

# **INCIDENTAL TAKE AUTHORIZATION APPLICATION AND CONSERVATION PLAN:**

**ILLINOIS CHORUS FROG (*Pseudacris illinoensis*)**

**PLAINS HOG-NOSED SNAKE (*Heterodon nasicus*)**

**North Morgan Water Coop**

**Willow Creek Phase  
Morgan and Cass Counties, Illinois**

**October 2020**

**JOB #17e3068**



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IL DESIGN FIRM REGISTRATION NO.: 184-000852

## **EXECUTIVE SUMMARY**

The purpose of this document is to describe the proposed North Morgan Water Coop **Willow Creek Phase** project and its potential effect on the Illinois Chorus Frog (*pseudacris illinoensis*) and the Plains Hog-Nosed Snake (*Heterodon nasicus*). The North Morgan Water Coop is a not-for-profit water cooperative with 943 existing customers located throughout northern Morgan County, as well as portions extending into Cass and Sangamon Counties. The water system has been constructed in phases beginning with the Phase 1 Distribution system, followed by Phase 1 Extensions, Virginia Interconnect, West Loop Phase, and West Loop Phase Extensions, all of which are currently in operation. Construction of the Indian Creek Phase is beginning in the fall of 2019. The **overall** Willow Creek Phase project contains approximately 37.5 additional miles of water main construction and serves 93 possible water customers. The project area of concern and as described in this document encompasses approximately 15.5 miles of water main construction. During the Coop's coordination with the Illinois Department of Natural Resources (IDNR) regarding the aforementioned project on July 26, 2019 (IDNR Project Numbers 2000927, 2000928, 2000930 and 2000931) IDNR determined that the proposed project is likely to have an adverse impact on the Illinois Chorus Frog and Plains Hog-Nosed Snake and recommended the North Morgan Water Coop obtain Incidental Take Authorization (ITA) from the Departments Office of Resource Conservation. The information in this report came from various sources including Illinois Department of Natural Resources, Illinois Natural History Survey, United States Fish and Wildlife Service, USDA Natural Resources Conservation Service, and from on-site observation of the proposed project area and potential habitat.

This document shows that the possible taking of Illinois Chorus Frogs and the Plains Hog-Nosed Snake is incidental to the construction and necessary to North Morgan Water Coop Willow Creek Phase project. This document also demonstrates that the potential impact will be minimal, temporary, and explains the alternatives that were considered.

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- A. PROJECT LOCATION MAP
- B. NRCS SOIL MAPS
- C. NATIONAL WETLANDS INVENTORY MAP

## 1) DESCRIPTIONS

**A) SITE DESCRIPTION:** North Morgan Water Coop (NMWC) intends to construct Nine (9) separate water main extensions. The sites for the proposed NMWC improvements are located in Morgan and Cass Counties as far west as the Illinois River bottom near Meredosia and as far east as the Morgan/Sangamon County line south of Ashland in Morgan and Cass Counties. More specifically the nine individual extensions are located in the following sections, townships, and ranges:

1. **Sections 26 - 35, T-17-N, R-12-W, Cass County; Sections 1, 2, 11, & 14, T-16-N, R-13-W, Sections 2 - 6, 8 & 9, T-16-N, R-12-W, Morgan County.**
2. Sections 15 & 16, T-16-N, R-12-W, Morgan County.
3. Sections 9 & 16, T-16-N, R-11-W, Morgan County.
4. Sections 26 & 27, T-16-N, R-11-W, Morgan County.
5. Section 13, T-16-N, R-11-W, Sections 18 & 19, T-16-N, R-10-W, Morgan County.
6. Sections 29 - 32, T-16-N, R-10-W, Morgan County.
7. Sections 3 & 4, T-16-N, R-9-W, Morgan County.
8. Sections 13, 14, 22, 23, 26, 27, 28, T-16-N, R-9-W, Morgan County.
9. Sections 4, 5, 8, 9, 16, 17, 19, 20, 21, 29, 30, T-16-N, R-8-W, Morgan County.

**Exhibit A** is a project location map that shows the nine individual water main extensions for the **OVERALL** project. The area of concern for this Incidental Take Authorization Application and Conservation Report is shown as **Extension #1** above and on the project location map. Construction will typically take place on private property within easements granted by the landowner and will cross public roads permitted by the road authority. Easements and permits for the proposed project area have not all been granted yet, however, construction will not begin until legal access to the construction corridor is fully executed.

**B) BIOLOGICAL DESCRIPTIONS:** According the Illinois Natural History Survey website, the Illinois Chorus Frog (*Pseudacris illinoensis*) is a small (up to 4.7 cm SVL) tan to gray frog with dark brown or black lines on back, belly white and skin granular rather than smooth. Habitats include sand prairies and remnants such as sandy agricultural fields and waste areas. Sandy soils are required for the species to burrow underground, and much of the private easement property and proposed project site contain sand or sandy soils as shown on the soils maps included as **Exhibit B**. Ponded water is required for breeding pools during the spring when the species is above-ground. Except in years of very high rainfall causing flooding conditions, the proposed project site does not contain ponded or pooled water conducive to breeding. However, potential breeding habitat is located near the proposed water main route and is most likely within close enough proximity that frogs could potentially travel through the site.

The Plains Hog-nosed Snake (*Heterodon nasicus*) averages 15-25 inches in length. Its snout is upturned with a ridge on top. The belly is black, and the scales are keeled (ridged). The body is gray-tan with brown blotches. Habitats includes sand prairies, savannas and nearby woodlots. The Plains Hog-nosed snake is a slow-moving terrestrial snake. It uses mammal burrows to remain underground in cold or wet weather. Mating occurs in the spring. The female lays from 8 to ten eggs in sand in July. Eggs hatch in August or September.

**C) DESCRIPTION OF ACTIVITIES:** The activities that could possibly result in taking of Illinois Chorus Frogs and the Plains Hog-nose Snake are those that are required for the construction of the proposed water main, water services and the related appurtenances. A general description of those activities includes construction and heavy equipment traffic, trenching, excavation and

backfill of the water main route, and miscellaneous on-site activities related to construction. Typically, the water main is installed by a trencher, and a bulldozer follows behind the trencher backfilling the trench as construction proceeds. In general, the trenches are open for less than 60 minutes before being backfilled, while many times they are open for 15 minutes or less. Trenches are not left open overnight except in extenuating circumstances involving equipment failure or other unforeseeable scenarios. Once construction is complete, daily operation of the water system will not cause any further disturbance or adverse effects, except in the rare event of a water main break or other failure to the system. In those instances, disturbance would be very minimal and would be confined to the location of the failure. Suitable habitat for the Illinois Chorus Frog in the form of sandy soils appears to be present on approximately 60% of the project area according to the aforementioned soil maps, while nearly the entire project area is potential habitat for the Plains Hog-Nose Snake. The proposed water main route totals approximately 82,000 linear feet, however, the actual area of disturbance along the route is relatively minimal. A typical water main trench will have a width of 12" and be 4.5' to 5' in depth, which equals 1.9 acres of total subsurface disturbance along the entire route. Surface disturbance along the route is typically 20' in width or less, but for the purposes of this report a width of 20' is utilized, therefore surface disturbance equals 37.6 acres. The work will typically take place on private easements adjacent to public road rights-of-way and will cross several private landowners along the route. Exceptions to this will be in the cases of public road crossings, avoidance of wetlands or other environmentally sensitive areas, and locations where landowners will not grant easements. Due to the proximity of the proposed project site to wetlands, woodlots, agricultural fields, and the sandy soil types present in the project area, and documented records of the species in the vicinity, adverse effects to the species are anticipated. A National Wetlands Inventory Map indicating the proximity of the proposed project site to recognized wetlands is included as **Exhibit C**. The anticipated start date of construction is not yet known, and work in the area should last 2-3 months potentially. However, the project site could hold the species year-round. Wetland areas that are encountered, will be directionally bored if inundated at the time of construction. Farm ground that is disturbed will be returned back to normal farming practices and all other areas will be fertilized and reseeded at the conclusion of the project leaving no permanent disturbance. It is not possible to determine exactly how many individuals of each species will be taken by the project, especially because the time of year of construction can change the type of impact. An estimate of the individuals to be taken based on the above descriptions and activities, and the below measures to be implemented is that a maximum take of 10 – 15 individuals of each species is possible. A general timeline of planning and construction activities and the type of disturbance associated with each activity is as follows:

- All permits and easements for the water main route granted, bids received, project awarded to construction contractor, and notice to proceed issued (all pre-construction requirements completed) – No project area disturbance or adverse effects.
- Limits of construction and permanent easements marked – No project area disturbance or adverse effects.
- Construction initiated and water main materials strung along project route on the day of, or one day prior to water main installation. Only the approximate amount of water main to be installed in the following 24 hours is laid out along the route – Surface disturbance from vehicle traffic only.
- Trenching/Directional Boring of water main, and backfilling of trenches – Surface and subsurface disturbance from trencher, bulldozer, boring machine, and construction traffic.
- Water mains pressure tested, disinfected, flushed, bacteriological samples collected, and operating permit received from IEPA – No project area disturbance or adverse effects.

- Water system in operation – No project area disturbance or adverse effects except rare instances as described in this report.

**D) DESCRIPTION OF ANTICIPATED ADVERSE EFFECTS:** Due to the proposed project location, soil types of the site, and proposed construction activities, the anticipated adverse effects are expected to be limited to the construction duration. Long-term adverse effects are not anticipated. With the exception of the associated piping, after construction is complete the site will be returned to the same use and will be maintained the same as is currently practiced. The highest probability of adverse effects comes from the possibility of frogs and snakes entering in or traveling through the project area during construction activities, or from excavation in potential burrowing habitat. Adverse effects to breeding pools are not of concern during construction or operation of the proposed equipment because no known pools are located on the site. The areas that hold water for extended periods include those indicated on the wetlands map.

## **2) MINIMIZATION AND MITIGATION MEASURES:**

**A) PLANS TO MINIMIZE THE AREA EFFECTED BY THE PROPOSED ACTION:** Breeding habitat for the chorus frog will not be effected by this project, but due to the potential for hog-nosed snakes to lay eggs in the sand, there is the potential that nests could be affected dependent upon the time of year when construction occurs. Only the minimum area needed will be utilized for the construction of the proposed improvements and all work will take place within the limits of the temporary and permanent easements and permitted roadway crossings, and the timeframe will be limited to the duration of construction. Surface disturbance in the project area will be kept minimal, underground disturbance will involve trenching and boring. Wetland, creek and road/ditch crossings will be directional bored instead of open cut. As previously mentioned, approximately 37.6 acres of surface disturbance of potential chorus frog and hog-nosed snake habitat will be temporarily affected by construction, however due to construction methods and actual current land use a much smaller footprint of potential impact will be realized. The utilization of directional boring for water main construction, the short duration of the construction traffic, and the minimal width of trench used for placing water main significantly reduces the possibility of impact.

**B) PLANS FOR MANAGEMENT OF THE AREA EFFECTED BY THE PROPOSED ACTION:** After construction, the water mains will be located within permanent easements on private property and the areas will be returned to their original state. Only in the event of a water main break will the area be disturbed as a result of this project after construction is complete. In those instances, the disturbance is kept very minimal due to the ability of locating a break in the water main with great accuracy. The effects of this project on the chorus frog and hog-nosed snake will be of short duration with no anticipated long term affects.

**C) DESCRIPTION OF IMPLEMENTED MEASURES TO AVOID, MINIMIZE, AND MITIGATE THE EFFECTS OF THE PROPOSED ACTION:** As stated above, disturbed areas will be either reseeded or returned to normal farming practices, dependent on the land use at the time of construction. Only infrequent and isolated instances of future disturbance could be necessary. Any future disturbances will follow the guidelines set forth in this report. During construction, trenches will be kept open for as short of duration as practicable to reduce the possibility of either species becoming trapped in a trench. As mitigation for the potential take of the Illinois Chorus Frog and the Plains Hog-nosed Snake, the cooperative will provide compensatory funds in the amount of \$1,929.00 to be placed in the Illinois Wildlife Preservation Fund earmarked for the conservation benefit of the species to support acquisition or protection of habitat, or

research on the species life history needs. The below table reflects the quantity of land types to be affected, the calculations used to determine the mitigation acres, and the mitigation value for each land type:

LAND TYPE	LINEAR FEET	IMPACT WIDTH	TOTAL ACRES	5.5:1 MITIGATION RATIO MULTIPLIER	VALUE (\$/ACRE)	MITIGATION VALUE
Crop/Hay	64,590	12" Trench	1.5	8.25 Acres	\$200	<b>\$1,650.00</b>
Residential	5,450	No Impact	N/A	N/A	N/A	<b>\$0</b>
Forested	3,240 @	12" Trench	0.07	9.0 Acres	\$15	<b>\$135.00</b>
	3,240 @	20' Corridor	1.5			
Grasses	5,480	12" Trench	0.13	0.72 Acres	\$200	<b>\$144.00</b>
<b>TOTAL</b>						<b>\$1,929.00</b>

**D) PLANS FOR MONITORING THE EFFECTS OF MEASURES IMPLEMENTED:** The NMWC will maintain and monitor the water system according to IEPA requirements and the requirements set forth by IDNR in regard to threatened and endangered species. Future correspondence with IDNR Office of Resource Conservation will be initiated if future disturbances are necessary.

**E) ADAPTIVE MANAGEMENT PRACTICES:** Adaptations to the management practices will be necessary dependent upon the time of year when construction occurs. If construction occurs during months when the species is burrowed, the potential for taking the species will be limited to excavation activities. If during time periods when the species are potentially above-ground or breeding, additional concerns arise with construction traffic and the potential for taking the species due to their presence in the work area. Equipment staging areas will not be located in sandy soils or drainage ditch areas, on-site personnel will be educated on how to identify the species and photos of the species will be displayed in the work area. If either species is identified in the work area, they will be avoided or allowed to leave the work area. The encounters will be documented and IDNR will be contacted immediately to determine a plan to preserve and protect them.

**F) VERIFICATION OF FUNDING:** The funds needed to mitigate and minimize the impact on the Illinois Chorus Frog and the Hognose Snake as stated in this document are through USDA-Rural Development loan and grant. The funds are available to cover cost associated with mitigation efforts as well as those needed to complete the proposed project.

**3) DESCRIPTION OF ALTERNATIVE ACTION:**

**A) NO ACTION:** This alternative would leave residents of the NMWC service area with the current problem they face. Currently they rely on private dug wells that do not supply the quality or quantity of water necessary to carry out domestic or farming activities. Due to location of the wells in farming communities, the water supplies are subject to contamination from pesticides, fertilizers, herbicides and fecal coliforms from livestock waste runoff. "No Action" does not present a solution to this problem and is therefore not considered.

**B) ALTERNATIVES WITHIN THE PROPOSED PROJECT:** The only viable option to supply potable water to the service area is through expansion of the existing system. Alternatives within the proposed project pertain mostly to the water main route. The proposed route was selected according to customer location, ease of construction, and avoidance of certain areas. No matter



the route chosen to get the customers in this area, potential adverse effects to the species will exist.



- 4) **DATA / INFORMATION TO INDICATE NO REDUCTION OF SURVIVAL OF THE ILLINOIS CHORUS FROG AND PLAINS HOG-NOSED SNAKE:** The proposed improvements are planned to be constructed on private property adjacent to and within existing public road right-of-ways. As stated above, due to the location, current use, and soil types of the site, the anticipated adverse effects are expected to be limited to the construction period with no permanent adverse effects. Ponded water and recognized wetlands that are essential for frog breeding purposes do not exist on the site, but are located nearby as indicated by the National Wetlands Inventory Map included as **Exhibit C**. Due to the absence of wetlands and ponded areas, frogs will not inhabit the site for breeding purposes. The highest anticipated threat to the frogs is the possibility of harm from traveling through the project site, or from harm during excavation and boring. Life History information on the species indicates that the chorus frogs are only seen above ground during the spring breeding season and spend the remaining portions of the year below ground. Sand and sandy soils which are prevalent in the proposed project location are required for the frogs to burrow below ground. According to the Natural Resources Conservation Service Soil Survey Maps included as **Exhibit B**, sandy soils encompass approximately 60% of the proposed project site. Sandy soils and suitable habitat are not limited to the construction area but are prevalent throughout much of the ground in the Illinois River Bottoms. Current records for Illinois Chorus Frogs exist sporadically throughout the sandy soil areas along the east side of the Illinois River in Scott, Morgan, Cass, and Mason Counties, as well as in other parts of the state. Therefore, the small footprint of the project and the minimal disturbance that will take place for construction will not significantly impact overall Illinois Chorus Frog habitat. After the construction is completed, the project site will be much the same as its current state. Therefore, due to the current records and the information in this Conservation Plan specifically pertaining to the proposed project and its possible effects on the species, the proposed project will not reduce the likelihood of the survival of the threatened species in the wild in the State of Illinois.

As with the Illinois Chorus Frog, due to the location, current use, and soil types of the site, the anticipated adverse effects are expected to be limited to the construction period with no permanent adverse effects for the Plains Hog-Nosed Snake. The Plains Hog-Nosed Snake is most often observed crossing sandy roads in brushy, weedy, sand prairie remnants. Sandy soils are essential for breeding and burrowing purposes, and exist throughout the construction site, but also throughout much of the Illinois River Bottoms. The anticipated threat to the snakes is the possibility of harm from traveling through the project site during excavation and boring and from construction traffic, or the possibility of disturbing nests dependent upon the time of year that construction takes place. Life History information on the species indicates that the plains hog-nosed snake burrows to remain underground in cold or wet weather. The plains hog-nosed snake may be found in central Illinois along the Illinois River, the upper Mississippi River and in Kankakee County. The small footprint of the project and the minimal disturbance that will take place for construction will not significantly impact overall Plains Hog-Nosed Snake habitat. After the construction is completed, the project site will be much the same as the current state.

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**5) IMPLEMENTING AGREEMENT:**

The following parties certify their legal authority to carry out their respective obligations and responsibilities under this conservation plan (listed below) and comply with all other applicable federal state and local regulations:

NAME	TITLE	NAME (PRINT)	SIGNATURE	DATE
North Morgan Water CO-OP PO Box 1566 Jacksonville, IL 62651	OWNER	Rodney Becker, President		10-27-2020
Benton & Associates, Inc. 1970 W. Lafayette Jacksonville IL, 62650	ENGINEER	Jamie L. Headen, P.E.		10-27-2020

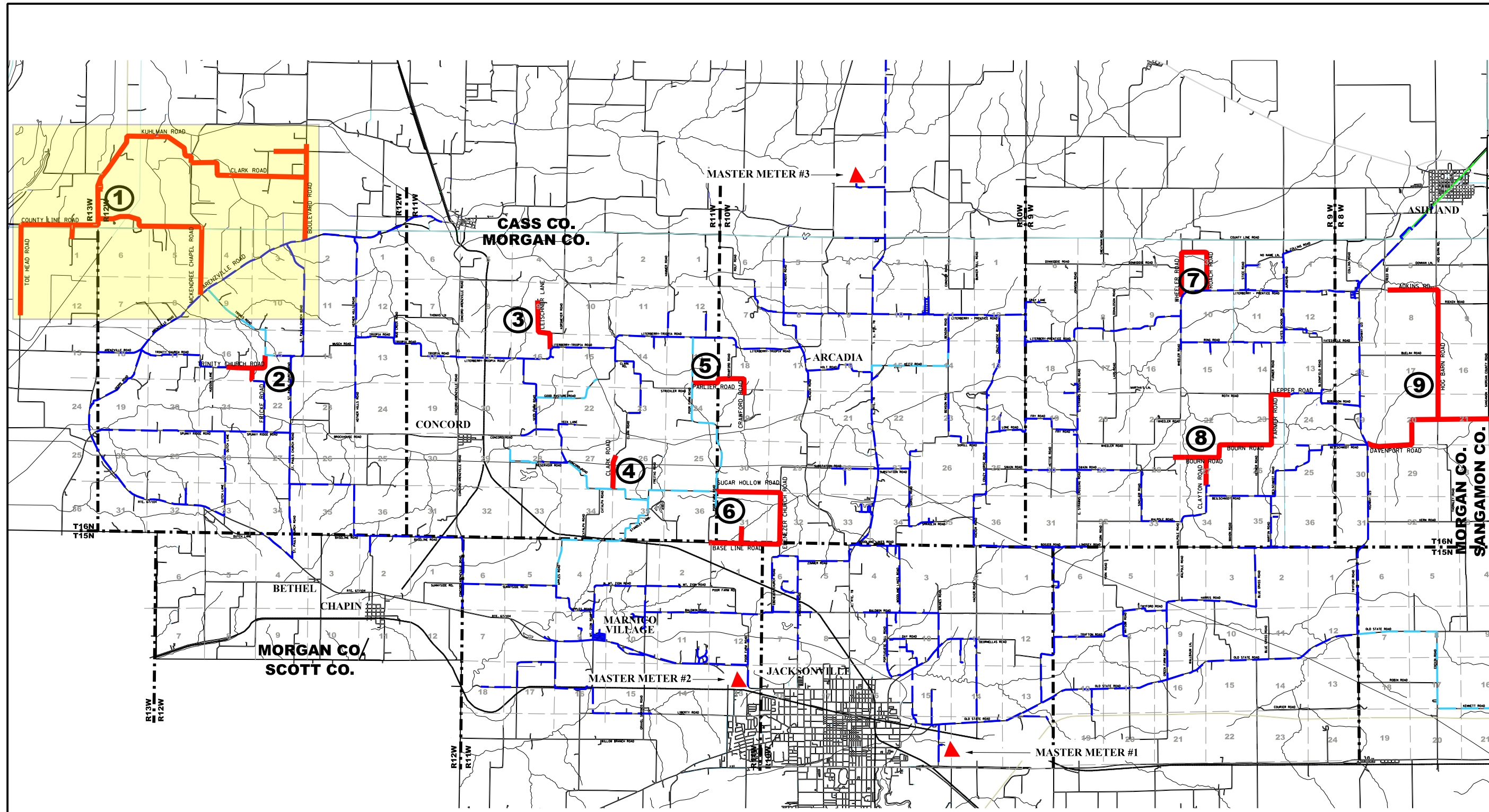
PROJECT CHECKLIST				
Item	Description	Responsible Party	Completion Date	
			Estimated	Actual (Sign & Date)
1	Verify Receipt of All Required Permits and Easements for Project	OWNER	October 2021	
2	Issue Notice for Project to Proceed	OWNER	January 2022	
3	Construction Completion	CONTRACTOR	January 2023	
4	Completion of Site Grading	CONTRACTOR	April 2023	
5	Completion of Seeding	CONTRACTOR	April 2023	
6	Completion of As-Built Drawings of Site	ENGINEER	May 2023	
7	Reseeding (if vegetation is not established)	OWNER/ CONTRACTOR	September 2023	
8	Conduct Post-Construction Surveys (if required)	OWNER/ ENGINEER	Spring/Summer 2024	
9	Submit Progress Reports (if required)	OWNER/ ENGINEER	Annually	

Note that the above Project Checklist will be updated as items are completed and will be re-submitted to the Department with annual progress reports.

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# **EXHIBIT A**

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**Water Main Extensions Section, Township, and Range Information**

1. Sections 26 - 35, T-17-N, R-12-W, Cass County;  
Sections 1, 2, 11, & 14, T-16-N, R-13-W, Sections 2 - 6, 8 & 9, T-16-N, R-12-W, Morgan County
2. Sections 15 & 16, T-16-N, R-12-W, Morgan County
3. Sections 9 & 16, T-16-N, R-11-W, Morgan County
4. Sections 26 & 27, T-16-N, R-11-W, Morgan County
5. Section 13, T-16-N, R-11-W, Sections 18 & 19, T-16-N, R-10-W, Morgan County
6. Sections 29 - 32, T-16-N, R-10-W, Morgan County
7. Sections 3 & 4, T-16-N, R-9-W, Morgan County
8. Sections 13, 14, 22, 23, 26, 27, 28, T-16-N, R-9-W, Morgan County
9. Sections 4, 5, 8, 9, 16, 17, 19, 20, 21, 29, 30, T-16-N, R-8-W, Morgan County



No.	Description	Date	Appr.

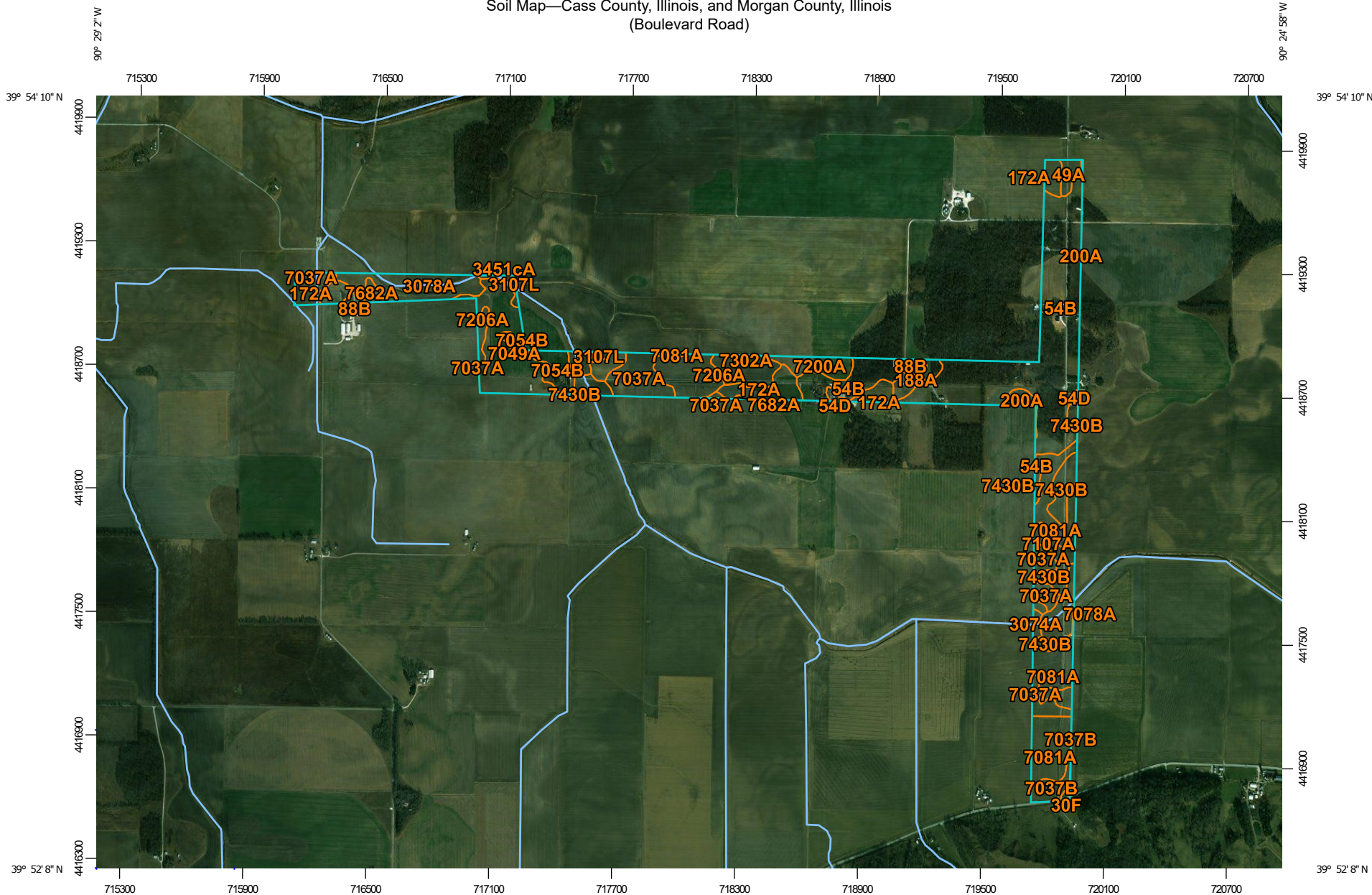
PROJECT LOCATION MAP  
 NORTH MORGAN WATER COOPERATIVE  
 WILLOW CREEK PHASE  
 MORGAN AND CASS COUNTIES, ILLINOIS  
**BENTON & ASSOCIATES, INC.**  
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 Kirksville Missouri  
 Macomb Illinois  
 St. Louis Missouri

Date: May, 2019  
 Designed by: David Hays  
 Drawn by: David Hays  
 Reviewed by: David Hays  
 Approved by: D.W. HAYS

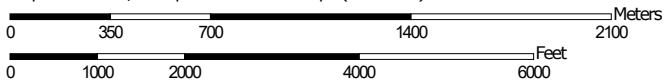
Job No. 17E3068

# **EXHIBIT B**

Soil Map—Cass County, Illinois, and Morgan County, Illinois  
(Boulevard Road)



Map Scale: 1:26,400 if printed on A landscape (11" x 8.5") sheet.




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

Soil Map—Cass County, Illinois, and Morgan County, Illinois  
(Boulevard Road)

**MAP LEGEND**

**Area of Interest (AOI)**

 Area of Interest (AOI)




















**Soils**







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

**Special Point Features**






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


**Water Features**

 Streams and Canals

**Transportation**

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

**Background**

 Aerial Photography

**MAP INFORMATION**

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:15,800.

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

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

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

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

Soil Survey Area: Cass County, Illinois  
Survey Area Data: Version 14, Sep 12, 2018

Soil Survey Area: Morgan County, Illinois  
Survey Area Data: Version 9, Sep 12, 2018

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Sep 25, 2013—Mar 6, 2017

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

## Map Unit Legend

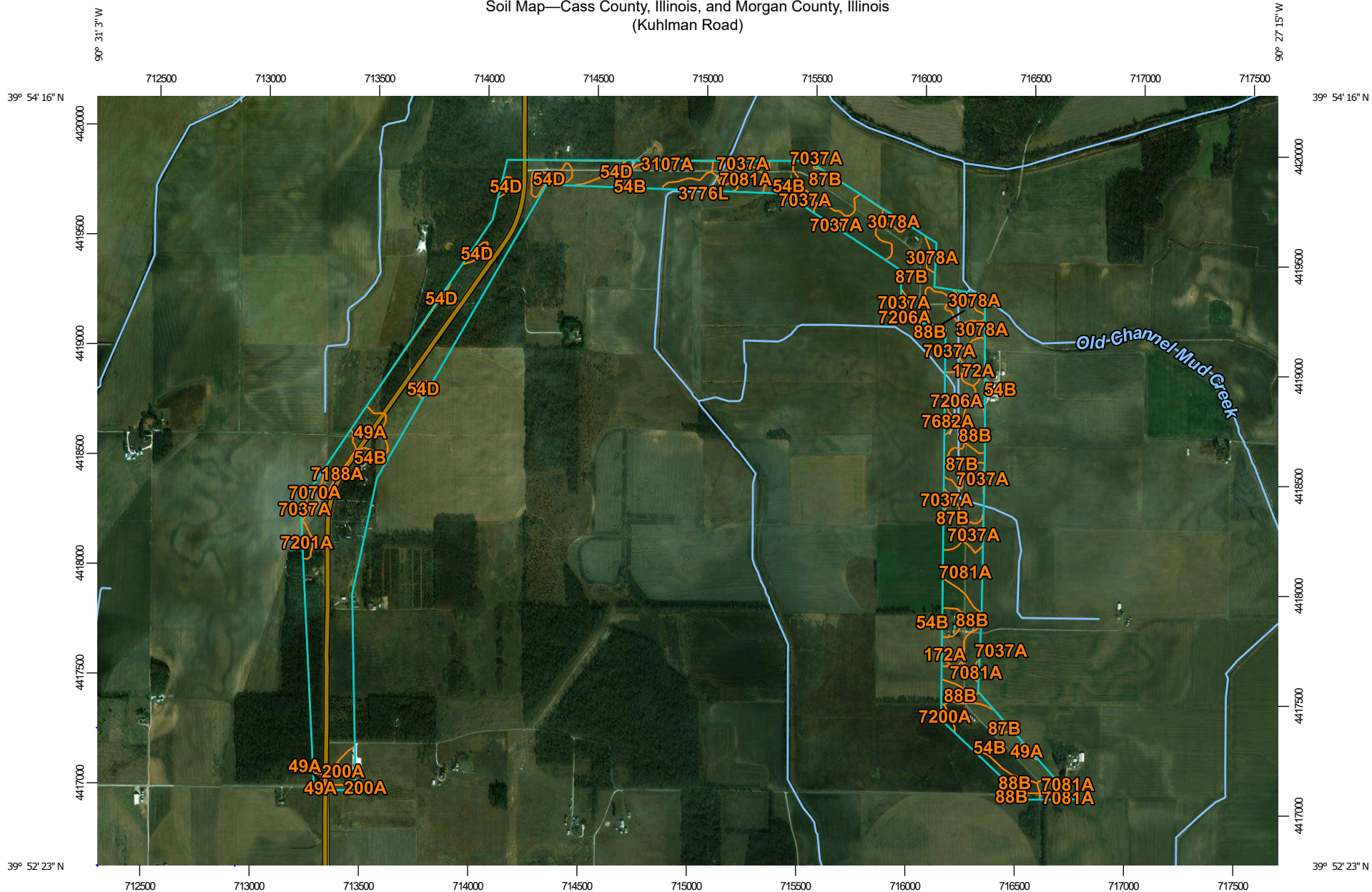
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
49A	Watseka loamy fine sand, 0 to 2 percent slopes	2.9	0.9%
54B	Plainfield sand, 1 to 7 percent slopes	100.7	29.3%
54D	Plainfield sand, 7 to 15 percent slopes	1.5	0.4%
88B	Sparta loamy sand, Illinois till plain, 2 to 6 percent slopes	3.3	1.0%
172A	Hoopeston sandy loam, 0 to 2 percent slopes	18.9	5.5%
188A	Beardstown loam, 0 to 2 percent slopes	5.0	1.4%
200A	Orio loam, 0 to 2 percent slopes	2.8	0.8%
3074A	Radford silt loam, 0 to 2 percent slopes, frequently flooded	1.2	0.3%
3078A	Arenzville silt loam, 0 to 2 percent slopes, frequently flooded	18.1	5.3%
3107L	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded, long duration	5.5	1.6%
3451cA	Lawson silt loam, cool mesic, 0 to 2 percent slopes, frequently flooded	3.6	1.1%
7037A	Worthen silt loam, 0 to 2 percent slopes, rarely flooded	58.2	16.9%
7049A	Watseka loamy fine sand, 0 to 2 percent slopes, rarely flooded	2.0	0.6%
7054B	Plainfield sand, 1 to 7 percent slopes, rarely flooded	7.1	2.1%
7078A	Arenzville silt loam, 0 to 2 percent slopes, rarely flooded	8.3	2.4%
7081A	Littleton silt loam, 0 to 2 percent slopes, rarely flooded	29.0	8.4%
7107A	Sawmill silty clay loam, 0 to 2 percent slopes, rarely flooded	4.6	1.4%
7200A	Orio loam, 0 to 2 percent slopes, rarely flooded	7.8	2.3%



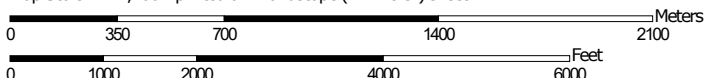
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
7206A	Thorp silt loam, 0 to 2 percent slopes, rarely flooded	16.0	4.7%
7302A	Ambraw clay loam, 0 to 2 percent slopes, rarely flooded	9.9	2.9%
7430B	Raddle silt loam, 2 to 5 percent slopes, rarely flooded	15.3	4.4%
7682A	Medway loam, 0 to 2 percent slopes, rarely flooded	2.1	0.6%
<b>Subtotals for Soil Survey Area</b>		<b>323.8</b>	<b>94.3%</b>
<b>Totals for Area of Interest</b>		<b>343.6</b>	<b>100.0%</b>

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
30F	Hamburg silt loam, 18 to 35 percent slopes	0.5	0.2%
7037B	Worthen silt loam, 2 to 5 percent slopes, rarely flooded	5.0	1.4%
7081A	Littleton silt loam, 0 to 2 percent slopes, rarely flooded	14.2	4.1%
<b>Subtotals for Soil Survey Area</b>		<b>19.7</b>	<b>5.7%</b>
<b>Totals for Area of Interest</b>		<b>343.6</b>	<b>100.0%</b>

Soil Map—Cass County, Illinois, and Morgan County, Illinois  
(Kuhlman Road)



Map Scale: 1:24,700 if printed on A landscape (11" x 8.5") sheet.




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



Soil Map—Cass County, Illinois, and Morgan County, Illinois  
(Kuhlman Road)

### MAP LEGEND

**Area of Interest (AOI)**

 Area of Interest (AOI)




















**Soils**






 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

**Special Point Features**






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


**Water Features**

 Streams and Canals

**Transportation**

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

**Background**

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:15,800.

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

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

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

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

Soil Survey Area: Cass County, Illinois  
Survey Area Data: Version 14, Sep 12, 2018

Soil Survey Area: Morgan County, Illinois  
Survey Area Data: Version 9, Sep 12, 2018

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Sep 25, 2013—Mar 6, 2017

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

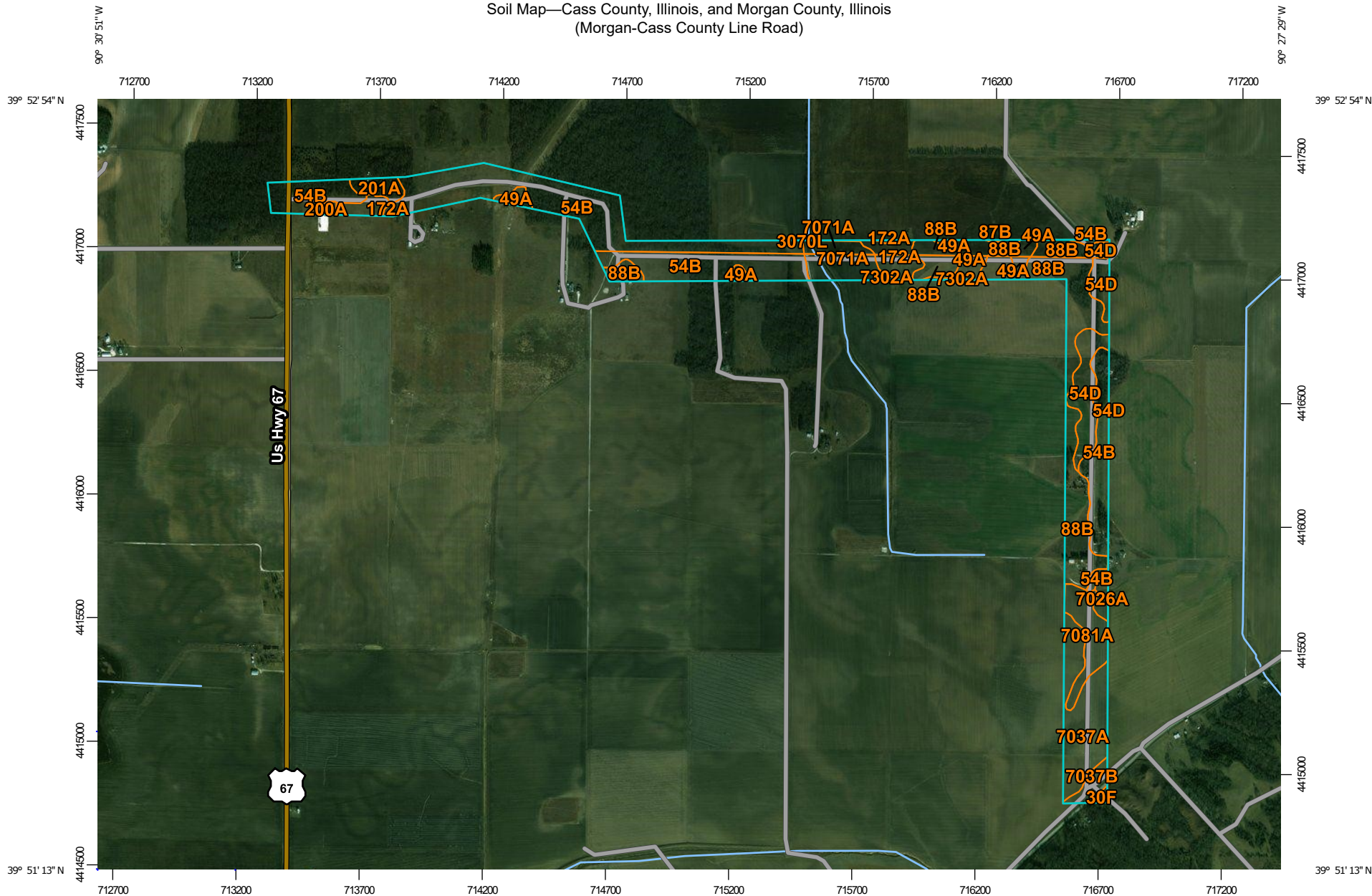
## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
49A	Watseka loamy fine sand, 0 to 2 percent slopes	7.2	2.1%
54B	Plainfield sand, 1 to 7 percent slopes	165.5	47.4%
54D	Plainfield sand, 7 to 15 percent slopes	11.3	3.2%
87B	Dickinson sandy loam, 2 to 5 percent slopes	38.8	11.1%
88B	Sparta loamy sand, Illinois till plain, 2 to 6 percent slopes	23.9	6.8%
172A	Hoopeston sandy loam, 0 to 2 percent slopes	12.2	3.5%
200A	Orio loam, 0 to 2 percent slopes	3.9	1.1%
3078A	Arenzville silt loam, 0 to 2 percent slopes, frequently flooded	5.0	1.4%
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded	9.1	2.6%
3776L	Comfrey clay loam, 0 to 2 percent slopes, frequently flooded, long duration	3.9	1.1%
7037A	Worthen silt loam, 0 to 2 percent slopes, rarely flooded	23.0	6.6%
7070A	Beaucoup silty clay loam, 0 to 2 percent slopes, rarely flooded	1.5	0.4%
7081A	Littleton silt loam, 0 to 2 percent slopes, rarely flooded	15.0	4.3%
7188A	Beardstown loam, 0 to 2 percent slopes, rarely flooded	4.6	1.3%
7200A	Orio loam, 0 to 2 percent slopes, rarely flooded	0.9	0.2%
7201A	Gilford fine sandy loam, 0 to 2 percent slopes, rarely flooded	1.5	0.4%
7206A	Thorp silt loam, 0 to 2 percent slopes, rarely flooded	8.1	2.3%
7682A	Medway loam, 0 to 2 percent slopes, rarely flooded	1.0	0.3%
8682A	Medway loam, 0 to 2 percent slopes, occasionally flooded	10.4	3.0%

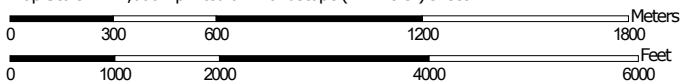
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
<b>Subtotals for Soil Survey Area</b>		<b>346.7</b>	<b>99.2%</b>
<b>Totals for Area of Interest</b>		<b>349.4</b>	<b>100.0%</b>

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
49A	Watseka loamy fine sand, 0 to 2 percent slopes	0.4	0.1%
54D	Plainfield sand, 7 to 15 percent slopes	0.8	0.2%
88B	Sparta loamy sand, Illinois till plain, 2 to 6 percent slopes	0.6	0.2%
200A	Orio loam, 0 to 2 percent slopes	0.7	0.2%
7081A	Littleton silt loam, 0 to 2 percent slopes, rarely flooded	0.2	0.1%
<b>Subtotals for Soil Survey Area</b>		<b>2.7</b>	<b>0.8%</b>
<b>Totals for Area of Interest</b>		<b>349.4</b>	<b>100.0%</b>

Soil Map—Cass County, Illinois, and Morgan County, Illinois  
(Morgan-Cass County Line Road)



Map Scale: 1:22,000 if printed on A landscape (11" x 8.5") sheet.




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



Soil Map—Cass County, Illinois, and Morgan County, Illinois  
(Morgan-Cass County Line Road)


### MAP LEGEND

**Area of Interest (AOI)**

 Area of Interest (AOI)




















**Soils**







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

**Special Point Features**






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


**Water Features**

 Streams and Canals

**Transportation**

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

**Background**

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:15,800.

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

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

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

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

Soil Survey Area: Cass County, Illinois  
Survey Area Data: Version 14, Sep 12, 2018

Soil Survey Area: Morgan County, Illinois  
Survey Area Data: Version 9, Sep 12, 2018

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Sep 25, 2013—Mar 6, 2017

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

## Map Unit Legend

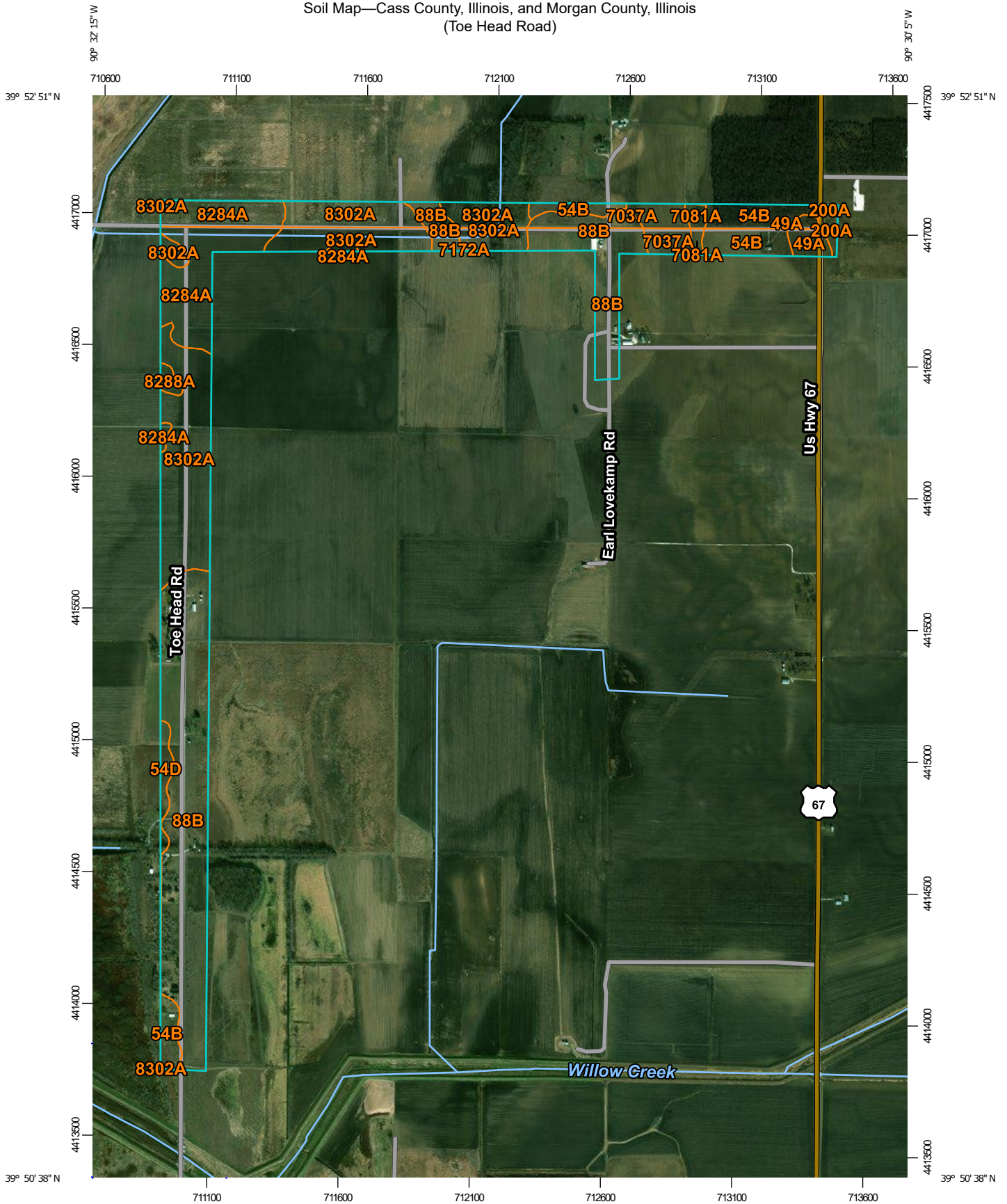
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
49A	Watseka loamy fine sand, 0 to 2 percent slopes	6.0	2.6%
54B	Plainfield sand, 1 to 7 percent slopes	53.3	23.3%
54D	Plainfield sand, 7 to 15 percent slopes	1.1	0.5%
87B	Dickinson sandy loam, 2 to 5 percent slopes	0.3	0.1%
88B	Sparta loamy sand, Illinois till plain, 2 to 6 percent slopes	7.3	3.2%
172A	Hoopeston sandy loam, 0 to 2 percent slopes	5.7	2.5%
200A	Orio loam, 0 to 2 percent slopes	1.0	0.4%
201A	Gilford fine sandy loam, 0 to 2 percent slopes	3.8	1.7%
3070L	Beaucoup silty clay loam, cool mesic, 0 to 2 percent slopes, frequently flooded, long duration	0.0	0.0%
7071A	Darwin silty clay, 0 to 2 percent slopes, rarely flooded	3.6	1.6%
<b>Subtotals for Soil Survey Area</b>		<b>82.2</b>	<b>36.0%</b>
<b>Totals for Area of Interest</b>		<b>228.3</b>	<b>100.0%</b>

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
30F	Hamburg silt loam, 18 to 35 percent slopes	0.6	0.3%
49A	Watseka loamy fine sand, 0 to 2 percent slopes	4.3	1.9%
54B	Plainfield sand, 1 to 7 percent slopes	36.1	15.8%
54D	Plainfield sand, 7 to 15 percent slopes	14.8	6.5%
88B	Sparta loamy sand, Illinois till plain, 2 to 6 percent slopes	40.2	17.6%
172A	Hoopeston sandy loam, 0 to 2 percent slopes	3.7	1.6%
7026A	Wagner silt loam, 0 to 2 percent slopes, rarely flooded	2.0	0.9%
7037A	Worthen silt loam, 0 to 2 percent slopes, rarely flooded	22.4	9.8%

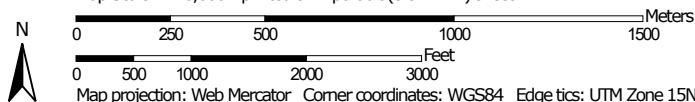


Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
7037B	Worthen silt loam, 2 to 5 percent slopes, rarely flooded	3.5	1.5%
7071A	Darwin silty clay, 0 to 2 percent slopes, rarely flooded	7.6	3.3%
7081A	Littleton silt loam, 0 to 2 percent slopes, rarely flooded	10.4	4.6%
7302A	Ambraw clay loam, 0 to 2 percent slopes, rarely flooded	0.5	0.2%
<b>Subtotals for Soil Survey Area</b>		<b>146.1</b>	<b>64.0%</b>
<b>Totals for Area of Interest</b>		<b>228.3</b>	<b>100.0%</b>

Soil Map—Cass County, Illinois, and Morgan County, Illinois  
(Toe Head Road)



Map Scale: 1:20,000 if printed on A portrait (8.5" x 11") sheet.




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



Soil Map—Cass County, Illinois, and Morgan County, Illinois  
(Toe Head Road)


**MAP LEGEND**

**Area of Interest (AOI)**

 Area of Interest (AOI)




















**Soils**






 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

**Special Point Features**

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

**Water Features**

 Streams and Canals

**Transportation**

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

**Background**

 Aerial Photography

**MAP INFORMATION**

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:15,800.

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

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

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Survey Area Data: Version 14, Sep 12, 2018

Soil Survey Area: Morgan County, Illinois  
Survey Area Data: Version 9, Sep 12, 2018

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

Date(s) aerial images were photographed: Sep 25, 2013—Mar 6, 2017

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

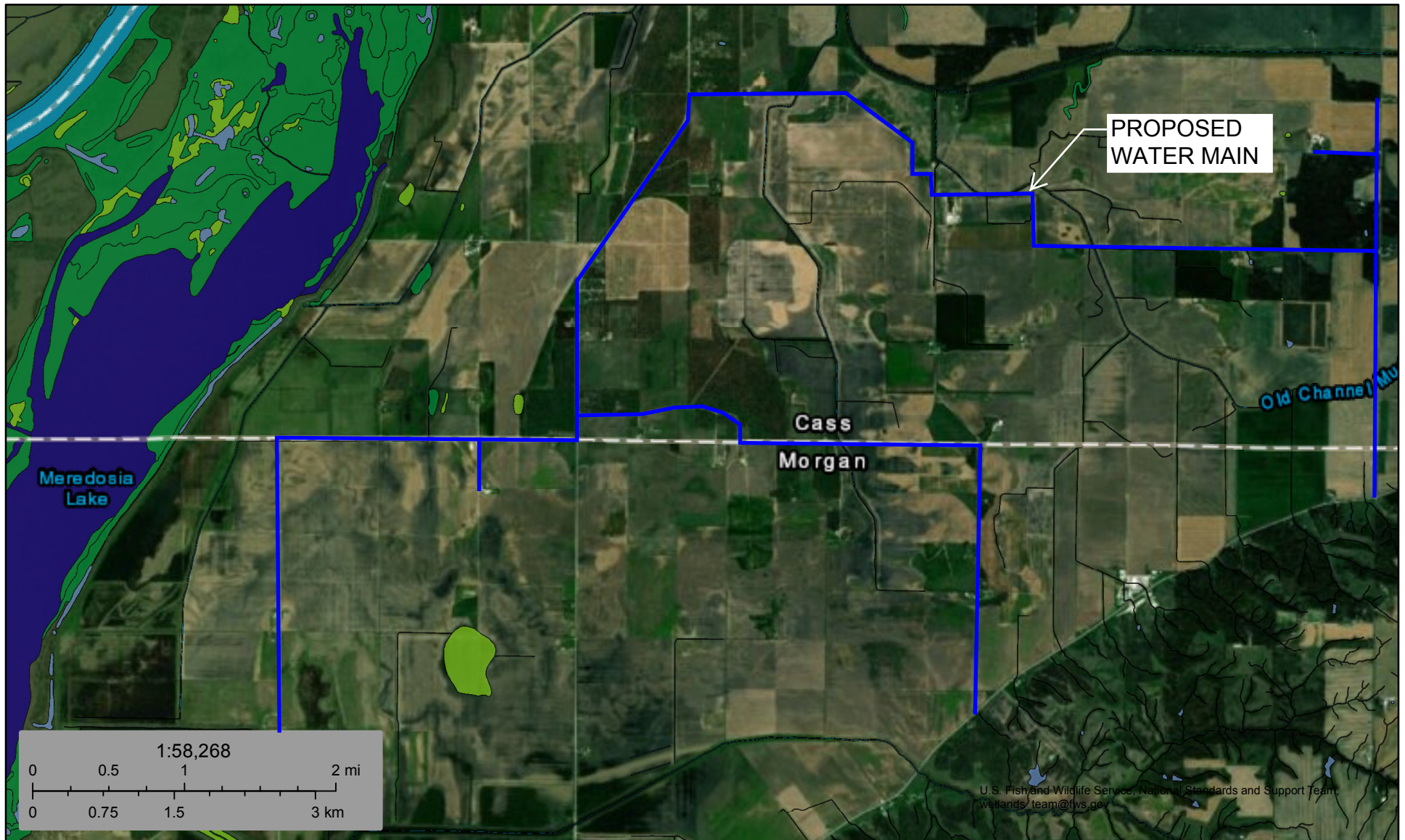
## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
49A	Watseka loamy fine sand, 0 to 2 percent slopes	1.2	0.4%
54B	Plainfield sand, 1 to 7 percent slopes	12.7	4.6%
88B	Sparta loamy sand, Illinois till plain, 2 to 6 percent slopes	8.5	3.1%
200A	Orio loam, 0 to 2 percent slopes	1.3	0.5%
7037A	Worthen silt loam, 0 to 2 percent slopes, rarely flooded	4.6	1.7%
7081A	Littleton silt loam, 0 to 2 percent slopes, rarely flooded	1.7	0.6%
8284A	Tice silty clay loam, 0 to 2 percent slopes, occasionally flooded	11.6	4.2%
8302A	Ambraw clay loam, 0 to 2 percent slopes, occasionally flooded	19.7	7.2%
<b>Subtotals for Soil Survey Area</b>		<b>61.3</b>	<b>22.3%</b>
<b>Totals for Area of Interest</b>		<b>275.1</b>	<b>100.0%</b>

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
49A	Watseka loamy fine sand, 0 to 2 percent slopes	3.7	1.4%
54B	Plainfield sand, 1 to 7 percent slopes	13.0	4.7%
54D	Plainfield sand, 7 to 15 percent slopes	3.8	1.4%
88B	Sparta loamy sand, Illinois till plain, 2 to 6 percent slopes	99.1	36.0%
200A	Orio loam, 0 to 2 percent slopes	0.9	0.3%
7037A	Worthen silt loam, 0 to 2 percent slopes, rarely flooded	4.3	1.5%
7081A	Littleton silt loam, 0 to 2 percent slopes, rarely flooded	1.1	0.4%
7172A	Hoopeston sandy loam, 0 to 2 percent slopes, rarely flooded	0.1	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8284A	Tice silty clay loam, 0 to 2 percent slopes, occasionally flooded	26.3	9.6%
8288A	Petrolia silt loam, 0 to 2 percent slopes, occasionally flooded	1.7	0.6%
8302A	Ambraw clay loam, 0 to 2 percent slopes, occasionally flooded	59.7	21.7%
<b>Subtotals for Soil Survey Area</b>		<b>213.8</b>	<b>77.7%</b>
<b>Totals for Area of Interest</b>		<b>275.1</b>	<b>100.0%</b>

# **EXHIBIT C**



November 4, 2019

### Wetlands

- |                                |                                   |          |
|--------------------------------|-----------------------------------|----------|
| Estuarine and Marine Deepwater | Freshwater Emergent Wetland       | Lake     |
| Estuarine and Marine Wetland   | Freshwater Forested/Shrub Wetland | Other    |
|                                | Freshwater Pond                   | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.