MID-AMERICA
RAIL CAMPUS

Falls City Economic Development and Growth Enterprise, Inc.

Industrial Site Comprehensive Diligence and Master Planning

March 13, 2024 – Final Report

022-03672

Falls City, NE EDGE
ECONOMIC DEVELOPMENT & GROWTH ENTERPRISE
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SUMMARY REPORT

To: Falls City Economic Development Growth and Enterprise, Inc. (EDGE)
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From: Olsson Omaha Office

Overview

Olsson performed a property assessment and due diligence review for the undeveloped area located south of Falls City in Richardson County. The land is primarily owned or under contract by Falls City Economic Development and Growth Enterprise (EDGE), a 501(c)6 nonprofit, private corporation whose members are private and public investors. The site consists of 1,017 acres of undeveloped land positioned approximately one mile south of Falls City, on US Hwy 73. The site is south of 703 Loop Road, with the southern boundary the Nebraska/Kansas State Line. The primary western boundary is US Hwy 73 and the eastern boundary follows Walnut Creek.

The purpose of this assessment is to review existing property features, identify existing transportation and utility infrastructure, and analyze the property's readiness and limitations for industrial development.

General Site Information

Study area location is below:

- The site is located south of the Falls City limits by approximately one mile. The site is located in Sections 23, 25, 26, 35, and 36 of Township 1 North, Range 16 in Richardson County, Nebraska.
  - **Eastern Boundary:** Agriculture land and Union Pacific rail line.
  - **Western Boundary:** US Highway 159, US Highway 73, agricultural land, and private residences.
  - **Northern Boundary:** Agricultural land, private residence, and Big Nemaha River.
  - **Southern Boundary:** 702 Road and Nebraska/Kansas state line, agricultural land, and private residence.
- The total acreage of this property is approximately 1,017 acres.
- The exact site location is shown on the site map and other property maps within the Site Developability section of the report.

Transportation Infrastructure

Roadway Infrastructure

The industrial site in Falls City ideally services the tri-state market - Nebraska, Missouri, and Kansas. The site is adjacent to US 73 and has many connections within proximity to an interstate highway. The industrial park is a 20-minute drive to Interstate 29 (I-29), which runs from Canada to Kansas City, connecting to I-35 that travels to Mexico. Interstate 29 also connects to the major east/west corridors, I-80 (approximately 95 miles to the north) and I-70 (approximately 90 miles to the south). US Highway 75 is approximately 15 miles west of the site using State Highway 8 and provides direct access to I-70. US Highway 36, with four lanes eastbound, is approximately 20

miles south of the site using US Highway 73. Major truck routes north/south and east/west are readily accessible from the interstate highway system.

The southwest corner of the property is the intersection of US 73 and the Nebraska/Kansas state line. The property is one mile south of Falls City. The major roadway connections are listed below.

- **East** – 20 minutes from I-29
- **West** – 15 miles from US 75
- **North** – 95 miles from I-80
- **South** – 90 miles from I-70

Railroad Infrastructure

The City of Falls City is fortunate to host two Class I railroads, Burlington Northern Santa Fe (BNSF) and Union Pacific Railroad (UPRR) main lines. The UP rail line travels north/south on the eastern edge of the site. The BNSF line is north of the site across the Big Nemaha River and intersects the UP line on the south edge of the city limits. The BNSF line is not currently accessible from the rail site.

UPRR owns and operates the rail line along the east boundary of the site. The line is a single track on the Falls City Subdivision on which UPRR operates freight service. Federal Railroad Agency (FRA) records indicate approximately 7 trains run on the track per day at a maximum speed of 60 mph and the track is not signalized. Google Earth imagery shows some signalization may be present along the track. UPRR will dictate if turnouts will need power operated or hand-thrown switches.

The majority of the track is tangent along the boundary of the site, with a slight horizontal curve near the 702 Trail at-grade crossing in the middle of the boundary. New industry track connections to the main track will need to be located along the tangent portions of the main track. The main track is largely located within a floodplain so an industrial lead track will need to be constructed from the main track to the industrial development outside the floodplain areas. There are three waterways that cross the UPRR track draining from west to east to Walnut Creek. There are bridges on the UPRR track at the waterway crossings and industry tracks should avoid crossing the waterways as the industry track crossings will also require bridges.

The UPRR industrial development process includes a new business plan review, review of track plans, and development of an industrial track agreement to provide rail service to the industrial site. The typical UPRR industrial development process is approximately one year from approval of business plan through construction to beginning rail service. Large industrial developments may take longer if rail operations or construction are complex and need additional time to review and complete.

Site Access

The Falls City industrial site is located 90-minutes from Kansas City, MO; Topeka, KS; Lincoln, NE; and Omaha, NE. Primary access into the site is north/south from US 73. Three primary east/west roads will lead into the park. A traffic study will be required for the new prospects at the industrial park.

- 702 Trail Road is the main entrance into the industrial park and travels east/west bisecting the industrial park. The park entrance will have a distinct welcoming entrance that complements similar designs for EDGE

and for the City. This primary route provides access to development areas on the north and south side of the roadway. The roadway is currently gravel and will need to be upgraded for industrial traffic, along with appropriate acceleration and deceleration lanes to the different businesses. In addition, separate entrances are needed for employee traffic and delivery vehicles. 702 Trail Road will also have a north/south roadway segment added to accommodate the non-rail sites on the western border of the property. This roadway provides access to the largest contiguous site at the park, which has rail access.

- The southern boundary of the site is 702 Road, an asphalt roadway running east/west and the Nebraska/Kansas state line. The roadway will need to be upgraded, just as 702 Trail Road, to accommodate industrial truck traffic with acceleration and deceleration lanes. This roadway provides access to the south development rail access property and the south solar panel maintenance areas.
- The third access is the farthest north, east/west roadway at the industrial park. An existing easement is in place for the pocket private property, not included in the industrial park. This roadway will need to be upgraded for industrial truck traffic. The roadway provides access to the largest contiguous non-rail site. The road will also provide access to the north solar panel maintenance areas.

Zoning, Land Use, and Annexation

The proposed site falls directly south of the city limits for Falls City. The site is currently zoned agriculture and does not have height restrictions. The proximity is shown on the overall site map within the site developability section of this due diligence report.

The goal of Falls City is to annex the industrial site into the city limits, which will provide sustainable utilities and oversite of development in the area. The 2014 City Comprehensive Development Plan identified potential annexation areas with a section south of the city adjacent to US 73 has potential to provide a connection to the industrial park. The sewer plant on the south side of the city is planned to be annexed into the city limits. The annexation of the sewer plant is a first step in getting closer to the industrial park. Other areas surrounding Falls City have potential to be annexed, particularly the northeast corner near the airport.

Site Construction and Building Permits

The following are general instructions for obtaining the necessary approvals and permits:

- **Floodplain Development:** Floodplains are identified on this property. Depending on grading operations within the flood areas, a floodplain development permit could be required.
- **Site Construction Permits:** Prior to moving dirt on a site, a grading permit must be granted. This process requires the creation of a stormwater pollution prevention plan (SWPPP) and the design of proper sediment and erosion control Best Management Practices (BMPs) to be used during construction.
- **Building Permits:** Obtaining a certificate of occupancy for a new structure is a multistep process that begins with obtaining a building permit. Plan reviews, inspections, and the Final Certificate of Occupancy are handled by authorities having jurisdiction.

Site Topography and Floodplain Information

Topography

- The maximum elevation on the property is as follows (per USGS 1/3-arc second Digital Elevation Model):

- Site elevation – 988.58 feet

- The minimum elevation on the property is as follows (per USGS 1/3-arc second Digital Elevation Model):
  - Site elevation – 857.36 feet

Floodplain

- A review of the current Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) was performed for the site. The following is a breakdown of the findings:
  - The site is completely covered by the FEMA Floodplain.
  - Approximately 730 acres (50%) is covered by Zone X, Area of Minimal Flood Hazard.
  - Approximately 707 acres (48%) is covered by Zone A, 1% Annual Chance Flood Hazard.
  - Approximately 18 acres (1%) is covered by Zone X, 0.2% Annual Chance Flood Hazard.
  - Information from the FIRM map is included within the Appendix A.

Wetlands and Waterway Information

Construction activities that affect wetlands or waterways should be given special consideration. Wetlands and waterways have the potential to be classified as Waters of the United States. The final determination of whether a wetland or waterway is jurisdictional is completed by the United States Army Corps of Engineers (USACE) acting under the authority of the Clean Water Act. Impacts to wetlands and waterways deemed jurisdictional must be permitted through the USACE. Minor impacts (less than 0.5 acre of wetlands or waterways impacted) require the application for a Nationwide Permit. Major impacts (greater than 0.5 acre) to existing wetlands or waterways will likely require an Individual Permit. This permit will typically have a review period with the USACE of at least six to nine months. Along with the permit, mitigation of the impacted wetlands and/or loss of stream channel is required as a part of the Individual Permit.

The National Wetlands Inventory (NWI) database maintained by the U.S. Fish and Wildlife Service (USFWS) was reviewed to determine the potential location of wetlands and waters within the study area. Wetland types are defined by Cowardin et al. (1979) as freshwater emergent, forested, shrub, pond, or riverine. The National Hydrography Dataset (NHD) was also reviewed to determine the potential location of waters within the study area. The Natural Resources map is attached within Appendix B.

- The NWI depicts 10 potential freshwater emergent wetlands, 2 freshwater forested/shrub wetlands, 2 freshwater ponds, and 10 riverine habitats in the study area. The riverine habitats correspond with the Big Nemaha River and Walnut Creek, extending along the northeastern and eastern boundaries of the site.

- The National Wetland Inventory (NWI) and National Hydrography Dataset do not always accurately depict the existing condition of wetlands, streams, and other water resources. A wetland delineation will need to be performed on the site to more accurately evaluate the condition of any wetlands that may exist. A wetland delineation should be completed during the growing season (May–1 - October 31) to provide the most accurate information for wetlands and waters that may be present on the site. Once the delineation is complete, the information can be sent to the USACE to obtain a formal jurisdictional determination or complete a Clean Water Act Section 404 permit.

Soils Information

Soil information was obtained from the Richardson County, Nebraska Soil Survey prepared by the National Resources Conversation Service (NRCS). A soil map showing the soil types has been included within the due diligence section of the report; full descriptions of the soil types is included in the Appendix C.

Soils at the site consist of the following map units:

- **38–0 - Geary sility clay loam, 7 to 11 percent slopes, eroded**
- **70–0 - Kennebec silt loam, occasionally flooded**
- **70–0 - Wabash silty clay loam, occasionally flooded**
- **70–9 - Zook silty clay loam, occasionally flooded**
- **71–3 - Kennebec silt loam, rarely flooded**
- **72–3 - Aksarben silty clay loam, 2 to 6 percent slopes, eroded**
- **72–4 - Aksarben silty clay loam, 6 to 11 percent slopes, eroded**
- **72–5 - Aksarben silty clay loam, 0 to 2 percent slopes**
- **72–1 - Judson silt loam, 2 to 6 percent slopes**
- **72–9 - Deroin silty clay loam, 6 to 11 percent slopes, severely eroded**
- **76–3 - Yutan silty clay loam, 3 to 11 percent slopes, eroded**
- **77–0 - Nodaway silt loam, occasionally flooded**
- **81–5 - Pohocco silty clay loam, 6 to 11 percent slopes, eroded**

38–0 - Geary sility clay loam, 7 to 11 percent slopes, eroded

This is a well drained soil found in hillslopes, with a medium runoff class. It is not a prime farmland soil and is not classified as a hydric soil. It has minor components of Mayberry, Aksarben, Morrill, and Sogn soils, which are not classified as hydric.

70–0 - Kennebec silt loam, occasionally flooded

This is a moderately well drained soil found in floodplains. It is a prime farmland soil and is not classified as a hydric soil. It has minor components of Muscotah, Reading, and Olmitz soils, which are not classified as hydric. It also has minor components of Wabash and Colo soils, which are classified as hydric.

70–0 - Wabash silty clay loam, occasionally flooded

This is a poorly drained soil found in floodplains, with a low runoff class. It is not a prime farmland soil and is classified as a hydric soil. It has minor components of Reading and Kennebec soils, which are not classified as hydric.

70–9 - Zook silty clay loam, occasionally flooded

This is a poorly drained soil found in floodplains, with a negligible runoff class. It is prime farmland soil if drained and is classified as a hydric soil.

71–3 - Kennebec silt loam, rarely flooded

This is a moderately well drained soil found in floodplains, with a negligible runoff class. It is a prime farmland soil and is not classified as a hydric soil. It has minor components of Zook soil, which is classified as hydric.

72–3 - Aksarben silty clay loam, 2 to 6 percent slopes, eroded

This is a well drained soil found in hillslopes, with a medium runoff class. It is prime farmland soil and is not classified as a hydric soil. It has minor components of Pawnee, Wymore, and Shelby soils, which are not classified as hydric.

72–4 - Aksarben silty clay loam, 6 to 11 percent slopes, eroded

This is a well drained soil found in hillslopes, with a high runoff class. It is farmland soil of statewide importance and is not classified as a hydric soil. It has minor components of Judson, Morrill, and Wymore soils, which are not classified as hydric.

72–5 - Aksarben silty clay loam, 0 to 2 percent slopes

This is a well drained soil found in hillslopes, with a low runoff class. It is a prime farmland soil and is not classified as a hydric soil. It has a minor component of Fillmore soil, which is classified as hydric.

72–1 - Judson silt loam, 2 to 6 percent slopes

This is a well drained soil found in hillslopes, with a low runoff class. It is a prime farmland soil and is not classified as a hydric soil. It has a minor component of Nodaway soil, which is not classified as hydric. It also has a minor component of Colo soil, which is classified as hydric.

72–9 - Deroin silty clay loam, 6 to 11 percent slopes, severely eroded

This is a well drained soil found in hillslopes, with a high runoff class. It is not a prime farmland soil and is not classified as a hydric soil.

76–3 - Yutan silty clay loam, 3 to 11 percent slopes, eroded

This is a well drained soil found in hillshopes, with a high runoff class. It is farmland soil of statewide importance and is not classified as a hydric soil. It has minor components of Morrill, Aksarben, and Geary soils, which are not classified as hydric.

77–0 - Nodaway silt loam, occasionally flooded

This is a moderately well drained soil found in floodplains, with a low runoff class. It is a prime farmland soil and is not classified as hydric. It has minor components of Judson and Zook soils, which are not classified as hydric. It also has a minor component of Colo soil, which is classified as hydric.

81–5 - Pohocco silty clay loam, 6 to 11 percent slopes, eroded

This is a well drained soil found in hillshopes, with a high runoff class. It is farmland soil of statewide importance and is not classified as a hydric soil.

ENVIRONMENTAL

The following sections summarize the review of regulatory databases and regulatory file review. The evaluation of the magnitude of the project impacts from a hazardous material is based on several factors, including the distance between a potential source of a hazardous material and the project; regulatory status of the identified sites (e.g., active or inactive); known or suspected releases into soil, surface water or groundwater; the hydrogeologic relationship of the source of contamination to the project; and the depth and/or duration of construction. The records review was used to identify and evaluate sites with potential concerns related to hazardous materials that are located adjacent to, or within the vicinity of, the proposed project improvements.

Identified sites were categorized as having either low, medium, or a high potential to impact the project area. The following describes the categories:

- **Low Potential:** The records review indicates that it is unlikely that contamination would be encountered during construction.
- **Medium Potential:** The records review indicates contamination is present at the site, but the extents have not been fully investigated. Contamination is unlikely to be present in the project footprint based on results of previous investigations.
- **High Potential:** Through file review or subsurface investigation, it has been determined that it is likely contamination would be encountered during construction.

The Nebraska Department of Environment and Energy (NDEE) programs reviewed included leaking storage tank (LST), Petroleum Release Remediation (PRR), Release Assessment (RA), Remedial Action Plan (RAP), Resource Conservation and Recovery (RCR) sites with reported violations, Tier 2 Chemical Reporting/ Superfund Amendments and Reauthorization Act (SARA) Title III (TL3), Brownfield (BF) sites, and Groundwater (GW) sites within 1/10-mile of the environmental study area.

Integrated waste management (IWM) sites within ½-mile of the environmental study area were reviewed.

National Priority List or Superfund (SF) sites were reviewed if they are located within 1-mile of the project footprint.

The consultant team reviewed the database information for its relevance to the Property; that is, as the information referred to spills or releases either occurring on the Property, or at properties having the potential to affect the Property. As used in this report, the terms “upgradient,” “downgradient,” and “cross-gradient” are used to describe the topographic relationship between the Property and offsite properties relative to the general groundwater flow direction.

One site was identified within the search radii and is summarized in the table and paragraphs below. An Environmental Facility Map showing the location of this site is included in the Appendix D.

Facility Alias	Facility ID	Street Address	Program/Status	Approximate Distance/Direction	Impact
Farm #1	99793	65276 703 Loop	IWM – Inactive	0.28 miles north	Low

Farm #1

The farm at, 65276 703 Loop, is listed in the IWM database. The facility is located approximately 0.28 miles north of and topographically upgradient from the Site.

NDEE files indicate the demolition debris from eight houses that were demolished in 2011 were hauled to Farm #1 to be burned. Upon burning the demolition debris, the burn site was covered with soil. Burning of the debris was a violation of NDEE regulations, so NDEE ordered the facility to excavate and remove the debris and ashes. The removed material was hauled to a licensed landfill in Hiawatha, KS. NDEE closed the file with no further action required.

Based on the information provided in the NDEE files, this facility has a low potential to impact the Site.

Threatened and Endangered Species

A desktop review of threatened and endangered species was completed to analyze the study areas for the likely presence of listed species (state and/or federal) or their habitat, as well as designated critical habitat for federally-listed threatened and endangered species. The desktop review consisted of a review of the Nebraska Game and Parks Commission (NGPC) state-listed species by county and USFWS Information for Planning and Consultation (IPaC) databases. The following table provides the species listed in Richardson County, a species/habitat description, and an impact evaluation.

NOTE: The monarch butterfly is listed as a Federal Candidate (FC) species according to USFWS. There are currently no regulatory requirements for FC species.

Federal and State Threatened and Endangered Species

Species	Status	Species and Habitat Description	County	Impact Evaluation
Reptiles				
Western Massasauga *Sistrurus tergeminus*	FT, ST	The species is found in grassland habitats including tallgrass prairies and grassy fields. This species hibernates during the winter months.	Richardson	The project site does not prove suitable habitat for the species. Species range information from NGPC indicates species could be present near the west side border of Richardson County, away from the project site. The project would likely have no effect to the species.
Timber Rattlesnake *Crotalus horridus*	ST	This species is found in woodlands and often use grasslands and fields to migrate between woodlands.	Richardson	Species range in information from NGPC indicates species could be present near the east side border of Richardson County and away from the project site. The project would likely have no effect to the species.
Fish				
Pallid Sturgeon *Scaphirhynchus albus*	FE, SE	This species prefers braided channels, sand bars, sand flats, and gravel bars. However, they can occur at the bottom of large, silty rivers.	Richardson	The project site does not provide suitable aquatic habitat for the species. The project would likely have no effect to the species.
Lake Sturgeon *Acipenser fulvescens*	ST	Species requires extensive areas of shallow (15-30 feet deep) water to forage. Spawn in fast flowing rivers.	Richardson	The project site does bot provide suitable aquatic habitat for the species. The project would likely have no effect to the species.
Sturgeon Chub *Macrhybopsis gelida*	SE	Sturgeon chub are found in turbid water with moderate to strong current over bottoms ranging from rocks and gravel to coarse sand.	Richardson	The project site does not provide suitable aquatic habitat for the species. The project would likely have no effect to the species.
Mammals				
Northern Long-eared Bat *Myotis septentrionalis*	FT, ST	In the summer months, the species can be found in woodland areas They roost singly or in colonies under bark of trees and in tree cavities. Males and non-reproductive females can also be found roosting in cooler locations such as mines.	Richardson	The project site is within NGPC estimated species range. Impacts to species can be mitigated by avoiding tree removal in the months of June and July. If tree removal is avoided, the project would likely not adversely affect the species.
Southern Flying Squirrel *Glaucomys volans*	ST	The species primarily inhabit hardwood forests and rely on existing cavities such as old nests or holes in trees for their nests.	Richardson	The project site is within NGPC estimated species range. Habitat is limited throughout the project site. Impacts to species can be mitigated by avoiding tree removal in the months of June and July. If tree removal is avoided, the project would likely not adversely affect the species.
Plants				
American Ginseng *Panax quinquefolius*	ST	Ginseng is an aromatic, perennial, herbaceous plant that grows 4-20 inches tall with bright red fruits visible in late summer (August). Ginseng grows only in rich, cool, moist, possibly older-growth, deciduous forest.	Richardson	The project site is within NGPC estimated species range. Habitat is limited throughout the project site. If disturbance of forest habitat is avoided, the project would likely not adversely affect the species.

Status Key			
Federal	FE - Federally listed as endangered	**State**	SE - State listed as endangered
	FT - Federally listed as threatened		ST - State listed as threatened

Utility Infrastructure

Falls City, Nebraska takes immense pride in the ownership and operation of its comprehensive utility infrastructure, encompassing electric, water, sewer, and gas services. This locally managed and community-centric approach allows Falls City to maintain a direct and responsive connection with its residents and local businesses. This local management not only ensures the efficiency of utility services but also reflects Falls City's dedication to the well-being and prosperity of its citizens and commerce, making it a community where pride in ownership translates into an elevated quality of life for all.

Electricity

The Mid-America Rail Campus aims to secure access to an additional 35 MW of power, ensuring sufficient infrastructure for site development. Falls City currently owns and operates its own power generation plant equipped with dual fuel generators capable of producing over 30 MW of power and current capacity of 40 MW. The existing infrastructure is connected to the broader electrical grid via a 69KV transmission line operated by the Omaha Public Power District. On-site, a 3-phase line stretches along US Hwy 73 in the northwest corner and partially along the west side of the property with a single-phase extension running south along US Hwy 73 for two miles. Feeders branch off east and west from the 3-phase dead-end with a current voltage of 13800/7970.

Falls City has an immediate opportunity to bolster its electrical capacity, as the Nebraska Legislature allocated $15,000,000 through LB977 in April 2022 for redundancy and resilience. The funds are specifically aimed at meeting the electrical demands of the rail site, accessed through the Department of Economic Development's Site and Building Fund. After construction of additional infrastructure, the desired capacity should cater to prospective needs, though the construction timeline is estimated at four to five years.

The Mid-America Rail Campus contains 187 developable acres within wetlands and could be designated for solar-to-power operations. A study shows the potential for 162,819,462 kilowatt hours of AC generation at the site. System output may range from 154,238,876 to 171,579,149 kWh per year near this location. Richardson County, Nebraska does not have zoning restrictions for renewable energy projects.

As part of ongoing efforts for improvement, Falls City is actively investing in capital improvements to update its distribution system. These investments reflect the city's commitment to staying technologically current and ensuring an efficient electrical grid that meets the changing needs of the community.

Natural Gas

The city-owned natural gas infrastructure is seamlessly connected to an active natural gas pipeline operated by Southern Star Central Gas Pipeline. With a current capacity surpassing 138,000 thousand cubic feet per month (Mcf/month), Falls City not only ensures a reliable and efficient supply of natural gas but also positions itself with an abundance of available capacity for future expansion. This strategic infrastructure underscores the city's commitment to meeting the energy needs of its residents and businesses while providing a solid foundation for potential growth and development. Falls City's robust natural gas system reflects a forward-looking approach, ensuring a resilient and adaptable energy network for the community's evolving requirements.

Falls City foresees a demand of 25,000 MCF per month for the entire site upon completion, while the base city load currently only utilizes about 17,000 MCF/month; thus, the available capacity far exceeds the anticipated

needs for the site development. The gas distribution lines within the city maintain a pressure of 150 psig, sourced from a 500 psig transmission line measuring 6 to 8 inches in diameter. The City will need to expand its gas line infrastructure to the site, a process that could be completed within 18 months to accommodate potential users. Plans for this expansion are already in progress with concept and design work well underway.

In February of 2024, Southern Star announced multiple Renewable Natural Gas (RNG) projects that have hit their radar. They are actively working on the feasibility of installing pipeline facilities to take an estimated 300 to 400 MMSCF per day of RNG into their system that could be contractually sent to customers at the Mid-America Rail Campus. If developers move forward, the RNG could be available around 2026 to 2027. This initiative is expected to yield significant benefits, including a reduction in infrastructure costs and potential eligibility for federal tax credits for natural gas customers. A sitemap detailing the pipeline location is included in Appendix E.

Pipelines

A review of the National Pipeline Mapping System (NPMS) Public Viewer was used to identify pipeline locations that intersect the site boundary or are within a 1/2-mile of the site. One pipeline was identified within the site boundary. It is an active natural gas pipeline operated by Southern Star Central Gas Pipeline, Inc. and runs through the east side of the site. A site map showing the pipeline location is included in the Appendix E.

In recent years, carbon sequestration pipelines have emerged as a utility needed to develop large industrial sites. Mid-America Rail Campus does not have direct access to a CO2 sequestration pipeline nor is one planned within seventy miles of the site. As of February 2024, neither the State of Nebraska nor Richardson County, Nebraska had laws restricting construction of these pipelines.

Water

Falls City's water infrastructure is a vital resource not only for the city but also for the Village of Rulo, NE and Rural Water District 2, spanning Richardson County and northern regions of Kansas. Situated ten miles east of Falls City near the Missouri River, Falls City's water plant plays a crucial role in supplying clean and reliable water to a broad community base. Recent infrastructure upgrades have been implemented, addressing both water collection and treatment processes. These enhancements signify Falls City's commitment to ensuring a sustainable and high-quality water supply for both its immediate residents and the extended areas covered by Rural Water District 2. By strategically investing in its water infrastructure, Falls City aims to meet the growing demands of a diverse community, fostering a resilient and reliable water system for the benefit of all stakeholders.

The current usage of the city averages about 500,000 gallons per day (GPD) for its base needs. To meet the additional demand of 500,000 GPD for the Mid-America Rail Campus, the city would extend production hours by approximately 4 to 8 hours per day. Adjustments to operational schedules and the hiring of additional staff would be necessary, although the existing wells and production facility can readily accommodate the increased output. The city aims to implement the necessary infrastructure for the site within 18 months.

Sanitary Sewer

Falls City's sanitary sewer infrastructure is equipped to process 1.4 million gallons per day (MGD) with a hydraulic capacity extending up to 3.46 MGD. The city is actively engaged in ongoing efforts to enhance its wastewater

management capabilities, with planned future expansions and system improvements aimed at increasing both capacity and processing efficiency. These proactive measures underscore Falls City's commitment to maintaining a reliable and adaptable sanitary sewer system, ensuring it can effectively meet the current and future needs of the community.

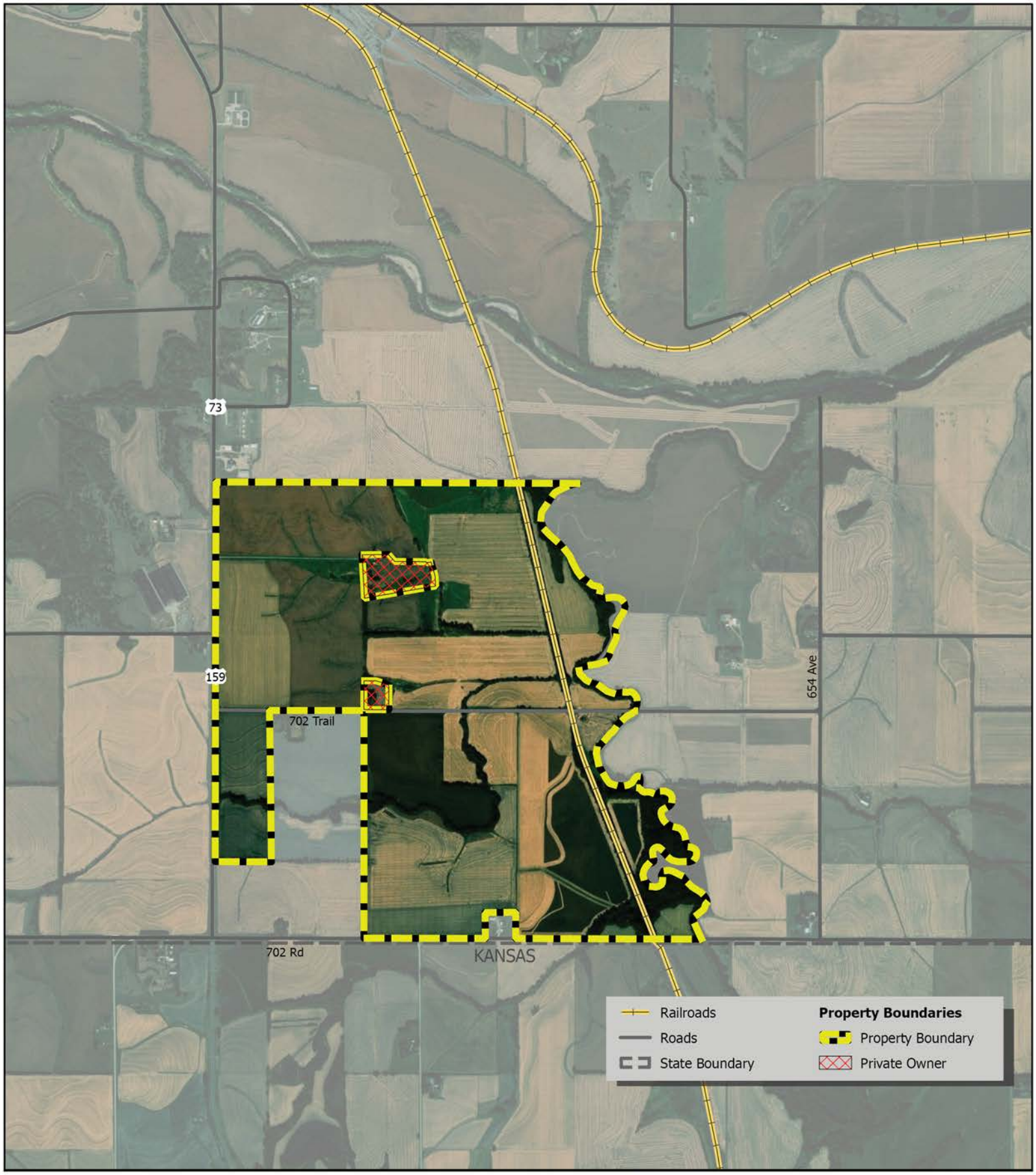
The Falls City sanitary sewer plant processes an average of 1.4 MGD (1,400,000 gallons/day). It has hydraulic capacity up to 3.46 MGD, but the maximum monthly average should not exceed 1.4 MGD or processing issues could arise. In 2022, the plant processed an average of 515,000 GPD with a 5-year average (2015-2020) of about 705,000 GPD. Excess capacity of the wastewater system is approximately 120,000 GPD, however the plant is rated for 630,000 GPD of additional capacity exceeding the anticipated site development need of an additional 400,000 GPD.

Upon completion, the Mid-America Rail Campus may require 400,000 gallons per day (GPD) for wastewater processing. The current facility is poised to handle this additional load with minimal to no modifications, aside from routine monitoring and adjustments to plant operations. It is probable that a lift station will need installation to aid in the flow of wastewater from the south side of the property to the plant for prospective users. Additionally, as the site reaches buildout, the plant may require upgrades to enhance processing capabilities and accommodate any additional capacity needs.

Telecommunications/Fiber

Telecommunications is provided by Southeast Nebraska Communications (SNC), which has served the eastern half of Richardson County since 2012. In August of 2010, Southeast Nebraska Communications was awarded USDA funding to extend Fiber-to-the-Home technology beyond the City limits of Falls City to rural areas of Richardson County. SNC's entire service territory is 100 percent fiber optics. With 2,366 homes and businesses looped into the system, Falls City became the first community in the State of Nebraska entirely interconnected by fiber optics.management capabilities, with planned future expansions and system improvements aimed at increasing both capacity and processing efficiency. These proactive measures underscore Falls City's commitment to maintaining a reliable and adaptable sanitary sewer system, ensuring it can effectively meet the current and future needs of the community.

SITE DEVELOPABILITY



MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS

SITE MAP

Falls City, NE – March 2024

0 500 1,000 2,000 Feet

N

Falls City, NE EDGE

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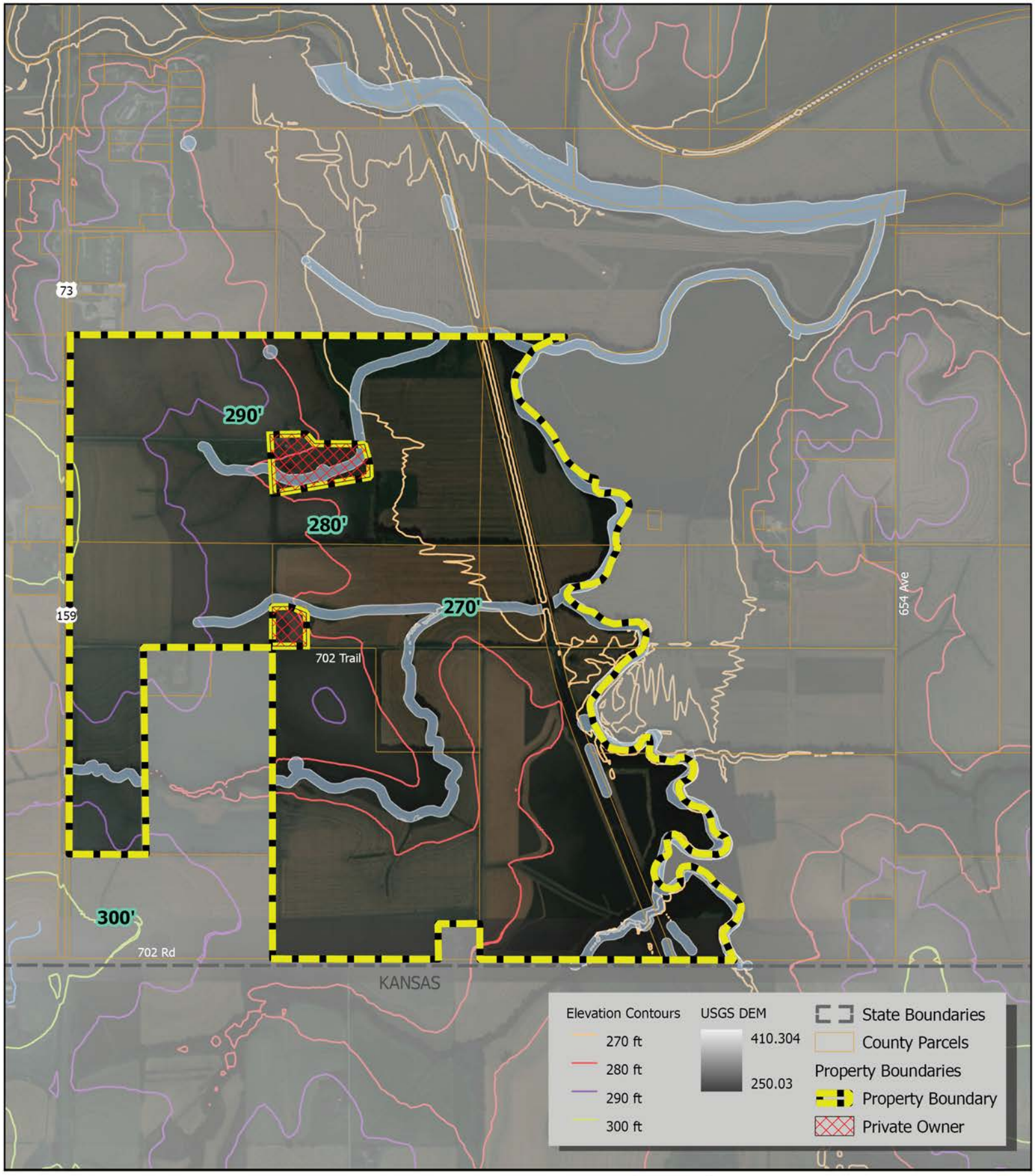

MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS
ELEVATION MAP
Falls City, NE – March 2024

0 500 1,000 2,000 Feet

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Falls City, NE EDGE

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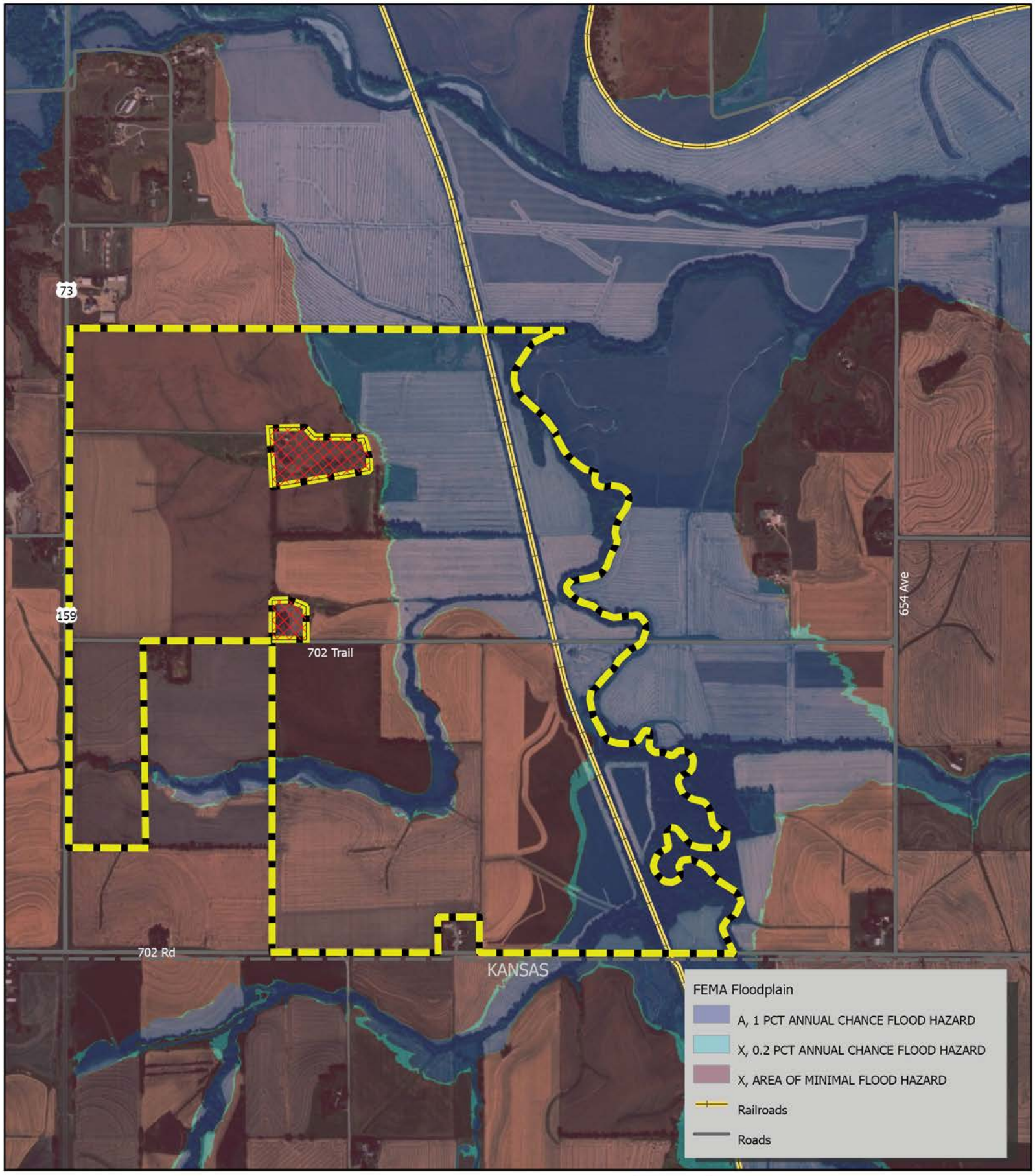

MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS

FEMA FLOODPLAIN MAP

Falls City, NE – March 2024

0 500 1,000 2,000 Feet

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Falls City, NE EDGE

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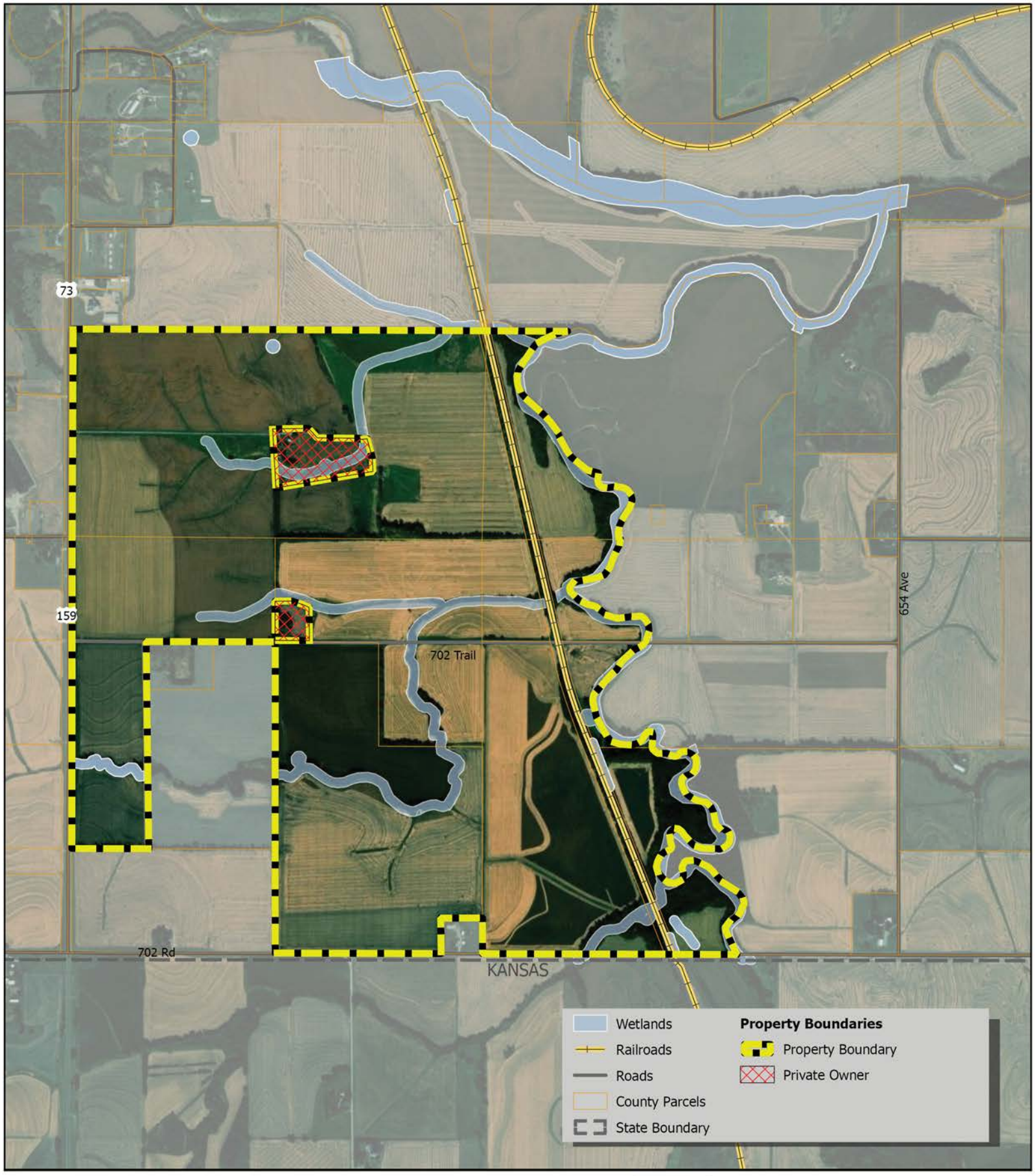

MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS
NATIONAL WETLANDS INVENTORY MAP
Falls City, NE – March 2024

0 500 1,000 2,000 Feet

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Falls City, NE EDGE

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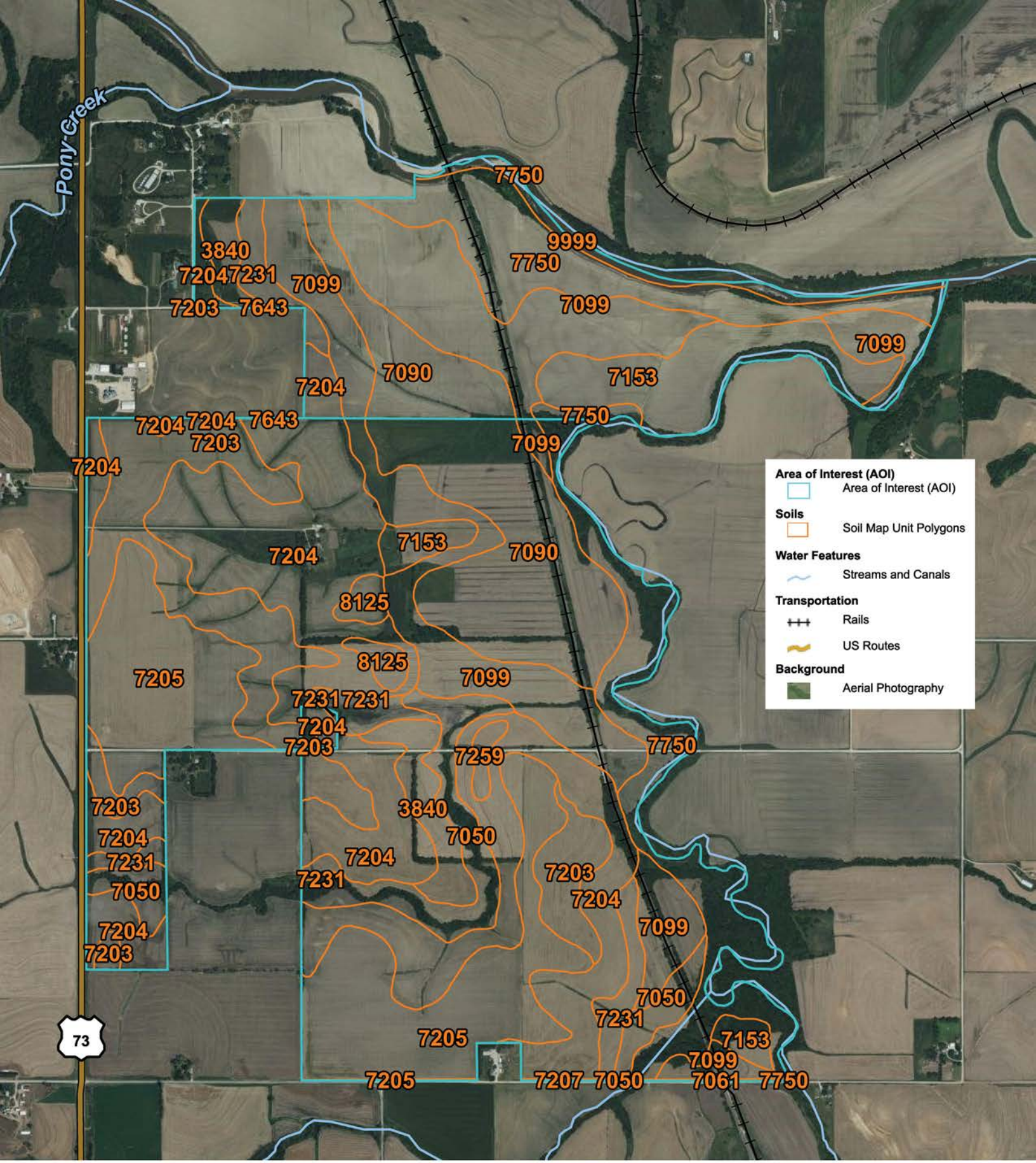

MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS

SSURGO SOIL MAP

Falls City, NE – March 2024

0 1000 2000 4000 Feet

N

Falls City, NE EDGE

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SSURGO Soil Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
7050	Kennebec silt loam, occasionally flooded	0.1	0.0%
7061	Muscotah silty clay loam, occasionally flooded	0.8	0.0%
7205	Aksarben silty clay loam, 0 to 2 percent slopes	0.7	0.0%
7207	Aksarben silty clay loam, 6 to 11 percent slopes	0.7	0.0%
7750	Nodaway silt loam, occasionally flooded	0.2	0.0%
7851	Judson silt loam, 1 to 5 percent slopes	0.1	0.0%
Subtotals for Soil Survey Area		**2.4**	**0.2%**
Totals for Area of Interest		**1,489.1**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3840	Geary silty clay loam, 7 to 11 percent slopes, eroded	35.6	2.4%
7050	Kennebec silt loam, occasionally flooded	64.5	4.3%
7090	Wabash silty clay loam, occasionally flooded	165.8	11.1%
7099	Zook silty clay loam, occasionally flooded	243.3	16.3%
7153	Kennebec silt loam, rarely flooded	82.3	5.5%
7203	Aksarben silty clay loam, 2 to 6 percent slopes, eroded	132.9	8.9%
7204	Aksarben silty clay loam, 6 to 11 percent slopes, eroded	322.9	21.7%
7205	Aksarben silty clay loam, 0 to 2 percent slopes	194.8	13.1%
7231	Judson silt loam, 2 to 6 percent slopes	43.2	2.9%
7259	Deroin silty clay loam, 6 to 11 percent slopes, severely eroded	4.9	0.3%
7643	Yutan silty clay loam, 3 to 11 percent slopes, eroded	0.4	0.0%
7750	Nodaway silt loam, occasionally flooded	170.5	11.4%
8125	Pohocco silty clay loam, 6 to 11 percent slopes, eroded	12.3	0.8%
9999	Water	13.3	0.9%
Subtotals for Soil Survey Area		**1,486.8**	**99.8%**
Totals for Area of Interest		**1,489.1**	**100.0%**

TRANSPORTATION AND UTILITY

MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS
OVERALL TRANSPORTATION
Falls City, NE – March 2024

N

Falls City, NE EDGE

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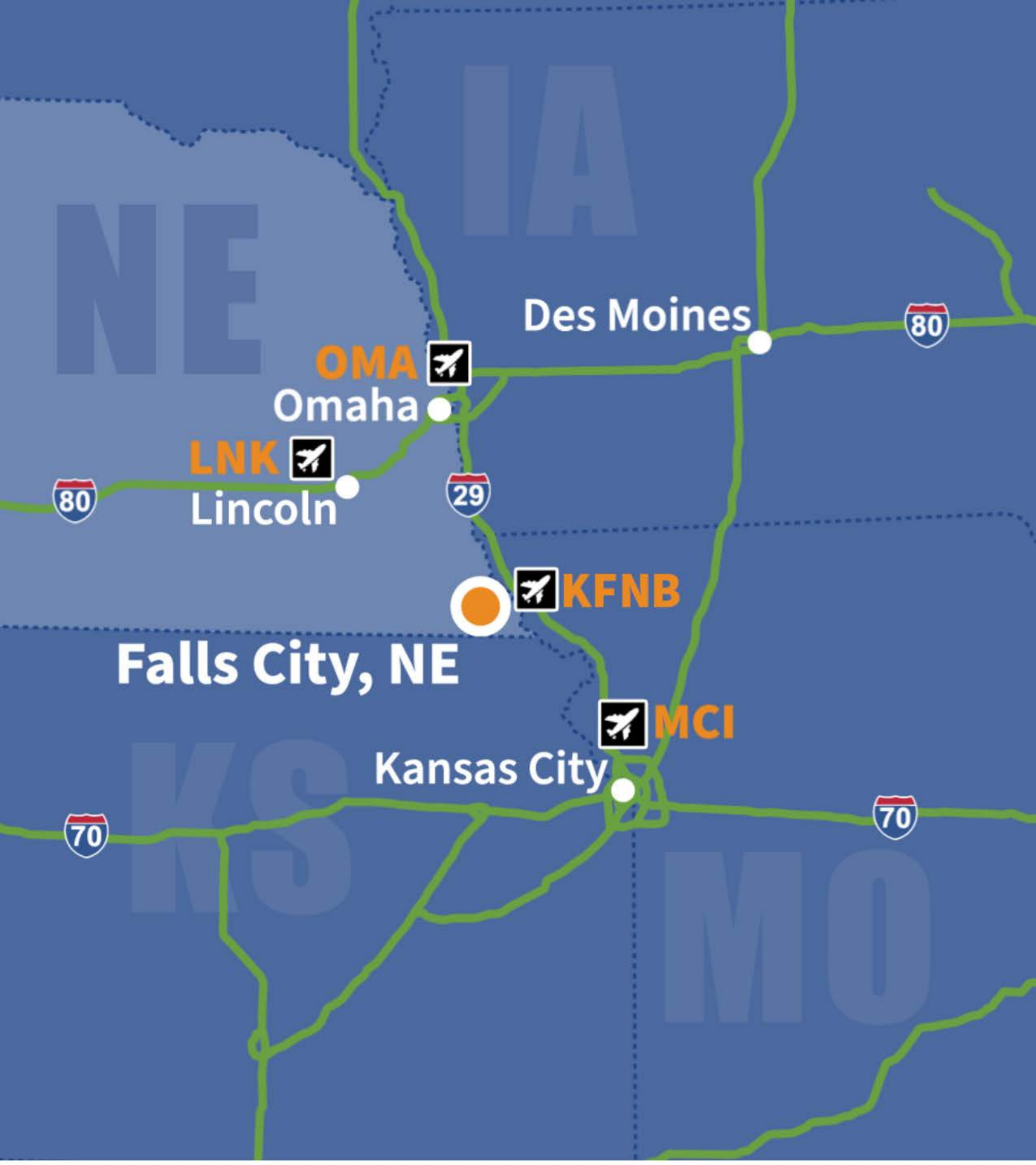

MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS
AIRPORTS
Falls City, NE – March 2024

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MID-AMERICA
RAIL CAMPUS

MID-AMERICA RAIL CAMPUS
REGIONAL TRANSPORTATION DELIVERY
Falls City, NE – March 2024

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Falls City, NE
EDGE
ECONOMIC DEVELOPMENT & GROWTH ENTERPRISE

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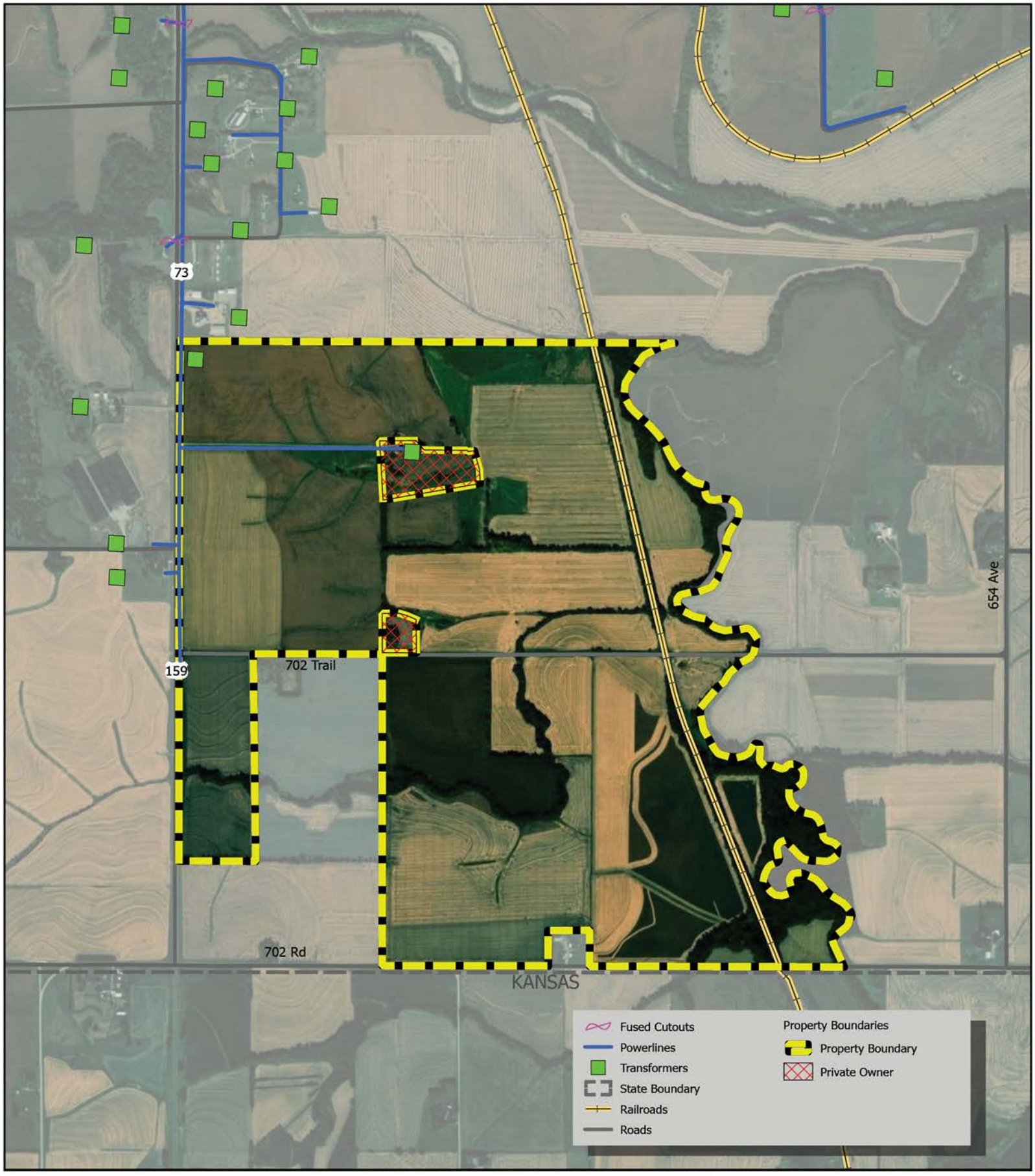
UTILITIES



MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS

ELECTRICAL

Falls City, NE – March 2024

0 500 1,000 2,000 Feet

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Falls City, NE EDGE

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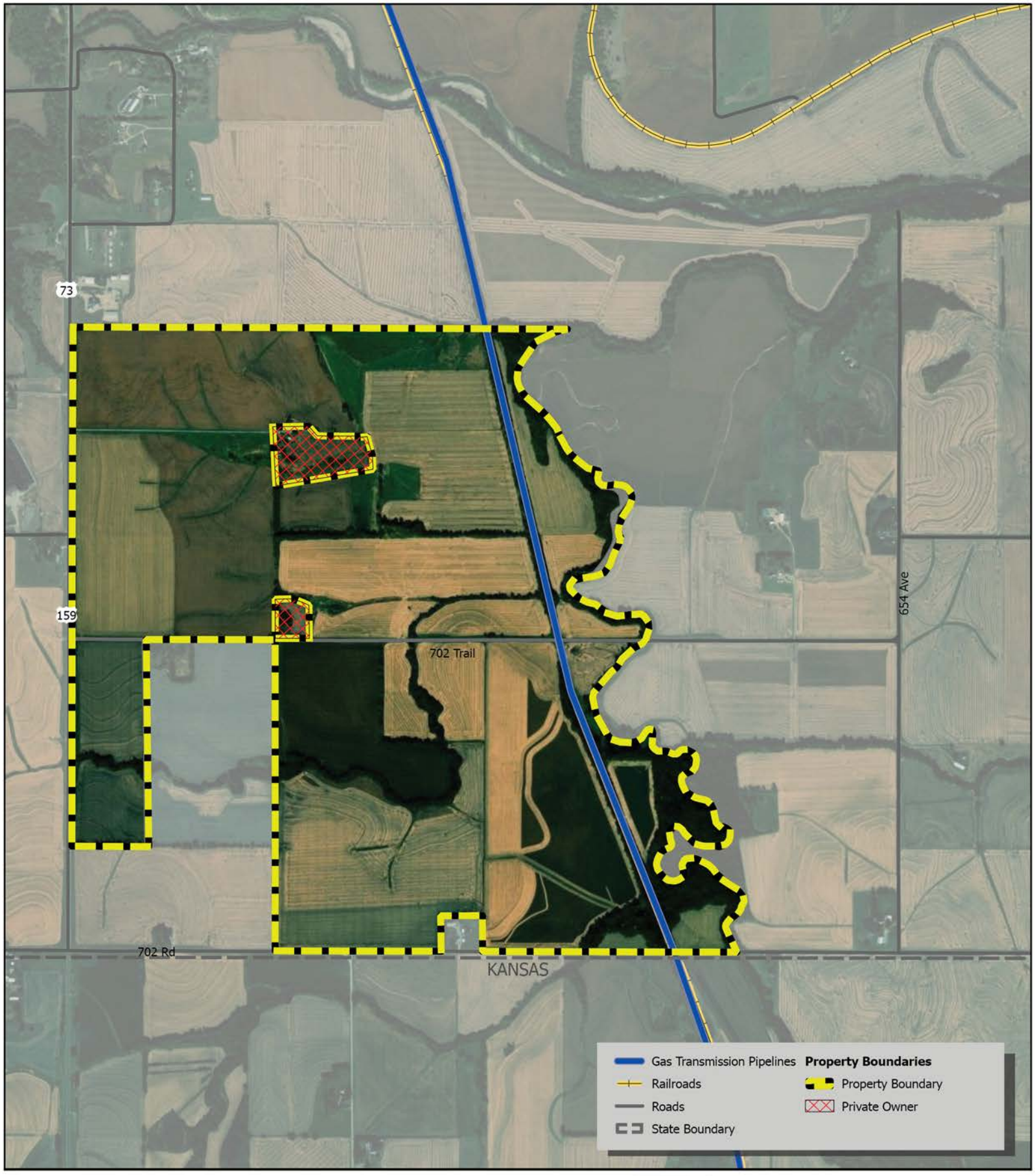

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MID-AMERICA RAIL CAMPUS

NATURAL GAS/SOUTHERN STAR PIPELINE

Falls City, NE – March 2024

0 500 1,000 2,000 Feet

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Falls City, NE EDGE

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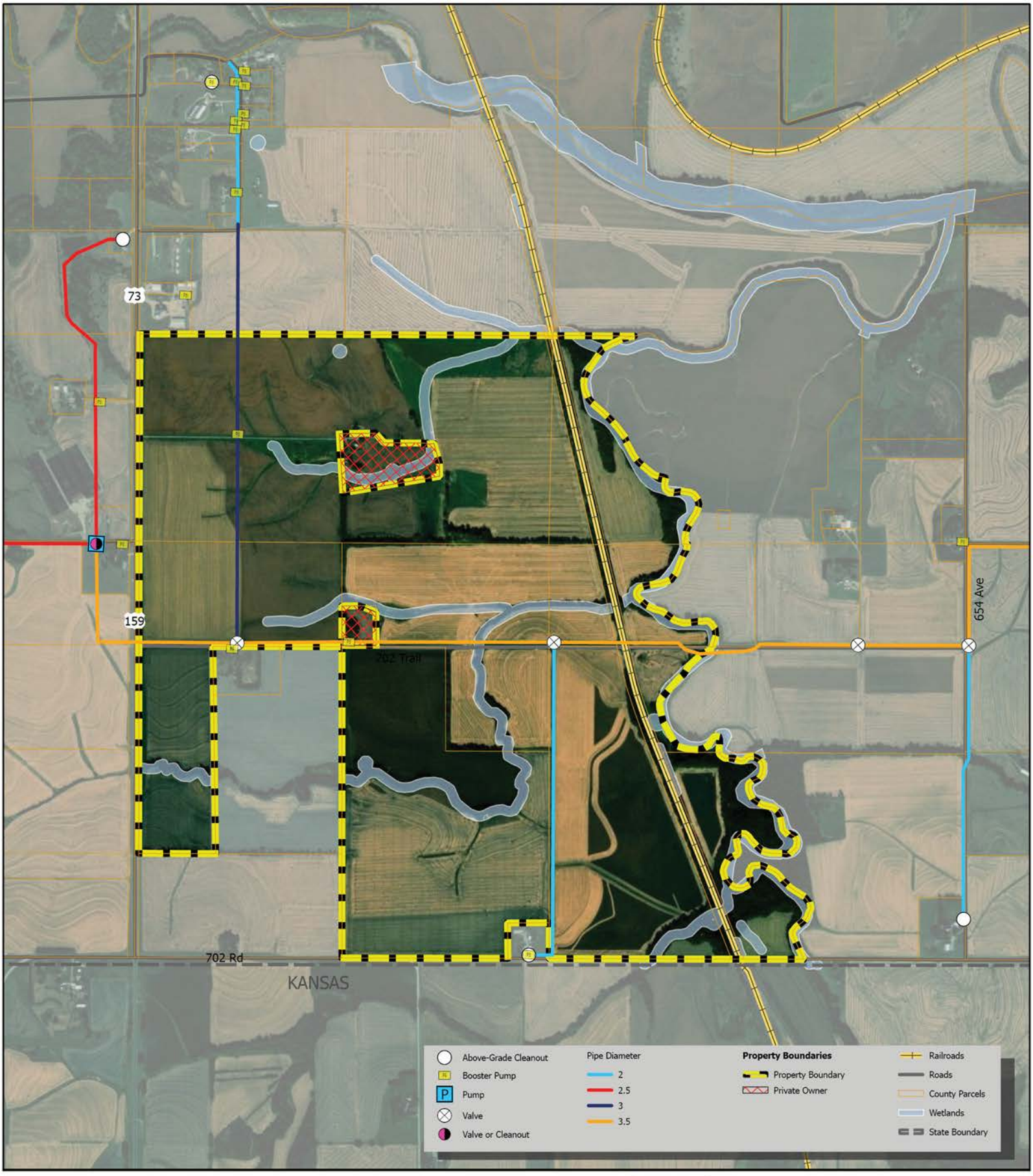

MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS
WATER INFRASTRUCTURE
Falls City, NE – March 2024

0 500 1,000 2,000 Feet

N

Falls City, NE EDGE

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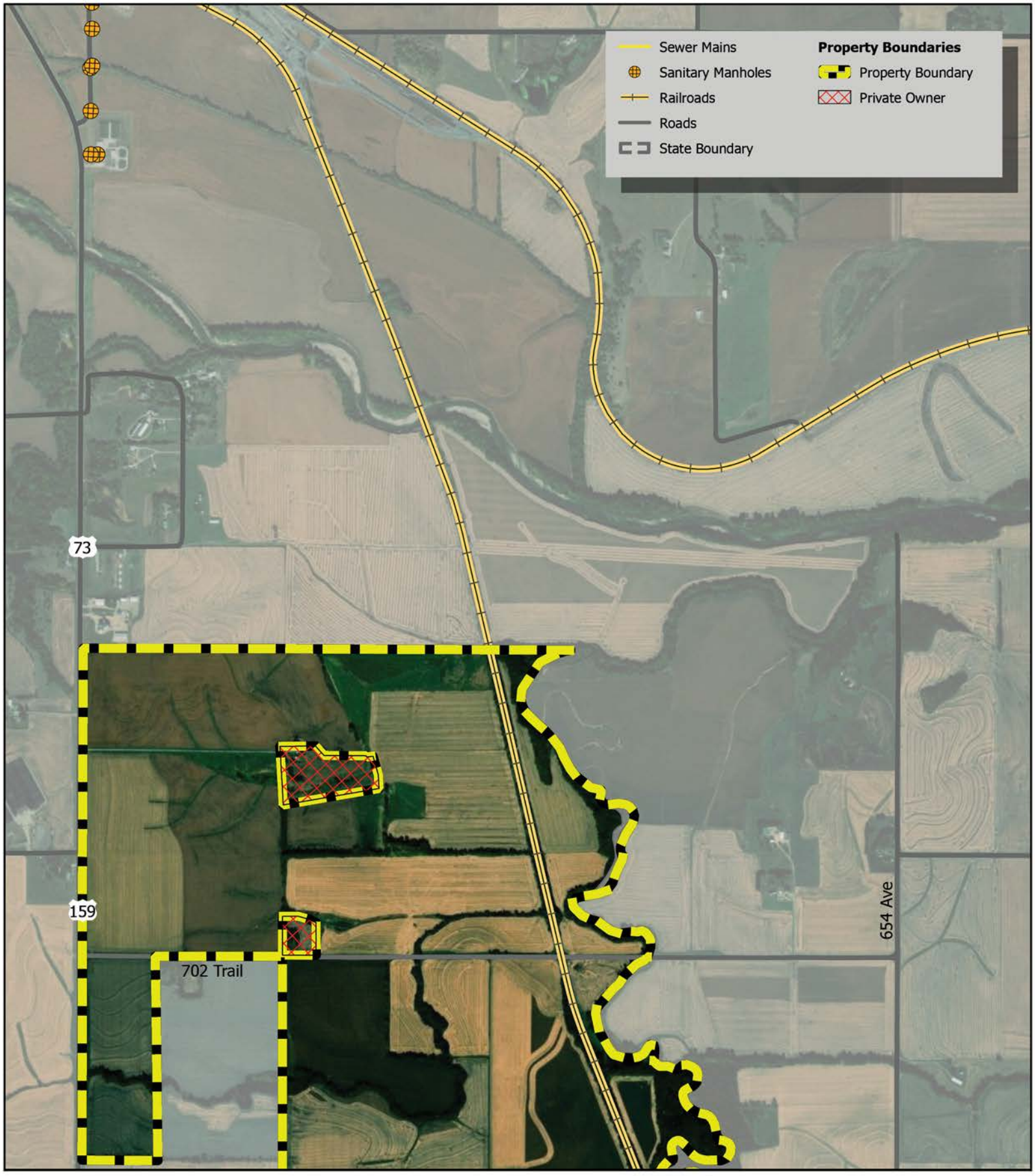

MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS
SANITARY SEWER INFRASTRUCTURE
Falls City, NE – March 2024

0 500 1,000 2,000 Feet

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Falls City, NE EDGE

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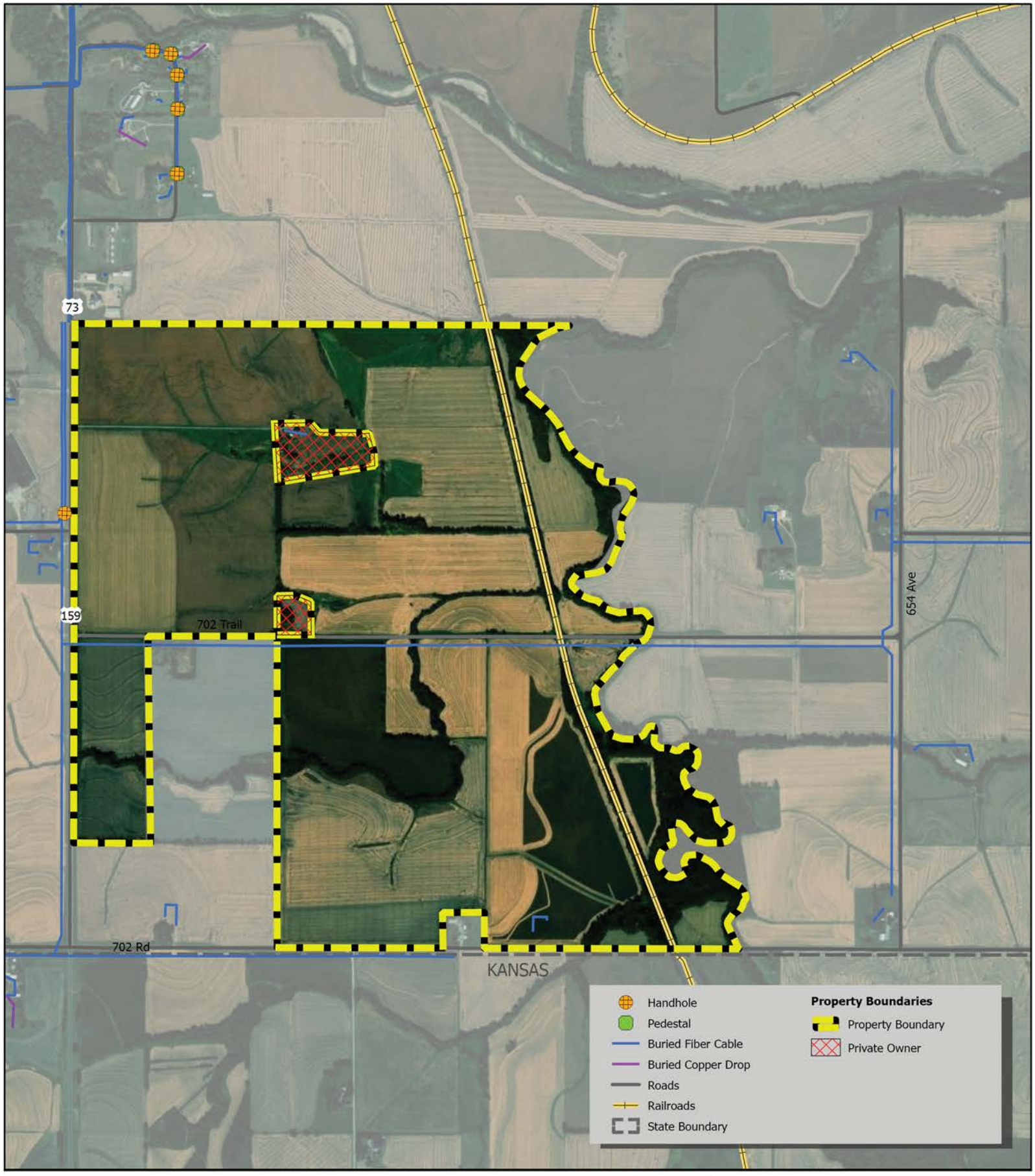

MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS
TELECOMMUNICATIONS
Falls City, NE – March 2024

0 500 1,000 2,000 Feet

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Falls City, NE EDGE

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SITE MARKETABILITY

The Falls City rail site is ideally located in southeast Nebraska with rail access. Active markets for the site include the sectors below. According to Forbes, Nebraska is the fifth in the nation for best states for business with high marks for labor supply and growth prospects. Other key factors for locating in Nebraska is the cost of doing business is eight percent below the national average with Nebraska ranking the sixth best state for financial health (Truth in Accounting, 2022). Nebraska is also the seventh best state for business and for life, health & inclusion (CNBC, 2022). Nebraska is ranked 9th in the country overall for education according to 2021 US News and World Report. Other rankings from U.S. News include number 4 best state in America, number 5 for infrastructure, tenth best econonomy (U.S. News, 2023). Lastly, as the only state served 100 percent by publicly owned utilities, Nebraska provides power customers with some of the lowest rates in the nation and is ranked number one in power reliability, as well as ranking sixth best state for energy (U.S. News, 2023).

An understanding of the key industrial development drivers, performance, supply chain competitive landscape, and operating conditions for identified primary development targets is critical to the design of an industrial park. This assessment will gauge the identified targets to determine the subject site's ability to host each form of development from a natural- and built-environment perspective.

The following seven industry segments have development potential for the Falls City rail site. The industrial growth and market share are important to external drivers for future development. The land is suitable for the industries and the infrastructure capacity for a large and super site can be met through strategic growth with the city.

1. Agriculture & Biofuels
2. Manufacturing & Distribution
3. Construction
4. Advanced Manufacturing/Wind and Solar Energy
5. Shipping and Logistics
6. Wholesale Trade
7. Business Services – Data Centers / Food & Beverage

To maximize the marketability of the subject land tract, it is necessary to assess the site's functionality for users. Because industrial prospects sometimes require very specific infrastructure and access characteristics, it is necessary for Falls City Economic Development and Growth Enterprise, Inc. (EDGE) to be conscious, not only of the general ability for the site to host development, but how the potential development proposal matches to the site's attributes. To identify the viability of primary development targets to the subject site, the following were considered.

- Identification of existing industry segments with market predominance in the Southeast Nebraska region.
- Review of identified targets for the region and the state.
- Review of the labor supply from previous report, summarized below.
- Determine the viability of identified industry targets to subject site infrastructure capacities.

The above industries have a strong to moderate likelihood of interest in the subject site. Industry information, including up- and down-line supply/demand drivers, key characteristics, regional dominance, and

industry concentrations support these data. This summary is intended to provide guidance in design and development of the industrial park and assist in the effective marketing of the sites to industry types best suited for future development.

EDGE continuously works with the City, County, and Nebraska Department of Economic Development to review grant opportunities for expanding businesses in the region. Several state funding programs are available to small business and larger development plans, but meet specific criteria to be eligible for funding.

Other key studies completed for EDGE included labor availability and characteristics which show the comprehensive review of the available labor pool for existing and future industry. The 2012 Richardson County Labor Basin Study included nine counties in Nebraska, Kansas and Missouri. The study provides a comprehensive analysis of the available labor pool, including education, occupational experiences and skills, desired wage and benefits. The key findings are shown below and are valuable to future prospects looking at the southeast region of Nebraska.

- The population of the Richardson County Labor Basin is estimated to be 62,305. The Civilian Labor Force (CLF) is estimated to be 34,126. The Institute estimates 13,331 individuals are considered to be part of the Available Labor Pool.
- Of the Available Labor Pool, an estimated 1,099 (8.2%) non-working and 2,117 (15.9%) working individuals are looking for new full-time employment, while 1,945 (14.6%) non-working and 8,170 (61.3%) working individuals would consider new and/or different full-time employment for the right opportunities.
- Almost 70% of the Available Labor Pool has at least some college experience and 97.2% has at least a high school diploma.
- An estimated 2,373 (17.8%) members of the Available Labor Pool currently work in general labor occupations (such as cleaning, construction, delivery and maintenance), while an additional 1,551 (11.6%) work in government services occupations (such as police and fire) or technical/high skill blue collar occupations (such as welder and lab technician).
- An estimated 4,236 (31.8%) members of the Available Labor Pool currently work in service sector occupations (such as clerical worker, retail sales clerk, certified nurse's assistant, small business manager), while an additional 2,126 (16.0%) work in white-collar professional occupations (such as administrator, doctor, teacher and professional sales).
- Of the 10,287 members in the subset of employed members of the Available Labor Pool, 3,477 (34%) consider themselves underemployed.
- 2022 Workforce Job Concentration Commuter Data
  - Richardson County, Nebraska
  - 2021 County Population: 7,759 (Falls City: 4,074)
  - 2021 Available Jobs: 2,987
  - 2021 Resident Workers: 4,373
  - 2021 Net Commuters: -1,386
  - **Conclusion:** This study shows the workforce exists locally in Falls City and suggests many residents are commuting to neighboring counties and states for employment.

CONCEPTUAL PLANS

Master Plan Introduction

Two master plans were created for the Falls City Rail Site. The concepts utilize, for the most part undeveloped land, however there are areas of existing wetlands within the site. The plans varied based on the number of buildings and the areas allotted for the assessed industry targets. It is important to find out which users will be interested in locating to the business park, and how much area they will need for their proposed sites to efficiently build out the industrial park in the most economical way. These concepts have been created for maximum flexibility and will allow the developer to pursue multiple users as the site continues to develop.

Many types of master planning are completed across the country. The type of planning used for this Falls City Diligence and Master Plan focuses on the foundation of developing master plan concepts with minimal or no disturbance to wetlands or encroachment to flood plains. The purpose behind this type of planning is to have intentional and immediate responses to future prospects looking at the Falls City industrial site. The second purpose is to show how Falls City is preparing for industrial growth with local and regional investments currently underway and those planned projects in the near future or likely within two years.

The following figure shows base information of wetlands and floodplains for the industrial site. The term 'Usable Area' identifies the cumulative areas on the property that are contiguous with having little or no disturbance to identified wetlands and avoiding recognized flood plains.

The industrial site comprises 1,017 acres, with 670 acres of useable and buildable land. Contiguous plots include areas of 305, 250, 68, 32, 21, 11, and 8 acres. Efforts were taken to locate detention cells in line with natural environmental features and to place the cells between development areas to serve as additional buffers between users. There is no current restriction on developing within these wetlands, however there are additional permits required. Acquiring those permits can prolong the development process so efforts were taken to avoid impacts where they do not incumber the potential development area. If wetlands are impacted, there is a need to find mitigation elsewhere within the site boundaries or mitigation points can be purchased from a nearby wetland bank to offset the impacts.

The site provides convenient access all targeted industries would require. The concepts are designed to be developed in a flexible manner. The proposed building layouts can be easily rearranged to accommodate large or smaller users. The layout is designed with respect to existing and future infrastructure. Any utilities crossed will need to be protected with encasements. To keep costs down, the plans avoid crossing utility lines as much as possible.

Solar Energy Focus

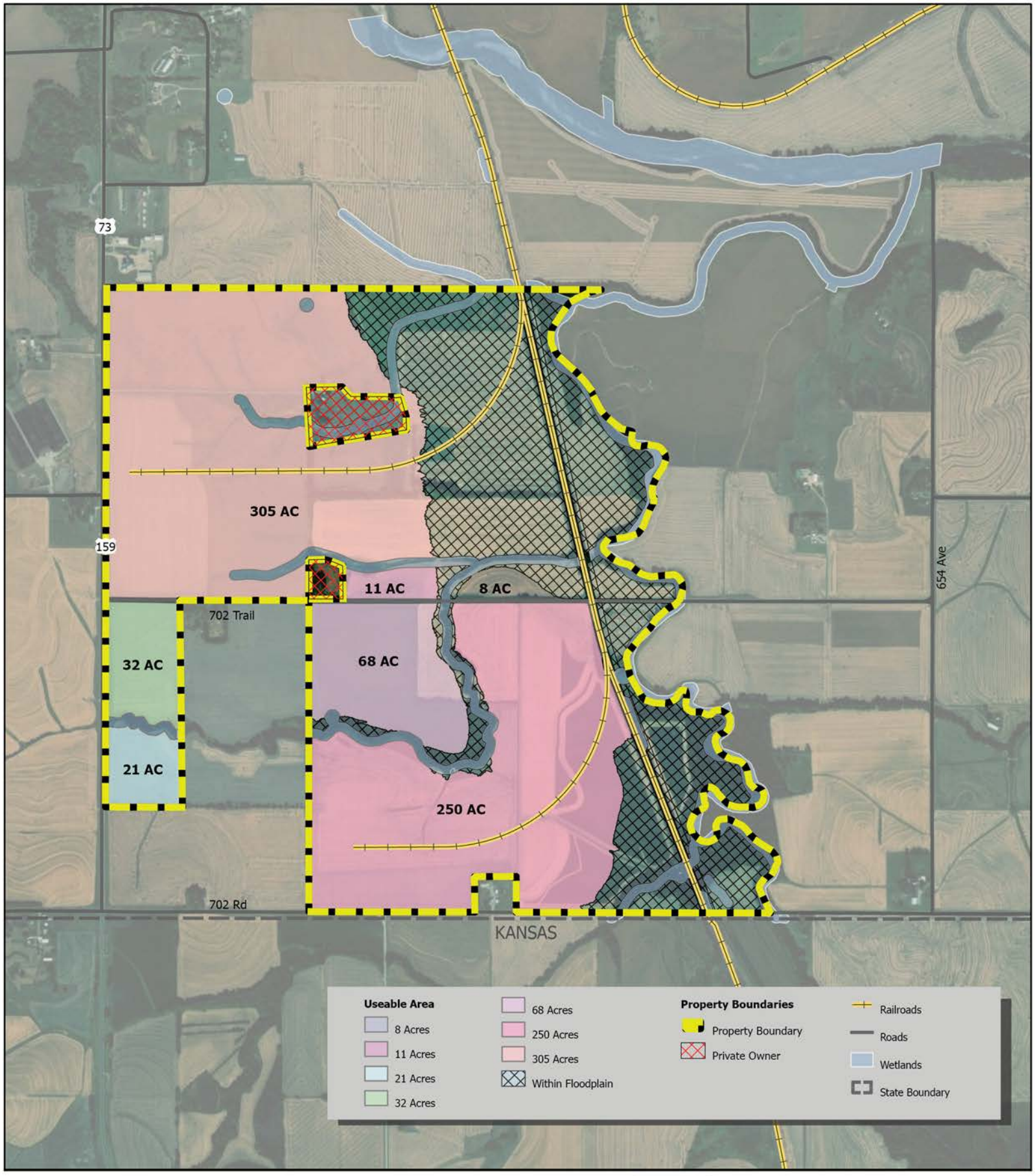
Another focus in the development of the industrial park is the option of sustainable energies available to prospective users through solar energy. Solar energy is one of the cleanest and most widely available renewable energy sources, which the U.S. has in abundance. As of mid-2022, the U.S. had approximately 130 GW of total installed solar PV capacity, roughly 10% of which can be attributed to commercial and industrial (C&I) solar. This puts the U.S. second on a global list of countries with the most PV installed, somewhat ahead of the major European countries (Germany, Italy and Spain), though China more than doubles the U.S. installations.

The U.S. C&I solar industry has grown by an average of 7.0% annually over the past decade. The surge has been

partly driven because of declining costs for PV panels, supportive government policies like the Investment Tax Credit (ITC), and the rising demand for clean energy from both public and private sectors. Much of the commercial growth comes from industrial buildings, such as warehouses and distribution centers.

Solar industry benefits both the industrial building owner and the local community. Solar infrastructure can reduce greenhouse gas (GHG) emissions and therefore limit a building's contribution to climate change. However, to achieve such an objective and to ensure a long-lasting impact, a relatively significant long-term upfront investment is required. Solar systems can reduce a building's reliance on grid-supplied electricity by as much as 80% and in many cases offset the electric bill by up to 95%, therefore lowering the tenant's cost of occupancy. Lower energy costs, and access to clean energy, can encourage tenants to sign longer lease agreements and make the building more attractive to potential tenants. The longer the lease terms, the higher the net present value (NPV) and cash flows. Such savings are particularly crucial for triple net lease tenants. In addition, a variety of federal, state and local incentives, rebates and tax credits can benefit landlords and tenants.

A marketing benefit of solar infrastructure help support the many companies who have set net-zero targets in recent years, putting pressure on other companies to adopt similar approaches. Solar infrastructure can help to achieve these objectives and, thereby, avoid regulatory risk and promote a sustainable environment.



MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS

USABLE AREA

Falls City, NE – March 2024

0 500 1,000 2,000 Feet

N

Falls City, NE EDGE

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Option 1 Summary

Option 1 works with the topography, drainage, and existing infrastructure (utilities, wetlands, and drainage) that naturally divides the property. The proposed site layout is broken up into three different areas, with existing and new internal roadways connecting the site from east to west and north to south. These roads use existing utilities and or drainage ways where possible.

This concept is a combination of freight/warehousing, manufacturing, and industrial flex. The design of this concept shows a mixture of larger to smaller probable building footprints within the allotted areas. The northern section (north side of 702 Trail, connecting the site east to west) features approximately 5 million square feet of available freight/warehousing building positioned between existing drainage ways and wetlands. The northern property options include rail access to two proposed building footprints.

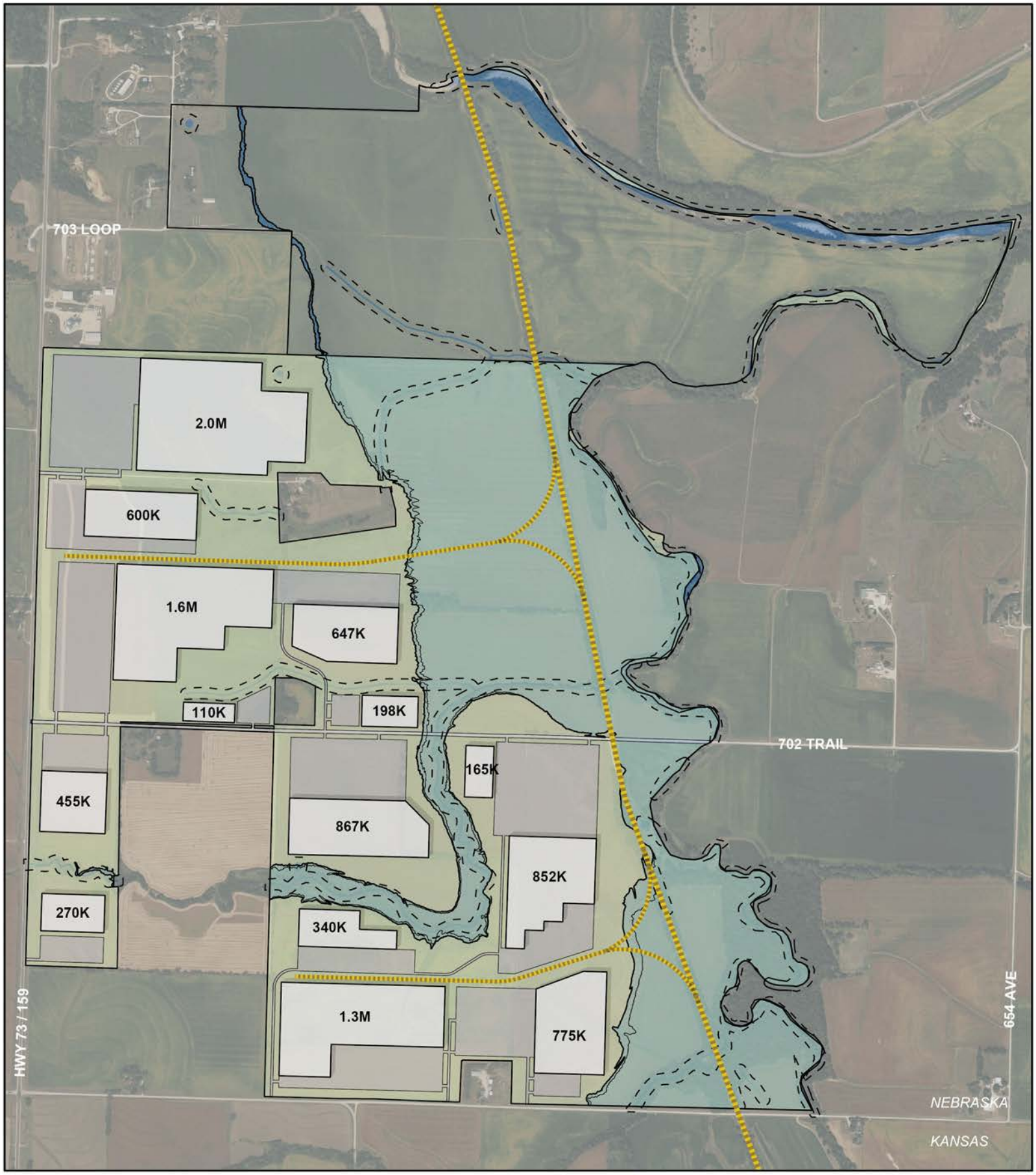
The largest proposed footprint in the northern section is a 2.0M square foot building without rail access. However, direct south of that footprint is a 1.6M square foot building option and a 600,000 square foot options with rail access. Four additional buildings include 647,000, 190,000, 110,000, and an 88,000 square foot available.

The southern portion of the site includes 5 building options designed around the wetland areas. Three of the five building have rail access. The largest footprint is 2 million square foot on the eastern boundary of the park. The two other rail access properties offer 1.3 million square foot building and a 539,000 square foot building. The remaining buildings are 867,000 square feet and 340,000 square feet.

The final portion of the site is smaller and is adjacent to US 73 and has two buildings, ranging from 356,000 square feet to 523,000 square feet. Should additional private properties be acquired by EDGE in the future, these two buildings would merge into the southern portion of the site.

The central part of the site has an internal roadway running east/west. Additional roadways are needed to access all potential areas on the site. Overall, this plan is adaptable and expandable based on need. This plan does show drives crossing existing utilities and drainage ways to allow access. Mitigation and permitting will likely need to take place if this plan is to be built as conceptually shown.

Solar infrastructure is planned for the eastern boundary of the park with approximately 187 acres, which would feed directly into the industrial park.



MID-AMERICA RAIL CAMPUS

CONCEPT 1

Falls City, NE – March 2024

MID-AMERICA RAIL CAMPUS

Falls City, NE EDGE

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Option 2 Summary

Option 2 works with the topography, drainage, and existing infrastructure (utilities, wetlands, and drainage) that naturally divides the property. The proposed site layout is broken up into three different areas, with existing and new internal roadways connecting the site from east to west and north to south. These roads use existing utilities and or drainage ways where possible.

This concept is a combination of freight/warehousing, manufacturing, and industrial flex. The design of this concept shows a mixture of larger to smaller probable building footprints within the allotted areas. The primary difference in Option 2 is the loop rail concept, which feeds from the main north/south rail line on the eastern site boundary.

The northern section (north of 702 Trail, connecting the site east to west) features approximately 4 million square feet of available freight/warehousing building positioned between existing drainage ways, wetlands, and the rail line. The northern property options include rail access to one large, proposed building footprint of 1.3 million square feet.

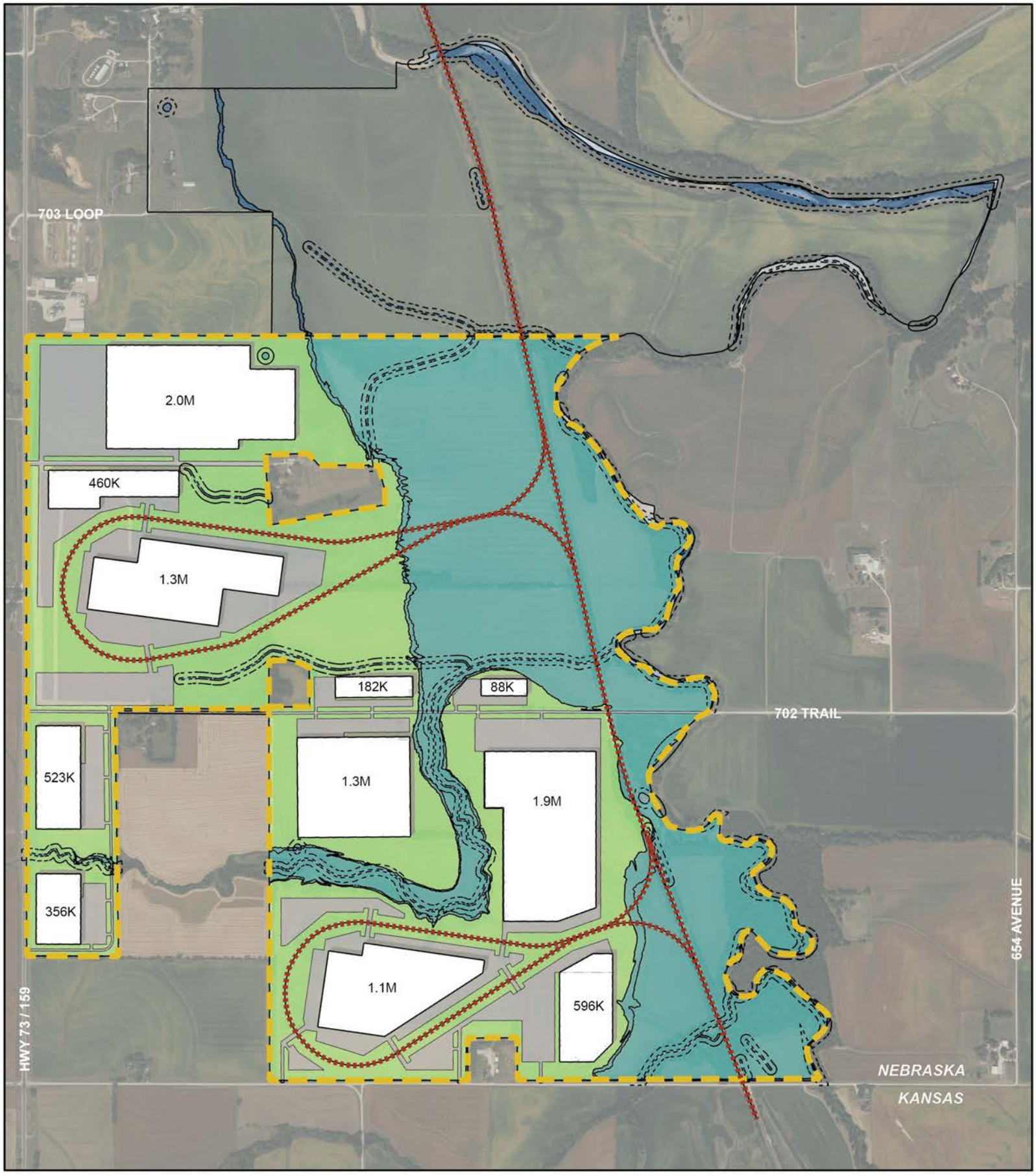
The largest proposed footprint in the northern section is a 2.0M square foot building without rail access. However, directly south of that footprint is a 480,000 square foot building and a 1.3M square foot building option with rail access. Two additional buildings include 182,000 and an 88,000 square foot building available.

The southern portion of the site includes 4 building options designed around the wetland areas and rail line. Three of the four buildings have rail access. The largest footprint is 1.9 million square feet on the eastern boundary of the park. The two other rail access properties offer a 1.1 million square foot building and a 596,000 square foot building. The last building is 1.3 million square feet.

The final portion of the site is smaller and adjacent to US 73 with two buildings ranging from 356,000 square feet to 523,000 square feet. Should additional private properties be acquired by EDGE in the future, these two buildings would merge into the southern portion of the site.

The central part of the site has an internal roadway running east/west. Additional roadways are needed to access all potential areas on the site. Overall, this plan is adaptable and expandable based on need. This plan does show drives crossing existing utilities and drainage ways to allow access. Mitigation and permitting will likely need to take place if this plan is to be built as conceptually shown.

Solar infrastructure is planned for the eastern boundary of the park with approximately 187 acres, which would feed directly into the industrial park.



MID-AMERICA RAIL CAMPUS

CONCEPT 2

Falls City, NE – March 2024

MID-AMERICA RAIL CAMPUS

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Preferred Concept

As with the initial Options 1 and 2, the Preferred Concept provides a conceptual layout which conforms to natural topography, drainage, and makes use of existing infrastructure (utilities, wetlands, and drainage) which divide the property into three different areas. The proposed site layout is broken up into three different areas.

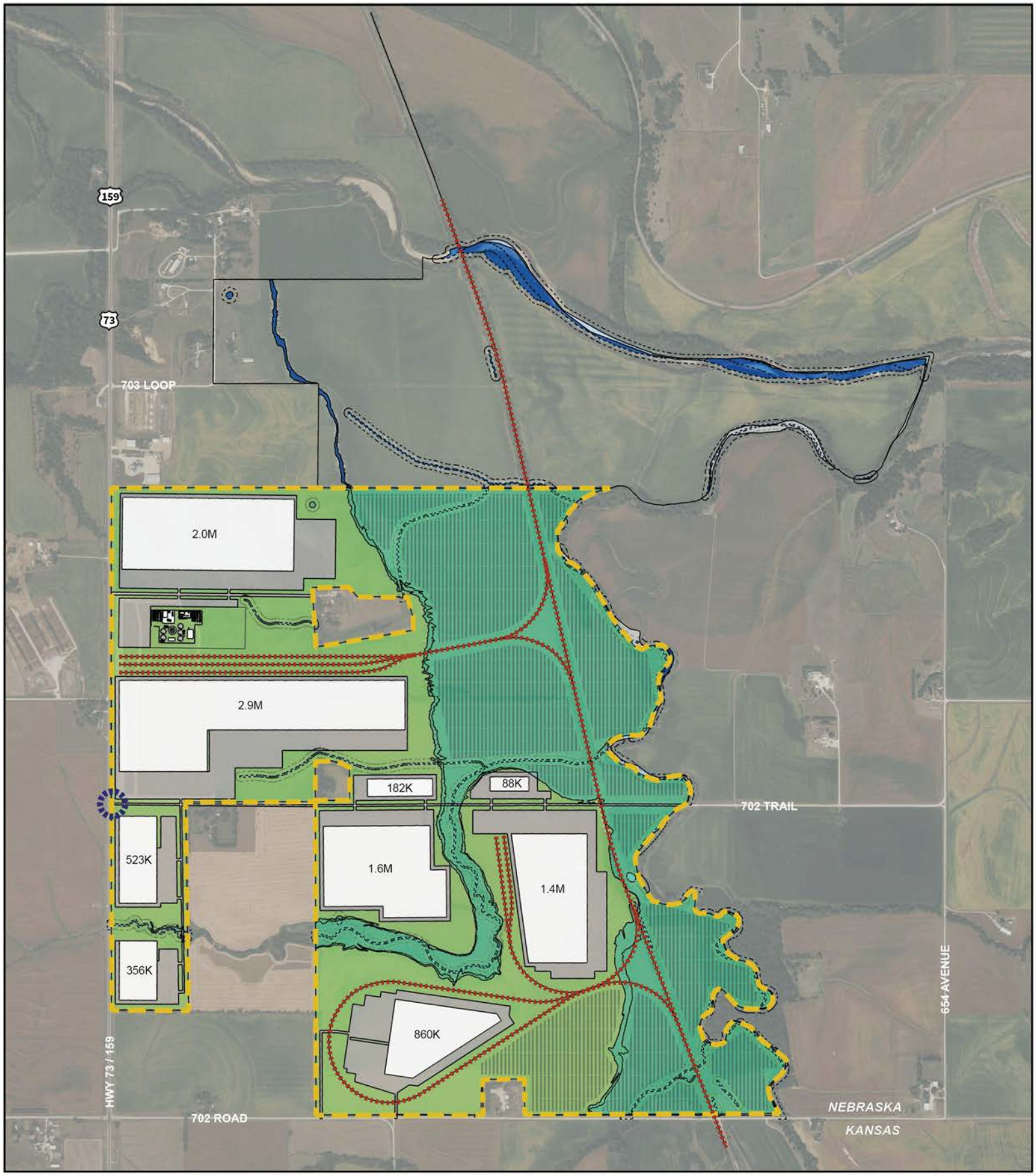
This preferred concept is a combination of freight/warehousing, manufacturing, and industrial flex. This concept is a combination of Option 1 and 2 and shows a mixture of both large to smaller building footprints within the allotted development areas.

The northern portion of the site consists of five development sites, ranging from 2.9 million to 88,000 square feet, including a bio-fuel design with rail access. This portion of the site accommodates two smaller non-rail access properties with 182,000 square feet and an 88,000 square feet option. The northern portion does not include the loop design, but could be adapted, as shown in previous Option 2.

The southern portion of the site incorporates the loop rail design as shown in Option 2 and has three potential footprint concepts. Two of the buildings have rail access. 1.4 million square feet and 860,000 square feet. The third footprint has 1.5 million square feet available. Natural buffers are suitable for the large single users for natural privacy barriers.

The Preferred Concept envisions a total of 10 building sites, with 9.9 million square feet of available square feet. Detention ponds are placed throughout the site located at the low portions of the topographic layout adjacent to the drainage ways and flood plains.

This site is expected to be phased from north to south to west due to the existing utility access. This Preferred Concept was created with flexibility in mind and can be molded to fit the overall phasing as potential users come to the site. Solar infrastructure is planned for the eastern boundary of the park with approximately 187 acres, which would feed directly into the industrial park.



MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS

PREFERRED CONCEPT

Falls City, NE – March 2024

0' 500' 1000' 2000'

SCALE IN FEET

N

Falls City, NE EDGE

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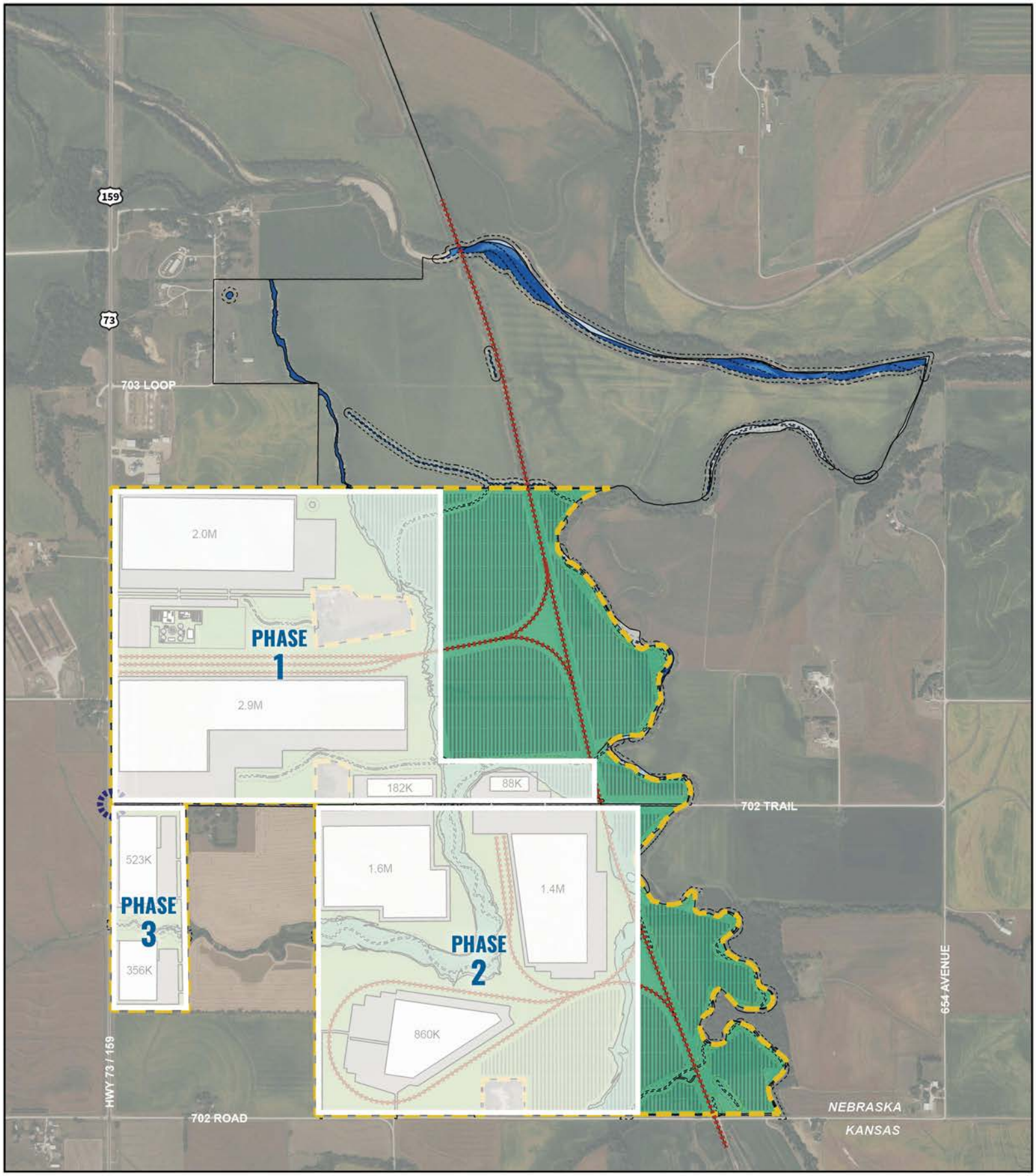
Solar Power Estimates

The indicative layout has approximately 187 acres of potential build out for solar PV installation in the state floodplain. We assume approximately 70% of this area will be useable. We estimate the Direct CUrrent (DC) system size as are (in square meters) x 1 kilowatt/square meter x module efficiency.

$$187 \text{ acres} * 0.7 * \frac{4046.86 \text{ sq. m}}{1 \text{ acre}} * \frac{1 \text{ kW}}{1 \text{ sq.m}} * 19\% = 100649 \text{ kW}$$

With a single axis tracking array, standard panel efficiency of 19%, 14.08% system lossed, ground coverage ratio of 0.4, and DC to AC system size ratio of 1.2, there could be:

- Potential for 162,819,462 kilowatt-hours of AC generation at the site.
- System output may range from 154,238,876 to 171,579,149 kWh per year near this location.



MID-AMERICA RAIL CAMPUS

MID-AMERICA RAIL CAMPUS

PHASING PLAN FOR PREFERRED ALTERNATIVE

Falls City, NE – March 2024

0' 500' 1000' 2000'

SCALE IN FEET

N

Falls City, NE EDGE

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Engineers Opinion of Costs

PHASE I (NORTH)					
Item No.	**Item Description**	**Qty**	**Units**	**Unit Price**	**Total**
101	EARTHWORK - SUBGRADE PREPARATION	563.1628	AC	$20,000.00	$1,1263,256
102	CONSTRUCT CONCRETE PAVEMENT (ROADWAY)	7,573.333	SY	$65.00	$492,267
103	CONNECT TO EXISTING CONCRETE PAVEMENT	1	EA	$5,000.00	$5,000
104	CONSTRUCT SANITARY SEWER GRAVITY LINE	1,1625	LF	$50.00	$581,250
105	CONSTRUCT WATER LINE	2,2250	LF	$90.00	$2,002,500
106	CONSTRUCT STORM SEWER (20% of Item 102)	1	LS	$98,453.33	$98,453
107	GAS LINE	1,3830	LF	$50.00	$691,500
Sub Total					**$15,134,226**
Contingency				**20%**	**$3,026,845**
Net Construction Total					**$18,161,071**
PHASE II (SOUTHEAST)					
Item No.	**Item Description**	**Qty**	**Units**	**Unit Price**	**Total**
301	EARTHWORK - SUBGRADE PREPARATION	463.3422	AC	$20,000.00	$9,266,844
302	CONSTRUCT CONCRETE PAVEMENT (ROADWAY)	21,146.67	SY	$65.00	$1,374,533
303	CONNECT TO EXISTING CONCRETE PAVEMENT	5	EA	$5,000.00	$25,000
304	CONSTRUCT SANITARY SEWER GRAVITY LINE	15,135	LF	$50.00	$756,750
305	CONSTRUCT WATER LINE	25,270	LF	$90.00	$2,274,300
306	CONSTRUCT STORM SEWER (20% of Item 202)	1	LS	$274,906.67	$274,907
307	GAS LINE	5,250	LF	$50.00	$262,500
Sub Total					**$14,234,834**
Contingency				**20%**	**$2,846,967**
Net Total Construction					**$17,081,801**
PHASE III					
Item No.	**Item Description**	**Qty**	**Units**	**Unit Price**	**Total**
201	EARTHWORK - SUBGRADE PREPARATION	58.1601	AC	$20,000.00	$1,163,202
202	CONSTRUCT CONCRETE PAVEMENT (ROADWAY)	12,986.67	SY	$65.00	$844,133
203	CONNECT TO EXISTING CONCRETE PAVEMENT	3	EA	$5,000.00	$15,000
204	CONSTRUCT SANITARY SEWER GRAVITY LINE	3,810	LF	$50.00	$190,500
205	CONSTRUCT WATER LINE	6,620	LF	$90.00	$595,800
206	CONSTRUCT STORM SEWER (20% of Item 302)	1	LS	$168,826.67	$168,827
207	GAS LINE	2,550	LF	$50.00	$127,500
Sub Total					**$3,104,962**
Contingency				**20%**	**$620,992**
Net Total Construction					**$3,725,954**
TOTAL – 3 PHASES					**$38,968,826**

Power Costs

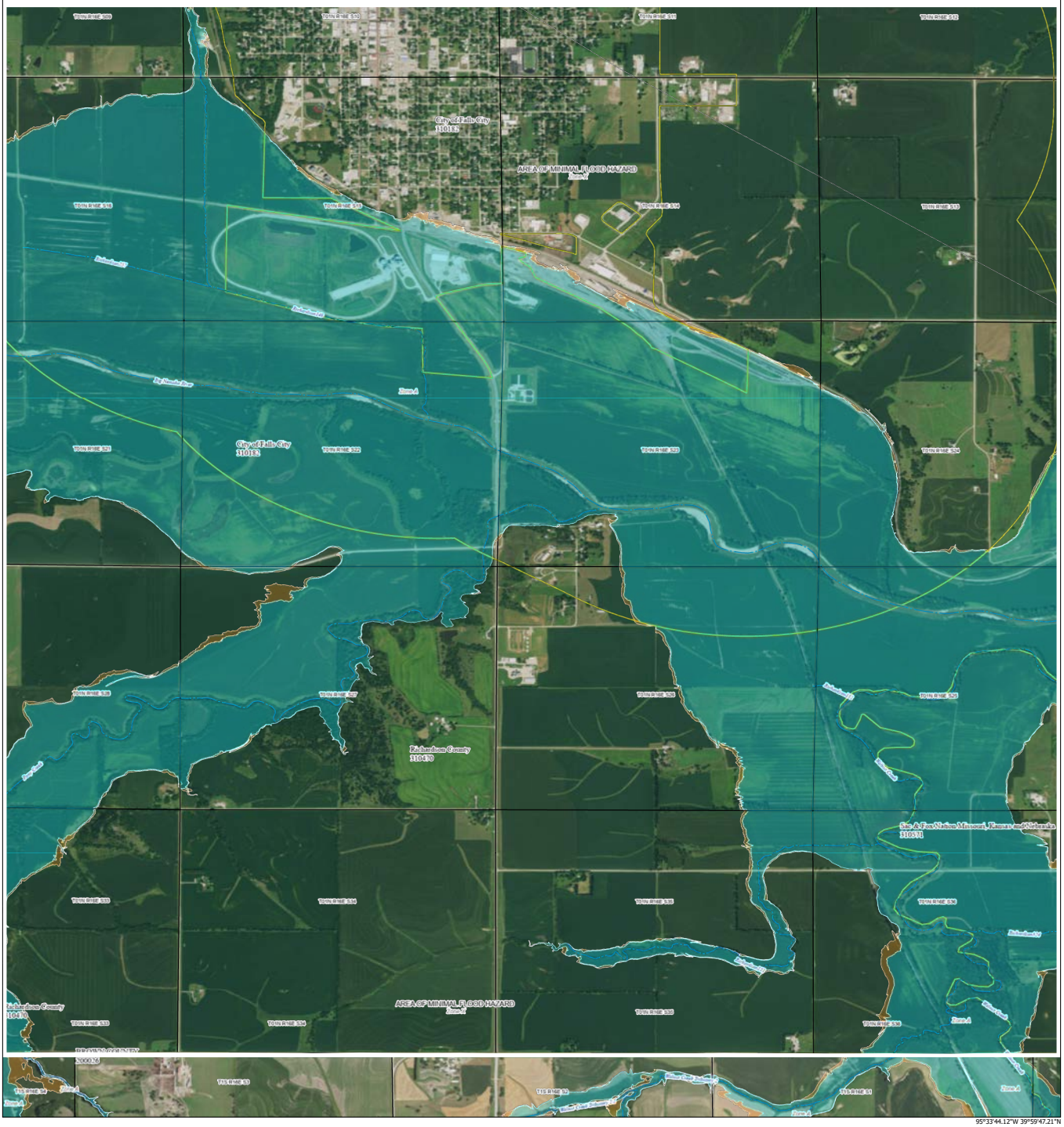
SUBSTATION COST BREAKDOWN	
Substation Labor Cost	$4,460,600
Substation Material Cost	$4,850,000
Substation Engineering Services (15%)	$1,396,590
Contingency (20%)	$1,862,120
Total	**$12,569,310**

DISTRIBUTION LINE COST BREAKDOWN

Item	Phase 1		Phase 2		Phase 3	
	Circuit 1	Circuit 2 (pt 1)	Circuit 3 (pt 1)	Circuit 4	Circuit 2 (pt 2)	Circuit 3 (pt 2)
Cable ($18/Circuit ft)	$126,684	$194,166	$221,706	$302,436	$221,706	$302,436
Sub Exits ($20,000/ea)	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000
Tangent Poles ($3,000/ea)	$108,000	$162,000	$186,000	$255,000	$186,000	$255,000
Corners/Dead Ends ($8,000/ea)	$48,000	$48,000	$80,000	$104,000	$80,000	$104,000
Double Circuit ($2,500/ea)	$15,000	$15,000	$25,000	$32,500	$25,000	$32,500
Rail Crossing ($15,000/ea)	$0	$15,000	$45,000	$0	$45,000	$0
Switches ($50,000/ea)	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
Cap Banks ($5,000/ea)	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000
Totals	**$881,850**		**$1,401,642**		**$274,416**	
Engineering Cost (20%)	**$176,370**		**$280,329**		**$54,884**	
Contingency (25%)	**$220,463**		**$350,411**		**$68,604**	
Total/Phase	**$1,278,683**		**$2,032,382**		**$397,904**	
Grand Total					**$3,708,969**	
Project Cost / Mile					**$363,625 / Mile**	

APPENDICES

95°37'30.83"W 40°3'58.56"N



95°33'44.12"W 39°59'47.21"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **1/6/2023 10:46 AM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: No elevation features on this FIRM
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

1 inch = 1,000 feet 1:12,000

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

N

0 105 210 420 630 840 Meters

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

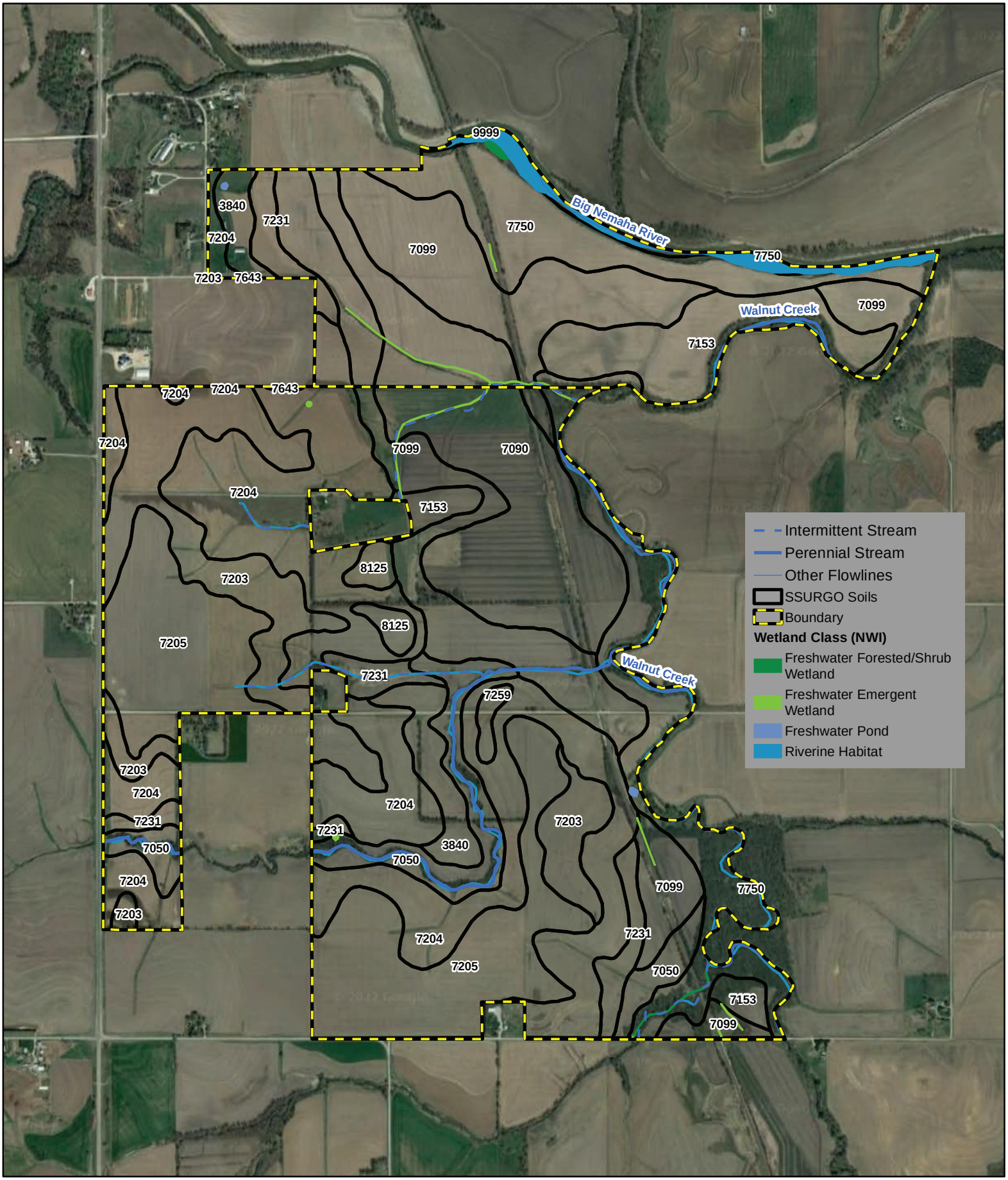
FLOOD INSURANCE RATE MAP

PANEL **390** OF **450**

Panel Contains:

COMMUNITY	NUMBER	PANEL
CITY OF FALLS CITY	310182	0390
RICHARDSON COUNTY	310470	0390
SAC & FOX NATION MISSOURI, KANSAS AND NEBRASKA	310571	0390
BROWN COUNTY	200026	0390

MAP NUMBER
31147C0390C
EFFECTIVE DATE
October 07, 2021



Falls City EDGE Master Plan

Natural Resources Map

Falls City, Nebraska
January 2024

0 500 1,000 2,000 ft

N

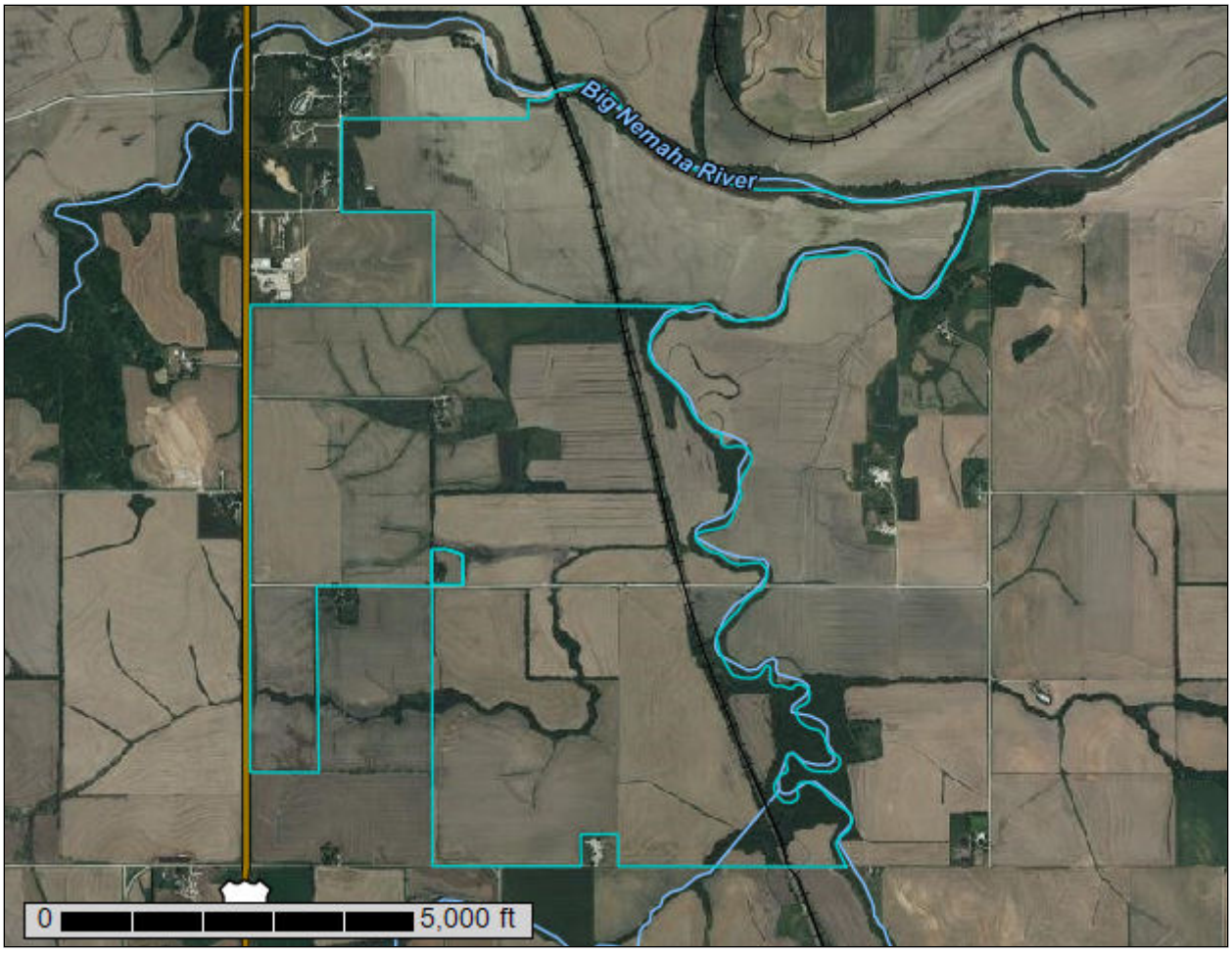
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Brown County, Kansas, and Richardson County, Nebraska



December 12, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

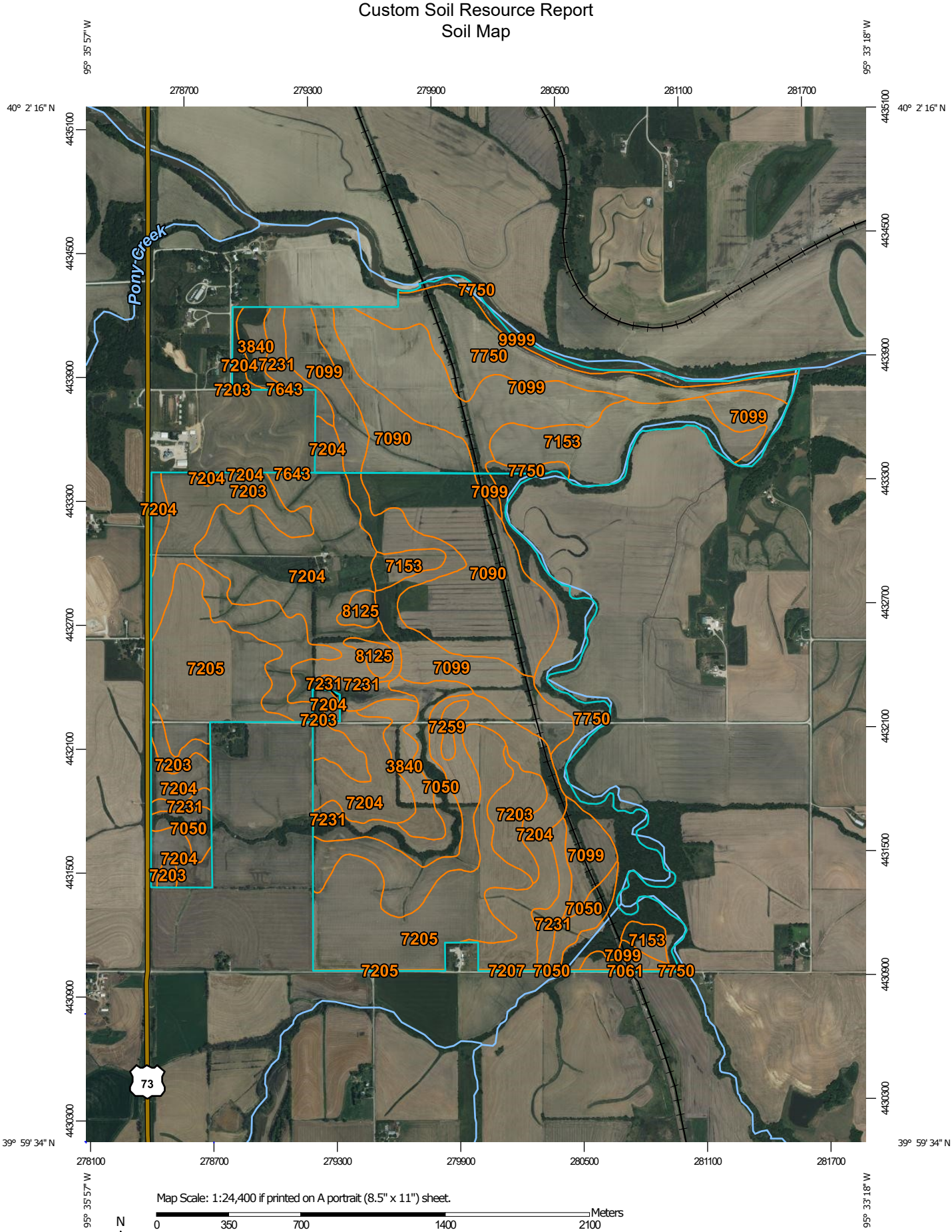
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



Map Scale: 1:24,400 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 350 700 1400 2100

Feet
0 1000 2000 4000 6000

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

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 1:20,000 to 1:24,000.

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: Brown County, Kansas
Survey Area Data: Version 26, Sep 12, 2022

Soil Survey Area: Richardson County, Nebraska
Survey Area Data: Version 21, Sep 8, 2022

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: Apr 25, 2021—Jun 10, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	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
7050	Kennebec silt loam, occasionally flooded	0.1	0.0%
7061	Muscotah silty clay loam, occasionally flooded	0.8	0.1%
7205	Aksarben silty clay loam, 0 to 2 percent slopes	0.7	0.0%
7207	Aksarben silty clay loam, 6 to 11 percent slopes	0.4	0.0%
7750	Nodaway silt loam, occasionally flooded	0.2	0.0%
7851	Judson silt loam, 1 to 5 percent slopes	0.1	0.0%
Subtotals for Soil Survey Area		**2.4**	**0.2%**
Totals for Area of Interest		**1,489.1**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3840	Geary silty clay loam, 7 to 11 percent slopes, eroded	35.6	2.4%
7050	Kennebec silt loam, occasionally flooded	64.5	4.3%
7090	Wabash silty clay loam, occasionally flooded	165.8	11.1%
7099	Zook silty clay loam, occasionally flooded	243.3	16.3%
7153	Kennebec silt loam, rarely flooded	82.3	5.5%
7203	Aksarben silty clay loam, 2 to 6 percent slopes, eroded	132.9	8.9%
7204	Aksarben silty clay loam, 6 to 11 percent slopes, eroded	322.9	21.7%
7205	Aksarben silty clay loam, 0 to 2 percent slopes	194.8	13.1%
7231	Judson silt loam, 2 to 6 percent slopes	43.2	2.9%
7259	Deroin silty clay loam, 6 to 11 percent slopes, severely eroded	4.9	0.3%
7643	Yutan silty clay loam, 3 to 11 percent slopes, eroded	0.4	0.0%
7750	Nodaway silt loam, occasionally flooded	170.5	11.4%
8125	Pohocco silty clay loam, 6 to 11 percent slopes, eroded	12.3	0.8%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
9999	Water	13.3	0.9%
Subtotals for Soil Survey Area		**1,486.8**	**99.8%**
Totals for Area of Interest		**1,489.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Brown County, Kansas

7050—Kennebec silt loam, occasionally flooded

Map Unit Setting

National map unit symbol: 2lprr
Elevation: 730 to 1,700 feet
Mean annual precipitation: 29 to 39 inches
Mean annual air temperature: 52 to 55 degrees F
Frost-free period: 159 to 203 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Kennebec and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kennebec

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 8 inches: silt loam
A - 8 to 41 inches: silt loam
AC - 41 to 54 inches: silty clay loam
C - 54 to 79 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 40 to 44 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 14.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: R106XY068NE - Loamy Floodplain
Forage suitability group: Overflow (G106XY500NE)
Other vegetative classification: Overflow (G106XY500NE)
Hydric soil rating: No

Minor Components

Muscotah

Percent of map unit: 5 percent

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY032NE - Subirrigated
Other vegetative classification: Clayey Subsoil (G106XY210NE)
Hydric soil rating: No

Reading

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R106XY070NE - Loamy Terrace
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Wabash

Percent of map unit: 3 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R106XY065NE - Wet Subirrigated
Other vegetative classification: Clayey Bottomland (G106XY295NE)
Hydric soil rating: Yes

Olmitz

Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R106XY075NE - Loamy Upland
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Colo

Percent of map unit: 2 percent
Landform: Flood plains on river valleys
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY065NE - Wet Subirrigated
Other vegetative classification: Wet (G106XY900NE)
Hydric soil rating: Yes

7061—Muscotah silty clay loam, occasionally flooded

Map Unit Setting

National map unit symbol: 2x6bw
Elevation: 730 to 1,700 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Muscotah, occasionally flooded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Muscotah, Occasionally Flooded

Setting

Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and clayey alluvium

Typical profile

Ap - 0 to 6 inches: silty clay loam
A1 - 6 to 16 inches: silty clay loam
A2 - 16 to 23 inches: silty clay loam
Bw1 - 23 to 35 inches: silty clay
Bw2 - 35 to 44 inches: silty clay
Bw3 - 44 to 60 inches: silty clay
Bg - 60 to 79 inches: silty clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 21 to 26 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C

Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: No

Minor Components

Reading, rarely flooded
Percent of map unit: 5 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY070NE - Loamy Terrace
Hydric soil rating: No

Wabash, occasionally flooded
Percent of map unit: 5 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R106XY065NE - Wet Subirrigated
Hydric soil rating: Yes

Kennebec, occasionally flooded
Percent of map unit: 5 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY068NE - Loamy Floodplain
Hydric soil rating: No

7205—Aksarben silty clay loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2q4rs
Elevation: 980 to 1,660 feet
Mean annual precipitation: 28 to 39 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 158 to 203 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Aksarben and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aksarben

Setting
Landform: Hillslopes

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silty clay loam
A - 6 to 14 inches: silty clay loam
Bt - 14 to 45 inches: silty clay loam
BC - 45 to 54 inches: silty clay loam
C - 54 to 79 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 0.4 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: R106XY075NE - Loamy Upland
Forage suitability group: Loam (G106XY100NE)
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Minor Components

Fillmore, frequentlly ponded

Percent of map unit: 5 percent
Landform: Playas
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R075XY049NE - Closed Upland Depression
Other vegetative classification: Wet (G106XY900NE)
Hydric soil rating: Yes

7207—Aksarben silty clay loam, 6 to 11 percent slopes

Map Unit Setting

National map unit symbol: 2q4rv
Elevation: 980 to 1,660 feet
Mean annual precipitation: 28 to 39 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 158 to 203 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Aksarben and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aksarben

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silty clay loam
A - 6 to 11 inches: silty clay loam
Bt1 - 11 to 17 inches: silty clay loam
Bt2 - 17 to 45 inches: silty clay loam
BC - 45 to 54 inches: silty clay loam
C - 54 to 79 inches: silty clay loam

Properties and qualities

Slope: 6 to 11 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C
Ecological site: R106XY015KS - Loamy Upland (PE 30-37)
Forage suitability group: Loam (G106XY100NE)
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Minor Components

Judson
Percent of map unit: 8 percent
Landform: Hillsides
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R106XY075NE - Loamy Upland
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Morrill
Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY075NE - Loamy Upland
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Wymore
Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R106XY074NE - Clayey Upland
Other vegetative classification: Clayey Subsoil (G106XY210NE)
Hydric soil rating: No

7750—Nodaway silt loam, occasionally flooded

Map Unit Setting
National map unit symbol: 2x6bn
Elevation: 730 to 1,700 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Nodaway, occasionally flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nodaway, Occasionally Flooded

Setting

Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-silty alluvium

Typical profile

Ap - 0 to 7 inches: silt loam
AC - 7 to 12 inches: stratified silt loam
C1 - 12 to 26 inches: silt loam
C2 - 26 to 79 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: R106XY068NE - Loamy Floodplain
Hydric soil rating: No

Minor Components

Judson

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R106XY013KS - Loamy Lowland (PE 30-37)
Hydric soil rating: No

Zook, occasionally flooded

Percent of map unit: 3 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: No

Colo, occasionally fllooded

Percent of map unit: 2 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: Yes

7851—Judson silt loam, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2x6bp
Elevation: 730 to 1,700 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Judson and similar soils: 94 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Judson

Setting

Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine-silty colluvium

Typical profile

Ap - 0 to 6 inches: silt loam
A1 - 6 to 22 inches: silty clay loam
A2 - 22 to 28 inches: silty clay loam
Bw - 28 to 35 inches: silty clay loam
BC - 35 to 52 inches: silty clay loam
C - 52 to 79 inches: silty clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R106XY013KS - Loamy Lowland (PE 30-37)
Hydric soil rating: No

Minor Components

Kennebec, occasionally flooded

Percent of map unit: 5 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY013KS - Loamy Lowland (PE 30-37)
Hydric soil rating: No

Colo, occasionally fllooded

Percent of map unit: 1 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY065NE - Wet Subirrigated
Hydric soil rating: Yes

Richardson County, Nebraska

3840—Geary silty clay loam, 7 to 11 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2r9d9
Elevation: 980 to 1,660 feet
Mean annual precipitation: 28 to 39 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Geary, eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Geary, Eroded

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silty clay loam
Bt1 - 6 to 22 inches: silty clay loam
Bt2 - 22 to 33 inches: silty clay loam
BC - 33 to 38 inches: silty clay loam
C - 38 to 79 inches: silt loam

Properties and qualities

Slope: 7 to 11 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 12.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R106XY075NE - Loamy Upland
Forage suitability group: Loam (G106XY100NE)
Other vegetative classification: Loam (G106XY100NE)

Hydric soil rating: No

Minor Components

Mayberry

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY074NE - Clayey Upland
Hydric soil rating: No

Aksarben

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R106XY075NE - Loamy Upland
Hydric soil rating: No

Morrill

Percent of map unit: 4 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R106XY075NE - Loamy Upland
Hydric soil rating: No

Sogn

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R106XY077NE - Shallow Limy
Hydric soil rating: No

7050—Kennebec silt loam, occasionally flooded

Map Unit Setting

National map unit symbol: 2lprr
Elevation: 730 to 1,700 feet
Mean annual precipitation: 29 to 39 inches
Mean annual air temperature: 52 to 55 degrees F

Frost-free period: 159 to 203 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Kennebec and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kennebec

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 8 inches: silt loam
A - 8 to 41 inches: silt loam
AC - 41 to 54 inches: silty clay loam
C - 54 to 79 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 40 to 44 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 14.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: R106XY068NE - Loamy Floodplain
Forage suitability group: Overflow (G106XY500NE)
Other vegetative classification: Overflow (G106XY500NE)
Hydric soil rating: No

Minor Components

Muscotah

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY032NE - Subirrigated
Other vegetative classification: Clayey Subsoil (G106XY210NE)
Hydric soil rating: No

Reading

Percent of map unit: 3 percent

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R106XY070NE - Loamy Terrace
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Wabash

Percent of map unit: 3 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R106XY065NE - Wet Subirrigated
Other vegetative classification: Clayey Bottomland (G106XY295NE)
Hydric soil rating: Yes

Olmitz

Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R106XY075NE - Loamy Upland
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Colo

Percent of map unit: 2 percent
Landform: Flood plains on river valleys
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY065NE - Wet Subirrigated
Other vegetative classification: Wet (G106XY900NE)
Hydric soil rating: Yes

7090—Wabash silty clay loam, occasionally flooded

Map Unit Setting

National map unit symbol: 2x6bl
Elevation: 730 to 1,700 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Wabash, occasionally flooded, and similar soils: 90 percent

Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wabash, Occasionally Flooded

Setting
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and clayey alluvium

Typical profile
Ap - 0 to 6 inches: silty clay loam
A - 6 to 16 inches: silty clay loam
Bg - 16 to 52 inches: silty clay
Cg - 52 to 79 inches: silty clay

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 2 to 9 inches
Frequency of flooding: Occasional
Frequency of ponding: Occasional
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: R106XY065NE - Wet Subirrigated
Hydric soil rating: Yes

Minor Components

Reading, rarely flooded
Percent of map unit: 5 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY013KS - Loamy Lowland (PE 30-37)
Hydric soil rating: No

Kennebec, occasionally flooded
Percent of map unit: 5 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY068NE - Loamy Floodplain
Hydric soil rating: No

7099—Zook silty clay loam, occasionally flooded

Map Unit Setting

National map unit symbol: 1trq2
Elevation: 800 to 1,300 feet
Mean annual precipitation: 30 to 32 inches
Mean annual air temperature: 52 to 55 degrees F
Frost-free period: 160 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Zook and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Zook

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium

Typical profile

H1 - 0 to 20 inches: silt loam
H2 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: R107XB019MO - Wet Floodplain Prairie
Other vegetative classification: Clayey Overflow - Veg. zone 4 (106XY069NE_2)
Hydric soil rating: Yes

7153—Kennebec silt loam, rarely flooded

Map Unit Setting

National map unit symbol: 2x6bg
Elevation: 730 to 1,700 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Kennebec, rarely flooded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kennebec, Rarely Flooded

Setting

Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-silty alluvium

Typical profile

Ap - 0 to 6 inches: silt loam
A - 6 to 41 inches: silt loam
AC - 41 to 54 inches: silty clay loam
C - 54 to 79 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 40 to 44 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 14.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: R106XY068NE - Loamy Floodplain
Hydric soil rating: No

Minor Components

Zook, occasionally flooded

Percent of map unit: 15 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: Yes

7203—Aksarben silty clay loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2scxh
Elevation: 980 to 1,660 feet
Mean annual precipitation: 28 to 39 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 158 to 203 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Aksarben, eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aksarben, Eroded

Setting

Landform: Hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silty clay loam
A - 6 to 11 inches: silty clay loam
Bt1 - 11 to 18 inches: silty clay loam
Bt2 - 18 to 45 inches: silty clay loam
BC - 45 to 54 inches: silty clay loam
C - 54 to 79 inches: silty clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R106XY075NE - Loamy Upland
Forage suitability group: Loam (G106XY100NE)
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Minor Components

Pawnee, eroded

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R106XY074NE - Clayey Upland
Other vegetative classification: Clayey Subsoil (G106XY210NE)
Hydric soil rating: No

Wymore, eroded

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R106XY074NE - Clayey Upland
Other vegetative classification: Clayey Subsoil (G106XY210NE)
Hydric soil rating: No

Shelby, eroded

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R106XY075NE - Loamy Upland
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

7204—Aksarben silty clay loam, 6 to 11 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2scxj
Elevation: 980 to 1,660 feet
Mean annual precipitation: 28 to 39 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 158 to 203 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Aksarben, eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aksarben, Eroded

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silty clay loam
A - 6 to 10 inches: silty clay loam
Bt1 - 10 to 14 inches: silty clay loam
Bt2 - 14 to 45 inches: silty clay loam
BC - 45 to 54 inches: silty clay loam
C - 54 to 79 inches: silty clay loam

Properties and qualities

Slope: 6 to 11 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C
Ecological site: R106XY075NE - Loamy Upland
Forage suitability group: Loam (G106XY100NE)
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Minor Components

Judson
Percent of map unit: 8 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: R106XY075NE - Loamy Upland
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Morrill, eroded
Percent of map unit: 4 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY075NE - Loamy Upland
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Wymore, eroded
Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R106XY074NE - Clayey Upland
Other vegetative classification: Clayey Subsoil (G106XY210NE)
Hydric soil rating: No

7205—Aksarben silty clay loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2q4rs
Elevation: 980 to 1,660 feet
Mean annual precipitation: 28 to 39 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 158 to 203 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Aksarben and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aksarben

Setting

Landform: Hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silty clay loam
A - 6 to 14 inches: silty clay loam
Bt - 14 to 45 inches: silty clay loam
BC - 45 to 54 inches: silty clay loam
C - 54 to 79 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 0.4 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: R106XY075NE - Loamy Upland
Forage suitability group: Loam (G106XY100NE)
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Minor Components

Fillmore, frequentlly ponded

Percent of map unit: 5 percent
Landform: Playas
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R075XY049NE - Closed Upland Depression
Other vegetative classification: Wet (G106XY900NE)

Hydric soil rating: Yes

7231—Judson silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2x6bq
Elevation: 730 to 1,700 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Judson and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Judson

Setting

Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine-silty colluvium

Typical profile

Ap - 0 to 6 inches: silt loam
A - 6 to 22 inches: silty clay loam
AB - 22 to 28 inches: silty clay loam
Bw - 28 to 35 inches: silty clay loam
BC - 35 to 52 inches: silty clay loam
C - 52 to 79 inches: silty clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C
Ecological site: R106XY070NE - Loamy Terrace
Hydric soil rating: No

Minor Components

Nodaway, occasionally flooded
Percent of map unit: 7 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY068NE - Loamy Floodplain
Hydric soil rating: No

Colo, occasionally fllooded
Percent of map unit: 1 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY065NE - Wet Subirrigated
Hydric soil rating: Yes

7259—Deroin silty clay loam, 6 to 11 percent slopes, severely eroded

Map Unit Setting
National map unit symbol: 1trnd
Elevation: 800 to 1,300 feet
Mean annual precipitation: 32 to 34 inches
Mean annual air temperature: 52 to 55 degrees F
Frost-free period: 165 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition
Deroin, eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Deroin, Eroded

Setting
Landform: Hillslopes
Down-slope shape: Concave, convex
Across-slope shape: Linear
Parent material: Reddish loess

Typical profile
H1 - 0 to 7 inches: silty clay loam
H2 - 7 to 40 inches: silty clay loam
H3 - 40 to 60 inches: silty clay loam

Properties and qualities

Slope: 5 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R106XY075NE - Loamy Upland
Forage suitability group: Loam (G106XY100NE)
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

7643—Yutan silty clay loam, 3 to 11 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2scyd
Elevation: 980 to 1,660 feet
Mean annual precipitation: 28 to 39 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 158 to 203 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Yutan, eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yutan, Eroded

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave, convex
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silty clay loam
Bt1 - 6 to 13 inches: silty clay loam
Bt2 - 13 to 28 inches: silty clay loam

BC - 28 to 43 inches: silt loam
C - 43 to 79 inches: silt loam

Properties and qualities

Slope: 3 to 11 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R106XY075NE - Loamy Upland
Forage suitability group: Loam (G106XY100NE)
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Minor Components

Morrill, severely eroded

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY075NE - Loamy Upland
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Aksarben, eroded

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R106XY075NE - Loamy Upland
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Geary, severely eroded

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY075NE - Loamy Upland

Other vegetative classification: Loam (G075XY100NE)
Hydric soil rating: No

7750—Nodaway silt loam, occasionally flooded

Map Unit Setting

National map unit symbol: 2x6bn
Elevation: 730 to 1,700 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Nodaway, occasionally flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nodaway, Occasionally Flooded

Setting

Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-silty alluvium

Typical profile

Ap - 0 to 7 inches: silt loam
AC - 7 to 12 inches: stratified silt loam
C1 - 12 to 26 inches: silt loam
C2 - 26 to 79 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: R106XY068NE - Loamy Floodplain

Hydric soil rating: No

Minor Components

Judson

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R106XY013KS - Loamy Lowland (PE 30-37)
Hydric soil rating: No

Zook, occasionally flooded

Percent of map unit: 3 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: No

Colo, occasionally fllooded

Percent of map unit: 2 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: Yes

8125—Pohocco silty clay loam, 6 to 11 percent slopes, eroded

Map Unit Setting

National map unit symbol: 1trnz
Elevation: 800 to 1,300 feet
Mean annual precipitation: 32 to 34 inches
Mean annual air temperature: 52 to 55 degrees F
Frost-free period: 165 to 185 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Pohocco, eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pohocco, Eroded

Setting

Landform: Hillslopes
Down-slope shape: Concave, convex

Across-slope shape: Linear
Parent material: Silty loess

Typical profile
H1 - 0 to 6 inches: silty clay loam
H2 - 6 to 45 inches: silt loam
H3 - 45 to 60 inches: silt loam

Properties and qualities
Slope: 5 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very high (about 12.2 inches)

Interpretive groups
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R106XY075NE - Loamy Upland
Forage suitability group: Loam (G106XY100NE)
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

9999—Water

Map Unit Setting
National map unit symbol: 1trpr
Elevation: 3,500 to 5,250 feet
Mean annual precipitation: 22 to 24 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups
Land capability classification (irrigated): None specified
Forage suitability group: Unnamed (G065XY0NENE)
Other vegetative classification: Unnamed (G065XY0NENE)
Hydric soil rating: Unranked

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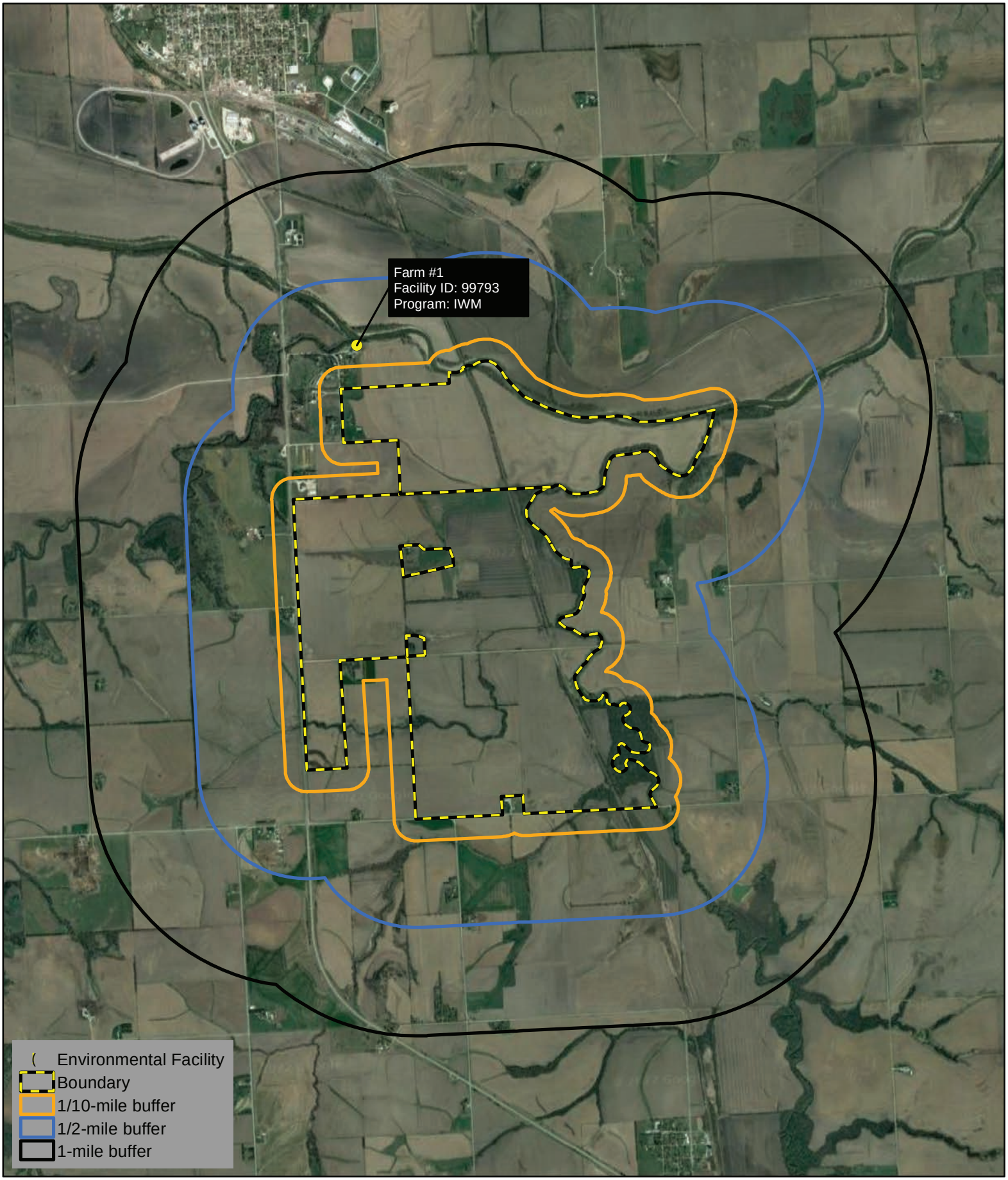

Falls City EDGE Master Plan

Environmental Facility Map

Falls City, Nebraska
January 2024

0 750 1,500 3,000
ft

N

Falls City EDGE Master Plan

Pipeline Map

Falls City, Nebraska
January 2024

0 500 1,000 2,000 ft

N