SR 55	HMA Overlay Minor Structural	Crawfordsville	1.38	STBG	\$4,805,000.00	Safety Construction	CN	\$727,200.00	\$181,800.00	\$73,000.00		\$836,000.00		
									Road Construction	CN	\$2,748,000.00	\$687,000.00		\$500,000.00	\$2,935,000.00		
									Safety ROW	RW	\$40,000.00	\$10,000.00		\$50,000.00			
									Road ROW	RW	\$320,000.00	\$80,000.00	\$200,000.00	\$200,000.00			
Performance Measure Impacted: Pavement Condition																	
Location: SR 55, From SR 352 S Jct to 0.82 mi N of SR 352 N Jct (Oxford) andintersection at US 41 & SR 18.																	
Comments:Include DES 2100059, 2100187																	
Indiana Department of Transportation	43688 / 2100187	M 45	SR 55	HMA Overlay Minor Structural	Crawfordsville	1.38	STBG	\$4,805,000.00	Road ROW	RW	\$0.00	\$0.00		(\$200,000.00)	\$200,000.00		
Performance Measure Impacted: Pavement Condition																	
Location: SR 55, From SR 352 S Jct to 0.82 mi N of SR 352 N Jct (Oxford)-Small Town Reconstruction Project- HMA Overlay, Minor Structure includes (1) intersection improv w/ added turn lanes at US 41 & SR 18.																	
Comments:Move RW from FY 25 to FY 26																	
Indiana Department of Transportation	43690 / 2100058	Init.	US 41	Intersect. Improv. W/ Added Turn Lanes	Crawfordsville	.2	NHPP	\$1,557,000.00	Safety ROW	RW	\$24,000.00	\$6,000.00		\$30,000.00			
									Safety Construction	CN	\$1,004,000.00	\$251,000.00	\$84,000.00	\$269,000.00	\$902,000.00		

\*Estimated Costs left to Complete Project column is for costs that may extend beyond the four years of a STIP. This column is not fiscally constrained and is for information purposes.

Indiana Department of Transportation (INDOT)  
State Preservation and Local Initiated Projects FY 2024 - 2028

SPONSOR	CONTR ACT # / LEAD DES	STIP NAME	ROUTE	WORK TYPE	DISTRICT	MILES	FEDERAL CATEGORY	Total Cost of Project*	PROGRAM	PHASE	FEDERAL	MATCH	2024	2025	2026	2027	2028
Performance Measure Impacted: Safety																	
Location: US 41 & SR 352																	
Comments:Include DES 2100058																	
Indiana Department of Transportation	43690 / 2100058	A 06	US 41	Intersect. Improv. W/ Added Turn Lanes	Crawfordsville	.2	NHPP	\$1,483,086.00	Safety Consulting	PE	\$20,000.00	\$5,000.00	\$25,000.00				
Performance Measure Impacted: Safety																	
Location: US 41 & SR 352, RCI																	
Comments:add FY24 PE \$25,000																	
Indiana Department of Transportation	44370 / 2200796	Init.	SR 352	Pavement Replacement	Crawfordsville	.78	STBG	\$7,193,000.00	Bridge Construction	CN	\$120,000.00	\$30,000.00			\$150,000.00		
									Road Consulting	PE	\$924,000.00	\$231,000.00	\$1,155,000.00				
									Road ROW	RW	\$144,000.00	\$36,000.00			\$180,000.00		
									Safety ROW	RW	\$44,000.00	\$11,000.00			\$55,000.00		
									Safety Construction	CN	\$370,400.00	\$92,600.00			\$50,000.00	\$413,000.00	
									Road Construction	CN	\$4,505,600.00	\$1,126,400.00			\$250,000.00	\$5,382,000.00	
Performance Measure Impacted: Pavement Condition																	
Location: SR 352, Pavement Replacement from 0.75 mi W of US 41 (Gillen Ditch) to US 41, adding Bike/Ped facilities. HMA Overlay Preventive Maintenance SR 352 from SR 55 E jct. to US 52.																	
Comments:Include DES 2200091, 2200796, 2200797																	
Indiana Department of Transportation	44370 / 2200796	A 05	SR 352	Pavement Replacement	Crawfordsville	.78	STBG	\$0.00	Safety Construction	CN	-\$4,996,000.00	-\$1,249,000.00			(\$450,000.00)	(\$5,795,000.00)	
									Safety ROW	RW	-\$44,000.00	-\$11,000.00			(\$55,000.00)		
									Road ROW	RW	-\$144,000.00	-\$36,000.00			(\$180,000.00)		
									Road Consulting	PE	-\$924,000.00	-\$231,000.00	(\$1,155,000.00)				
Performance Measure Impacted: Pavement Condition																	
Location: SR 352, Pavement Replacement from 0.75 mi W of US 41 (Gillen Ditch) to US 41, adding Bike/Ped facilities. HMA Overlay Preventive Maintenance SR 352 from SR 55 E jct. to US 52.																	
Comments:Eliminate project																	
Indiana Department of Transportation	44382 / 2200795	Init.	US 52	HMA Overlay Minor Structural	Crawfordsville	10.306	NHPP	\$30,328,000.00	Road Construction	CN	\$22,422,400.00	\$5,605,600.00			\$15,000.00	\$28,013,000.00	
									Road ROW	RW	\$240,000.00	\$60,000.00			\$300,000.00		

\*Estimated Costs left to Complete Project column is for costs that may extend beyond the four years of a STIP. This column is not fiscally constrained and is for information purposes.

## **APPENDIX I: ADDITIONAL STUDIES/REPORTS**

Land and Water Conservation Fund List - Benton County  
Abbreviated Engineering Assessment



**Land and Water Conservation Fund (LWCF) County Property List for Indiana (Last Updated March 2022)**

ProjectNumber	SubProjectCode	County	Property
1800027	1800027	Benton	Fowler Park and Community Swimming Pool
1800535	1800535	Benton	Fowler Park and Community Swimming Pool
1800569	1800569	Benton	Fowler Park and Community Swimming Pool

\*Park names may have changed. If acquisition of publically owned land or impacts to publically owned land is anticipated, coordination with IDNR, Division of Outdoor Recreation, should occur.

Found at: <https://www.in.gov/indot/engineering/environmental-services/environmental-policy/>

**PARSONS**

# Abbreviated Engineering Assessment

**US 41 and SR 352 Intersection**

**Crawfordsville District**

**Indiana Department of Transportation**



Prepared for INDOT Crawfordsville District

December 2021



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## LIST OF ABBREVIATIONS

- AADT – Average Annual Daily Traffic
- ADA – Americans with Disabilities Act
- CE – Categorical Exclusion
- EA – Environmental Assessment
- EB – Eastbound
- HCS – Highway Capacity Software
- HSM – Highway Safety Manual
- ICC – Index of Crash Cost
- ICF – Index Crash Frequency
- IDEM – Indiana Department of Environmental Management
- IDM – Indiana Design Manual
- IDNR – Indiana Department of Natural Resources
- INDOT – Indiana Department of Transportation
- HMA – Hot Mix Asphalt
- LOS – Level of Service
- MPH – Miles Per Hour
- MPPA – Minor Projects Programmatic Agreement
- MOT – Maintenance of Traffic
- MUTCD – Manual of Uniform Traffic Control Devices
- NCHRP - National Cooperative Highway Research Program
- NEPA – National Environmental Policy Act
- NB – Northbound
- RFI – Red Flag Investigation
- RoadHAT – Road Hazard Analysis Tool
- SB - Southbound
- SR – State Road
- SUE – Subsurface Utility Exploration
- USACE – United States Army Corps of Engineers
- WB – Westbound
- WQC – Water Quality Certification

## SECTION 1: PROJECT OVERVIEW

### 1.1 PROJECT LOCATION

---

The US 41 and SR 352 Intersection Project is located approximately 4.0 miles north of SR 26 and 7.0 miles south of SR 18 in township 24N, Range 8 W and Sections 18 and 19 in Grant Township in Benton County, Indiana. The approximate location of the project has a latitude of 40°31'16" and a longitude of 87°22'33" within the subdistrict of West Lafayette of the INDOT Crawfordville District. The Project Limits are shown in Figure 1 below. The town of Boswell, Indiana is on the west side of the intersection

### 1.2 PURPOSE AND NEED STATEMENT

---

Within the project limits, the US 41 and SR 352 Intersection is experiencing an above normal number of crashes and crash severity for an Unsignalized Rural State Intersection.

The purpose of this project is to increase public safety by reducing the number of crashes at this intersection and to reduce right angle crashes.



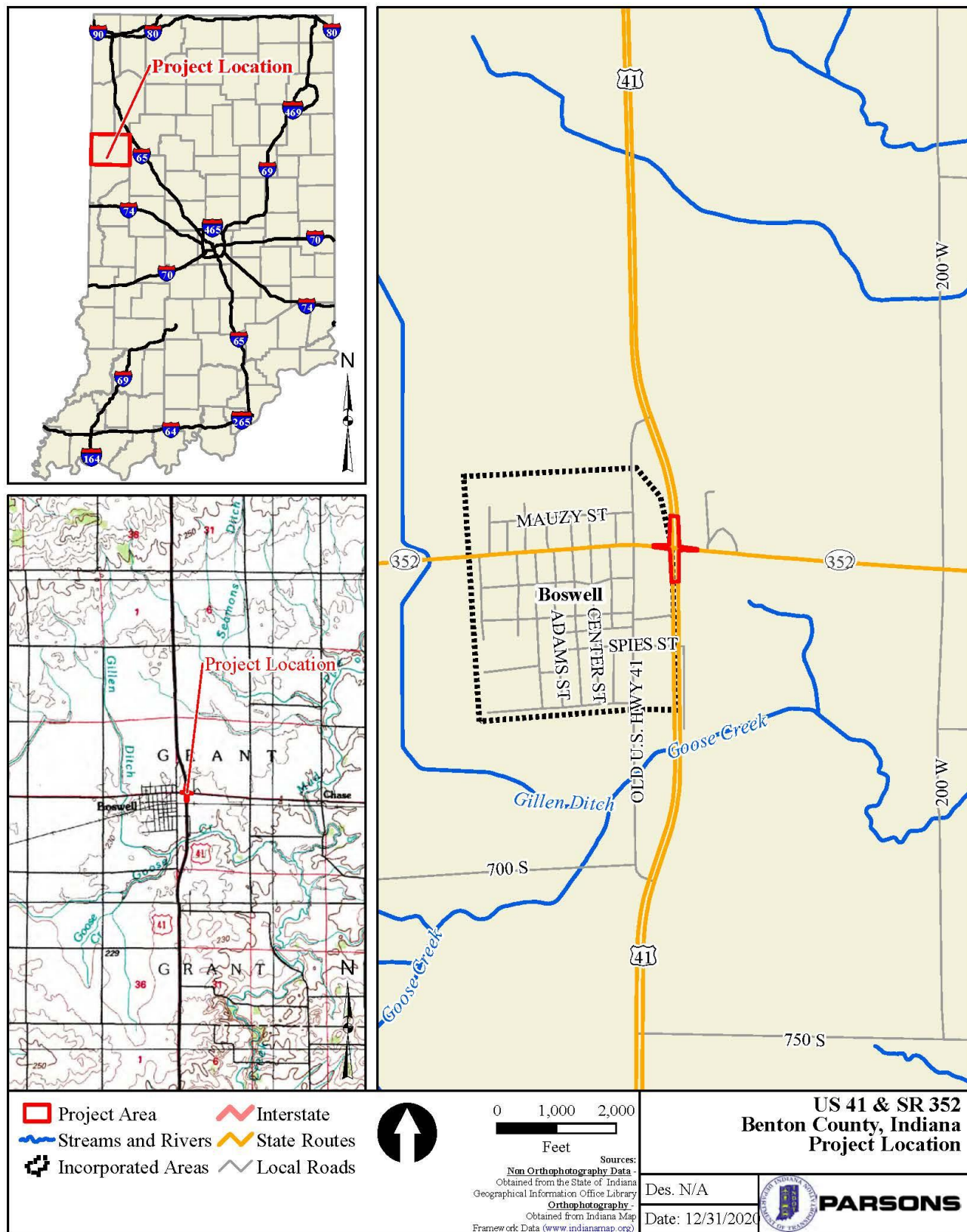


Figure 1: Project Area

## SECTION 2: EXISTING CONDITIONS

### 2.1 HISTORY AND GEOMETRY

---

US 41 is a rural principal arterial and SR 352 is a major collector. US 41 is on the National Highway System and on the National Truck Network and serves heavy commercial traffic over long distances. SR 352 serves more localized, shorter distance trips. The US 41 and SR 352 intersection is classified as an Unsignalized Rural State Intersection. US 41 is a four-lane divided highway and is constructed with two 12-foot travel lanes with 10-foot outside shoulders and four-foot median shoulders in each direction. SR 352 is a two-lane undivided highway and is constructed with two 11-foot lanes with 1-foot shoulders within the project limit. The posted speed along US 41 is 60 mph and 50 mph along SR 352 east of the intersection and 30 mph west of the intersection.

US 41 within the project limits was constructed in 1925 with concrete pavement and then reconstructed and widened in 1974. In 2013, US 41 was overlaid with asphalt pavement. Right and left turn lanes exist in both the northbound and southbound direction on US 41. There is a superelevated horizontal curve just north of the intersection on US 41.

### 2.2 EXISTING UTILITIES

---

Aerial electric and communication lines are present in the project area on the east side of US 41 and south side of SR 352. There is also an overhead red/yellow flashing beacon that spans across US 41 at the intersection. A railroad flashing signal is present south of the intersection. There is a railroad track located 0.15 miles south of the intersection. A call ticket was created and is attached in Appendix 5.

### 2.3 EXISTING DRAINAGE

---

There are two culverts within the project limits; one is located under SR 352 east of US 41 and the second one is located under SR 352 west of US 41. Multiple median inlets are located in the US 41 grass median within the project limits. The median inlets are draining east and west into the existing roadside ditches along US 41.

## SECTION 3: TRAFFIC AND CRASH DATA

### 3.1 TRAFFIC DATA

---

The AADT per INDOT's Traffic Count Database System (TCDS) from 2020 is 3928 vehicles per day on US 41 and 1583 vehicles per day on SR 352. The truck percentages are 45-50% for US 41 and 10% for SR 352.

### 3.2 CRASH DATA

---

There were 13 crashes at this intersection between 2015 and 2020 including one fatal crash. From the available information in the narratives of the crashes, three crashes involved incapacitating injuries (when either the driver or the passenger was transported to the hospital), two crashes involved non-incapacitating injuries, and seven crashes involved property damages only.

The roadway performance was analyzed using RoadHAT. This Segment has an Index of Crash Frequency (ICF) of 0.57 and an Index of Crash Costs (ICC) of 1.01. The RoadHAT report and crash data are attached in Appendix 1. An ICF and ICC above 0 and less than 1 indicates that the number of crashes and their severity are slightly higher than usual.

The primary crash factors for all the recorded incidents are listed in Table 1 which shows the majority of crashes are more likely attributable to driver failure to yield right of way than road features.

Table 1: Primary cause of accidents

MANNER OF COLLISION	% OF ACCIDENTS CAUSED
DRIVER DISTRACTED	8%
REAR END	15%
RIGHT ANGLE	77%

## SECTION 4: ALTERNATIVE ANALYSIS

The project team analyzed different alternatives in order to determine the optimized solution. Several alternatives were considered using a WB-67 as the design vehicle. A brief description of each alternative is below.

### 4.1 NO BUILD ALTERNATIVE

#### No-Build Alternative: Matches the Existing conditions with No Improvements

The no-build alternative would include no changes to either the existing geometry or the roadside features. This alternative will not reduce the number of crashes and will not meet the Project Purpose and Need.

### 4.2 LOW-COST ALTERNATIVE

#### Low-Cost Alternative: Install a Traffic Signal

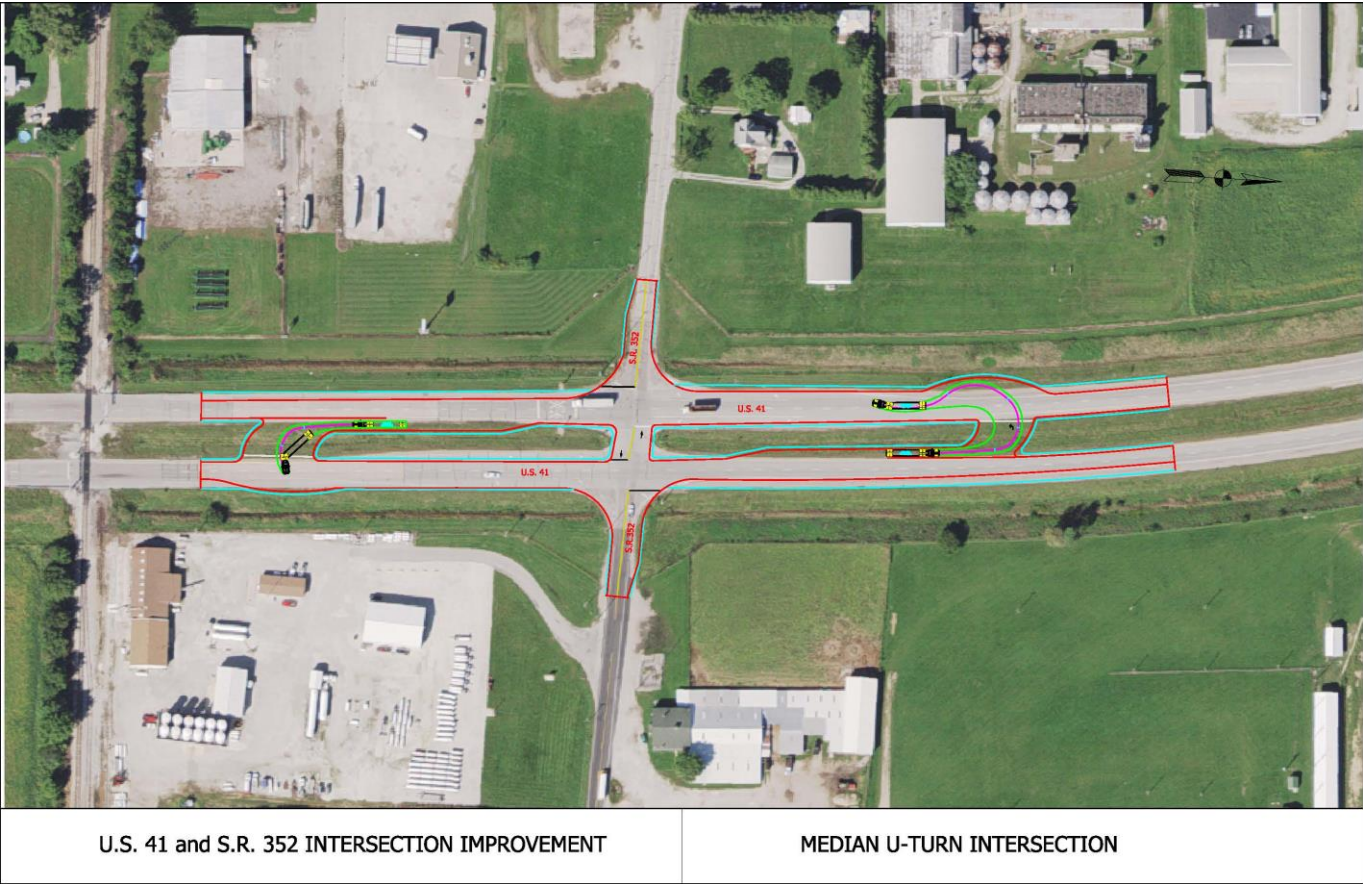
Traffic signal warrants have been checked by District Traffic personnel who found a signal is not warranted for this location. Installing an unwarranted signal will cause excessive delay, higher crash rates and may result in disobedience of the traffic signal in this rural area. This alternative will not meet the Project Purpose and Need and therefore is discarded from consideration. The signal warrant can be found in Appendix 6.

4.3 RECONSTRUCTION ALTERNATIVES

Reconstruction Alternative 1: Median U-Turn Intersection

The Median U-Turn (MUT) Intersection is also known as the Median U-Turn Crossover and sometimes referred to as a Michigan Left Turn. The MUT refers to an intersection replacing direct left turns at an intersection with indirect left turns using a U-turn movement in a wide median. The MUT intersection requires drivers on SR 352 to turn right onto the main road and then make a U-turn maneuver at a one-way median opening at least 400 feet after the intersection. The MUT intersection also eliminates left turns on SR 352 from US 41 and thus reduces the number of conflict points at the main crossing intersection, resulting in improved safety at the intersection. Right turn lanes were incorporated in the design, but they are not required; this would separate the through vehicles from the turning vehicles. The addition of the right turning lanes are included in the cost estimate. This alternative would be un-signalized. US 41 and SR 352 will be milled and resurfaced after the completion of adding the median U-turns.

Figure 2: Median U-Turn

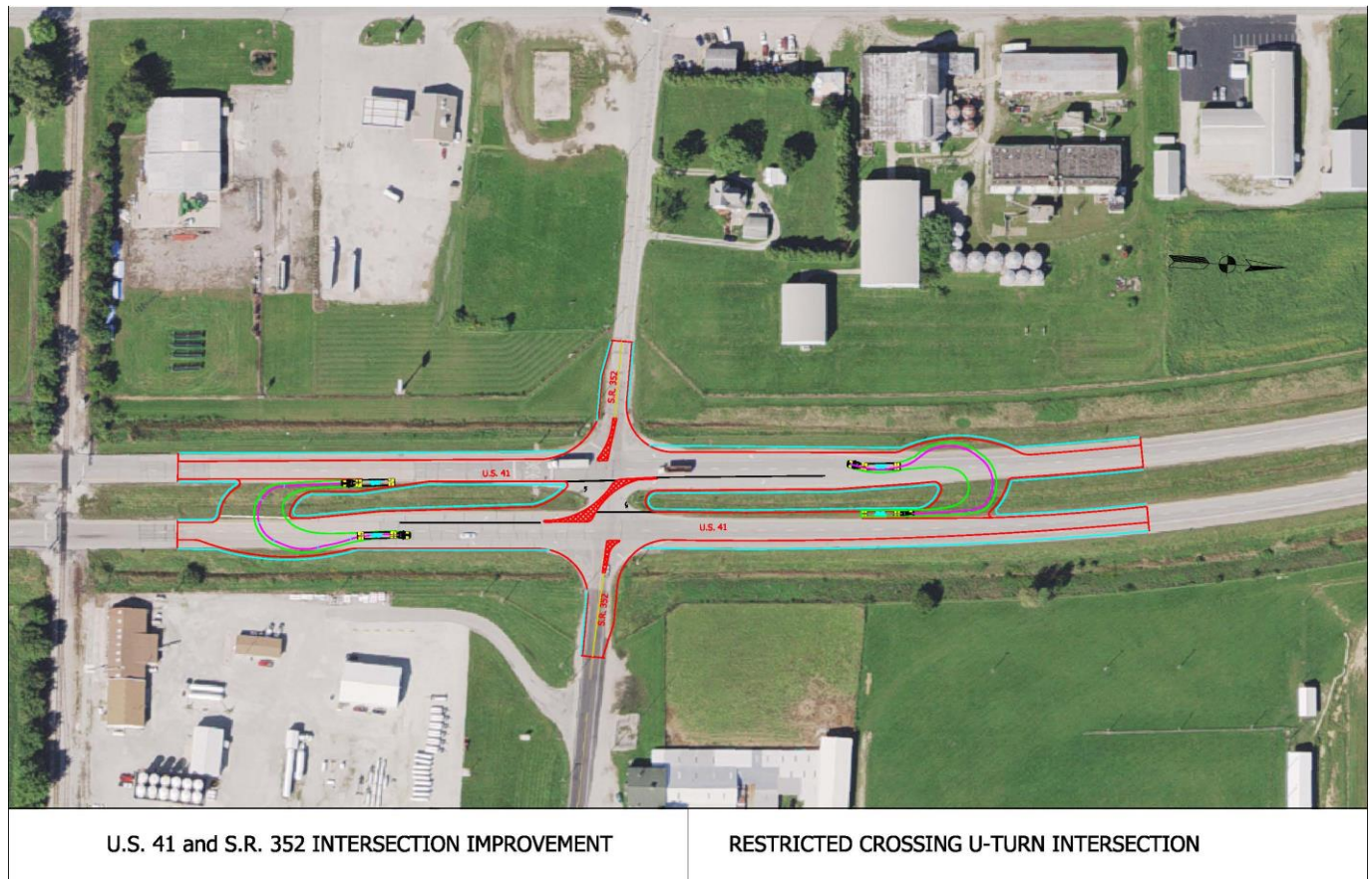




## Reconstruction Alternative 2: Restricted Crossing U-Turn Intersection

The Restricted Crossing U-Turn (RCUT) Intersection is also known as a superstreet intersection, a J-turn intersection, and a synchronized street intersection. The RCUT intersection differs from a conventional intersection by eliminating the left-turn and through movements from cross street approaches. To accommodate these movements, the RCUT intersection requires SR 352 drivers to turn right onto the main road and then make a U-turn maneuver at a one-way median opening at least 400 feet after the intersection. US 41 traffic will still be allowed to turn left on SR 352. RCUT intersections can have either three or four legs. In the case of a four-legged RCUT intersection, there are two U-turn crossovers, and minor street left-turn and through movements are not allowed to be made directly at the intersection. A stop-controlled RCUT intersection is used as a safety treatment at an isolated intersection on a four-lane divided arterial in a rural area. This alternative would be un-signalized and the turns (both the right and U-turns) would be stop controlled. US 41 and SR 352 will be milled and resurfaced after the completion of adding the median U-turns and center medians.

Figure 3: Restricted Crossing U-Turn

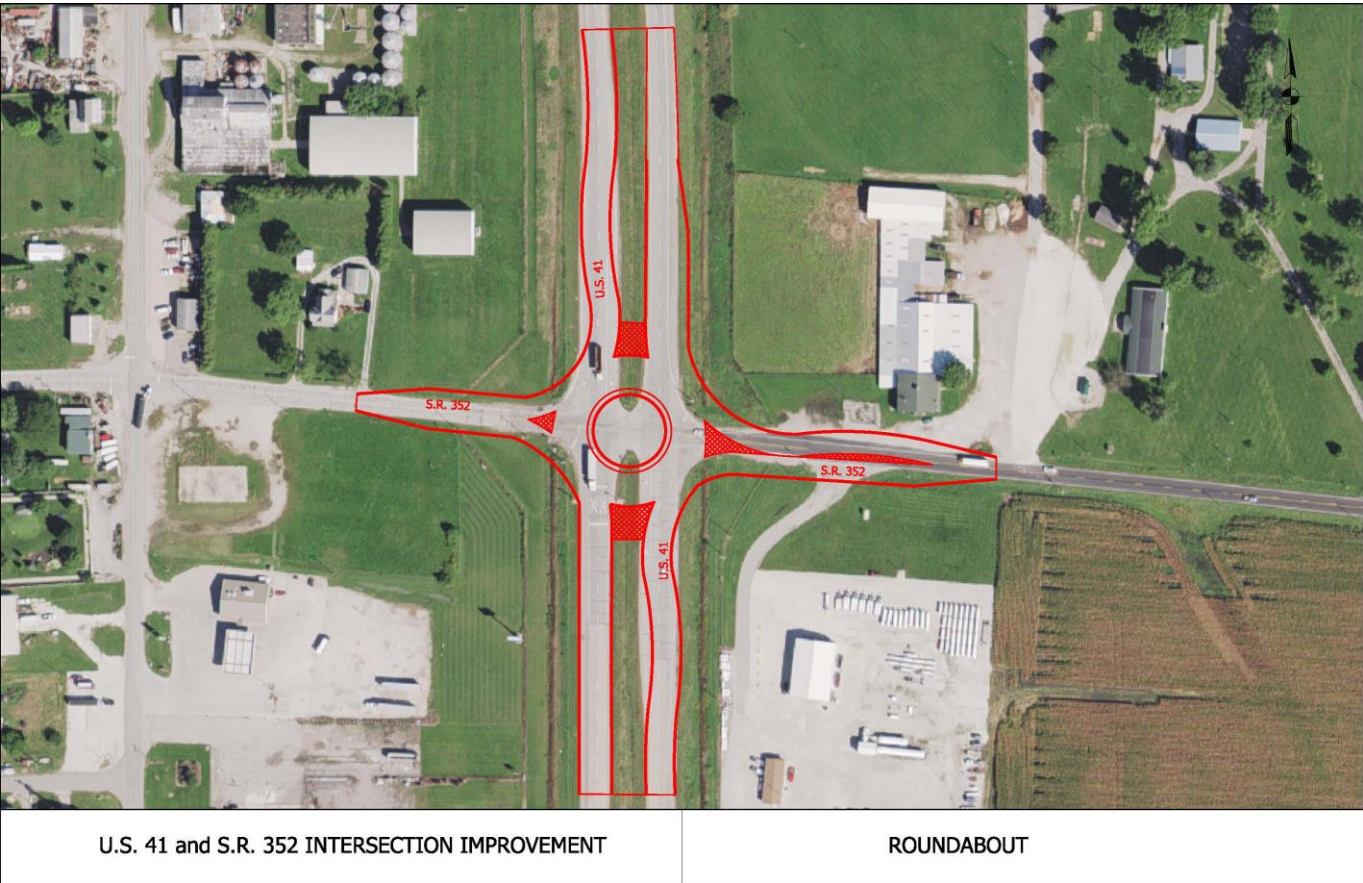




**Reconstruction Alternative 3: Multi-Lane Roundabout**

This alternative will consist of a multi-lane roundabout that follows the design standards per NCHRP 672 and the IDM. Multi-lane roundabouts have at least one entry with two or more lanes. SR 352 will be widened to two entry lanes to allow more vehicles to enter the roundabout. The geometric design will include raised spitter islands, truck apron, non-traversable central island, and appropriate entry path deflection. Since US 41 and the east leg of SR 352 are high speed roadways, a series of curves will be designed leading up to the roundabout to reduce the speed of vehicles. US 41 and SR 352 will be milled and resurfaced after the completion of the roundabout.

**Figure 4: Multi-Lane Roundabout**



**4.4 MAINTENANCE OF TRAFFIC**

The maintenance of traffic (MOT) for all reconstruction alternatives is to close one lane in each direction on US 41 while still maintaining one lane in each direction. For the median U-turn and restricted U-turn alternatives, the inside travel lanes will be closed in both directions in order to build the U-turns. For the restricted U-turn alternative, U-turns would be built first then the main intersection will be closed in order to construct the new islands while the through movement on SR 352 can now use the U-turns. US 41 left turns can also use the U-turns during construction of the central islands. For the roundabout alternative, construction would require 2 phases. Traffic would be shifted onto one side by using median crossovers and half of the roundabout would be built then and switched to the other side to build the other half. This may

require temporary widening and shoulder strengthening on one side of US 41 and assumes that permanent shoulders would be wider than the existing shoulders to help maintain traffic through the zone.

## 4.5 ENVIRONMENTAL

---

### Impacts

A preliminary Red Flag Investigation (RFI) was performed for the project area. One 'Contributing' historic resource was noted adjacent to the project area. Per the current scope of work, this project will likely fall under the Minor Projects Programmatic Agreement (MPAA).

Other resources, including a pipeline, landfill, and other hazardous resources were identified within or adjacent to the project area. Any areas that will be disturbed outside of pavement work and drainage improvements will need to be investigated for potential water resources. No other resources are anticipated to be impacted by the proposed project.

The CE level will be dependent on the Section 106 investigations and right-of-way amounts.

### Permits Required

It is anticipated that there will be >1 acre of disturbance. Therefore, a Rule 5 permit is anticipated. If water resources are identified within any of the disturbed areas outside of pavement, a USACE Section 404 permit and IDEM Section 401 WQC will be required. Per the current scope of work, an IDNR Construction in a Floodway permit is not anticipated to be required.

## 4.6 UTILITY COORDINATION

---

Utility impacts are expected for the existing utilities within the project limits. Culverts under SR 352 would need to be extended due to the lane addition. The traffic signal will need to be removed to allow for an auxiliary lane. Utility poles will need to be relocated due to pavement widening.

## 4.7 RAILROAD COORDINATION

---

There is an existing railroad track that is located 750 feet south of the US 41 and SR 352 intersection. Work is not anticipated on the adjacent railroad grade crossings' approaches. No railroad gates will be installed or repaired. A railroad clear certification must be obtained.

## 4.8 RIGHT OF WAY

---

Permanent right of way is required for the roundabout alternative. Right of Way Engineering and Title Research is required for any affected parcels.

# SECTION 5: COST ESTIMATE

## 5.1 CONSTRUCTION COST

---

The estimated total project costs for all alternatives including preliminary engineering, survey, utility coordination, construction and construction services are shown in Table 2.

Table 2: Construction Cost

TASK #	TASK	COST		
		ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
1	Preliminary Engineering	\$45,000	\$45,000	\$120,000
2	Survey	\$35,000	\$35,000	\$90,000
3	Right of Way	\$0	\$0	\$29,500
4	Utility Coordination	\$69,000	\$69,000	\$147,450
5	Construction (20% Contingency)	\$760,495	\$809,715	\$2,532,385
6	Construction Support Services	\$42,000	\$42,000	\$120,000
TOTAL		\$951,495	\$1,000,715	\$3,039,335

The quantities and assumptions for each pay item is included with Appendix 2.

## SECTION 6: CONCLUSION

### 6.1 ANALYSIS

Each reconstruction alternative was analyzed to determine how effectively it met the Project Purpose and Need.

The Multi-Lane Roundabout is not well suited to very high truck volumes combined with higher speeds on US 41 compared to the low volumes of traffic on SR 352. The trucks traveling from US 41 would be forced to slow down and navigate a roundabout on a rural US highway with very little traffic on the side roads. It is anticipated that this alternative will receive political opposition from local stakeholders, the public and truck drivers who drive this road regularly. Maintenance of traffic is more difficult for the roundabout and right of way is required. Since the roundabout has a larger footprint at the intersection, more drainage analysis is required and more grading is expected. The roundabout has significantly higher construction costs compared to the other reconstruction alternatives. For these reasons, the Multi-Lane Roundabout is discounted from further consideration.

The RCUT intersection meets the purpose and need and is a little safer than the MUT intersection. However, one major disadvantage of the RCUT intersection is that it prevents traffic on SR 352 from traveling straight through the intersection at US 41. RCUT intersection have 14 conflict points compared to 32 at a conventional intersection. Eliminating every through movement on SR 352 at US 41 does add an extra level of safety. It is anticipated that the local stakeholders and traveling public will be opposed to the RCUT intersection since through movements are not allowed.

The MUT intersection meets the purpose and need but does not close off the US 41 median to through traffic on SR 352 which will do little to reduce the number of crashes because of non-compliance and/or confusion. MUT intersection have 16 conflict points compared to 32 at conventional intersection without including the non-compliance left turn movements. This intersection will experience a reduction in crashes by using signs to require SR 352 traffic turning left onto US 41 to turn right and then make a U-turn. However, an MUT intersection has no physical restriction to stop traffic from turning left at the intersection so the presence of law enforcement may be encouraged for a longer duration upon opening the new intersection.

Per FHWA, enforcement needs at RCUT intersections may be higher in the short term but those needs are anticipated to drop in the long term. Upon opening a new MUT intersection in Michigan, MDOT typically allocates extra enforcement resources during the first few weeks of operation. Such an enforcement program is also desirable for RCUT intersections to help confused motorists avoid wrong-way movements through crossovers. Enforcement during the periods after the

RCUT intersections are initially opened to traffic help drivers become familiar and help reduce unintentional illegal maneuvers. After drivers form new habits, the need for extra enforcement is likely to subside, and normal vigilance in enforcing traffic laws at RCUT and MUT intersections should suffice.


The MUT and RCUT have smaller footprints than the roundabout which minimizes impacts to existing drainage patterns. MOT is similar for both the MUT and RCUT. The major difference between the MUT and the RCUT intersections in this scenario is that in the RCUT, there is an inability for SR 352 to make an illegal through or left turn movement. Once the central island is built in the RCUT, through and left turning traffic on SR 352 will no longer be able to go through the intersection, which can reduce the amount and severity of the crashes. The traffic in the RCUT will be forced to make the right turn onto US 41 and then a U-turn, which allows for that traffic to only have to cross one direction of traffic at a time.

## 6.2 RECOMMENDED ALTERNATIVE


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After considering the reconstruction alternatives, even though the cost of the MUT intersection is the smallest, it has been determined that the Restricted Crossing U-Turn Intersection (Reconstruction Alternative 2) is the recommended alternative for how effectively it meets the Project Purpose and Need and not that much more in cost.

This document was prepared by:

  
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[12/17/2021]

  
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