October 8, 2021

Mr. James Durian
Chief Executive Officer
Marshall Area Economic Development Alliance
323 West Michigan Avenue
Marshall, MI 49068

Re: Wetland Delineation Report
Marshall Mega Site Project
Burns & McDonnell Project No: 134707

Dear Mr. Durian:

Burns & McDonnell Michigan, Inc. (Burns & McDonnell) was retained by the Marshall Area Economic Development Alliance to provide wetland delineation services for the Marshall Mega Site Project (Project). The Project site consists predominantly of agricultural land and undeveloped, forested habitat located between the City of Marshall, which lies to the east, and the unincorporated community of Ceresco, which lies to the west, within Calhoun County, Michigan (Figure 1, Appendix A). The following sections provide information on the proposed Project and summarize the completed wetland delineation.

INTRODUCTION

The Marshall Area Economic Development Alliance is currently evaluating the potential for developing the Project, a commercial or industrial facility and associated infrastructure. The Project site is generally bounded by Michigan Avenue (Michigan Highway 96 [M-96]) on the north, the North Branch Kalamazoo River on the south, Bear Creek on the east, and 12 Mile Road on the west, in Calhoun County, Michigan (Figure 1, Appendix A). Burns & McDonnell understands that areas identified as potential options for the proposed Project would consist of approximately 1,770 acres (Survey Area).

The Project has the potential to impact wetlands and other streams that may be under the jurisdiction of the State of Michigan. U.S. Army Corps of Engineers (USACE) jurisdiction is not anticipated as no waterways within Calhoun County are listed in the December 2018 *Navigable Waters of the United States within the Regulatory Jurisdiction of the U.S. Army Corps of Engineers Detroit District*. As a result, a wetland delineation of the Project was conducted on September 15 and 16, 2021, to evaluate for the presence of wetlands and water bodies, including streams, drainages, and ponds.

METHODS

The following discussions summarize the methods used for the review of existing data and the wetland delineation.

Existing Data Review
Burns & McDonnell reviewed available background information for the Survey Area prior to conducting a site visit. The available background information included:

- 2011 U.S. Geological Survey (USGS) 7.5-minute topographic maps (Ceresco, MI quadrangle),
- USGS National Hydrography Dataset (NHD),
- U.S. Fish & Wildlife Service (USFWS) National Wetlands Inventory (NWI) map,
- Michigan Department of Natural Resources (DNR) Michigan Resource Inventory System (MIRIS) map,
- Federal Emergency Management Agency (FEMA) 2011 National Flood Hazard Layer (NFHL), and
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) 2020 Soil Survey Geographic (SSURGO) digital data for Calhoun County, Michigan.

Maps generated from this available data are included as Figures 2 and 3 in Appendix A.

Wetland and waterbody presence based only on NWI and NHD maps cannot be assumed to be an accurate assessment of potentially occurring jurisdictional wetlands and streams. Wetland and stream identification criteria differ between the USFWS and the USACE. As a result, wetlands and streams shown on an NWI and NHD map may not be under the jurisdiction of the USACE, and all USACE-jurisdictional wetlands and streams are not always included on NWI and NHD maps. Therefore, a field visit was conducted to identify any wetlands or other water bodies that may be present.

Wetland Delineation Field Survey
The wetland delineation of the Survey Area was completed in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* (1987 Manual) and the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (Version 2.0) (Regional Supplement). Sample plots were established at multiple locations, and Wetland Determination Data Forms from the Regional Supplement were completed to characterize the Survey Area (Appendix B). Vegetation, soil conditions, and hydrologic indicators were recorded at each sample plot. Vegetation nomenclature was derived from the 2018 *National Wetland Plant List*. The National Wetland Plant List assigns a wetland indicator status for plant species that are typical in the region. Locations of sample plots and other identified features were surveyed using a real-time sub-meter accurate global positioning system (GPS) unit. Natural color photographs were taken onsite and are included in Appendix C (Photographs C-1 through C-17).

RESULTS
The following sections describe the results of the existing data review and the completed wetland delineation.

Existing Data Review
The following information, pertaining to the Survey Area, was gathered from the review of available data sources:

The existing USGS topographic map was reviewed to familiarize Burns & McDonnell wetland personnel with the topography and potential locations of wetlands and other water bodies (Figure 2, Appendix A). The USGS topographic map indicates the Survey Area crosses a mostly flat area with the majority of the Survey Area draining south towards the Kalamazoo River.

The NWI data indicates two Palustrine Emergent Persistent Seasonally Flooded (PEM1C) wetlands, one Palustrine Emergent Persistent Seasonally Flooded Partially Drained/Ditched (PEM1Cd) wetland, two Palustrine Emergent Persistent Seasonally Flooded Diked/Impounded (PEM1Ch) wetlands, one Palustrine Emergent Persistent Temporary Flooded Partially Drained/Ditched (PEM1Ad) wetland, one Palustrine Emergent Persistent Temporary Flooded Partially Farmed (PEM1Af) wetland, two Palustrine Emergent Non-Persistent Semi Permanently Flooded (PEM2F) wetlands, two Palustrine Scrub-Shrub Broad-leaved Deciduous Seasonally Flooded (PSS1C) wetlands, one Riverine Lower Perennial Unconsolidated Bottom Permanently Flooded (R2UBH) wetland, two Riverine Lower Perennial Unconsolidated Bottom Permanently Flooded Diked/Impounded (R2UBHh) wetlands, and one Riverine Unknown Perennial Unconsolidated Bottom Permanently Flooded (R5UBH) wetland are located within the Survey Area. (Figure 2, Appendix A).

The MIRIS map indicates four wetlands within the Survey Area (Figure 2, Appendix A).

The NHD data indicates Bear Creek intersecting the eastern and southeastern portions of the Survey Area at two locations (Figure 2, Appendix A).

The 2011 NFHL data indicates that the southern and eastern portions of the Survey Area are located within a FEMA mapped Zone A floodplain associated the Kalamazoo River and Bear Creek, respectively. (Figure 2, Appendix A).

The NRCS SSURGO digital data indicates that portions of 18 soil map units are located within the Survey Area. Two of these soil map units are included on local or national hydric soil lists (Figure 3, Appendix A). Soils identified as hydric within the Survey Area are listed below:

- Adrian muck, 0 to 1 percent slopes (4)
- Histosols and Fluvaquents, frequently flooded (85)

Wetland Delineation Field Survey
On September 15 and 16, 2021, Burns & McDonnell wetland scientists conducted a wetland delineation of the Survey Area. A global positioning system (GPS) unit was used to record the location and extent of features identified within the Survey Area. The land cover and delineated wetlands and other water bodies from the site visits are discussed in detail below.

Vegetation. The Survey Area consisted predominantly of agricultural land interspersed with forested habitat and riparian habitat associated with the Kalamazoo River. Cultivated crops in the agricultural portions of the Survey Area included soybean (*Glycine max)* and corn (*Zea mays*). Typical vegetation in the upland portions of the Survey Area included black cherry (*Prunus serotina*), European buckthorn (*Rhamnus cathartica*), Amur honeysuckle (*Lonicera maackii*), multiflora rose (*Rosa multiflora*), grass species (Poa sp.), brome species (Bromus sp.), fescue species (Festuca sp.), poison ivy (*Toxicodendron radicans*), late goldenrod (*Solidago altissima*), and panicled aster (*Symphyotrichum lanceolatum*)

Soils. Typical upland soils were grayish brown (10YR 5/2), dark grayish brown (10YR 4/2), brown (10YR 4/3), yellowish brown (10YR 5/4), and black (10YR 2/1) in color and ranged in texture from sand to sandy loam to sandy clay loam. Redoximorphic features were typically present in wetland soils and less common in upland soils.

Hydrology. The primary sources of hydrology for the wetlands were overland flow, precipitation, and groundwater. Common indicators of hydrology within the wetlands included Hydrogen Sulfide Odor, Presence of Reduced Iron, Saturation Visible on Aerial Imagery, Geomorphic Position, and FAC-Neutral Test. Hydrology in the area has been significantly altered by agricultural practices.

Delineated Areas
A total of seven wetlands and three streams were identified during the wetland delineation efforts. The wetlands and streams are described by type below, and their locations are shown on Figure 4 in Appendix A. Sample plots were taken in the wetlands and adjacent uplands. Data forms and photographs of these sample plots are included in Appendix B and Appendix C, respectively.

Wetlands
A total of three PEM wetlands, three PEM/PSS wetlands, and one PEMf wetland, encompassing 16.01 acres, were delineated within the Survey Area. Table 1 provides the type, area, and summary of wetland indicators for each wetland delineated within the Survey Area.

Table 1: Summary of Wetlands Delineated

Wetland Number	Wetland Type[a]	Dominant Vegetation[b]	Hydric Soil Indicator(s)[c]	Wetland Hydrology Indicator(s)[d]	Area of Wetland Delineated in Survey Area (acre)	Figure 4 Page Number	Regulated by EGLE Under Part 303 (Y/N)[e]	Potential WOTUS Under Rapanos (Y/N)[f]
W-1	PEM	Reed canary grass, purple Joe-Pye weed, American basswood, gray dogwood, prairie cordgrass	F6, F7	C3, C4, C9, D2, D5	2.37	11	Y	Y
W-2	PEM/PSS	European buckthorn, reed canary grass, kudzu, riverbank grape	F6	C4	4.05	11	Y	Y
W-3	PEM	Reed canary grass	F6	C1, C4, C9, D2, D5	0.60	11	Y	Y*
W-4	PEM	Reed canary grass, prairie cordgrass, purple loosestrife	F6	A3, C9, D5	1.97	4, 5, 6, 7, 8, 9	Y	Y
W-5	PEM/PSS	Silky dogwood, black elderberry, reed canary grass, panicled aster, common woodland sedge, riverbank grape	F6, F7	C9, D2, D5	3.84	2	Y	Y
W-6	PEM/PSS	Silky dogwood, sedge sp., common spike rush	A4	A1, A2, A3, C1, C9, D2, D5	3.00	3	Y	Y
W-7	PEMf	N/A	F6	A3, D2	0.18	1	N	N
Total:					16.01			

(a) Symbols for wetland type: PEM = Palustrine Emergent, PSS = Palustrine Scrub-Shrub, PEMf = Farmed Wetland
(b) Reed canary grass (*Phalaris arundinacea*), purple Joe-Pye weed (*Eutrochium purpureum*), American basswood (*Tilia americana*), gray dogwood (*Cornus racemosa*), prairie cordgrass (*Spartina pectinata*), European buckthorn (*Rhamnus cathartica*), kudzu (*Pueraria montana*), riverbank grape (*Vitis riparia*), purple

loosestrife (*Lythrum salicaria*), black elderberry (*Sambucus nigra*), panicled aster (*Symphyotrichum lanceolatum*), common fox sedge (*Carex vulpinoidea*), sedge sp. (*Carex* sp.), and common spike rush (*Eleocharis palustris*)
(c) Indicator code for hydric soil: F6 = Redox Dark Surface, F7 = Depleted Dark Surface, A4 = Hydrogen Sulfide
(d) Indicator code for wetland hydrology: A1 = Surface Water, A2 = High Water Table, A3 = Saturation, C1 = Hydrogen Sulfide Odor, C3 = Oxidized Rhizospheres on Living Roots, C4 = Presence of Reduced Iron, C9 = Saturation Visible on Aerial Imagery, D2 = Geomorphic Position, D5 = FAC-Neutral Test
(e) Michigan Department of Environment, Great Lakes and Energy (EGLE); Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA)
(f) WOTUS = Waters of the U.S. Jurisdiction is based on professional judgement using the definition of WOTUS under Rapanos v. United States. The USACE makes the final determination of jurisdictional status.
* W-3 is anticipated to require a Significant Nexus determination

Areas Determined to not Meet Wetland Criteria
One area had saturation present on aerial images and geomorphic position but was not determined to be a wetland during the site investigation. This area did not meet other wetland indicators and was not considered a wetland at the time of the site investigation. Table 2 provides a summary of the wetland indicators for sample plot recorded in this area.

Table 2: Sample Plot Not Determined to Meet Wetland Criteria

Sample Plot	Dominant Vegetation[a]	Hydric Soil Indicator(s)[b]	Wetland Hydrology Indicator(s)[c]	Figure 4 Page Number
SP-13	Barnyard grass, soybean	None	C9, D2	2

(a) Barnyard grass (*Echinochloa crus-galli*), soybean (*Glycine max*)
(b) Indicator code for hydric soil: None
(c) Indicator code for wetland hydrology: C9 = Saturation Visible on Aerial Imagery, D2 = Geomorphic Position

Sample Plot 13 (SP-13)
SP-13 is located within a farmed area near wetland W-5 and was investigated due to the presence potential farmed wetland signatures on available historical aerial imagery and position in the landscape. No indicators of hydrophytic vegetation were present at the time of the site visit. No indicators of hydric soil were present within the soil profile at the time of the site visit. Saturation Visible on Aerial Imagery (C9) and Geomorphic Position (D2) confirmed wetland hydrology at the time of the site visit. As one of three wetland criteria was met, this area was determined to not meet wetland criteria.

Streams
A total of three streams, extending for a total of 2,693 feet, were identified within the Survey Area.

Intermittent (*S-3*)
One intermittent stream, totaling approximately 120 feet in length, was delineated within the Survey Area. Intermittent streams typically have a defined bed and bank, discernable ordinary high-water mark (OHWM), and surface water flowing continuously during certain times of the year and more than in direct response to precipitation (e.g., seasonally when the groundwater table is elevated or when snowpack melts). Common riparian vegetation along the stream includes silky dogwood, common spike rush, reed canary grass, winged loosestrife (*Lythrum alatum*), and common boneset (*Eupatorium perfoliatum*). Stream substrate was comprised of silt and algae.

Perennial (*S-1, S-2*)
A total of two perennial streams (Bear Creek [S-1] and Kalamazoo River [S-2]), totaling approximately 2,573 feet in length, were delineated within the Survey Area. Perennial streams

typically have a defined bed and bank and constant surface water flow throughout the year supplied by groundwater. Common riparian vegetation along these streams includes reed canary grass, European buckthorn, Canada goldenrod (*Solidago canadensis*), riverbank grape (*Vitis riparia*), eastern cottonwood (*Populus deltoides*), sandbar willow (*Salix interior*), and orange jewelweed (*Impatiens capensis*). Stream substrate was comprised of silt, sand, gravel, and rock.

Table 3 provides the type and length of each stream delineated within the Survey Area.

Table 3: Type and Length of Streams Delineated

Stream ID[a]	Flow Regime/ Stream Type[b]	Stream Name[c]	Width at OHWM (feet)	OHWM Height (Feet)	Substrate	Length of Stream Delineated in Survey Area (feet)	Figure 6 Page Number	Regulated by EGLE Under Part 301 (Y/N)[d]	Potential WOTUS Under Rapanos (Y/N)[e]
S-1	P/RPW	Bear Creek	10	3	Silt, sand, and gravel	1,764	2, 11	Y	Y
S-2	P/RPW	Kalamazoo River	N/A	N/A	Sand, gravel, and rock	809	3, 4, 5, 6, 7, 8, 9, 10, 11	Y	Y
S-3	I/RPW	UNT to Kalamazoo River	3	1	Silt and algae	120	3	Y	Y
					Total:	**2,693**			

(a) Assigned by Burns & McDonnell staff during the site investigation; S = Stream
(b) P = Perennial, I = Intermittent; RPW= Relatively Permanent Waters
(c) Stream name follows USGS topographic map, USGS National Hydrography Dataset (NHD), or state/local data source; UNT = Unnamed Tributary
(d) Michigan Department of Environment, Great Lakes and Energy (EGLE); Part 301, Inland Lakes and Streams, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA)
(e) WOTUS = Waters of the U.S. Jurisdiction is based on professional judgement using the definition of WOTUS under Rapanos v. United States. The USACE makes the final determination of jurisdictional status.

SUMMARY

Burns & McDonnell completed a wetland delineation of the Survey Area to identify wetlands and other water bodies. A total of seven wetlands and three stream channels were identified during the delineation efforts.

The Survey Area is entirely within the jurisdiction of the Michigan Department of Environment, Great Lakes and Energy (EGLE) and the USACE Detroit District. Avoidance of wetlands and surface waters should be considered in project planning. If avoidance is not possible, permits for impacts and alterations may be required. In 1984, Michigan received authorization from the federal government to administer Section 404 of the federal Clean Water Act in most areas of the state. Permits for impacts to waterways and wetlands within Calhoun County, Michigan are regulated by EGLE under Part 301 and 303 of the Natural Resources and Environmental Protection Act (NREPA). The USACE, U.S. Environmental Protection Agency (USEPA), and USFWS may review and/or authorize permit applications in certain instances.

If you have any questions or require additional information, please feel free to contact Evan Markowitz at (331) 205-8911 or ejmarkowitz@burnsmcd.com.

Sincerely,

Evan Markowitz

Evan Markowitz
Senior Environmental Scientist, PWS

Attachments:

- Appendix A - Figures
- Appendix B - Routine Wetland Determination Data Forms, Northcentral and Northeast Region
- Appendix C - Site Photographs

APPENDIX A - FIGURES

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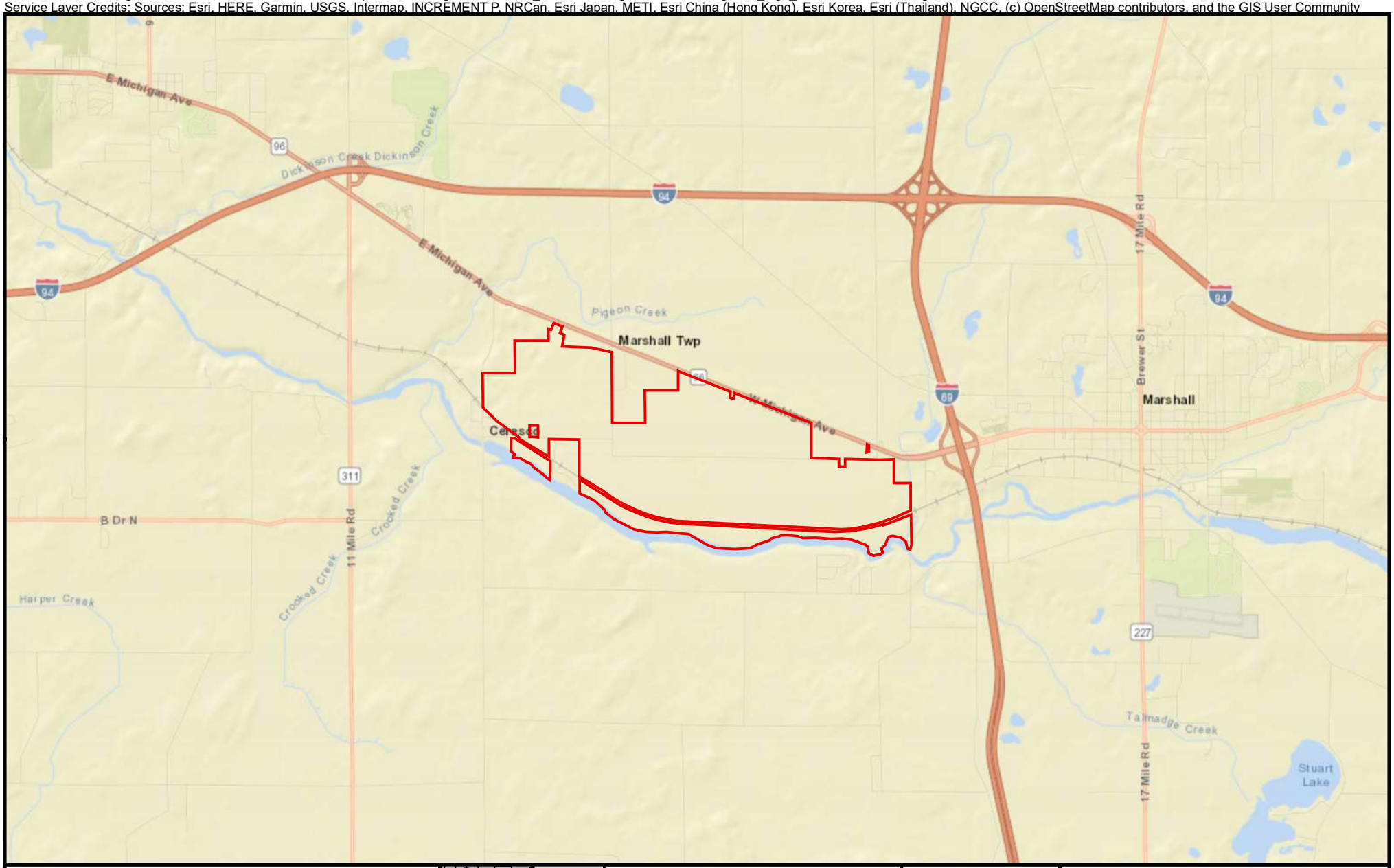
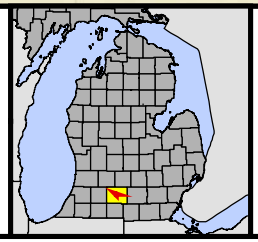
Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



Survey Area



NORTH

1 0.5 0 1

Scale in Miles

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Figure 1
Overview Map
Marshall Mega Site
Calhoun County, MI

Source: Esri and Burns & McDonnell Engineering Company

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Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

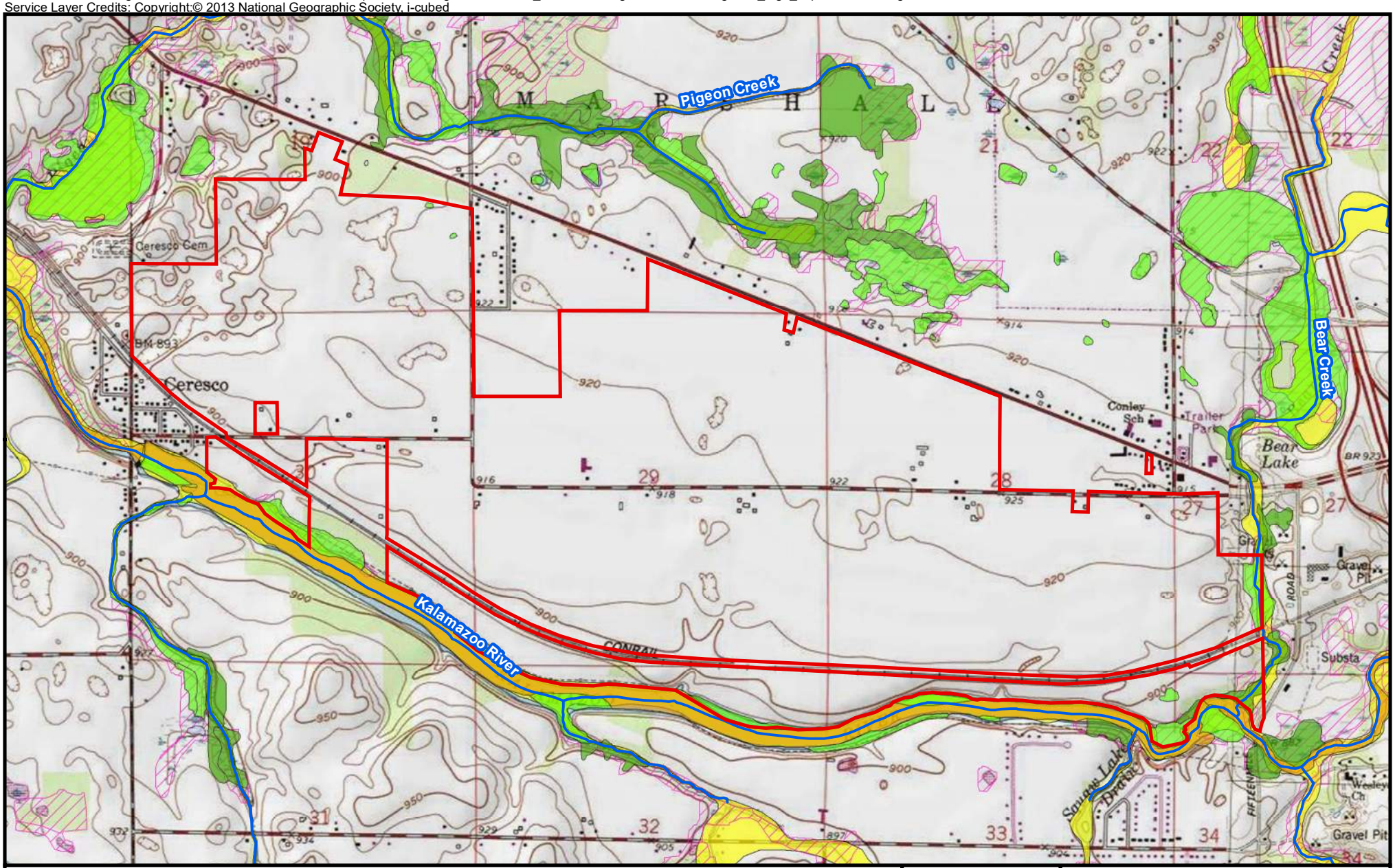

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Figure 2
NWI, NHD,
MIRIS and FEMA Map
Marshall Mega Site
Calhoun County, MI

Source: Esri, National Wetlands Inventory (NWI), National Hydrography Dataset (NHD), Michigan Resource Inventory System (MIRIS), Federal Emergency Management Agency (FEMA), and Burns & McDonnell Engineering Company

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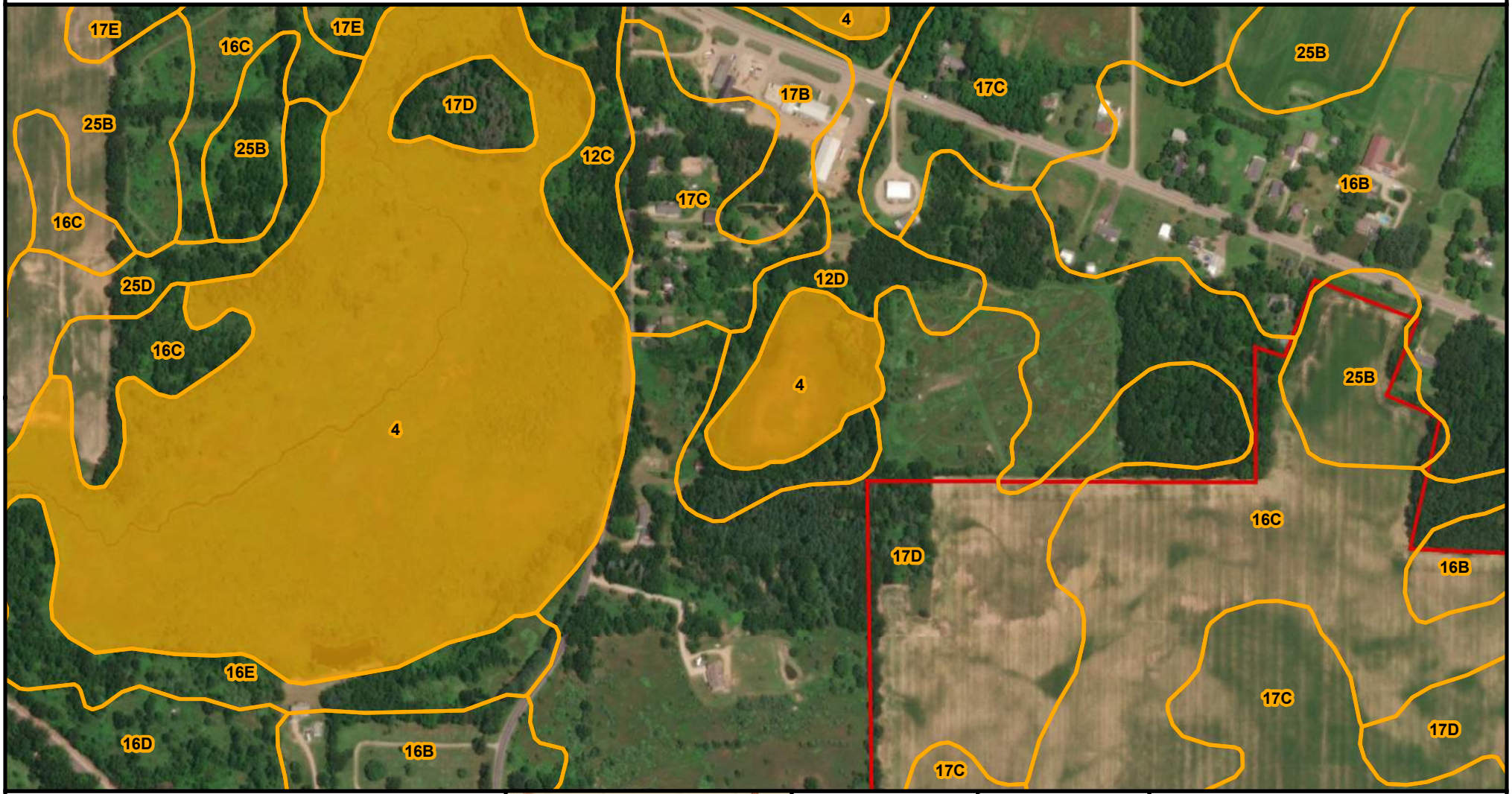
Map Unit Symbol & Name

- 12C - Coloma loamy sand, 6 to 12% slopes
- 12D - Coloma loamy sand, 12 to 18% slopes
- 16B - Oshtemo sandy loam, 0 to 6% slopes
- 16C - Oshtemo sandy loam, 6 to 12% slopes
- 16D - Oshtemo sandy loam, 12 to 18% slopes
- 16E - Oshtemo sandy loam, 18 to 35% slopes
- 17B - Boyer sandy loam, 0 to 6% slopes
- 17C - Boyer sandy loam, 6 to 12% slopes
- 17D - Boyer sandy loam, 12 to 18% slopes
- 17E - Boyer sandy loam, 18 to 40% slopes
- 25B - Kalamazoo loam, 2 to 6% slopes
- 25D - Kalamazoo loam, 12 to 18% slopes
- 4 - Adrian muck, 0 to 1% slopes*

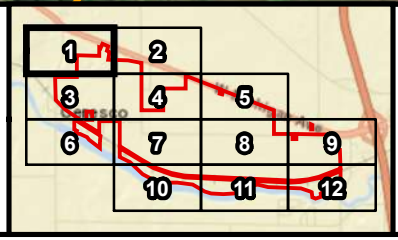


Survey Area
SSURGO Soils Map Unit (Symbol)

Hydric Rating by Map Unit

SSURGO Soils Map Unit (Hydric)
SSURGO Soils Map Unit (Non-Hydric)

Asterisk (*) indicates hydric soil.



NORTH

0 250 500

Scale in Feet

BURNS McDONNELL

Figure 3
Soils Map
Marshall Mega Site
Calhoun County, MI
Page 1 of 12

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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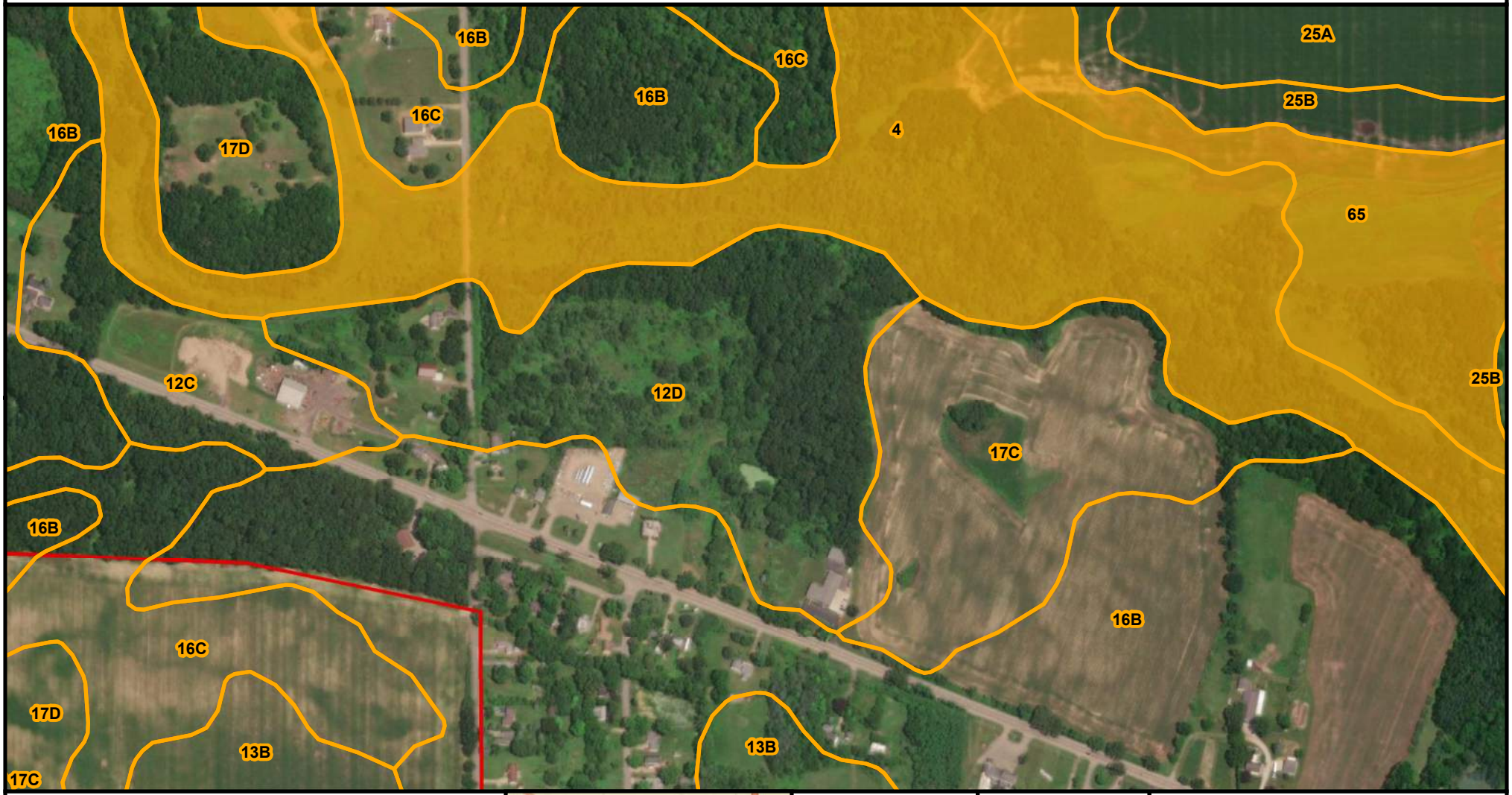
Map Unit Symbol & Name

- 12C - Coloma loamy sand, 6 to 12% slopes
- 12D - Coloma loamy sand, 12 to 18% slopes
- 13B - Spinks loamy sand, 0 to 6% slopes
- 16B - Oshtemo sandy loam, 0 to 6% slopes
- 16C - Oshtemo sandy loam, 6 to 12% slopes
- 17C - Boyer sandy loam, 6 to 12% slopes
- 17D - Boyer sandy loam, 12 to 18% slopes
- 25A - Kalamazoo loam, 0 to 2% slopes
- 25B - Kalamazoo loam, 2 to 6% slopes
- 4 - Adrian muck, 0 to 1% slopes*
- 65 - Sebewa loam, 0 to 2% slopes*

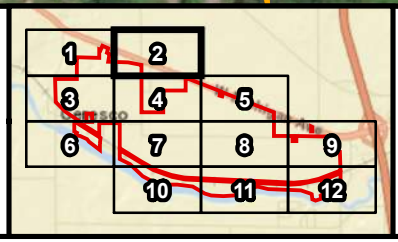


Survey Area
SSURGO Soils Map Unit (Symbol)

Hydric Rating by Map Unit

SSURGO Soils Map Unit (Hydric)
SSURGO Soils Map Unit (Non-Hydric)

Asterisk (*) indicates hydric soil.



NORTH

0 250 500

Scale in Feet

BURNS McDONNELL

Figure 3
Soils Map
Marshall Mega Site
Calhoun County, MI
Page 2 of 12

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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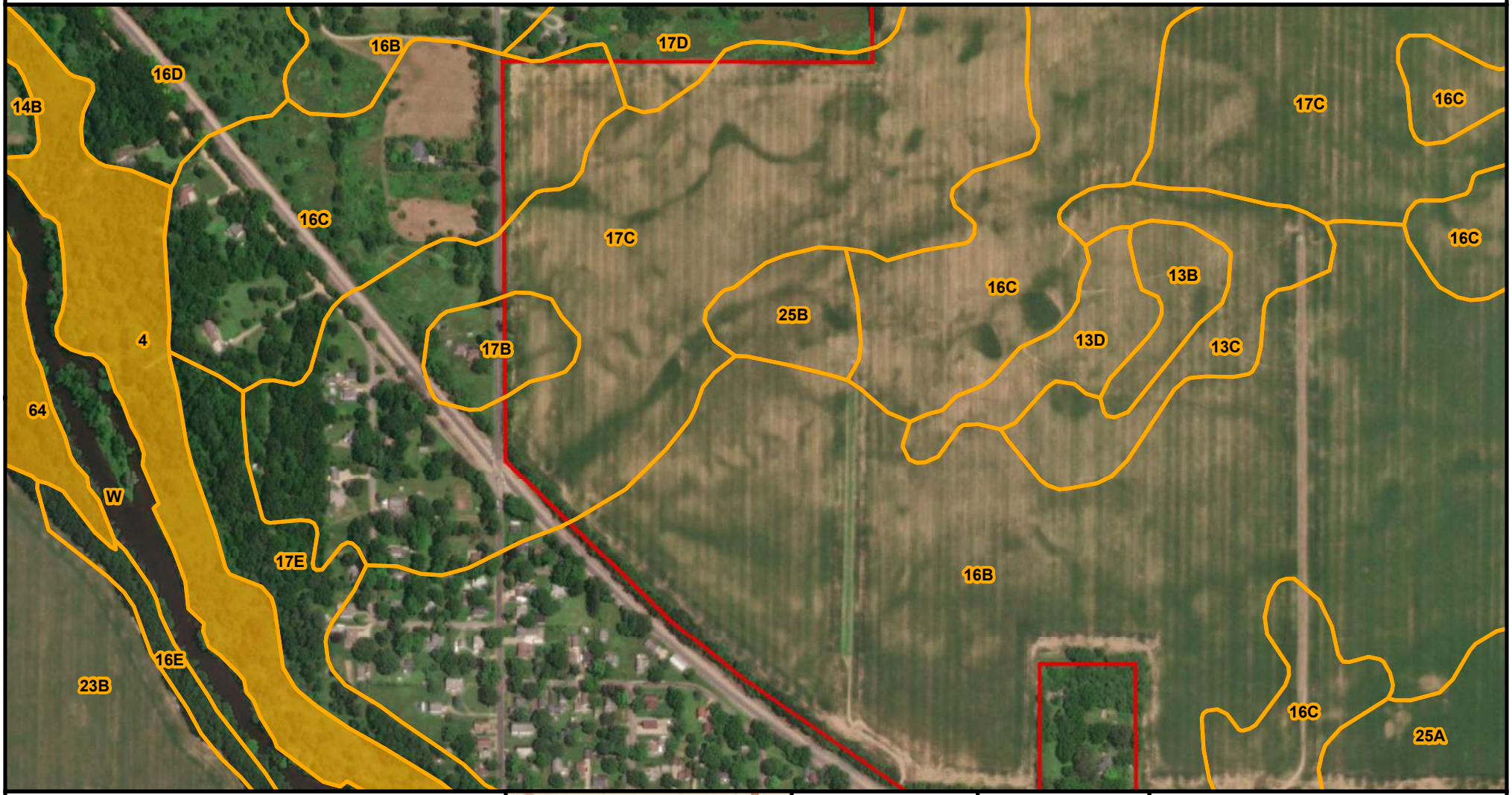
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Map Unit Symbol & Name

- 13B - Spinks loamy sand, 0 to 6% slopes
- 13C - Spinks loamy sand, 6 to 12% slopes
- 13D - Spinks loamy sand, 12 to 18% slopes
- 14B - Bronson sandy loam, 0 to 6% slopes
- 16B - Oshtemo sandy loam, 0 to 6% slopes
- 16C - Oshtemo sandy loam, 6 to 12% slopes
- 16D - Oshtemo sandy loam, 12 to 18% slopes
- 16E - Oshtemo sandy loam, 18 to 35% slopes
- 17B - Boyer sandy loam, 0 to 6% slopes
- 17C - Boyer sandy loam, 6 to 12% slopes
- 17D - Boyer sandy loam, 12 to 18% slopes
- 17E - Boyer sandy loam, 18 to 40% slopes
- 23B - Hixton loam, 0 to 6% slopes
- 25A - Kalamazoo loam, 0 to 2% slopes
- 25B - Kalamazoo loam, 2 to 6% slopes
- 4 - Adrian muck, 0 to 1% slopes*
- 64 - Cohoctah loam, gravelly substratum, frequently flooded*
- W - Water

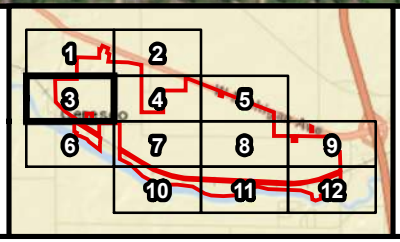


Survey Area
SSURGO Soils Map Unit (Symbol)

Hydric Rating by Map Unit

SSURGO Soils Map Unit (Hydric)
SSURGO Soils Map Unit (Non-Hydric)

Asterisk (*) indicates hydric soil.



NORTH

0 250 500

Scale in Feet

BURNS McDONNELL

Figure 3
Soils Map
Marshall Mega Site
Calhoun County, MI
Page 3 of 12

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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Map Unit Symbol & Name

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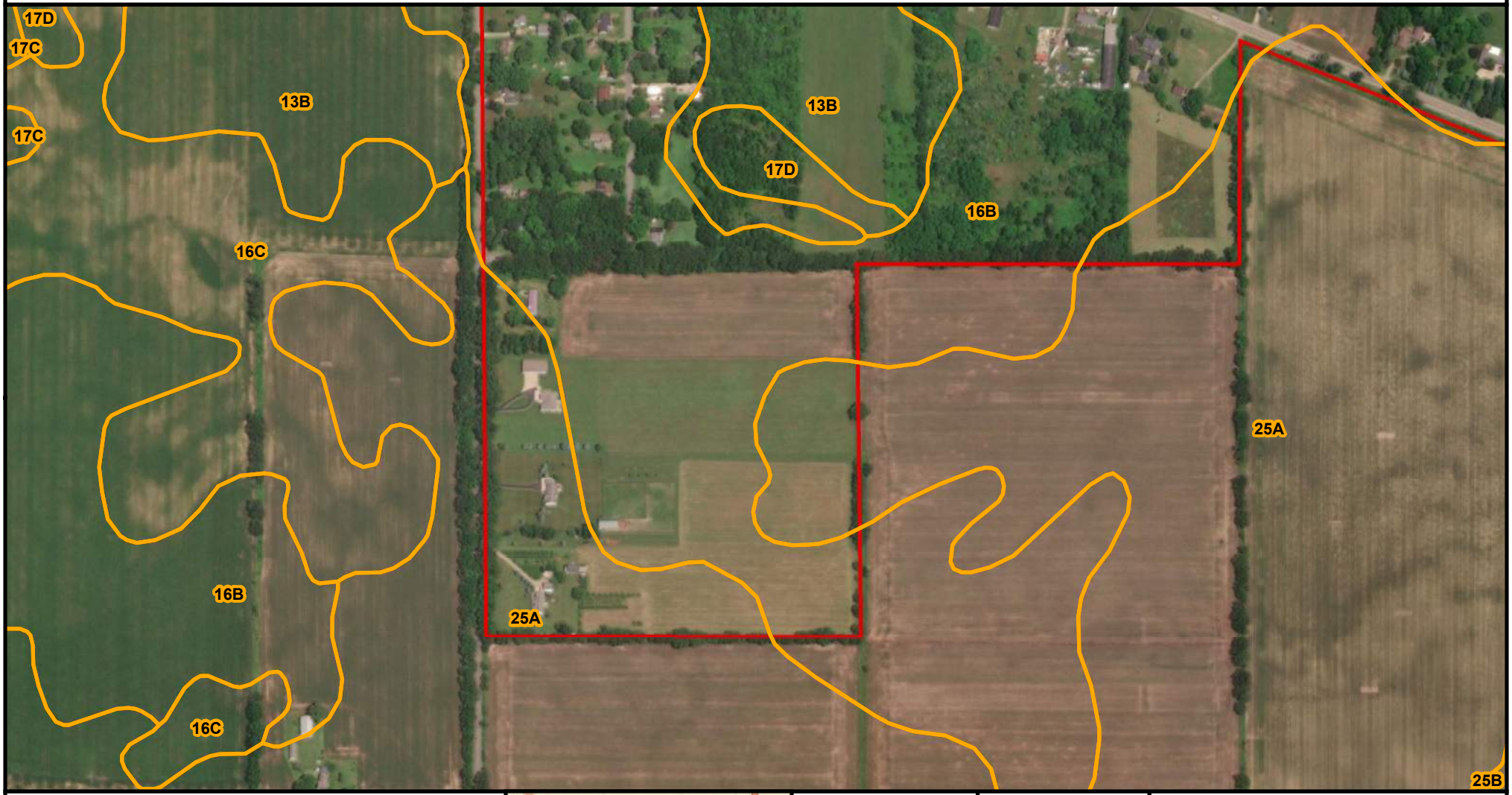
16B - Oshtemo sandy loam, 0 to 6% slopes
16C - Oshtemo sandy loam, 6 to 12% slopes
17C - Boyer sandy loam, 6 to 12% slopes
17D - Boyer sandy loam, 12 to 18% slopes
25A - Kalamazoo loam, 0 to 2% slopes
25B - Kalamazoo loam, 2 to 6% slopes

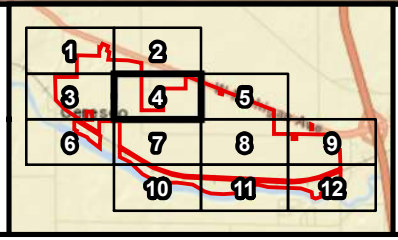


Survey Area
SSURGO Soils Map Unit (Symbol)

Hydric Rating by Map Unit

SSURGO Soils Map Unit (Hydric)
SSURGO Soils Map Unit (Non-Hydric)

Asterisk (*) indicates hydric soil.



NORTH
0 250 500
Scale in Feet

BURNS McDONNELL

Figure 3
Soils Map
Marshall Mega Site
Calhoun County, MI
Page 4 of 12

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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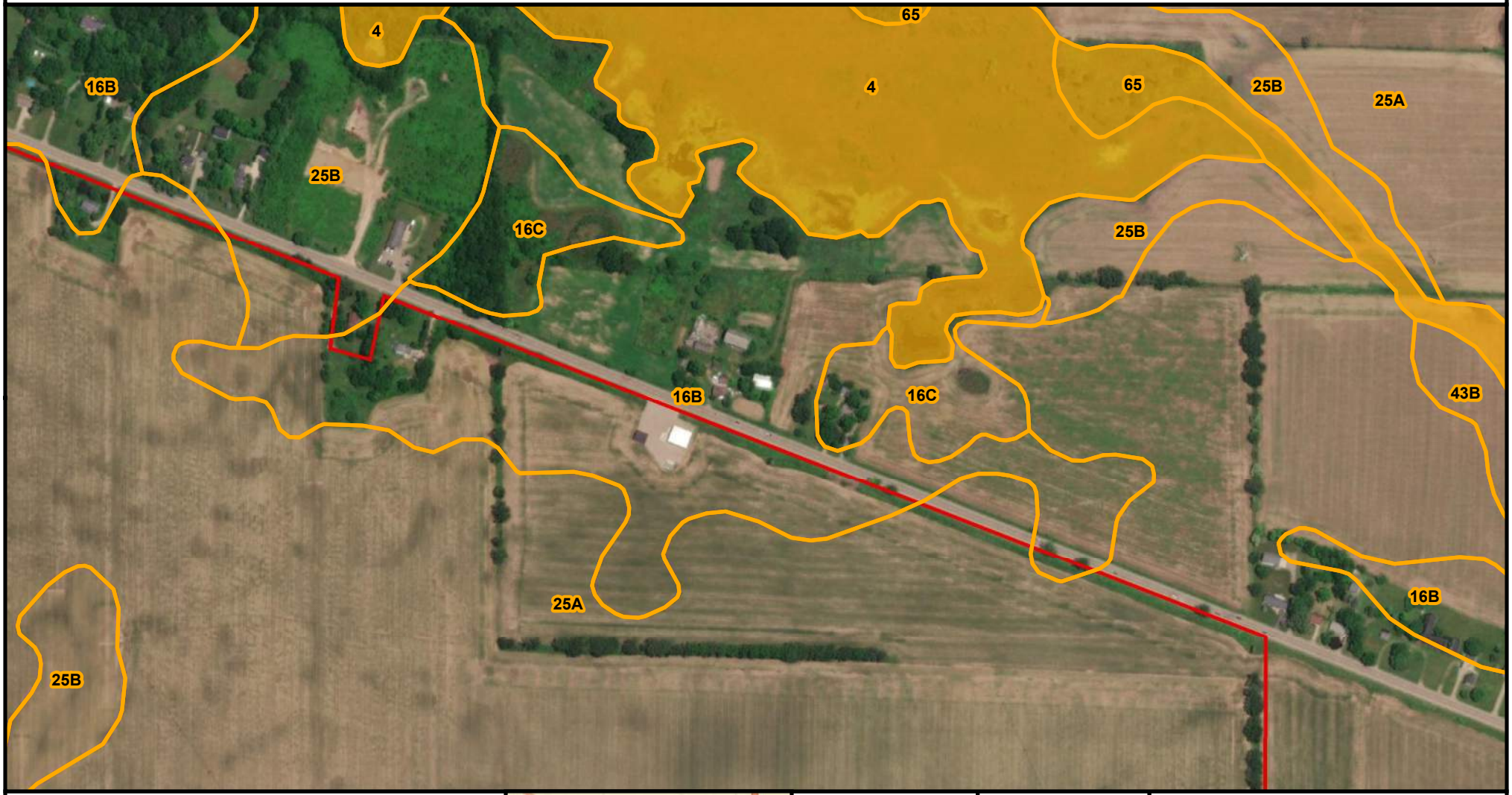
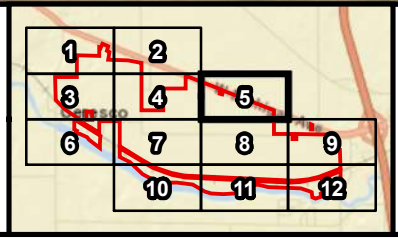
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Map Unit Symbol & Name

16B - Oshtemo sandy loam, 0 to 6% slopes
16C - Oshtemo sandy loam, 6 to 12% slopes
25A - Kalamazoo loam, 0 to 2% slopes
25B - Kalamazoo loam, 2 to 6% slopes
4 - Adrian muck, 0 to 1% slopes*
43B - Brady sandy loam, 1 to 4% slopes
65 - Sebewa loam, 0 to 2% slopes*



Survey Area
SSURGO Soils Map Unit (Symbol)
Hydric Rating by Map Unit
SSURGO Soils Map Unit (Hydric)
SSURGO Soils Map Unit (Non-Hydric)
Asterisk (*) indicates hydric soil.



NORTH
0 250 500
Scale in Feet

BURNS McDONNELL

Figure 3
Soils Map
Marshall Mega Site
Calhoun County, MI

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company
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Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Map Unit Symbol & Name

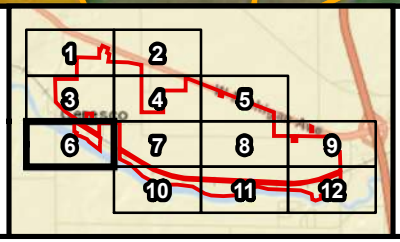
16B - Oshtemo sandy loam, 0 to 6% slopes
16C - Oshtemo sandy loam, 6 to 12% slopes
16E - Oshtemo sandy loam, 18 to 35% slopes
17E - Boyer sandy loam, 18 to 40% slopes
23B - Hixton loam, 0 to 6% slopes
25A - Kalamazoo loam, 0 to 2% slopes
25B - Kalamazoo loam, 2 to 6% slopes
25C - Kalamazoo loam, 6 to 12% slopes
29B - Hillsdale sandy loam, 0 to 6% slopes
29C - Hillsdale sandy loam, 6 to 12% slopes
4 - Adrian muck, 0 to 1% slopes*
64 - Cohoctah loam, gravelly substratum, frequently flooded*
65 - Sebewa loam, 0 to 2% slopes*
85 - Histosols and Fluvaquents, frequently flooded
W - Water

Survey Area
SSURGO Soils Map Unit (Symbol)

Hydric Rating by Map Unit

SSURGO Soils Map Unit (Hydric)
SSURGO Soils Map Unit (Non-Hydric)

Asterisk (*) indicates hydric soil.



NORTH

0 250 500

Scale in Feet

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Figure 3
Soils Map
Marshall Mega Site
Calhoun County, MI
Page 6 of 12

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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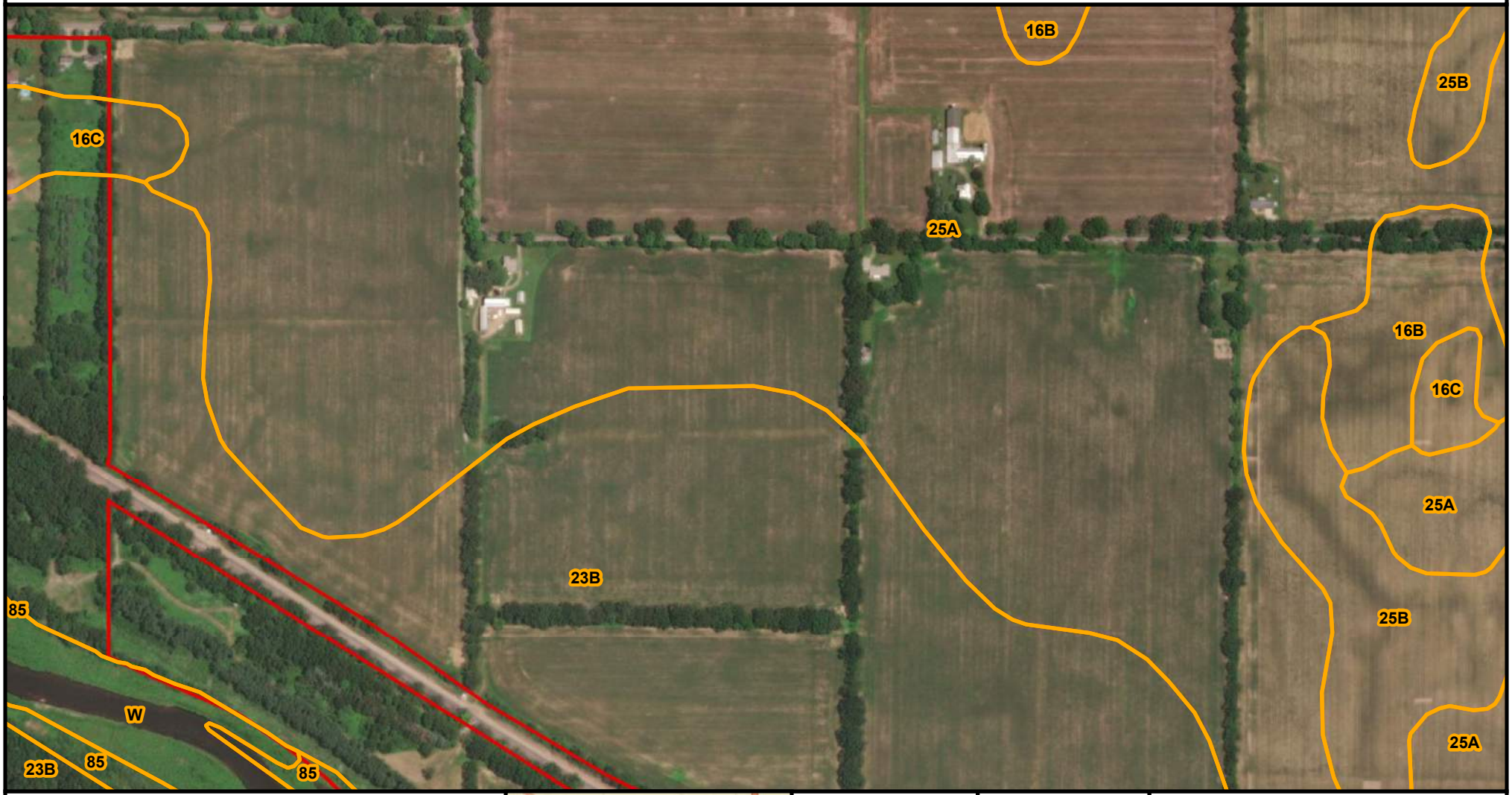
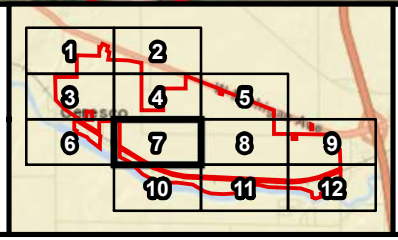
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Map Unit Symbol & Name

16B - Oshtemo sandy loam, 0 to 6% slopes
16C - Oshtemo sandy loam, 6 to 12% slopes
23B - Hixton loam, 0 to 6% slopes
25A - Kalamazoo loam, 0 to 2% slopes
25B - Kalamazoo loam, 2 to 6% slopes
85 - Histosols and Fluvaquents, frequently flooded
W - Water



Survey Area
SSURGO Soils Map Unit (Symbol)
Hydric Rating by Map Unit
SSURGO Soils Map Unit (Hydric)
SSURGO Soils Map Unit (Non-Hydric)
Asterisk (*) indicates hydric soil.



NORTH
0 250 500
Scale in Feet

BURNS McDONNELL

Figure 3
Soils Map
Marshall Mega Site
Calhoun County, MI
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Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company
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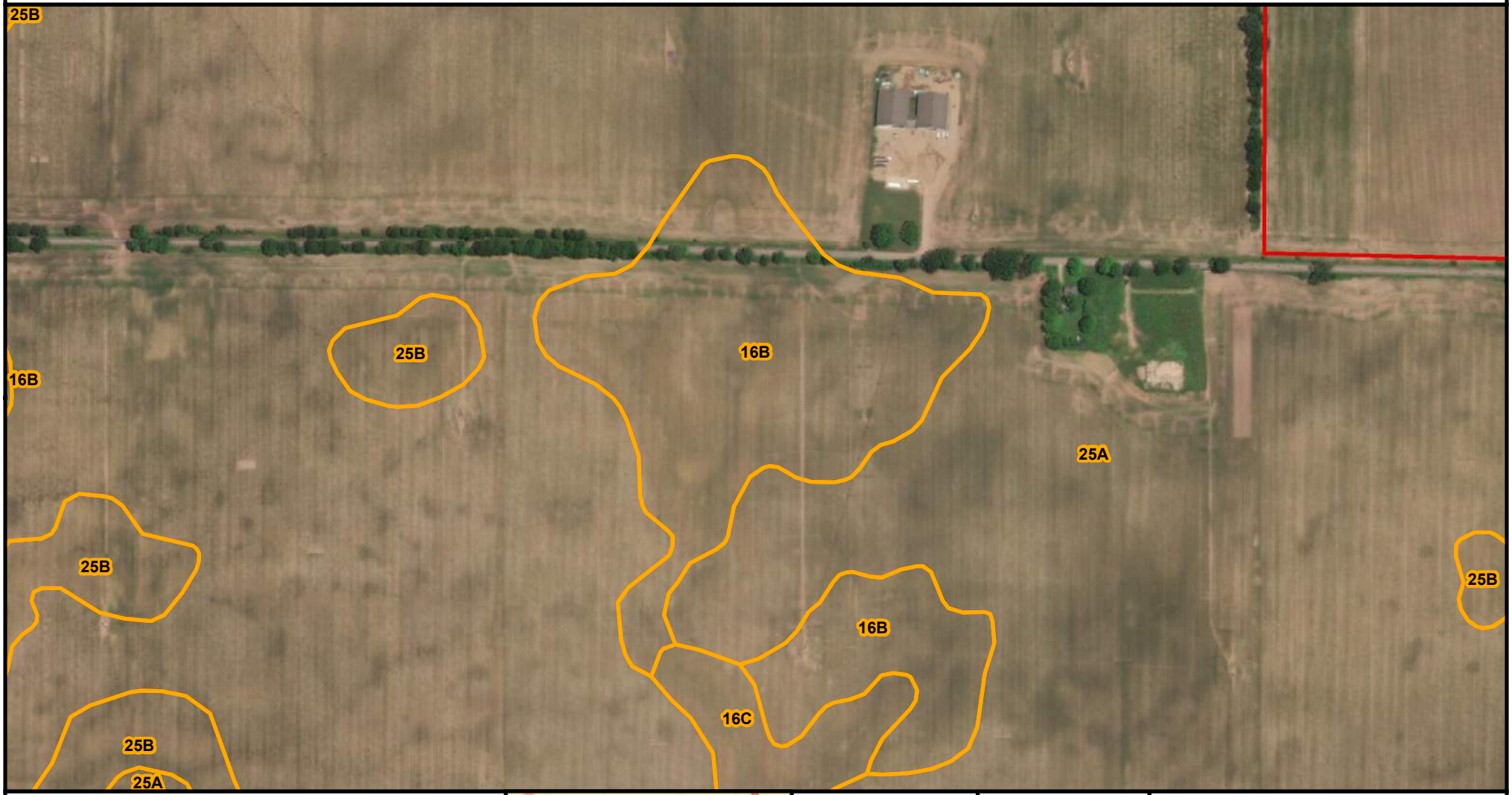
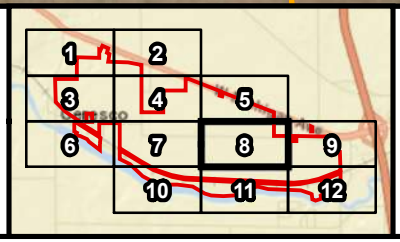
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Map Unit Symbol & Name

16B - Oshtemo sandy loam, 0 to 6% slopes
16C - Oshtemo sandy loam, 6 to 12% slopes
25A - Kalamazoo loam, 0 to 2% slopes
25B - Kalamazoo loam, 2 to 6% slopes



Survey Area
SSURGO Soils Map Unit (Symbol)
Hydric Rating by Map Unit
SSURGO Soils Map Unit (Hydric)
SSURGO Soils Map Unit (Non-Hydric)
Asterisk (*) indicates hydric soil.



NORTH
0 250 500
Scale in Feet

BURNS McDONNELL

Figure 3
Soils Map
Marshall Mega Site
Calhoun County, MI

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company
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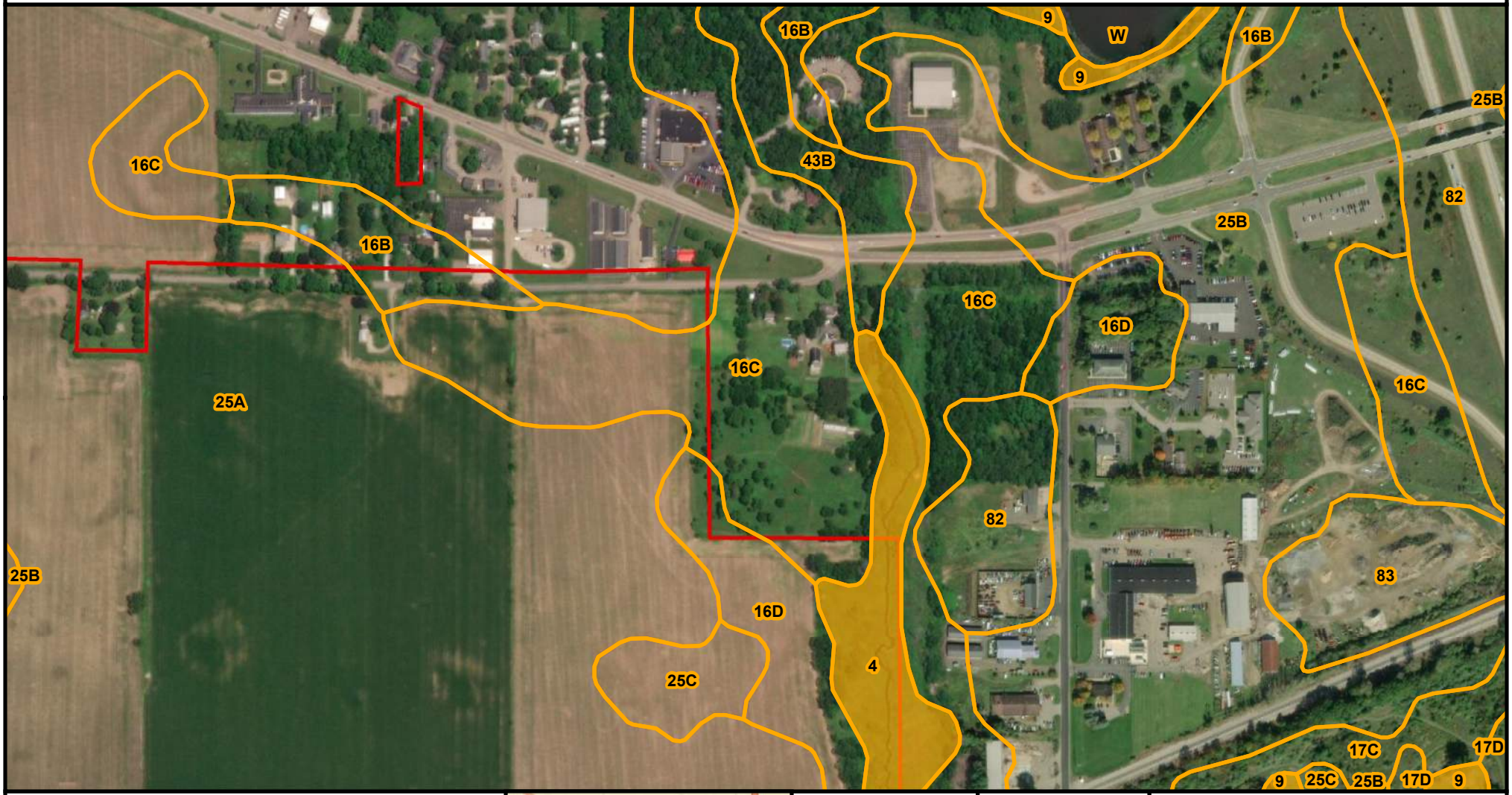
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Map Unit Symbol & Name

16B - Oshtemo sandy loam, 0 to 6% slopes
16C - Oshtemo sandy loam, 6 to 12% slopes
16D - Oshtemo sandy loam, 12 to 18% slopes
17C - Boyer sandy loam, 6 to 12% slopes
17D - Boyer sandy loam, 12 to 18% slopes
25A - Kalamazoo loam, 0 to 2% slopes
25B - Kalamazoo loam, 2 to 6% slopes
25C - Kalamazoo loam, 6 to 12% slopes
4 - Adrian muck, 0 to 1% slopes*
43B - Brady sandy loam, 1 to 4% slopes
82 - Udipsamments and Udorthents, nearly level to steep
83 - Pits, sand and gravel
9 - Martisco muck*
W - Water

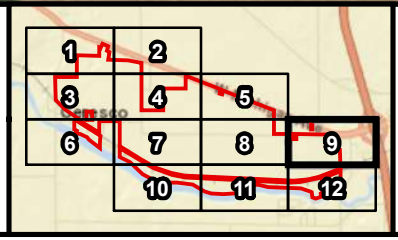


Survey Area
SSURGO Soils Map Unit (Symbol)

Hydric Rating by Map Unit

SSURGO Soils Map Unit (Hydric)
SSURGO Soils Map Unit (Non-Hydric)

Asterisk (*) indicates hydric soil.



NORTH
0 250 500
Scale in Feet

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Figure 3
Soils Map
Marshall Mega Site
Calhoun County, MI
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Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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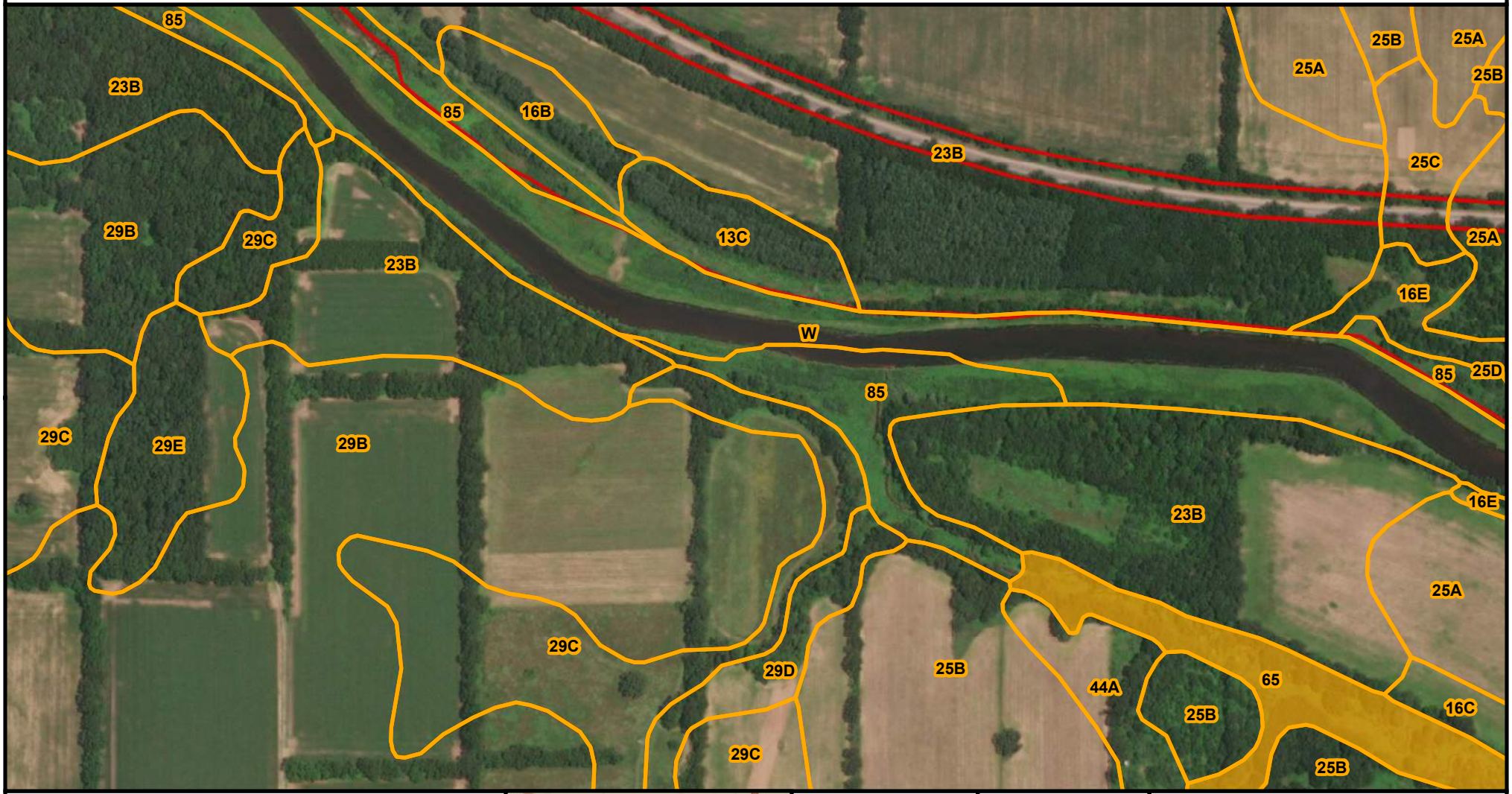
Map Unit Symbol & Name

13C - Spinks loamy sand, 6 to 12% slopes
16B - Oshtemo sandy loam, 0 to 6% slopes
16C - Oshtemo sandy loam, 6 to 12% slopes
16E - Oshtemo sandy loam, 18 to 35% slopes
23B - Hixton loam, 0 to 6% slopes
25A - Kalamazoo loam, 0 to 2% slopes
25B - Kalamazoo loam, 2 to 6% slopes
25C - Kalamazoo loam, 6 to 12% slopes
25D - Kalamazoo loam, 12 to 18% slopes
29B - Hillsdale sandy loam, 0 to 6% slopes
29C - Hillsdale sandy loam, 6 to 12% slopes
29D - Hillsdale sandy loam, 12 to 18% slopes
29E - Hillsdale sandy loam, 18 to 25% slopes
44A - Matherton loam, 0 to 3% slopes
65 - Sebewa loam, 0 to 2% slopes*
85 - Histosols and Fluvaquents, frequently flooded
W - Water

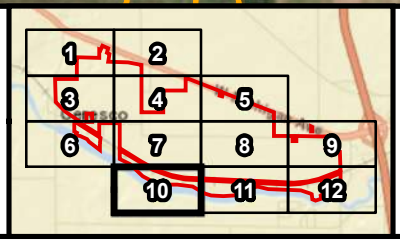


Survey Area
SSURGO Soils Map Unit (Symbol)

Hydric Rating by Map Unit

SSURGO Soils Map Unit (Hydric)
SSURGO Soils Map Unit (Non-Hydric)

Asterisk (*) indicates hydric soil.



NORTH

0 250 500

Scale in Feet

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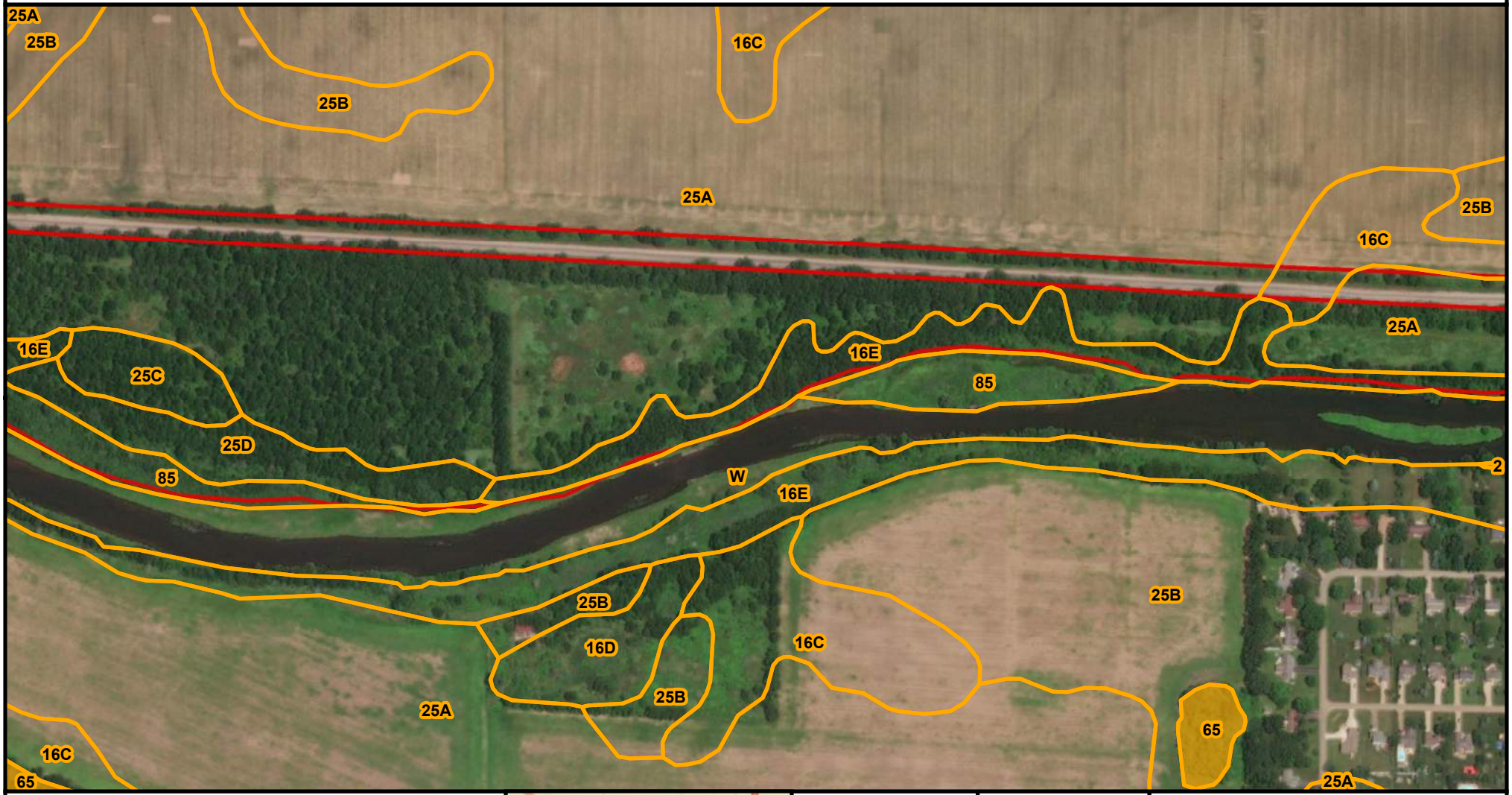
Figure 3
Soils Map
Marshall Mega Site
Calhoun County, MI
Page 10 of 12

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

Issued: 9/26/2021

Map Unit Symbol & Name

- 16C - Oshtemo sandy loam, 6 to 12% slopes
- 16D - Oshtemo sandy loam, 12 to 18% slopes
- 16E - Oshtemo sandy loam, 18 to 35% slopes
- 2 - Houghton muck, undrained, 0 to 1% slopes*
- 25A - Kalamazoo loam, 0 to 2% slopes
- 25B - Kalamazoo loam, 2 to 6% slopes
- 25C - Kalamazoo loam, 6 to 12% slopes
- 25D - Kalamazoo loam, 12 to 18% slopes
- 65 - Sebewa loam, 0 to 2% slopes*
- 85 - Histosols and Fluvaquents, frequently flooded
- W - Water

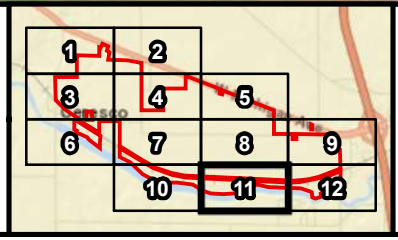


Survey Area
SSURGO Soils Map Unit (Symbol)

Hydric Rating by Map Unit

SSURGO Soils Map Unit (Hydric)
SSURGO Soils Map Unit (Non-Hydric)

Asterisk (*) indicates hydric soil.



NORTH

0 250 500

Scale in Feet

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Figure 3
Soils Map
Marshall Mega Site
Calhoun County, MI

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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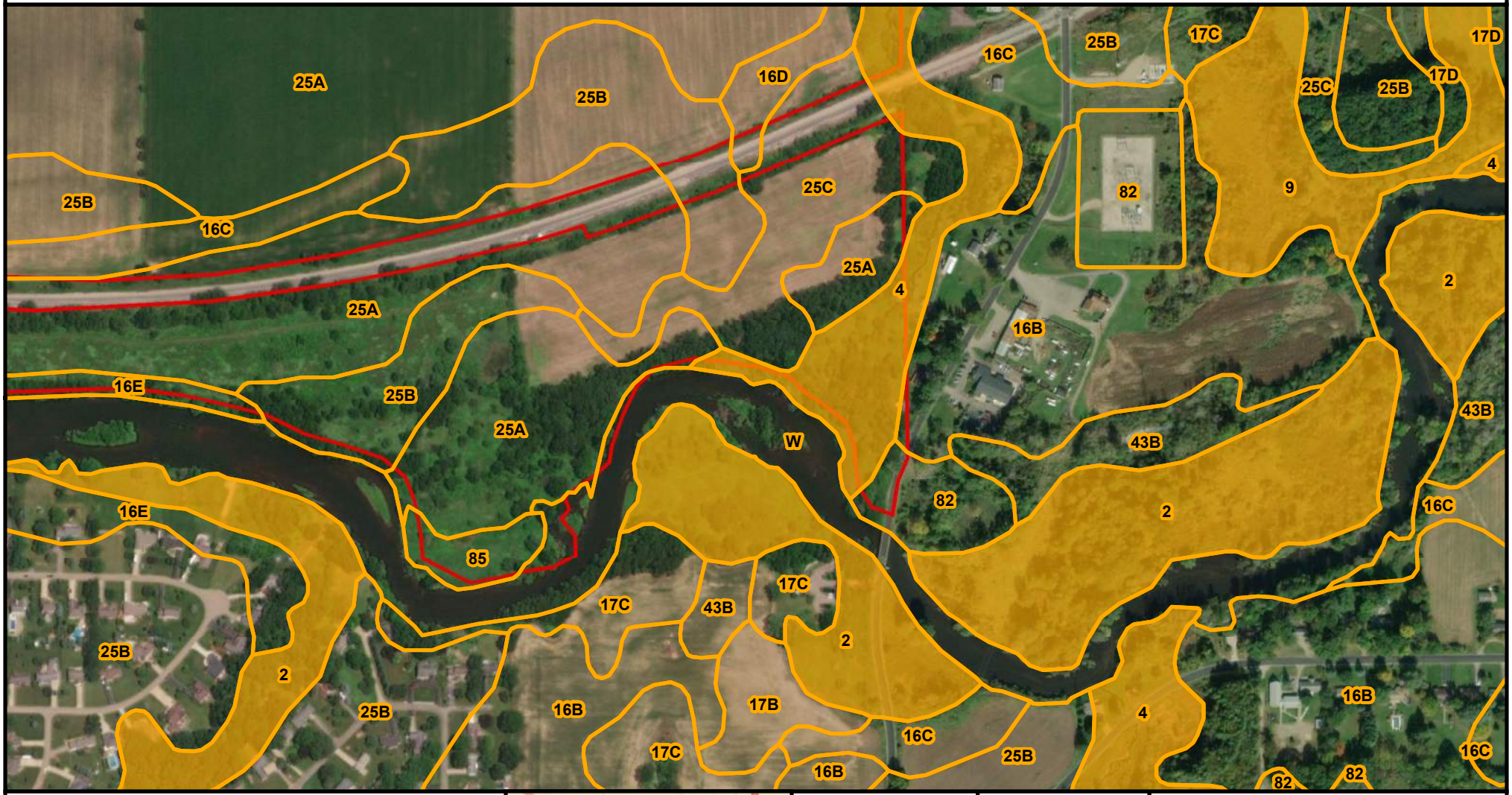
Map Unit Symbol & Name

16B - Oshtemo sandy loam, 0 to 6% slopes
16C - Oshtemo sandy loam, 6 to 12% slopes
16D - Oshtemo sandy loam, 12 to 18% slopes
16E - Oshtemo sandy loam, 18 to 35% slopes
17B - Boyer sandy loam, 0 to 6% slopes
17C - Boyer sandy loam, 6 to 12% slopes
17D - Boyer sandy loam, 12 to 18% slopes
2 - Houghton muck, undrained, 0 to 1% slopes*
25A - Kalamazoo loam, 0 to 2% slopes
25B - Kalamazoo loam, 2 to 6% slopes
25C - Kalamazoo loam, 6 to 12% slopes
4 - Adrian muck, 0 to 1% slopes*
43B - Brady sandy loam, 1 to 4% slopes
82 - Udipsamments and Udorthents, nearly level to steep
85 - Histosols and Fluvaquents, frequently flooded
9 - Martisco muck*
W - Water

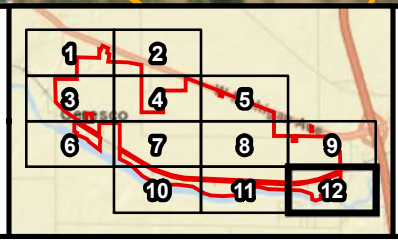


Survey Area
SSURGO Soils Map Unit (Symbol)

Hydric Rating by Map Unit

SSURGO Soils Map Unit (Hydric)
SSURGO Soils Map Unit (Non-Hydric)

Asterisk (*) indicates hydric soil.



NORTH
0 250 500
Scale in Feet

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Figure 3
Soils Map
Marshall Mega Site
Calhoun County, MI
Page 12 of 12

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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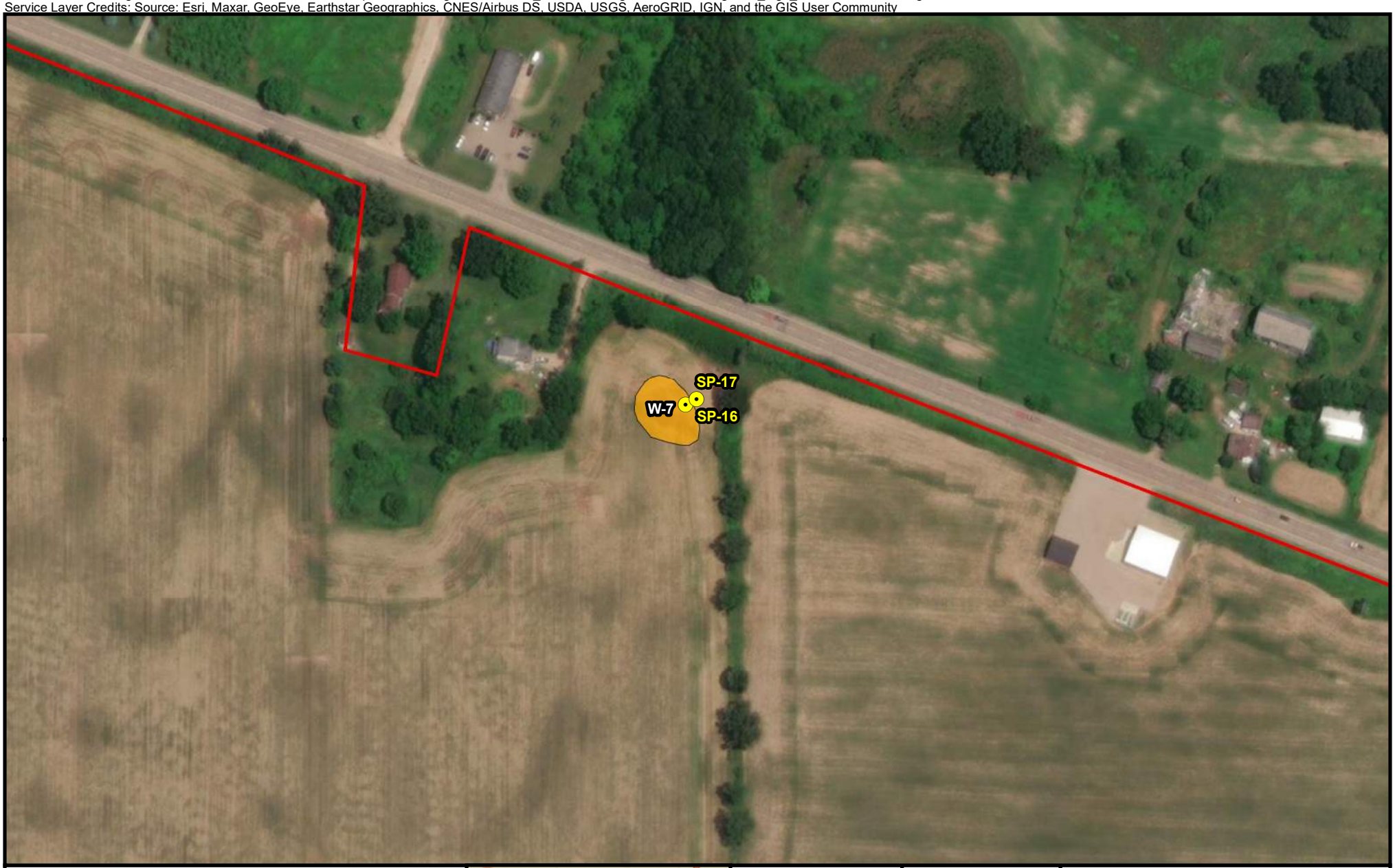
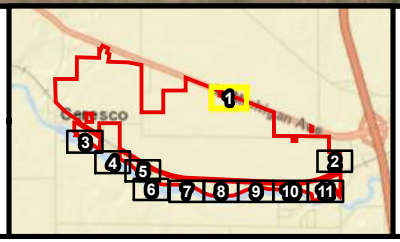


Survey Area
Sample Plot
Stream

Stream (S)
Perennial
Intermittent

Wetland (W)
PEM
PEM/PSS
PEMf



NORTH

0 100 200

Scale in Feet

BURNS McDONNELL

Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
Page 1 of 11

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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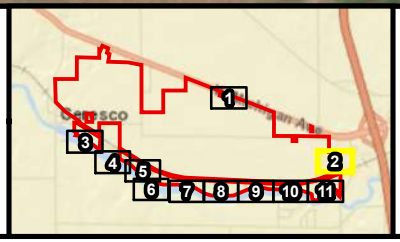
Survey Area
Sample Plot
Stream

Stream (S)
Perennial
Intermittent

Wetland (W)
PEM
PEM/PSS
PEMf



NORTH
0 100 200
Scale in Feet

BURNS McDONNELL

Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
Page 2 of 11

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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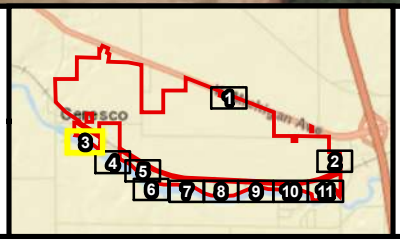
Survey Area
Sample Plot
Stream

Stream (S)
Perennial
Intermittent

Wetland (W)
PEM
PEM/PSS
PEMf



NORTH
0 100 200
Scale in Feet

BURNS McDONNELL

Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
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Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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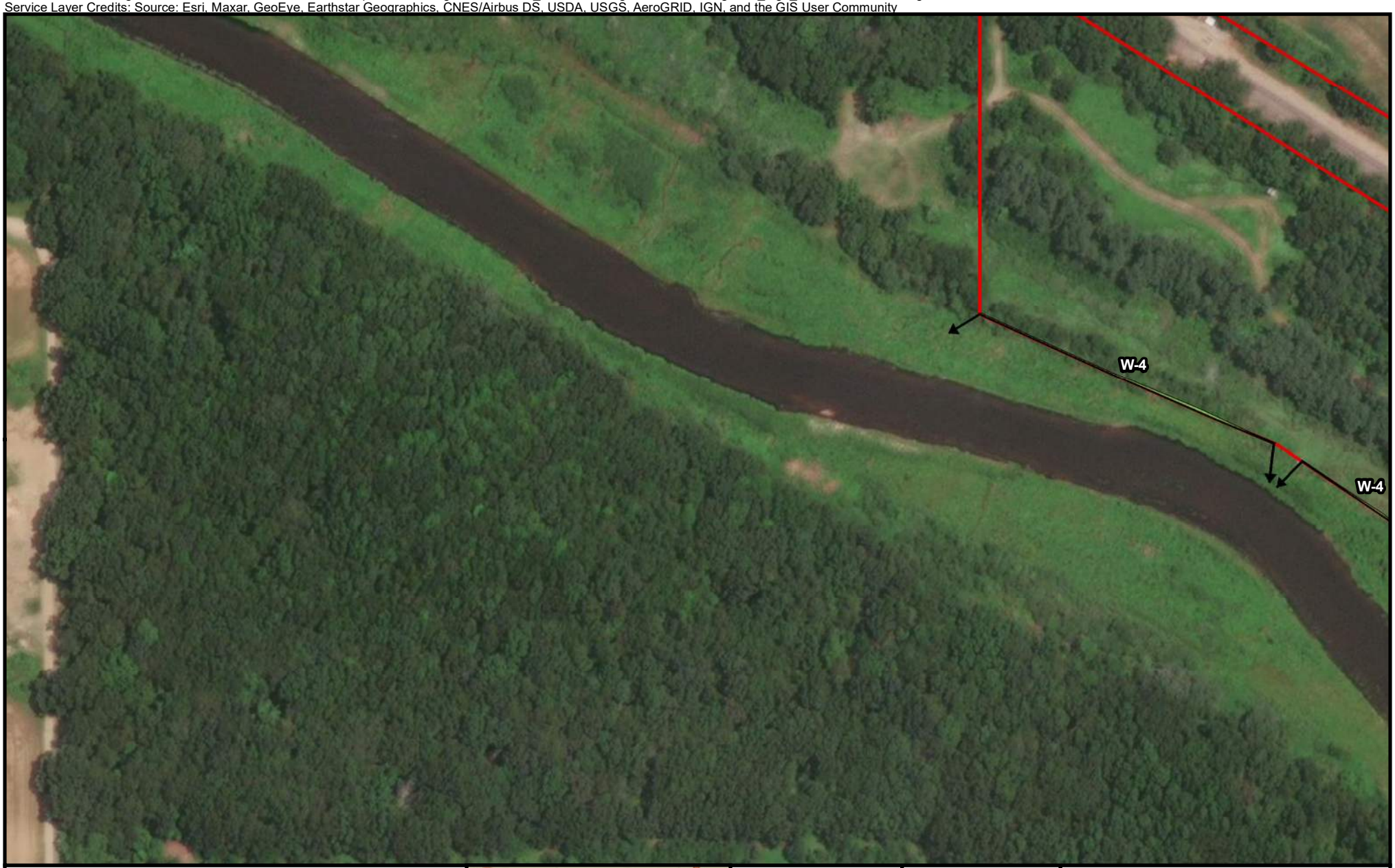
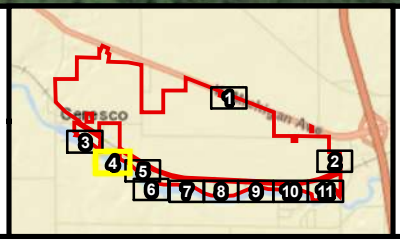


Survey Area
Sample Plot
Stream

Stream (S)
Perennial
Intermittent

Wetland (W)
PEM
PEM/PSS
PEMf



NORTH
0 100 200
Scale in Feet

BURNS McDONNELL

Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
Page 4 of 11

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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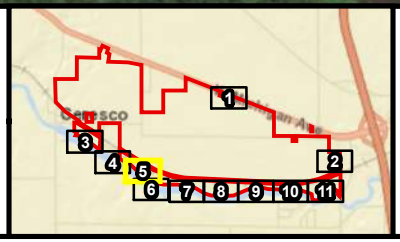
Survey Area
Sample Plot
Stream

Stream (S)
Perennial
Intermittent

Wetland (W)
PEM
PEM/PSS
PEMf



NORTH

0 100 200

Scale in Feet

BURNS McDONNELL

Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
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Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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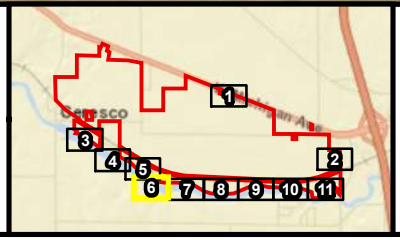
Survey Area
Sample Plot
Stream

Stream (S)
Perennial
Intermittent

Wetland (W)
PEM
PEM/PSS
PEMf



NORTH
0 100 200
Scale in Feet

BURNS McDONNELL

Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
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Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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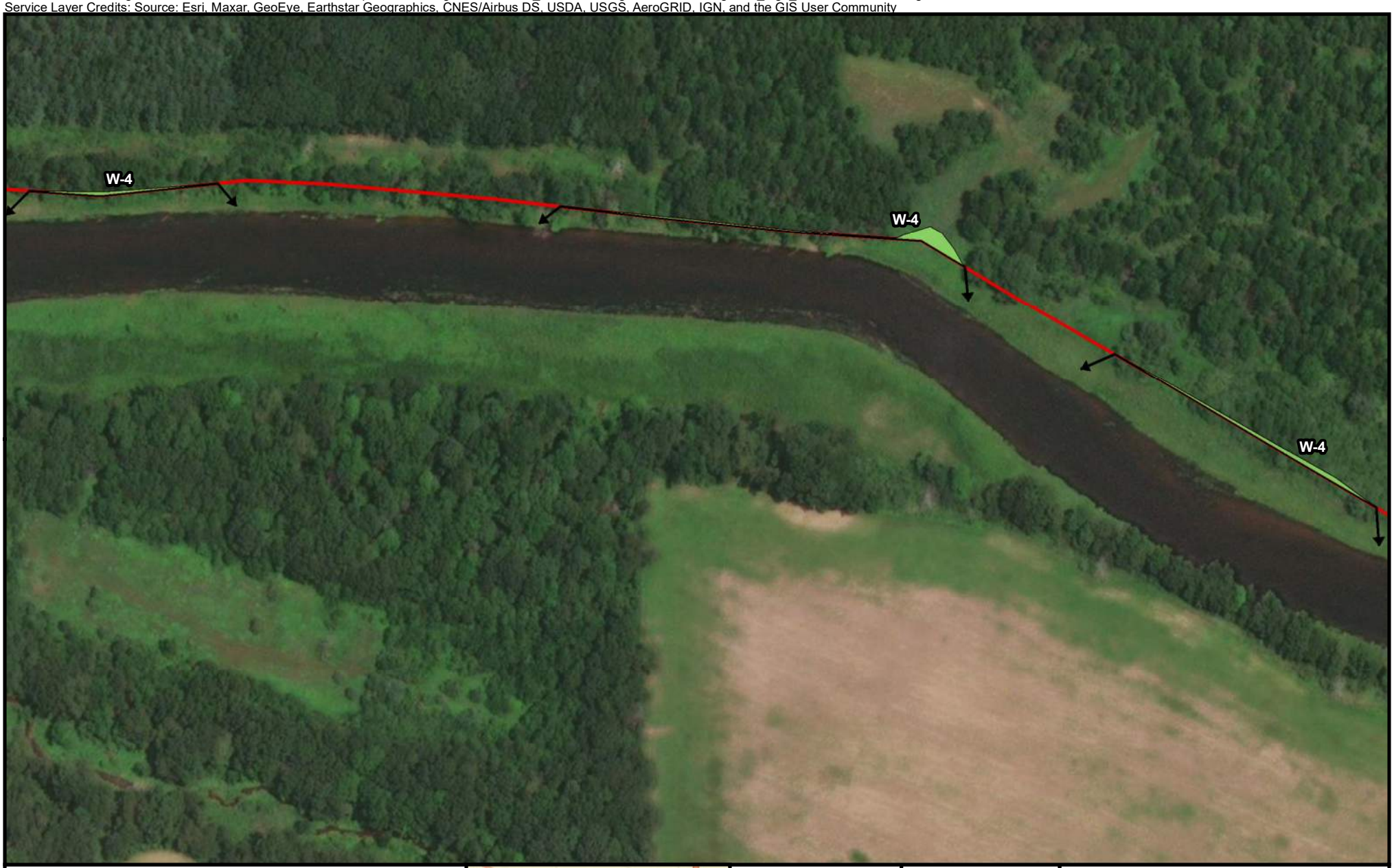
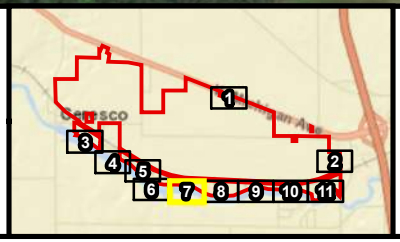


Survey Area
Sample Plot
Stream

Stream (S)
Perennial
Intermittent

Wetland (W)
PEM
PEM/PSS
PEMf



NORTH

0 100 200

Scale in Feet

BURNS McDONNELL

Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
Page 7 of 11

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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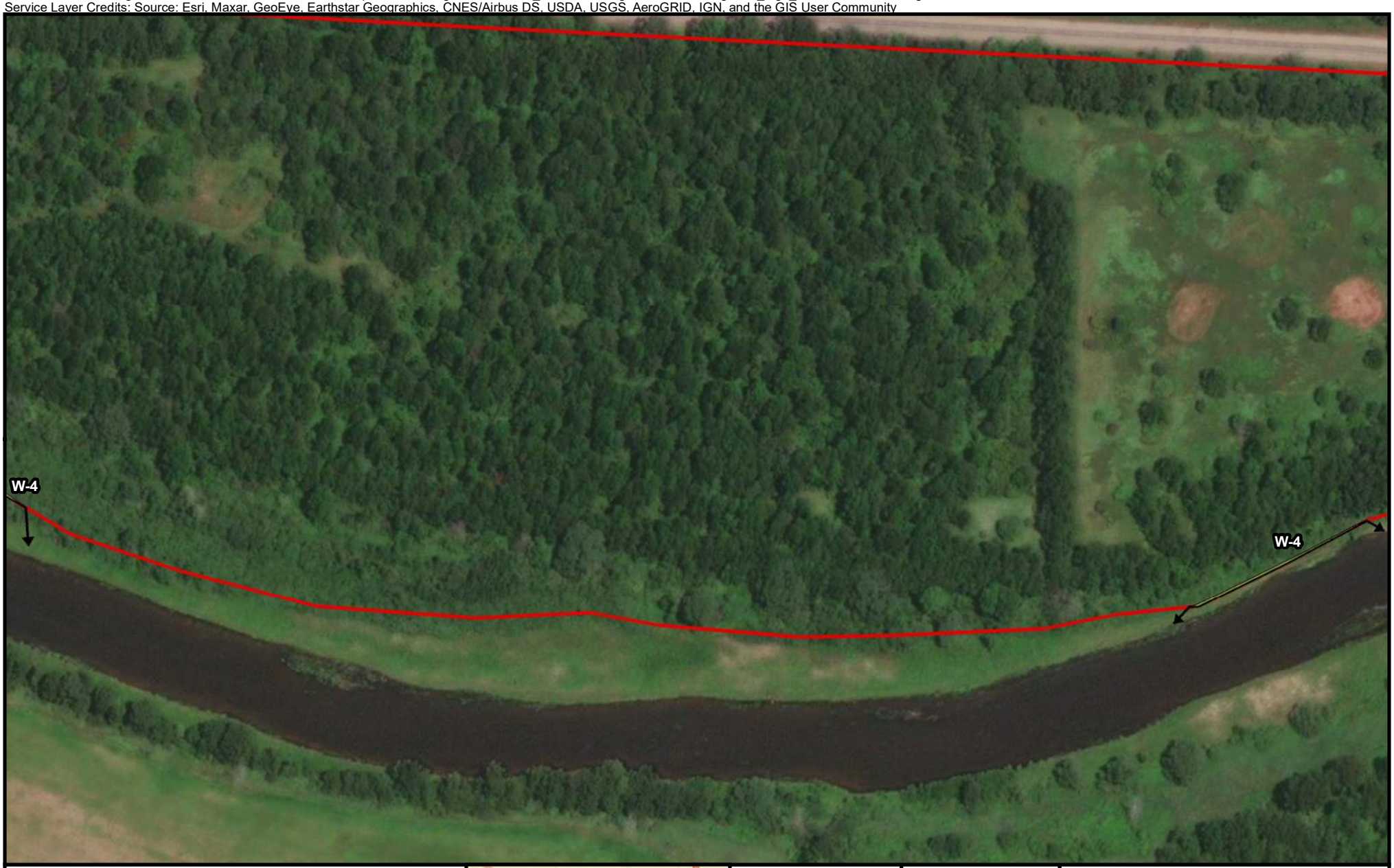
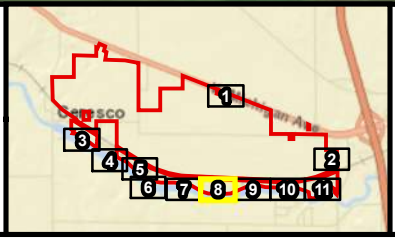


Survey Area
Sample Plot
Stream

Stream (S)
Perennial
Intermittent

Wetland (W)
PEM
PEM/PSS
PEMf



NORTH

0 100 200

Scale in Feet

BURNS McDONNELL

Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
Page 8 of 11

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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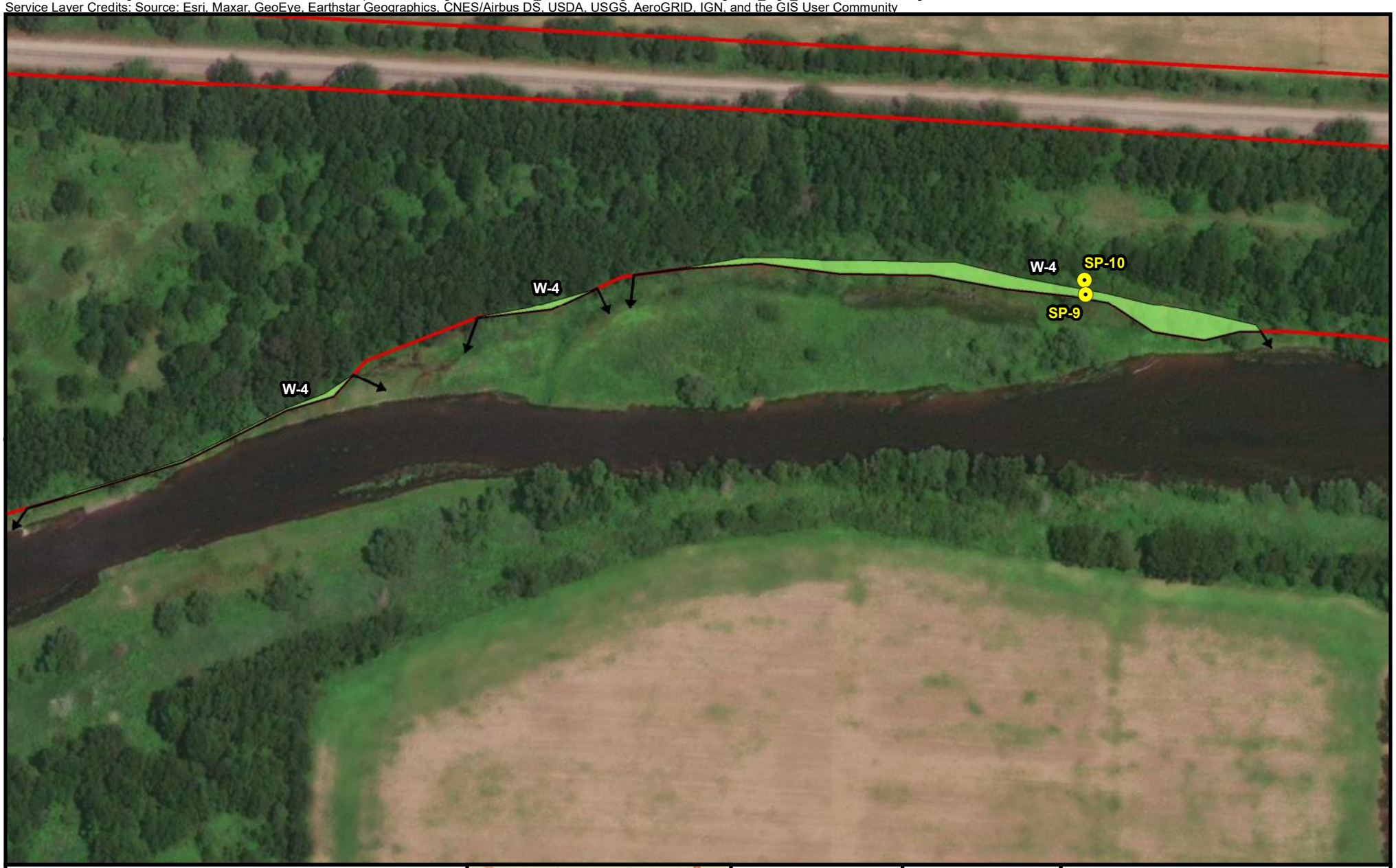
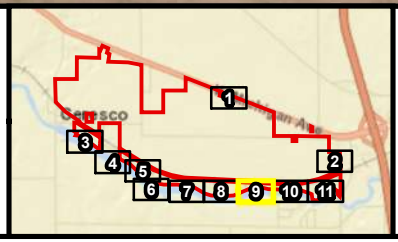


Survey Area
Sample Plot
Stream

Stream (S)
Perennial
Intermittent

Wetland (W)
PEM
PEM/PSS
PEMf



NORTH

0 100 200

Scale in Feet

BURNS McDONNELL

Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
Page 9 of 11

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

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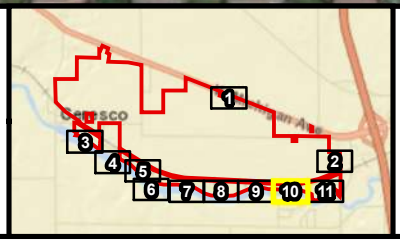
Survey Area
Sample Plot
Stream

Stream (S)
Perennial
Intermittent

Wetland (W)
PEM
PEM/PSS
PEMf



NORTH

0 100 200

Scale in Feet

BURNS McDONNELL

Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
Page 10 of 11

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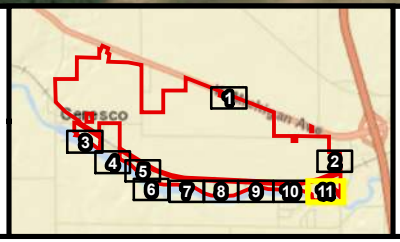
Survey Area
Sample Plot
Stream

Stream (S)
Perennial
Intermittent

Wetland (W)
PEM
PEM/PSS
PEMf



NORTH
0 100 200
Scale in Feet

BURNS McDONNELL

Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
Page 11 of 11

Source: Esri, SSURGO Soils Database, and Burns & McDonnell Engineering Company

Issued: 10/8/2021

APPENDIX B - ROUTINE WETLAND DETERMINATION DATA FORMS, NORTHCENTRAL AND NORTHEAST REGION

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/15/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-1

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S34 T2S R6W

Landform (hillslope, terrace, etc.) Flat in depression Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): L Lat: 42.260695 Long: -84.998354 Datum: NAD83

Soil Map Unit Name: Adrian muck, 0 to 1 percent slopes NWI Classification: PSS1C

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☒	☐
Hydric Soil Present?	☒	☐
Wetland Hydrology Present?	☒	☐
Is the Sampled Area within a Wetland?	☒	☐

Remarks: Wetland 1 (W-1) is a Palustrine Emergent (PEM) wetland.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☒ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☐	☒	
Wetland Hydrology Present?	☒	☐	

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

Remarks: Saturation Visible on Aerial Imagery (C9), Geomorphic Position (D2), and FAC-Neutral Test (D5) confirmed wetland hydrology.

VEGETATION – Use scientific names of plants Sampling Point: **Error! Reference source not found.**

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		
Herb Stratum (Plot size: 5 ft. x 5 ft.)			
1. *Phalaris arundinacea*	55 %	Y	FACW
2. *Eutrochium purpureum*	20 %	Y	FAC
3. *Impatiens capensis*	15 %	N	FACW
4. *Ipomoea purpurea*	10 %	N	FACU
5. *Solidago gigantea*	5 %	N	FACW
6. *Symphyotrichum novae-angliae*	5 %	N	FACW
7. *Cirsium arvense*	2 %	N	FACU
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	112 % = Total Cover		
Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
	0 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 %	(A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Remarks *(include photo numbers here or on a separate sheet)*: The Dominance Test confirmed hydrophytic vegetation at the time of the site visit.

SOIL

Sampling Point: Error! Reference source not found.

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					Muck	
2-6	10YR 2/1	100					Silty Clay Loam	
6-18	10YR 2/1	90	10YR 4/1	10	D	M	Silty Clay Loam	
18-20	10YR 2/1	98	10YR 4/1	2	D	M	Silty Clay Loam	Pebbles

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☒ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____ Depth (inches): _____

Hydric Soil Present?

☒ Yes ☐ No

Remarks: Depleted Dark Surface (F7) confirmed hydric soils.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/15/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-2

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S34 T2S R6W

Landform (hillslope, terrace, etc.) Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): L Lat: 42.260808 Long: -84.998395 Datum: NAD83

Soil Map Unit Name: Adrian muck, 0 to 1 percent slopes NWI Classification: N/A

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☐	☒
Hydric Soil Present?	☐	☒
Wetland Hydrology Present?	☐	☒
Is the Sampled Area within a Wetland?	☐	☒

Remarks: Sample Plot (SP)-2 is located adjacent to Wetland (W)-1.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☐	☒	
Wetland Hydrology Present?	☐	☒	

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

Remarks: No indicators of wetland hydrology were present at the time of the site visit.

VEGETATION – Use scientific names of plants Sampling Point: SP-2

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Sassafras albidum*	30 %	Y	FACU
2. *Prunus serotina*	2 %	N	FACU
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	32 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)			
1. *Lonicera maackii*	30 %	Y	UPL
2. *Rhamnus cathartica*	20 %	Y	FAC
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	50 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)			
1. *Rhamnus cathartica*	5 %	Y	FAC
2. *Toxicodendron radicans*	2 %	N	FAC
3. *Rosa multiflora*	2 %	N	FACU
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	9 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)			
1. *Vitis aestivalis*	10 %	Y	FACU
2.	%		
3.	%		
4.	%		
	10 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 %	(A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Remarks *(include photo numbers here or on a separate sheet)*: No indicators of hydrophytic vegetation were present at the time of the site visit.

SOIL

Sampling Point: SP-2

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 5/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: Compacted sand and dense roots

Depth (inches): 4

Hydric Soil Present?

☐ Yes ☒ No

Remarks: No indicators of hydric soil were present at the time of the site visit. Compacted sand and dense roots were encountered at four inches below the soil surface.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/15/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-3

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S34 T2S R6W

Landform (hillslope, terrace, etc.) Flat in depression Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): L Lat: 42.259263 Long: -84.998245 Datum: NAD83

Soil Map Unit Name: Udipsamments and Udorthents, nearly level to steep NWI Classification: N/A

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☒	☐
Hydric Soil Present?	☒	☐
Wetland Hydrology Present?	☒	☐
Is the Sampled Area within a Wetland?	☒	☐

Remarks: Wetland 1 (W-1) is a Palustrine Emergent (PEM) wetland.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres on Living Roots (C3)
- ☒ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☐	☒	
Wetland Hydrology Present?	☒	☐	

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

Remarks: Oxidized Rhizospheres on Living Roots (C3), Presence of Reduced Iron (C4), Saturation Visible on Aerial Imagery (C9), and Geomorphic Position (D2).

VEGETATION – Use scientific names of plants Sampling Point: SP-3

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tilia americana*	5 %	Y	FACU
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	5 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)			
1. *Cornus racemosa*	10 %	Y	FAC
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	10 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)			
1. *Spartina pectinata*	60 %	Y	FACW
2. *Solidago gigantea*	15 %	N	FACW
3. *Ipomoea purpurea*	15 %	N	FACU
4. *Sagittaria latifolia*	5 %	N	OBL
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	95 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)			
1. *Vitis riparia*	5 %	Y	FAC
2.	%		
3.	%		
4.	%		
	5 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 % (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Remarks *(include photo numbers here or on a separate sheet)*: The Dominance Test confirmed hydrophytic vegetation at the time of the site visit.

SOIL

Sampling Point: SP-3

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/1	100					Silty Clay Loam	
2-14	10YR 3/1	75	5YR 4/6	15	C	M	Silty Clay Loam	
			2.5YR 5/6	10	C	M/PL		
14-20	10YR 3/1	75	2.5YR 5/6	15	C	M/PL	Silty Clay Loam	
			5YR 4/6	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____ Depth (inches): _____

Hydric Soil Present?

☒ Yes ☐ No

Remarks: Redox Dark Surface (F6) confirmed hydric soils.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/15/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-4

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S34 T2S R6W

Landform (hillslope, terrace, etc.) Hillslope Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR or MLRA): L Lat: 42.259361 Long: -84.998179 Datum: NAD83

Soil Map Unit Name: Udipsamments and Udorthents, nearly level to steep NWI Classification: N/A

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☐	☒
Hydric Soil Present?	☐	☒
Wetland Hydrology Present?	☐	☒
Is the Sampled Area within a Wetland?	☐	☒

Remarks: Sample Plot (SP)-4 is located adjacent to Wetland (W)-1.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☐	☒	
Wetland Hydrology Present?	☐	☒	

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

Remarks: No indicators of wetland hydrology were present at the time of the site visit.

VEGETATION – Use scientific names of plants Sampling Point: SP-4

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tilia americana*	25 %	Y	FACU
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	25 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)			
1. *Lonicera maackii*	30 %	Y	UPL
2. *Rhamnus cathartica*	10 %	Y	FAC
3. *Fraxinus pennsylvanica*	10 %	Y	FACW
4.	%		
5.	%		
6.	%		
7.	%		
	50 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)			
1. *Toxicodendron radicans*	20 %	Y	FAC
2. *Rosa multiflora*	10 %	Y	FACU
3. *Symphyotrichum lanceolatum*	10 %	Y	FACU
4. *Solidago altissima*	5 %	N	FACU
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	45 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)			
1. *Parthenocissus quinquefolia*	15 %	Y	FACU
2. *Vitis riparia*	10 %	Y	FAC
3.	%		
4.	%		
	25 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 44% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 %	(A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Remarks *(include photo numbers here or on a separate sheet)*: No indicators of hydrophytic vegetation were present at the time of the site visit.

SOIL

Sampling Point: SP-4

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/1	60					Sandy Clay	
	10YR 7/2	30						Sand
	10YR 4/4	10						
4-14	10YR 2/1	65					Sandy Clay	
	10YR 4/4	30						
	10YR 7/2	5						Sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: Compacted sand and dense roots

Depth (inches): 14

Hydric Soil Present?

☐ Yes ☒ No

Remarks: No indicators of hydric soil were present at the time of the site visit. Compacted sand and dense roots were encountered at 14 inches below the soil surface.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/15/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-5

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S34 T2S R6W

Landform (hillslope, terrace, etc.) Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): L Lat: 42.259304 Long: -85.002286 Datum: NAD83

Soil Map Unit Name: Kalamazoo loam, 0 to 2 percent slopes NWI Classification: PSS1C

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☒	☐
Hydric Soil Present?	☒	☐
Wetland Hydrology Present?	☒	☐
Is the Sampled Area within a Wetland?	☒	☐

Remarks: Wetland 2 (W-2) is a Palustrine Emergent (PEM)/Palustrine Scrub-Shrub (PSS) wetland located in the floodplain of the south branch of the Kalamazoo River.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☒ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☐	☒	
Wetland Hydrology Present?	☒	☐	

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

Remarks: Presence of Reduced Iron (C4) confirmed wetland hydrology.

VEGETATION – Use scientific names of plants Sampling Point: SP-5

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rhamnus cathartica*	10 %	Y	FAC
2. *Frangula alnus*	2 %	N	FAC
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	12 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Phalaris arundinacea*	60 %	Y	FACW
2. *Pueraria montana*	30 %	Y	UPL
3. *Solidago gigantea*	10 %	N	FACW
4. *Symphyotrichum lanceolatum*	5 %	N	FACW
5. *Rubus occidentalis*	2 %	N	UPL
6. *Amaranthus retroflexus*	2 %	N	FACU
7. *Lythrum salicaria*	2 %	N	OBL
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	111 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vitis riparia*	5 %	Y	FAC
2.	%		
3.	%		
4.	%		
	5 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 %	(A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Remarks *(include photo numbers here or on a separate sheet)*: The Dominance Test confirmed hydrophytic vegetation at the time of the site visit.

SOIL

Sampling Point: SP-5

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					Sandy Clay Loam	
2-16	10YR 3/1	70	7.5YR 4/6	10	C	M	Sandy Clay Loam	
	10YR 6/2	20						Sand
16-24	10YR 3/1	60	7.5YR 4/6	10	C	M	Sandy Clay Loam	
	10YR 6/2	20	10YR 5/1	10	C	M		Sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____ Depth (inches): _____

Hydric Soil Present?

☒ Yes ☐ No

Remarks: Redox Dark Surface (F6) confirmed hydric soils.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/15/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-6

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S34 T2S R6W

Landform (hillslope, terrace, etc.) Hillslope Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR or MLRA): L Lat: 42.259416 Long: -85.002173 Datum: NAD83

Soil Map Unit Name: Kalamazoo loam, 0 to 2 percent slopes NWI Classification: PSS1C

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☒	☐
Hydric Soil Present?	☐	☒
Wetland Hydrology Present?	☐	☒
Is the Sampled Area within a Wetland?	☐	☒

Remarks: Sample Plot (SP)-6 is located adjacent to Wetland (W)-2.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☐	☒	
Wetland Hydrology Present?	☐	☒	

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

Remarks: No indicators of wetland hydrology were present at the time of the site visit.

VEGETATION – Use scientific names of plants Sampling Point: SP-6

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus palustris*	40 %	Y	FACW
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	40 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)			
1. *Rhamnus cathartica*	15 %	Y	FAC
2. *Frangula alnus*	15 %	Y	FAC
3. *Quercus palustris*	2 %	N	FACW
4.	%		
5.	%		
6.	%		
7.	%		
	50 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)			
1. *Toxicodendron radicans*	20 %	Y	FAC
2. *Solidago altissima*	20 %	Y	FACU
3. *Lysimachia nummularia*	5 %	N	FACW
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	45 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)			
1. *Toxicodendron radicans*	20 %	Y	FAC
2. *Parthenocissus quinquefolia*	15 %	Y	FACU
3.	%		
4.	%		
	35 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 71% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 %	(A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Remarks *(include photo numbers here or on a separate sheet)*: The Dominance Test confirmed hydrophytic vegetation.

SOIL Sampling Point: SP-6

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/3	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: Rock Depth (inches): 4

Hydric Soil Present?

☐ Yes ☒ No

Remarks: No indicators of hydric soil were present at the time of the site visit. Rock was encountered at four inches below the soil surface.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/15/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-7

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S33 T2S R6W

Landform (hillslope, terrace, etc.) Flat in depression Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): L Lat: 42.260272 Long: -85.00339 Datum: NAD83

Soil Map Unit Name: Kalamazoo loam, 0 to 2 percent slopes NWI Classification: PEM1C

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☒	☐
Hydric Soil Present?	☒	☐
Wetland Hydrology Present?	☒	☐
Is the Sampled Area within a Wetland?	☒	☐

Remarks: Wetland 3 (W-3) is a Palustrine Emergent (PEM) wetland.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☒ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☒ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☒	☐	18
Saturation Present? (includes capillary fringe)	☒	☐	15
Wetland Hydrology Present?	☒	☐	

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

Remarks: Hydrogen Sulfide Odor (C1), Presence of Reduced Iron (C4), Saturation Visible on Aerial Imagery (C9), Geomorphic Position (D2), and FAC-Neutral Test (D5) confirmed wetland hydrology.

VEGETATION – Use scientific names of plants Sampling Point: SP-7

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)			
1. *Phalaris arundinacea*	90 %	Y	FACW
2. *Scirpus cyperinus*	5 %	N	OBL
3. *Carex sp.*	5 %	N	UNK
4. *Lythrum salicaria*	2 %	N	OBL
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	102 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
	0 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 %	(A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☒ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Remarks *(include photo numbers here or on a separate sheet)*: The Rapid Test for Hydrophytic Vegetation confirmed hydrophytic vegetation at the time of the site visit. The sedge species (*Carex* sp.) could not be identified to the species level at the time of the site investigation. The identification of this species would not change the hydrophytic vegetation determination.

SOIL

Sampling Point: SP-7

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					Silty Clay Loam	
6-15	10YR 2/1	90	5YR 3/4	10	C	M	Silty Clay Loam	
15-20	10YR 2/1	100					Sandy Clay Loam	Pebbles present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____ Depth (inches): _____

Hydric Soil Present?

☒ Yes ☐ No

Remarks: Redox Dark Surface (F6) confirmed hydric soils.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/15/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-8

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S33 T2S R6W

Landform (hillslope, terrace, etc.) Hillslope Local relief (concave, convex, none): Concave Slope (%): 10

Subregion (LRR or MLRA): L Lat: 42.260342 Long: -85.003483 Datum: NAD83

Soil Map Unit Name: Kalamazoo loam, 0 to 2 percent slopes NWI Classification: N/A

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☒	☐
Hydric Soil Present?	☐	☒
Wetland Hydrology Present?	☐	☒
Is the Sampled Area within a Wetland?	☐	☒

Remarks: Sample Plot (SP)-8 is located adjacent to Wetland (W)-3.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☐	☒	
Wetland Hydrology Present?	☐	☒	

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

Remarks: No indicators of wetland hydrology were present at the time of the site visit.

VEGETATION – Use scientific names of plants Sampling Point: SP-8

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)			
1. *Phalaris arundinacea*	90 %	Y	FACW
2. *Cirsium arvense*	5 %	N	FACU
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	95 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
	0 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 %	(A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☒ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Remarks *(include photo numbers here or on a separate sheet)*: The Rapid Test for Hydrophytic Vegetation confirmed hydrophytic vegetation.

SOIL

Sampling Point: SP-8

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/4	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: Rock Depth (inches): 8

Hydric Soil Present?

☐ Yes ☒ No

Remarks: No indicators of hydric soil were present at the time of the site visit. Rock was encountered at eight inches below the soil surface.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/15/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-9

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S33 T2S R6W

Landform (hillslope, terrace, etc.) Hillslope Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR or MLRA): L Lat: 42.26013 Long: -85.01465 Datum: NAD83

Soil Map Unit Name: Oshtemo sandy loam, 18 to 35 percent slopes NWI Classification: N/A

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☒	☐
Hydric Soil Present?	☒	☐
Wetland Hydrology Present?	☒	☐
Is the Sampled Area within a Wetland?	☒	☐

Remarks: Wetland 4 (W-4) is a Palustrine Emergent (PEM) wetland.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☒ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☒	☐	16
Saturation Present? (includes capillary fringe)	☒	☐	10
Wetland Hydrology Present?	☒	☐	

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

Remarks: Saturation (A3), Saturation Visible on Aerial Imagery (C9), and FAC-Neutral Test (D5) confirmed wetland hydrology.

VEGETATION – Use scientific names of plants Sampling Point: SP-9

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)			
1. *Phalaris arundinacea*	40 %	Y	FACW
2. *Spartina pectinate*	20 %	Y	FACW
3. *Lythrum salicaria*	20 %	Y	OBL
4. *Eupatorium perfoliatum*	10 %	N	FACW
5. *Eutrochium purpureum*	5 %	N	FAC
6. *Campanulastrum americanum*	2 %	N	FAC
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	97 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
	0 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 %	(A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☒ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Remarks *(include photo numbers here or on a separate sheet)*: The Rapid Test for Hydrophytic Vegetation confirmed hydrophytic vegetation at the time of the site visit.

SOIL Sampling Point: SP-9

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	95	5YR 4/4	5	C	M	Sandy Clay Loam	
16-20	10YR 2/1	83	10Y 6/1	15	C	M	Sandy Clay Loam	
			10GY 4/1	2	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____ Depth (inches): _____

Hydric Soil Present?

☒ Yes ☐ No

Remarks: Redox Dark Surface (F6) confirmed hydric soils.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/15/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-10

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S33 T2S R6W

Landform (hillslope, terrace, etc.) Hillslope Local relief (concave, convex, none): Concave Slope (%): 20

Subregion (LRR or MLRA): L Lat: 42.260192 Long: -85.014657 Datum: NAD83

Soil Map Unit Name: Oshtemo sandy loam, 18 to 35 percent slopes NWI Classification: N/A

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☐	☒
Hydric Soil Present?	☐	☒
Wetland Hydrology Present?	☐	☒
Is the Sampled Area within a Wetland?	☐	☒

Remarks: Sample Plot (SP)-10 is located adjacent to Wetland (W)-4.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☐	☒	
Wetland Hydrology Present?	☐	☒	

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

Remarks: No indicators of wetland hydrology were present at the time of the site visit.

VEGETATION – Use scientific names of plants Sampling Point: SP-10

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Prunus serotina*	20 %	Y	FACU
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	20 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)			
1. *Salix nigra*	10 %	Y	OBL
2. *Acer saccharum*	10 %	Y	FACU
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	20 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)			
1. *Bromus inermis*	60 %	Y	UPL
2. *Solidago altissima*	30 %	Y	FACU
3. *Daucus carota*	5 %	N	UPL
4. *Symphyotrichum lanceolatum*	2 %	N	FACW
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	97 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)			
1. *Rubus allgheniensis*	30 %	Y	FACU
2. *Vitis riparia*	20 %	Y	FAC
3. *Rosa multiflora*	10 %	N	FACU
4.	%		
	60 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 29% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 % (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Remarks *(include photo numbers here or on a separate sheet)*: No indicators of hydrophytic vegetation were present at the time of the site visit.

SOIL Sampling Point: SP-10

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 5/2	70					Sandy Clay	
	10YR 7/2	30						Sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: Rock Depth (inches): 5

Hydric Soil Present?

☐ Yes ☒ No

Remarks: No indicators of hydric soil were present at the time of the site visit. Rock was encountered at five inches below the soil surface.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/16/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-11

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S27 T2S R6W

Landform (hillslope, terrace, etc.) Flat in depression Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): L Lat: 42.26554 Long: -84.999032 Datum: NAD83

Soil Map Unit Name: Adrian muck, 0 to 1 percent slopes NWI Classification: PEM1Cd

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☒	☐
Hydric Soil Present?	☒	☐
Wetland Hydrology Present?	☒	☐
Is the Sampled Area within a Wetland?	☒	☐

Remarks: Wetland 5 (W-5) is a Palustrine Emergent (PEM)/Palustrine Scrub-Shrub (PSS) wetland.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☒ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☒	☐	18
Wetland Hydrology Present?	☒	☐	

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

Remarks: Saturation Visible on Aerial Imagery (C9), Geomorphic Position (D2), and FAC-Neutral Test (D5) confirmed wetland hydrology.

VEGETATION – Use scientific names of plants Sampling Point: SP-11

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Cornus amomum*	20 %	Y	FACW
2. *Sambucus nigra*	15 %	Y	FACW
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	35 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Phalaris arundinacea*	40 %	Y	FACW
2. *Symphyotrichum lanceolatum*	25 %	Y	FACW
3. *Carex vulpinoidea*	20 %	Y	OBL
4. *Rubus occidentalis*	5 %	N	UPL
5. *Eutrochium purpureum*	2 %	N	FAC
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	92 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vitis riparia*	20 %	Y	FAC
2.	%		
3.	%		
4.	%		
	20 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 % (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Remarks *(include photo numbers here or on a separate sheet)*: The Dominance Test confirmed hydrophytic vegetation at the time of the site visit.

SOIL

Sampling Point: SP-11

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					Silty Clay Loam	
2-6	10YR 2/1	90	5YR 3/4	10	C	M	Silty Clay Loam	
6-20	10YR 2/1	83	5YR 3/4	5	C	M	Silty Clay Loam	Gravel present
			10YR 5/1	10	D	M		
			N 2.5/0	2	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☒ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____ Depth (inches): _____

Hydric Soil Present?

☒ Yes ☐ No

Remarks: Redox Dark Surface (F6) and Depleted Dark Surface (F7) confirmed hydric soils.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/16/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-12

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S27 T2S R6W

Landform (hillslope, terrace, etc.) Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): L Lat: 42.26562 Long: -84.99919 Datum: NAD83

Soil Map Unit Name: Oshtemo sandy loam, 12 to 18 percent slopes NWI Classification: N/A

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☐	☒
Hydric Soil Present?	☐	☒
Wetland Hydrology Present?	☐	☒
Is the Sampled Area within a Wetland?	☐	☒

Remarks: Sample Plot (SP)-12 is located adjacent to Wetland (W)-5.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☐	☒	
Wetland Hydrology Present?	☐	☒	

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

Remarks: No indicators of wetland hydrology were present at the time of the site visit.

VEGETATION – Use scientific names of plants Sampling Point: SP-12

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Prunus serotina*	5 %	Y	FACU
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	5 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)			
1. *Juglans nigra*	2 %	N	FACU
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	2 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)			
1. *Rubus occidentalis*	25 %	Y	UPL
2. *Phalaris arundinacea*	20 %	Y	FACW
3. *Amaranthus retroflexus*	20 %	Y	FACU
4. *Solidago altissima*	5 %	N	FACU
5. *Urtica dioica*	1 %	N	FAC
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	97 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)			
1. *Vitis riparia*	5 %	Y	FAC
2.	%		
3.	%		
4.	%		
	5 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 %	(A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Remarks *(include photo numbers here or on a separate sheet)*: No indicators of hydrophytic vegetation were present at the time of the site visit.

SOIL

Sampling Point: SP-12

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/2	80					Sandy Clay Loam	
	10YR 7/2	20						Sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: Compacted clay Depth (inches): 12

Hydric Soil Present?

☐ Yes ☒ No

Remarks: No indicators of hydric soil were present at the time of the site visit. Compacted clay was encountered at 12 inches below the soil surface.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/16/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-13

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S27 T2S R6W

Landform (hillslope, terrace, etc.) Flat in depression Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): L Lat: 42.262835 Long: -84.999123 Datum: NAD83

Soil Map Unit Name: Kalamazoo loam, 6 to 12 percent slopes NWI Classification: N/A

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☒	☒	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☐ Yes ☒ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☐	☒
Hydric Soil Present?	☐	☒
Wetland Hydrology Present?	☒	☐
Is the Sampled Area within a Wetland?	☐	☒

Remarks: Sample Plot (SP)-13 is located in a farmed area near Wetland W-5. Vegetation and soil are disturbed due to active agricultural activities occurring at the sample plot location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☐	☒	
Wetland Hydrology Present?	☒	☐	

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

Remarks: Saturation Visible on Aerial Imagery (C9) and Geomorphic Position (D2) confirmed wetland hydrology.

VEGETATION – Use scientific names of plants Sampling Point: SP-13

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)			
1. *Echinochloa crus-galli*	40 %	Y	FAC
2. *Glycine max*	20 %	Y	UPL
3. *Plantago lanceolata*	5 %	N	FACU
4. *Solanum carolinense*	2 %	N	FACU
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	67 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
	0 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	40 %	x 3 =	120
FACU species	7 %	x 4 =	28
UPL species	20 %	x 5 =	100
Column Totals:	67 %	(A)	248 (B)

Prevalence Index = B/A = 3.7

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Remarks *(include photo numbers here or on a separate sheet)*: No indicators of hydrophytic vegetation were present at the time of the site visit.

SOIL

Sampling Point: SP-13

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	100					Sandy Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: Compacted clay Depth (inches): 4

Hydric Soil Present?

☐ Yes ☒ No

Remarks: No indicators of hydric soil were present at the time of the site visit. Compacted clay was encountered at four inches below the soil surface.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/16/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-14

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S30 T2S R6W

Landform (hillslope, terrace, etc.) Flat in depression Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): L Lat: 42.267565 Long: -85.053481 Datum: NAD83

Soil Map Unit Name: Histosols and Fluvaquents, frequently flooded NWI Classification: PEM1Ch

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☒	☐
Hydric Soil Present?	☒	☐
Wetland Hydrology Present?	☒	☐
Is the Sampled Area within a Wetland?	☒	☐

Remarks: Wetland 6 (W-6) is a Palustrine Emergent (PEM)/Palustrine Scrub-Shrub (PSS) wetland.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☒ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☒	☐	4
Water Table Present?	☒	☐	0
Saturation Present? (includes capillary fringe)	☒	☐	0
Wetland Hydrology Present?	☒	☐	

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

Remarks: Surface Water (A1), High Water Table (A2), Saturation (A3), Hydrogen Sulfide Odor (C1), Saturation Visible on Aerial Imagery (C9), Geomorphic Position (D2), and FAC-Neutral Test (D5) confirmed wetland hydrology.

VEGETATION – Use scientific names of plants Sampling Point: SP-14

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Cornus racemosa*	10 %	Y	FAC
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	10 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carex sp.*	30 %	Y	UNK
2. *Eleocharis palustris*	25 %	Y	OBL
3. *Lythrum alatum*	20 %	N	OBL
4. *Eupatorium perfoliatum*	10 %	N	FACW
5. *Caltha palustris*	10 %	N	OBL
6. *Typha angustifolia*	5 %	N	OBL
7. *Salix interior*	5 %	N	FACW
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	105 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.	%		
2.	%		
3.	%		
4.	%		
	0 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 % (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☒ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Remarks *(include photo numbers here or on a separate sheet)*: The Rapid Test for Hydrophytic Vegetation confirmed hydrophytic vegetation at the time of the site visit. The sedge species (*Carex* sp.) could not be identified to the species level at the time of the site investigation. The identification of the sedge species would not change the hydrophytic vegetation determination.

SOIL

Sampling Point: SP-14

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	80					Muck	
	10YR 6/1	20						Sand
2-20	10YR 2/1	80					Loam	
	10YR 7/2	20						Sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____ Depth (inches): _____

Hydric Soil Present?

☒ Yes ☐ No

Remarks: Hydrogen Sulfide (A4) confirmed hydric soils.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/16/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-15

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S30 T2S R6W

Landform (hillslope, terrace, etc.) Hillslope Local relief (concave, convex, none): Concave Slope (%): 10

Subregion (LRR or MLRA): L Lat: 42.267611 Long: -85.053338 Datum: NAD83

Soil Map Unit Name: Oshtemo sandy loam, 6 to 12 percent slopes NWI Classification: PEM1Ch

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☐	☐	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☒ Yes ☐ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☐	☒
Hydric Soil Present?	☐	☒
Wetland Hydrology Present?	☐	☒
Is the Sampled Area within a Wetland?	☐	☒

Remarks: Sample Plot (SP)-15 is located adjacent to Wetland (W)-6.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☐	☒	
Wetland Hydrology Present?	☐	☒	

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

Remarks: No indicators of wetland hydrology were present at the time of the site visit.

VEGETATION – Use scientific names of plants Sampling Point: SP-15

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rhus typhina*	40 %	Y	UPL
2. *Alnus glutinosa*	5 %	N	FACW
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	2 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Phalaris arundinacea*	30 %	Y	FACW
2. *Solidago altissima*	20 %	Y	FACU
3. *Rubus allegheniensis*	15 %	N	FACU
4. *Cirsium arvense*	10 %	N	FACU
5. *Arctium minus*	5 %	N	FACU
6. *Amaranthus retroflexus*	2 %	N	FACU
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	82 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.	%		
2.	%		
3.	%		
4.	%		
	0 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 %	(A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Remarks *(include photo numbers here or on a separate sheet)*: No indicators of hydrophytic vegetation were present at the time of the site visit.

SOIL Sampling Point: SP-15

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	N 2.5/0	100					Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: Rock Depth (inches): 16

Hydric Soil Present?

☐ Yes ☒ No

Remarks: No indicators of hydric soil were present at the time of the site visit. Rock was encountered at 16 inches below the soil surface.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/16/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-16

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S29 T2S R6W

Landform (hillslope, terrace, etc.) Flat in depression Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): L Lat: 42.275056 Long: -85.023042 Datum: NAD83

Soil Map Unit Name: Oshtemo sandy loam, 0 to 6 percent slopes NWI Classification: N/A

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☒	☒	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☐ Yes ☒ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☒	☐
Hydric Soil Present?	☒	☐
Wetland Hydrology Present?	☒	☐
Is the Sampled Area within a Wetland?	☒	☐

Remarks: Wetland 7 (W-7) is a farmed wetland. Vegetation and soil are disturbed due to active agricultural activities occurring at the sample plot location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☒	☐	0
Wetland Hydrology Present?	☒	☐	

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

Remarks: Saturation (A3) and Geomorphic Position (D2) confirmed wetland hydrology.

VEGETATION – Use scientific names of plants Sampling Point: SP-16

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	0 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
	0 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 %	(A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☒ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Remarks *(include photo numbers here or on a separate sheet)*: No vegetation was observed within the sample plot due to the location occurring within an agricultural field. Due to the position in the landscape, slope, and landform, and presence of wetland hydrology and hydric soil indicators it is assumed hydrophytic vegetation would be present if agricultural activities were to cease.

SOIL

Sampling Point: SP-16

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	80	5YR 5/6	20	C	M	Sandy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: Rock Depth (inches): 6

Hydric Soil Present?

☒ Yes ☐ No

Remarks: Redox Dark Surface (F6) confirmed hydric soils. Rock was encountered at six inches below the soil surface.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Marshall Mega Site City/County: Marshall Township Calhoun County Sampling Date: 9/16/21

Applicant/Owner: Marshall Area Economic Development Alliance State: MI Sampling Point: SP-17

Investigator(s): Burns & McDonnell (EJM & AO) Section, Township, Range: S29 T2S R6W

Landform (hillslope, terrace, etc.) Hillslope Local relief (concave, convex, none): Concave Slope (%): 15

Subregion (LRR or MLRA): L Lat: 42.275082 Long: -85.022981 Datum: NAD83

Soil Map Unit Name: Oshtemo sandy loam, 0 to 6 percent slopes NWI Classification: N/A

Are climate/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No *(If no, explain in Remarks)*

	Vegetation	Soil	Hydrology
Significantly Disturbed?	☒	☒	☐
Naturally Problematic?	☐	☐	☐

Are "Normal Circumstances" present? ☐ Yes ☒ No

(If needed, explain any answers in Remarks)

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

	Yes	No
Hydrophytic Vegetation Present?	☐	☒
Hydric Soil Present?	☐	☒
Wetland Hydrology Present?	☐	☒
Is the Sampled Area within a Wetland?	☐	☒

Remarks: Sample Plot (SP)-17 is located adjacent to Wetland (W)-7 within an agricultural field. Vegetation and soil are disturbed due to active agricultural activities occurring at the sample plot location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators *(minimum of one required; check all that apply)*

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators *(minimum of two required)*

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:	Yes	No	Depth (inches):
Surface Water Present?	☐	☒	
Water Table Present?	☐	☒	
Saturation Present? (includes capillary fringe)	☐	☒	
Wetland Hydrology Present?	☐	☒	

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

Remarks: No indicators of wetland hydrology were present at the time of the site visit.

VEGETATION – Use scientific names of plants Sampling Point: SP-17

Tree Stratum (Plot size: 30 ft. x 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	0 % = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft. x 15 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
	2 % = Total Cover		

Herb Stratum (Plot size: 5 ft. x 5 ft.)			
1. *Zea mays*	40 %	Y	UPL
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
12.	%		
	40 % = Total Cover		

Woody Vine Stratum (Plot size: 30 ft. x 30 ft.)			
1.	%		
2.	%		
3.	%		
4.	%		
	0 % = Total Cover		

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	%	x 1 =	0
FACW species	%	x 2 =	0
FAC species	%	x 3 =	0
FACU species	%	x 4 =	0
UPL species	%	x 5 =	0
Column Totals:	0 %	(A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? ☐ Yes ☒ No

Remarks *(include photo numbers here or on a separate sheet)*: No indicators of hydrophytic vegetation were present at the time of the site visit.

SOIL

Sampling Point: SP-17

Profile Description: (*Describe to the depth needed to document the indicator or confirm the absence of indicators.)*

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	70					Sand	Gravel present
	10YR 4/3	30						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR, K, L**)
- ☐ Thin Dark Surface (S9) (**LRR, K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR, K, L**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: Rock Depth (inches): 2

Hydric Soil Present?

☐ Yes ☒ No

Remarks: No indicators of hydric soil were present at the time of the site visit. Rock was encountered at two inches below the soil surface.

APPENDIX C - SITE PHOTOGRAPHS

Photograph C-1: View of Sample Plot (SP)-1, facing southwest, towards palustrine emergent (PEM) Wetland (W)-1.

Photograph C-2: View of SP-2, facing north, in upland adjacent to W-1.

Photograph C-3: View of SP-3, facing west, towards PEM W-1.

Photograph C-4: View of SP-4, facing northeast, in upland adjacent to W-1.

Photograph C-5: View of SP-5, facing south towards palustrine emergent/ palustrine scrub-shrub (PEM/PSS) W-2.

Photograph C-6: View of SP-6, facing southwest, in upland adjacent to W-2.

Photograph C-7: View of SP-7, facing southeast towards PEM W-3.

Photograph C-8: View of SP-8, facing southeast, in upland adjacent to W-3.

Photograph C-9: View of SP-9, facing southeast towards PEM W-4.

Photograph C-10: View of SP-10, facing south, in upland adjacent to W-4.

Photograph C-11: View of SP-11, facing southeast toward PEM/PSS W-5.

Photograph C-12: View of SP-12, facing east, in upland adjacent to W-5.

Photograph C-13: View of SP-13, facing north, in upland within an agricultural field.

Photograph C-14: View of SP-14, facing southeast toward PEM/PSS W-6.

Photograph C-15: View of SP-15, facing south, in upland adjacent to W-6.

Photograph C-16: View of SP-16, facing west toward PEMf W-7.

Photograph C-17: View of SP-17, facing east, in upland adjacent to W-7.