July 2013 version

ENVIRONMENTAL ASSESSMENT WORKSHEET

This Environmental Assessment Worksheet (EAW) form and EAW Guidelines are available at the Environmental Quality Board's website at:
http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm. The EAW form provides information about a project that may have the potential for significant environmental effects. The EAW Guidelines provide additional detail and resources for completing the EAW form.
Cumulative potential effects can either be addressed under each applicable EAW Item, or can be addresses collectively under EAW Item 19.
Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. **Project title: Doran Creek Stream Rehabilitation Project**

2. **Proposer: Bois de Sioux Watershed District**
   Contact person: Jamie Beyer
   Title: Administrator
   Address: 704 Hwy 75 South
   City, State, ZIP: Wheaton, MN 56296
   Phone: 320-563-4185
   Fax: 320-563-4987
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3. **RGU: Bois de Sioux Watershed District**
   Contact person:
   Title:
   Address:
   City, State, ZIP:
   Phone:
   Fax:
   Email:

4. **Reason for EAW Preparation:** (check one)

Required:	Discretionary:
☐ EIS Scoping	☐ Citizen petition
X Mandatory EAW	☐ RGU discretion
	☐ Proposer initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s):

MN Rules 4410.4300 Subpart 27A: Public waters, public waters wetlands, and wetlands.
A. For projects that will change or diminish the course, current, or cross-section of one acre or more of any public water or public waters wetland except for those to be drained without a permit according to Minnesota Statutes, chapter 103G, the DNR or local governmental unit is the RGU.

5. Project Location:

County: Wilkin
City/Township: Bandrup TWP/Breckenridge TWP – near Doran, MN
PLS Location (¼, ¼, Section, Township, Range): T132N, R47W, Sections 16, 21, 25, 26, 27, 28, 36; T131N, R47W, Section 1; T131N, R46W, Sections 4, 5, 6, 7
Watershed (81 major watershed scale): 54 - Bois de Sioux River (HUC 09020101)
GPS Coordinates: 46.2183770°N, 96.5334080°W (approximate center of the project)
Tax Parcel Number:

At a minimum attach each of the following to the EAW:

- County map showing the general location of the project; **See attached Figures**
- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and **See attached Figures**
- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan. **See attached Site Plans**

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Attachments

1. Well Log Reports
2. Minnesota Conservation Explorer Report (NHIS)
3. Phase 1A Literature Review

6. Project Description:

a. Provide the brief project summary to be published in the *EQB Monitor*, (approximately 50 words).

The proposed project would rehabilitate approximate 19.25 miles of Doran Creek, from the town of Doran at the upstream end to the confluence with the Bois de Sioux River at the downstream end. The portion of Doran Creek in Breckenridge Township is listed as a Public Watercourse. The project will provide flood control in addition to significant natural resource and wildlife benefits.

b. Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

The Doran Creek Stream Rehabilitation Project will occur over 19.25 miles of Doran Creek, located in Wilkin County (Figure 1). Doran Creek is a 20.6-mile-long system located within the Bois De Sioux Watershed (Figures 2 and 3). The creek has a total watershed area of 28,000 acres and is a direct tributary to the Bios De Sioux River. The creek is a DNR public water (PW# 84005a) that meanders through a largely agricultural landscape. Years of uncontrolled runoff have resulted in significant sediment deposition in the channel. The existing stream channel and valley is currently choked with several feet of sediment and no longer functions as a perennial or intermittent stream. Doran Creek is now a flashy and flood-prone ephemeral waterway functioning as a marshy wetland system within a historic stream valley. This has led to loss of hydraulic function, loss of aquatic wildlife habitat, and frequent flooding of adjacent fields. In keeping with the goals set forth in the One Watershed One Plan (1W1P) Comprehensive Plan, the Bois de Sioux Watershed District (District) desires to create an enhanced flood control project that rehabilitates the Doran Creek channel while also providing significant additional natural resource and wildlife benefits.

The Doran Creek Stream Rehabilitation Project will rehabilitate Doran Creek and restore its natural stream flow by reestablishing the channel and floodplain corridor through the removal of the accumulated sediment. Approximately two to four feet of sediment will be excavated from the channel while completing minor regrading of the banks to restore the floodplain and create a stable condition. An anticipated 428,000 cubic yards of sediment removal is anticipated, which will be spread in adjacent uplands or used to construct project infrastructure when suitable. The project will reestablish a pool-riffle system within the channel to create habitat not present under existing conditions. The project will simultaneously provide an ecological enhancement that will be maintained and protected through the use of perpetual easements and constructed best management practices (BMPs). Project BMPs may require long-term maintenance, which will be achieved through the use of these perpetual easements. The project will be implemented over an approximately 1,400-acre project area, which includes the stream channel and its 10-year floodplain, proposed work limits, and approximately 1,300 acres of proposed conservation easement lands.

In order to meet the goals of the project, the following activities are proposed:

- Rehabilitate 19 miles of within-channel, riparian, and upland habitat along the Doran Creek Drainage through:
    - excavation of accumulated sediment,
    - increasing the depth variety and diversity of channel habitat through riffle and pool hydrology,
    - enhancing the state's geographic and genetic diversity by creating a local reservoir of biodiversity and ecotypes,
    - planting at least 25 representative and biologically diverse native prairie species, and
    - installing woody stabilization at key locations to provide a woody debris habitat.
- Protect 1,300 acres of riparian and upland buffer through permanent conservation easements.
- Reduce erosion and stabilize banks while controlling downstream sediment loading through targeted grading of channel banks and adjacent floodplain, side inlet control, flow diffusion points, and woody stabilization.

Proposed project activities were developed to target 80% of the 10-year goal for sediment transport reduction and 53% of the 10-year goal for nutrient load reduction for Doran Creek, and to reduce the 2-, 5-, and 10-year floodplains by approximately 174 acres, 125 acres, and 116 acres, respectively.

The proposed rehabilitation is scoped as a singular project which will be constructed in phases over the course of three to five years. The project phasing will be closely tied to funding awarded and may be implemented in both a geographic and practice-oriented approach.

c. Project magnitude:

Table 1. Project Magnitude

Total Project Acreage	1,387 acres
Linear project length	19.25 miles
Number and type of residential units	NA
Commercial building area (in square feet)	NA
Industrial building area (in square feet)	NA
Institutional building area (in square feet)	NA
Other uses – specify (in square feet)	NA
Structure height(s)	NA

d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The Bois de Sioux Watershed District has been seeking options to mitigate flooding and sedimentation issues along Doran Creek, which was identified in the Bois de Sioux One Watershed One Plan (1W1P) Comprehensive Plan. The statewide practice of cultivation of lands adjacent to streams and rivers has destabilized banks and directed sediment runoff into many of Minnesota's aquatic resources. Additionally, increased peak flows due to climate change can lead

to channel destabilization. Like many of Minnesota's waterways, Doran Creek has been altered by these historical land use practices and climate change. The Doran Creek Stream Rehabilitation Project will reestablish a natural pool and riffle hydrology and will also significantly expand the stream's riparian/upland buffer by planting native perennial vegetation. The project will seek to restore and permanently protect 1,300 acres of riparian and upland habitat, thereby establishing a floodplain and habitat corridor along Doran Creek's 19-mile run. Using Natural Channel Design principles, the project will simultaneously establish a low-flow channel that significantly reduces flooding and increases the local agricultural economy's resiliency to climate effects like more frequent and severe storms. This large-scale project will provide regional benefit to the Bois de Sioux watershed and overall Red River of the North basin.

e. Are future stages of this development including development on any other property planned or likely to happen? x Yes □ No
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

The proposed rehabilitation is scoped as a singular project which will be constructed in phases over the course of three to five years. The project phasing will be closely tied to funding awarded and may be implemented in both a geographic and practice-oriented approach. Phase 1 may include other minor activities located throughout the entirety of the project, through excavation of the channel, with first target the outlet of Doran Creek at the Bois de Sioux River. The project will also include clearing of snags and woody debris throughout the channel for access, though no sunken woody material will be removed from the channel as per Minnesota Statute Section 103G.651. The remaining Phases will likely be performed in separate reaches, targeting 5-7 miles of stream restoration per year. Activities slated for each year will be dependent on funding received and what is allowed under those funding mechanisms, as different funds are eligible for different practices.

f. Is this project a subsequent stage of an earlier project? □ Yes X No
If yes, briefly describe the past development, timeline and any past environmental review.

7. Cover types: Estimate the acreage of the site with each of the following cover types before and after development:

Pre-project cover types and quantities were determined within the project area using the 2019 National Land Cover Dataset (NLCD) (Figure 4). The majority of the project area is mapped as cultivated crops, with Doran Creek mapped intermittently as open water and emergent herbaceous wetlands. The project will create more open water within the channel and will convert cropland to permanent perennial vegetation within the floodplain. Currently, much of the wetlands in the project area are actively cropped and experience periodic drown out and crop damage. The project does not propose new impervious surfaces or any stormwater features. Accumulated sediment will be removed

from the main channel and will create more open water habitat at periodic times of the year. Portions of the system will still be ephemeral and therefore may not have standing water year-round.

Table 2. Cover Types within the Project Area

	Before	After		Before	After
Wetlands	516	516	Lawn/landscaping	0	0
Deep water/streams	10	10	Impervious surface (Roads)	40	40
Wooded/forest	6	6	Stormwater Pond	0	0
Brush/Grassland	10	316	Other (describe)		
Cropland*	806	500			
			TOTAL		

*The project intends to capture the cropland acres necessary to achieve the goals of the project in permanent easement. This is contingent upon landowner agreements and therefore a lesser value is reflected in the table.

8. **Permits and approvals required:** List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. *All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.*

Table 3. Permits and Approvals Required

Agency	Permit	Description/Purpose
Minnesota Department of Natural Resources	Aquatic Plant Management Permit	Removal/destruction of emergent and submerged vegetation Transplanting aquatic plants into public waters Removal of floating-leaf vegetation from an area larger than a 15-ft wide channel that extends into open water
	Special Permits for Beaver Management	If needed to mitigate beaver impacts as coordinated locally with the DNR conservation officer
	Work in Public Waters Permit	For all work below the ordinary high-water level (OHWL)
	Dewatering Permit	To be applied for by contractor, as needed
United States Army Corps of Engineers	Clean Water Act Section 404	Work within waters of the U.S. (Determined with Jurisdictional Determination as part of Joint Application for DNR and 401 permitting)
Minnesota Pollution Control Agency	Clean Waters Act Section 401	Water Quality Certification for navigable US Waters (Determined with Jurisdictional Determination as part of Joint Application for DNR and 404 permitting)
	NPDES for Construction	Construction Stormwater Management

	Dredged Material Disposal	Disposal of Dredged Material
Minnesota Board of Water and Soil Resources	Wetland Conservation ActNo Loss	Impacts to wetlands (Determined as part of the Joint Application)
Minnesota Department of Transportation	Utility Accommodation on Trunk Highway Right-of-Way	Place, construct, and reconstruct utilities within trunk highway 75 right of way, whether longitudinal, oblique, or perpendicular to the centerline of the highway.
	Miscellaneous Work on Trunk Highway Right of Way	Removal of vegetation on, maintenance of facilities, temporary obstructions, and other random work that may have effects with the trunk highway 75 right-of-way
	Drain Permit	All types of drainage changes on trunk highway 75 right-of-way
Bois-De-Sioux Watershed District	Review	Review and approval of plans and water management district establishment
Wilkin County	Conditional Use Permits	Not anticipated to need
	Work in ROW	Work in CSAH 9
Red River Valley & Western Railroad	Work in railroad ROW	Any work in the railroad right-of-way will need coordination to determine what is needed for agreements or permitting
City of Doran	TBD	Work within City limits particularly around public ROW

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 9-18, or the RGU can address all cumulative potential effects in response to EAW Item No. 19. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 19

9. Land use:

a. Describe:

i. Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

Doran Creek is located in a predominantly agricultural landscape. Review of the NLCD 2019 land cover types indicate that the channel itself is mapped as a combination of open water and emergent herbaceous and woody wetlands (Figure 4). According to the 2021 USDA National Agricultural Statistics Service, the principal crops grown in the project area and vicinity include corn, soybeans, sugar beets, spring wheat, and alfalfa (Figure 5).

There are no parks or trails, Scientific and Natural Areas, Wildlife Management Areas, or waterfowl production areas in the project area or a one-mile radius. There are two State Funded Conservation Easements (RIM Reserve) within the project area. Both conservation easements are privately owned (Figure 6). Additionally, there are three NRCS Wetlands Reserve Program (WRP) private conservation easements within the project area. WRP easements are intended to help protect, restore, and enhance wetlands previously degraded due to agricultural uses, provide habitat for migratory waterfowl and other wetland dependent wildlife, reduce flooding, improve water quality, and protect biological diversity.

Review of SSURGO soils data indicates that the project falls within soil map units considered prime farmland, not prime farmland, and prime farmland if drained. The primary map unit that correlates with the channel itself is the Lamoure-Fluvaquents complex, which is considered not prime farmland (Figure 7).

ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

The Bois de Sioux-Mustinka River Comprehensive Watershed Management Plan (CWMP) 2021-2030 is applicable in the project area. The CWMP was developed with stakeholders from the two watersheds under the Minnesota Board of Water and Soil Resources (BWSR) 1W1P program. The purpose of this plan is to equip local governments with information necessary to identify natural and water resources issues specific to each watershed, identify goals, and develop projects to address these issues. The CWMP specifically identifies the Doran Creek Rehabilitation project as a priority Capital Improvement Project that would contribute to measurable goals for sediment and nutrient load reductions in the watershed. The CWMP identified nutrient reduction goals for Lake Traverse and the Bois de Sioux river of 26,800 tons per year of sediment and 1,225 pounds per year of phosphorus. The Doran Creek: project will contribute to this overall goal by achieving sediment reduction of 890 tons per year and phosphorus reduction by 170 pounds per year.

Additionally, the Bois de Sioux River Watershed Restoration and Protection Strategy (WRAPS) Report, completed by the MPCA, is applicable in the project area. WRAPS are developed at the watershed scale to identify and address threats to water quality in each of Minnesota's 80 major watersheds. WRAPS Reports have two components: impaired waters with strategies for restoration and waters that are not impaired with strategies for protection. WRAPS also incorporates prior TMDL goals. Several goals were identified within the Bois de Sioux River Watershed WRAPS Report for Doran Creek, including developing riparian buffers along at least 50% of the stream, increasing the amount of deep-rooted and woody vegetation where appropriate, and removing the 10-year floodplain from agricultural production.

iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

The project is located partially within the shoreland zone, 100-year floodplain, and within an agricultural district, according to Wilkin County zoning data and the County Zoning Ordinance (Figure 8). The County Zoning Ordinance Section 22, Floodplain District, Part 22.01 Subpart 3B states that the ordinance is intended to preserve the natural characteristics and functions of watercourses and floodplains in order to moderate flood and stormwater impacts, improve water quality, and protect aquatic and riparian habitat.

A portion of Doran Creek is mapped as a DNR public water and thus is within the shoreland district, regulated under Section 23 of the Zoning Ordinance. The intent of the shoreland ordinance is to regulate the use and developments of the shorelands of public waters in Wilkin County in order to preserve and enhance the quality of surface waters,

conserve the economic and natural environmental values of shorelands, and provide for the wise use of waters and related land resources.

b. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

The project is compatible with local zoning and land use. The project will result in some land use conversion from tilled/annual cropland to conservation easement with perennial vegetation. or the construction of any structures within the shoreland or floodplain zones. The CWMP identifies the Doran Creek Rehabilitation project as a planned Capital Improvement Project and thus it is compatible with the goals set forth in that plan.

The project proposes to convert up to 1,300 acres of adjacent land in riparian buffer that will be put into permanent conservation easement. The final amount will be determined on landowner participation and funding, though a designated easement will be established regardless to allow for long term maintenance of the project. The conversion of cropland will achieve goals from the CWMP and the WRAPS Report, including the establishment of a riparian buffer along the creek, the removal of the 10-year floodplain from agricultural production, and increase the amount of deep-rooted and woody vegetation along the riparian buffer where appropriate. Additionally, the project will remove accumulated sediment in the channel and install side inlet control structures to address sediment and phosphorus water quality goals laid out in the CWMP and the WRAPS Report.

Riparian buffers will be established, if absent, along the entire reach of the project. Buffer widths will vary depending on enrollment in permanent conservation easement. At a minimum, the buffer width will conform to requirements of Minnesota State Law, which currently says a minimum of 30' and an average of 50', and is subject to any future changes in this requirement..

c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

There are no incompatibilities with local plans. The proposed project was derived from two major planning efforts and is intended to achieve goals described in each of these plans, as described in item 9a above.

9. Geology, soils and topography/land forms:

a. Geology – Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

Review of the Minnesota Geological Survey indicates that surficial geology in the project area consists of glacial sediment (diamicton) washed by waves. Bedrock geology is located approximately 200-300 feet below the ground surface and is described as Superior Province, Neoarchean mafic metavolcanic rocks and foliated to gneissic tonalite, diorite and granodiorite. Proposed excavation activities are anticipated to occur within 10 feet of the surface and therefore will not impact bedrock. Soils consist of alluvium and overbank sediment in former channels and

floodplains of the Lake Agassiz plain. Review of MN Geospatial Commons data indicates that there are no karst features or areas prone to karst development within the project area.

b. Soils and topography – Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.

The project area intersects several soil map units, according to SSURGO geospatial data (Figure 9). The soil map unit primarily associated with the channel itself is Lamoure-Fluvaquents, channeled complex, 0 to 6 percent slopes, frequently flooded. This is a complex of two major soil types: the Lamoure series is very deep, somewhat poorly drained soils formed in silty alluvium on floodplains. Fluvaquents are a lesser developed soil typical of permanently or semi permanently wet areas in river valleys, especially those with a high sediment load.

Topography of the project area is relatively flat, with very little topographic change between the channel and its banks. Topography slopes generally from southeast to northwest, starting at an elevation of approximately 970 feet in the southeastern end near Doran, sloping towards an elevation of 960 feet at the Bois de Sioux River. Soil K factor is an indicator of erosion susceptibility to sheet and rill erosion by water and ranges from 0.02 to 0.69. K factors in the project area range from 0.18 to 0.36, which consist of low to moderate erosion values.

The anticipated volume of soil excavation is 428,000 cubic yards. Construction methods will utilize erosion and sediment control best management practices (BMPs) to prevent downstream sedimentation of aquatic resources. Work will primarily occur in the drier parts of the construction season.

NOTE: For silica sand projects, the EAW must include a hydrogeologic investigation assessing the potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water. Descriptions of water resources and potential effects from the project in EAW Item 11 must be consistent with the geology, soils and topography/land forms and potential effects described in EAW Item 10.

10. Water resources:

a. Describe surface water and groundwater features on or near the site in a.i. and a.ii. below.

1) Surface water – lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the

current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

The Doran Creek channel and its 10-year floodplain is the focus of the project area and the primary surface water resource present. Doran Creek is a Minnesota DNR Public Watercourse (PWI ID #84005a) and flows northwest into the Red River (Figure 10). Doran Creek is an MPCA 303(d) stream, which is listed as impaired for bacteria and dissolved oxygen. There are no trout streams or lakes, calcareous fens, wildlife lakes, migratory waterfowl feeding/resting lakes, or outstanding resource value waters within the project area. There are eight unnamed tributaries to Doran Creek mapped within the project area as designated in MN DNR geospatial data; however, there are also more than 100 side inlets and points of concentrated flow along the channel.

Wetlands within the project area were identified via desktop methods and available geospatial, model, and field data. Wetlands in this system are flood driven and occur in frequently disturbed environments, which makes typical field wetland delineation processes that rely on accurate interpretation of soils, vegetation, and hydrology indicators difficult and not representative of wetland boundary locations. Off-site delineations relying on the review of aerial photographs and precipitation data, along with topography, soils, and other information to determine the extent of wetness signatures that are indicative of the location of wetland boundaries are commonly the most acceptable method to determine wetland boundaries in these situations. Modeled flood elevations (2-year, 5-year) are also commonly used to estimate the extent of areas meeting wetland hydrology criteria in floodplains similar to those within the proposed project area.

Preliminary wetland boundaries were estimated by reviewing the National Wetlands Inventory and several years of aerial images in coordination with 1-foot topographic contours to document the presence and extent of consistent wetness signatures that are indicative of areas potentially meeting wetland criteria (Figure 11). The preliminary wetland boundaries were then compared to the extent of different flood events (2, 5, 10, 100-year). This analysis indicates that most of the preliminary wetland areas identified from review of aerial photographs correlate approximately with the 2-year event elevations (and occasionally the 5-year event elevation), which generally supports the likelihood that these areas meet criteria.

Based on the preliminary assessment and observations of conditions within the channel, it is likely that much of the channel below the OHW also meets wetland criteria.

ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

Three groundwater monitoring wells were installed along Doran Creek in the Spring of 2021 to determine where groundwater is anticipated in relation to the creek enhancement (Figure 12). The groundwater showed seasonal tendencies with the water level being above the creek bottom in the spring. Groundwater monitoring data show that the system is not significantly groundwater dependent and the project is not anticipated to have an effect on groundwater.

The project area is not located in a wellhead protection area. A query of the Minnesota Well Index indicated that there are 29 wells within a one-mile radius of the project area. A table of wells within a one-mile radius is provided below. Well log reports are provided in Attachment 1.

Table 4. Wells within One Mile of the Project Area

Well ID	Name	Township	Range	Section
416277	Betsch, Leigh	132	47	33
129749	Segor, Greg	131	46	5
224266	Rrvd 23 Erickson Farm	131	46	6
262037	Doran United Presbyterian Church #1	131	46	5
129748	Valley Fertelizer	131	46	5
175707	Leiner, Roland	131	46	18
416262	Wientzema, Vern	132	47	35
221767	Laken, Palmer	131	46	5
144711	Burhaus, Edward	131	46	5
175722	Klein, Darold	132	47	21
130576	Valley Lake Boys Home	132	47	26
136397	Richards, Don	132	47	22
113678	Langseth, Verle	132	47	16
221753	Doran Section House	131	46	5
723404	Lawyseth, Brian	132	47	16
416264	Jirak, Tim	132	47	25
243412	Doran Stockyard	131	46	5
113691	Larson, Douglas	131	47	13
630974	Christensen, James G.	131	46	18
462459	Lechleiter, Don	132	47	24
723416	Dell, Bruce	131	46	5
727117	Martin, Annetta	131	46	5
780726	Lommel, Steve	132	47	28
723401	Lienen, Laura	131	46	5
723414	Enkers, Wesley	132	46	32
784401	Pazdernik, Ellen	132	47	33
780728	Quinn, John	131	46	5
262036	Valley Lake Boys Home 1	132	47	26
791326	Valley Lake Boys Home	132	47	26

2) Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.

i. Wastewater – For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.

3) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

   No wastewater will be discharged as a result of the project construction or operations.

4) If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.

   No wastewater will be discharged as a result of the project construction or operations.

5) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges.

There will be no project-generated wastewater either during construction or operation.

ii. Stormwater – Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

The project will require an NPDES Construction Stormwater permit for each phase of construction. Construction best management practices (BMP) will be implemented to control erosion and sedimentation of downstream waters during active construction. The project proposes no impervious surface; therefore, there will be no increase in stormwater volumes onsite as a result of operation and no requirement to establish permanent stormwater management features for the project. Establishment of a riparian buffer will help provide a long term reduction in sedimentation of the creek from existing conditions by reducing surface runoff from crop fields. The rehabilitation of the channel and improvements to the floodplain will increase flood storage and reduce stormwater discharge rates from the system.

iii. Water appropriation – Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal

water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

No dewatering is anticipated for this project. Doran Creek is typically wet after spring melt and dries up significantly during the summer months. Dewatering, if necessary, would include only temporary construction dewatering for work in the channel. If dewatering is required for select activities during the phases of construction, the selected contractor will apply for a dewatering permit.

iv. Surface Waters

a) Wetlands – Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed, and identify those probable locations.

   Several wetlands frame the Doran Creek channel and occupy its floodplain (Figure 10). Riparian wetlands along the channel are important for flood storage and habitat. The project does not aim to impact adjacent wetlands aside from where necessary to remove sediment from wetlands and tributary inlets along the channel. Wetland impacts may occur from several of the proposed improvement activities, including excavation in the channel and wetland connections, flow diffusion structures, and the installation of side inlet control, but principally will result from excavation. Proposed wetland impacts will be permitted appropriately under the Clean Water Act (CWA) Section 404 program and under the Minnesota Wetland Conservation Act (WCA) program. Project improvement activities have been designed and located accordingly to avoid wetland impacts (fill, conversion to non-wetland) and are therefore not anticipated to require mitigation. Project improvement activities will be field verified and may be changed or relocated to avoid permanent loss of wetlands. The project aims to have a net positive benefit to the resource.. The project proponent is working closely with the WCA LGU, the DNR, BWSR, and the USACE to determine permitting requirements, to evaluate potential project impacts to wetlands and other surface waters and it is anticipated project activities may fit a No Loss under the Wetland Conservation Act.

b) Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are

proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

The project will excavate the main channel of Doran Creek to remove accumulated sediment and restore hydraulic capacity. The goal of the design is to recreate an E-Channel type low flow system that mimics the natural pool and riffle characteristics of a slow, meandering stream. This will be accomplished primarily through excavation of accumulated material. The excavated material will be used to construct project features such as berms for floodwater diversion and fill for side inlet features. Excess material will be spread in upland areas.

The proposed rehabilitation will also include the installation of woody stabilization features at key locations to provide bank stability and woody habitat. These practices will occur at various points and at variable frequencies along the entire 19.25 mile reach of the project.

Woody materials will be cleared within the channel prior to excavation and be reused in the project for stabilization methods and habitat. No sunken woody material will be removed from the channel as per Minnesota Statute Section 103G.651. Appropriate construction BMPs will be used to avoid sedimentation of downstream reaches while a current reach is under construction. There is no anticipated change in the number or type of watercraft using Doran Creek; currently the stream system does not experience watercraft use.

12. Contamination/Hazardous Materials/Wastes:

a. Pre-project site conditions - Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

Review of the MPCA "What's in my Neighborhood" (WIMN) indicates that there are 28 known sites within a one-mile radius of the project area (Figure 13). Of these 28, four are construction stormwater permits and ten are considered inactive. One site (Site ID 214268, Construction Stormwater) is located within the immediate project area. The Doran Dump (Site ID 190725) is approximately one-half mile from the eastern end of the project area. There are no anticipated potential environmental effects from prior contamination or environmental hazards. A table of MPCA WIMN sites within a one-mile radius of the project area is provided below.

Table 5. MPCA WIMN Sites within One Mile of the Project Area

Site ID	Name	Active	Activity Type	MPCA ID
1592	Wolverton WWTP	N	Petroleum Remediation, Leak Site; Wastewater, Municipal NPDES/SDS Permit	LS0014321 MN0025291

5782	Country Cobbler	N	Hazardous Waste	702017146
8668	Riveland Aircraft Upholstery	N	Hazardous Waste	707124103
9314	RDO Equipment Co – Breckenridge	N	Aboveground Tanks; Construction Stormwater; Hazardous Waste, Small quantity generator	C00030539 MND022731566 TS0130782
11319	Mn Dept Of Ag Wilkin County Highway Bldg	N	Hazardous Waste	MND985689280
38966	Tillmann Tool & Die Inc	N	Hazardous Waste	MND982641136
38967	TNT Auto	Y	Hazardous Waste; Site Assessment	MND982222440 SA0003045
42064	Cenex	Y	Aboveground Tanks; Hazardous Waste; Underground Tanks	MND022731236 TS0011225
42066	Todd's Welding Shop Inc	N	Hazardous Waste	MND985680313
85088	Pro Auto Body & Glass	N	Hazardous Waste	MNS000106997
107198	Wilkin County Highway Dept	Y	Aboveground Tanks; Petroleum Remediation, Leak Site	LS0004480 TS0011221
131144	Wilkin County Recycling Facility	Y	Solid Waste, Permit by Rule	PBR000610
133570	Dump Site Remediation – Breckenridge	Y	Construction Stormwater	C00026729
135410	SP 5601-31 TH 210	N	Construction Stormwater	C00030333
137237	Doran city of WW Improvement	Y	Construction Stormwater	C00031371
141029	Wilkin County	Y	Aboveground Tanks	TS0125932
151735	Conzco Trucking Shop	N	Underground Tanks	TS0016252
186830	Breckenridge Levee Project	Y	Brownfields, Voluntary Investigation and Cleanup	VP17620
186835	Conzco Truck Shop	Y	Petroleum Remediation, Leak Site	LS0005813
187725	Ready Residence	Y	Petroleum Remediation, Leak Site	LS0010395
190095	Bontjes Residence	Y	Petroleum Remediation, Leak Site	LS0010413
190659	Clint Conzemius	Y	Petroleum Remediation, Contaminated Soil Treatment Facility	PRE000121 PRE000328

190725	Doran Dump	Y	Site Assessment	SA0008959
191895	Oden Residence	Y	Petroleum Remediation, Leak Site	LS0010332
194802	Bengtson Residence	Y	Petroleum Remediation, Leak Site	LS0010378
195691	Jirak Residence	Y	Petroleum Remediation, Leak Site	LS0010406
214268*	SP 8406-20, TH 75	Y	Construction Stormwater	C00044509

*Site is located in project area

b. Project related generation/storage of solid wastes – Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

There will be no project related generation of solid wastes from operations. However, there will be solid waste generated in the form of sediment excavated from the channel. Where possible, sediment excavated from the channel that is suitable for building materials will be used for construction of project practices including berms, culverts, etc. Where the material is not suitable for this (contains too much organic content), it will be spread in an upland area for disposal. A Dredged Material Disposal Plan will be generated as part of the final design to identify specific upland locations for disposal of excavated sediment.

c. Project related use/storage of hazardous materials - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

The completed project will not require the use or storage of hazardous materials. Some hazardous materials will be utilized by construction equipment during the rehabilitation project. Excavators, trucks, skid steers, and other heavy equipment utilized for construction contain petroleum-based fuels, hydraulic oils, and other materials that could be potentially hazardous if released into the environment. The materials will be required to be properly managed by the selected construction contractor to minimize the potential for release. All hazardous substances will be stored at an appropriate construction staging or laydown area that will be located outside of the floodplain of Doran Creek, minimizing the chance that an unintended release would reach the waterway. Fuels, oil, and solvents must be stored in appropriate containers such as double walled tanks or tanks with secondary containment. The contractor will be required to implement a spill prevention and response plan for the project and have the appropriate materials available on site to address a spill in the event one occurs. All used waste oils and materials will require offsite disposal at the appropriate solid waste disposal facility that can accept these substances.

d. Project related generation/storage of hazardous wastes - Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

There is no anticipated project related hazardous materials generation or storage proposed for the operation of the project. A minor amount of hazardous materials storage is anticipated during construction, primarily fuel for construction equipment, as described above. The materials will be required to be properly managed by the selected construction contractor to minimize the potential for release. Fuels, oil, and solvents must be appropriately stored and the contractor will be required to implement a spill prevention and response plan. All used waste oils and materials will require offsite disposal at an appropriate facility.

13. Fish, wildlife, plant communities, and sensitive ecological resources (rare features):

a. Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

The project area consists primarily of Doran Creek and its riparian corridor with adjacent agricultural land. The existing stream channel is currently choked with several feet of sediment and no longer functions as a perennial or intermittent stream, which has led to loss of aquatic wildlife habitat, and frequent flooding of adjacent fields. Documentation of existing site conditions shows that the channel is dominated by emergent vegetation, with intermittent pools and wetlands both within the channel and immediately adjacent. The channel is fringed by a woody vegetative buffer throughout much of the project area, though some reaches include crop fields directly abutting the stream channel with little vegetative buffer in the riparian area. Woody debris is common in and adjacent to the channel throughout the extent of the project. The channel itself is expected to provide habitat for species common in agricultural areas and riparian corridors, including small mammals, bats, songbirds, waterfowl, raptors, game animals, small predators, reptiles, and amphibians that may benefit from shallow waters and ephemeral pools. Existing low flow/ephemeral flow and high sedimentation conditions are presumed to have a highly limiting effect on fisheries within the channel.

In 2021, the Bois de Sioux Watershed District performed a Minnesota Stream Quantification Tool (SQT) field survey to assess the existing condition of Doran Creek. The Minnesota SQT is intended to provide a thorough assessment of existing conditions to assist with regulatory permitting for the design and construction of the project as well as provide a planning strategy for improvements to stream ecological function. The field work assessed several stream criteria, including biological, chemical, and physical quality observations. During the 2021 assessment, several species of wildlife were observed within the project area, including whitetail deer, beaver, muskrats, birds, and many frogs within the intermittent pools of water. Emergent species observed in the channel included river bulrush, reed canary grass, and cattail. The field study determined that expanding vegetative cover within the project area would provide a significant ecological lift.

Doran Creek is located in the Glacial Lake Agassiz Basin Level IV Ecoregion (Omernik), which is broadly described as having extremely flat topography, with fewer lakes than neighboring ecoregions, and extensive conversion of historical tallgrass prairie to intensive agriculture (Figure 14). The MPCA 2014 Bois de Sioux River Watershed, Watershed Monitoring and Assessment

Report describes the basin as predominantly used for agricultural row crop production with extensive hydrologic alterations to support this land use. This includes stream channelization and ditching. The MPCA began monitoring surface waters in the watershed and performed an assessment in 2012 of aquatic life and other surface water quality indicators. All stream segments within the watershed failed to meet aquatic life use standards and most were impaired for low dissolved oxygen and/or excess turbidity. The report states that 86 different fish species are documented in the Red River Basin, of which 31 were noted during the 2012 assessment, with the most diversity in the main stem of the Bois de Sioux River. Fathead minnows were the most abundant, with black bullhead, creek chub, common carp, white sucker, and orange spotted sunfish also commonly observed. Many of these species are commonly associated with degraded water quality such as high turbidity or low dissolved oxygen. The overall watershed was also noted to contain several aquatic macro invertebrate species that are tolerant of low-quality habitat conditions.

b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (ERDB _____) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

A query of the Minnesota DNR Natural Heritage Information System (NHIS) data (License Number LA-1057) indicated that there are no known occurrences of state-listed endangered, threatened, or special concern species in the project area or within a one-mile buffer. Additionally, the project was queried via the Minnesota Conservation Explorer and NHIS planning tool. The nearest results of the NHIS query are a lark sparrow (*Chondestes grammacus*) observation 1.16 miles outside of the project area and a black sandshell (*Ligumia recta*) and mudpuppy (*Necturus maculosus)* 1.36 miles outside of the project area. The DNR Rare Species Guide provides a filtered list of state threatened, endangered, and state concern species with potential to be found the Bois de Sioux watershed. The tables below provide a summary of these species in the watershed. The Minnesota Conservation Explorer report is provided in Attachment 2.

Table 6. State Threatened & Endangered Species within the Bois de Sioux Watershed

Common name	Scientific name	Group	State Status	Federal Status
Henslow's Sparrow	*Centronyx henslowii*	bird	Endangered	None
Loggerhead Shrike	*Lanius ludovicianus*	bird	Endangered	None
Piping Plover	*Charadrius melodus*	bird	Endangered	Threatened
Wilson's Phalarope	*Phalaropus tricolor*	bird	Threatened	None
Dakota Skipper	*Hesperia dacotae*	insect	Endangered	Threatened
Poweshiek Skipperling	*Oarisma poweshiek*	insect	Endangered	Endangered
Fluted-shell	*Lasmigona costata*	mussel	Threatened	None
Waterhyssop	*Bacopa rotundifolia*	vascular plant	Threatened	None
Yellow Prairie Violet	*Viola nuttallii*	vascular plant	Threatened	None

Table 7. Species of State Concern within the Bois de Sioux Watershed

Common name	Scientific name	Group
Great Plains Toad	*Anaxyrus cognatus*	amphibian
American White Pelican	*Pelecanus erythrorhynchos*	bird
Forster's Tern	*Sterna forsteri*	bird
Franklin's Gull	*Leucophaeus pipixcan*	bird
Greater Prairie-chicken	*Tympanuchus cupido*	bird
Lark Sparrow	*Chondestes grammacus*	bird
Marbled Godwit	*Limosa fedoa*	bird
Iowa Skipper	*Atrytone arogos iowa*	insect
Leonard's Skipper	*Hesperia leonardus*	insect
Regal Fritillary	*Argynnis idalia*	insect
Black Sandshell	*Ligumia recta*	mussel
Cutleaf Ironplant	*Xanthisma spinulosum var. spinulosum*	vascular plant
Missouri Milk-vetch	*Astragalus missouriensis var. missouriensis*	vascular plant
Northern Gentian	*Gentiana affinis*	vascular plant
Plains Reedgrass	*Calamagrostis montanensis*	vascular plant
Prairie Moonwort	*Botrychium campestre*	vascular plant
Red Three-awn	*Aristida purpurea var. longiseta*	vascular plant
Slender Milk-vetch	*Astragalus flexuosus var. flexuosus*	vascular plant
Small White Lady's-slipper	*Cypripedium candidum*	vascular plant
Small-leaved Pussytoes	*Antennaria parvifolia*	vascular plant
Soft Goldenrod	*Solidago mollis*	vascular plant
Western White Prairie-clover	*Dalea candida var. oligophylla*	vascular plant

A Minnesota County Biological Survey Site of Biodiversity Significance is mapped at the northern end of the project area. The site, Breckenridge 21, is mapped as a site of moderate biodiversity significance. Sites mapped as moderate rank are described as “sites contain occurrences of rare species, moderately disturbed native plant communities, and/or landscapes that have strong potential for recovery of native plant communities and characteristic ecological processes”. Concurrently mapped with the Breckenridge 21 site are two segments of MN DNR UPn23b Mesic Prairie (Northern) native plant communities. The MN DNR describes the Northern Mesic Prairie community as grass dominated (75-100%) with sparse forbs (5-50%), with somewhat poorly drained to well drained loam soils on level to gently rolling topography.

The northern long-eared bat is currently listed as a state special concern species in Minnesota; however, the USFWS published a final rule on November 29, 2022 to reclassify the northern long eared bat from a threatened listing to endangered under the Endangered Species Act (ESA). This new status is effective as of January 30th, 2023. Due to the nature of the project and the need for federal permits, this review includes evaluation of this federal species.

A query of the USFWS Information for Planning and Consultation (IPaC) database was generated to identify federally-listed endangered, threatened, or candidate species with potential to occur within a one-mile buffer of the project area. The IPaC query identified the northern long-eared bat (*Myotis septentrionalis*), the tricolored bat (*Perimyotis subflavus*), the monarch butterfly (*Danaus plexippus*), and the western prairie fringed orchid (*Plantanthera praeclara*). A brief description of habitat needs for each of these species and their listing status is included below.

Table 8. Federal Threatened and Endangered Species within 1 Mile of the Project Area

Species	Federal Status	Habitat Description
Northern long-eared bat *Myotis septentrionalis*	Endangered	Relies on the bark of live trees and snags or dead trees for summer roosting and overwinters in caves and mines. Males and non-reproductive females may also roost in cooler places, like caves and mines. Forested habitat is not only used for roosting but also foraging and travel between suitable habitat fragments.
Tricolored bat *Perimyotis subflavus*	Proposed Endangered	Tricolored bats hibernate in caves, mines, and tunnels and roost singly in trees, but also some males and non-reproductive females may roost in their winter hibernacula. According to the MN DNR Rare Species Guide, maternity colonies have not yet been located in Minnesota, but elsewhere they have been located in trees, rock crevices, barns, or other buildings.
Monarch butterfly *Danaus plexippus*	Candidate	May use many different types of plant communities for foraging and nectar sources but is dependent on the presence of milkweed for larval rearing. Adults will nectar from milkweed species while in bloom but will utilize many other nectar sources during the spring and fall, prior to and after the bloom season for milkweed.
Western prairie fringed orchid *Plantanthera praeclara*	Threatened	Remnant prairie species which occurs primarily in moist to wet calcareous tallgrass prairies and sedge meadows. Prefers undisturbed grasslands, but may also be found in moderately disturbed habitats, such as roadside ditches.

c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

The project will improve the aquatic resource by providing a low flow channel, installing woody habitat features, and protecting adjacent riparian lands via conservation easement. The project will improve water quality in Doran Creek, which will also benefit downstream aquatic resources. The low flow channel will improve habitat for species dependent on flowing water; the current condition experiences no-flow conditions for much of the year. The project does not intend to permanently

impact or cause a loss of wetlands in the channel or adjacent to the channel, which will continue to provide habitat for amphibians, reptiles, birds, and invertebrates that currently utilize the resource. The MCBS Site (Breckenridge 21) will not be negatively impacted by the project. The majority of the Site appears to be actively farmed under existing conditions. With the conversion of adjacent floodplain from farmland to native perennial vegetation in conservation easement, it is anticipated the project will have a net benefit on this Site. The Bois de Sioux will coordinate with the DNR regarding proposed activities and proposed vegetation seed mixes at this Site to determine what additional measures are required, as needed.

d. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

Tree removal, as needed, will be restricted during the active roosting season for the northern long-eared bat and tri-colored bat. The project will enhance approximately 1,300 acres of land within the 10-year floodplain in conservation easement, removing these acres from agricultural production. These conservation easements will be revegetated with native perennial vegetation, providing significant habitat for wildlife, pollinators, and rare species within the project area. This will also provide native habitat adjacent to the Breckenridge Site which will help to protect and enhance the site of biodiversity. These conservation easements will be protected in perpetuity. The conversion of farmland to perennial vegetation in the 10-year floodplain to conservation easement will provide additional wildlife habitat by establishing additional riparian buffer. This will reduce sedimentation of the creek and provide transitional riparian habitat. Excavation of the channel will restore aquatic habitat to the creek by providing areas of flowing water and deeper pool habitat. Currently, portions of the project area do not flow in most conditions, some drying up entirely. Others have remnant pools of standing water, but flow is not typically observed. Additionally, trees felled within the project area will be reused for bank stabilization, creating aquatic habitat within the creek.

14. Historic properties:

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

A records request was submitted to the Minnesota SHPO in November 2022. The SHPO indicated that there are 16 records of historic properties within the project area. One archaeological record was identified within the project area, classified as SA which indicates records of previously document "single artifact". A Phase 1A Literature Review of the SHPO information has been completed by a licensed professional archeologist to further evaluate the records of previous artifacts found at the project site (Attachment 3). The Phase 1A Literature Review was completed in January 2023 and updated in August 2023, and found eleven previously recorded archaeological sites, nine previously recorded historic structures, and two previous cultural resource surveys are located within the study area. None of the archaeological sites are located within the proposed project area, however six sites are located adjacent (within 500 ft) to the proposed project and three of the architectural resources overlap with the proposed project area. Of the surveys, one previous survey overlaps with portions of the project area.

The project is located largely within wooded, grassy, and agricultural areas located along Doran Creek, which feeds into the Bois de Sioux River. Some of the wooded area within the project area has been subject to clearing, agriculture, and rural development, but the area does not appear to have been subject to any considerable impacts. The project area consists of mostly flat terrain near the Creek. The Creek provides an intermittent freshwater resource within the proposed project area. In general, sources of fresh water and certain landforms such as river terraces have high potential for archaeological resources. Long-term occupations sites are more likely to occur along permanent water sources, as more resources are readily available, rather than intermittent systems like Doran Creek. There are no river terraces within the project area.

Six archaeological sites are located adjacent (within 500 ft) to the proposed project area. Due to these factors, the project area has a moderate to high potential for significant cultural resources. As a result a Phase I Survey will be completed to identify locations of any potential resources. The project intends to avoid impacts to cultural resources and will field verify proposed improvement practices in relation to any cultural resources that are identified during the Phase I Survey. The project proponent is working closely with the USACE in regards to Section 106 coordination needs, which will be completed through the federal action of the Section 404 permit; and the Minnesota SHPO, to complete state cultural resources review.

15. Visual:

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

There are no anticipated project related visual effects. The project will not alter any viewsheds in the landscape nor does it propose any structures with vapor plumes or intense lighting. The majority of the project area is relatively flat agricultural land, with predominately agricultural vegetation outside of the emergent and woody vegetation within channel.

16. Air:

a. Stationary source emissions - Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

   There will be no stationary source emissions involved with this project. Any air emissions produced will be temporary and on the scale of normal construction activities.

b. Vehicle emissions - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

Project-related vehicle emissions will be consistent with typical construction activities, including emissions from construction crew personal vehicles and heavy construction equipment. Construction is going to be taking place within Doran Creek and its riparian area and will have minimal impact on the surrounding roads. The effect of the project's traffic generation on air emissions is anticipated to be minimal and temporary. No additional measures have been developed or are planned to minimize or mitigate vehicle-related emissions.

c. Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

   Odor disturbances will be limited to the construction equipment emissions and will only occur within the immediate construction area. The project will not generate substantial odor during construction. Potential odors will include exhaust from diesel engines. Dust generated during construction will be minimized through standard dust control measures, such as applying water to gravel roads used for site access and limiting the extent and duration of exposed soil conditions.

17. Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

Project-related noise generation is anticipated to be temporary and will result only from construction of the project. There will be no operational noises associated with the project. Noise sources will include those typical of heavy construction equipment and equipment use comply with applicable working hour ordinances.

18. Transportation

a. Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

   The project will not generate traffic, with the exception of traffic generated during construction. During construction, there will be an increase in vehicle traffic to and from the project area, but this increase is temporary.

b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system. *If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW.* Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 *(available at: http://www.dot.state.mn.us/accessmanagement/resources.html)* or a similar local guidance,

There will be no permanent effect on traffic congestion on affected roads.

c. Identify measures that will be taken to minimize or mitigate project related transportation effects.

There are no traffic mitigation measures proposed.

19. Cumulative potential effects: (Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

Any negative environmental impacts of the Doran Creek Rehabilitation project will be primarily temporary in nature, occurring during construction. Soil excavated from the creek will be stockpiled in upland locations outside of aquatic resources. The project is designed as an aquatic rehabilitation project and intends to enhance the ecosystem of Doran Creek, while providing erosion control and flood protection benefits to adjacent landowners.

b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

Similar rehabilitation and flood management projects are proposed throughout the Bois de Sioux Watershed. Many of the District's projects aim to address water quantity, water quality, flood storage, sediment control, and impoundments. The District has four multi-benefit stream/river rehabilitation and restoration projects currently proposed, including one under construction (Mustinka River Fish and Habitat Corridor Rehabilitation), the Fivemile Creek Project and Twelvemile Creek Project (currently in the study phase), and Doran Creek. Similar projects are proposed or being constructed in adjacent watersheds under 1W1P initiative.

c. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

Current District projects are spread throughout various counties within the Watershed. There are no similar projects within an immediate vicinity to Doran Creek, which reduces the potential for cumulative impacts during construction, such as impacts to traffic, air, noise, etc. All similar projects aim at enhancing local resources within the Bois de Sioux Watershed and therefore are anticipated to have a cumulative benefit to the region.

20. Other potential environmental effects: If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

The project will have an overall benefit to the resource and negative effects will be temporary in nature. These have been sufficiently addressed in items 1 to 19.

RGU CERTIFICATION. *(The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)*

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Date January 26, 2024

Signature _____

Title Administrator

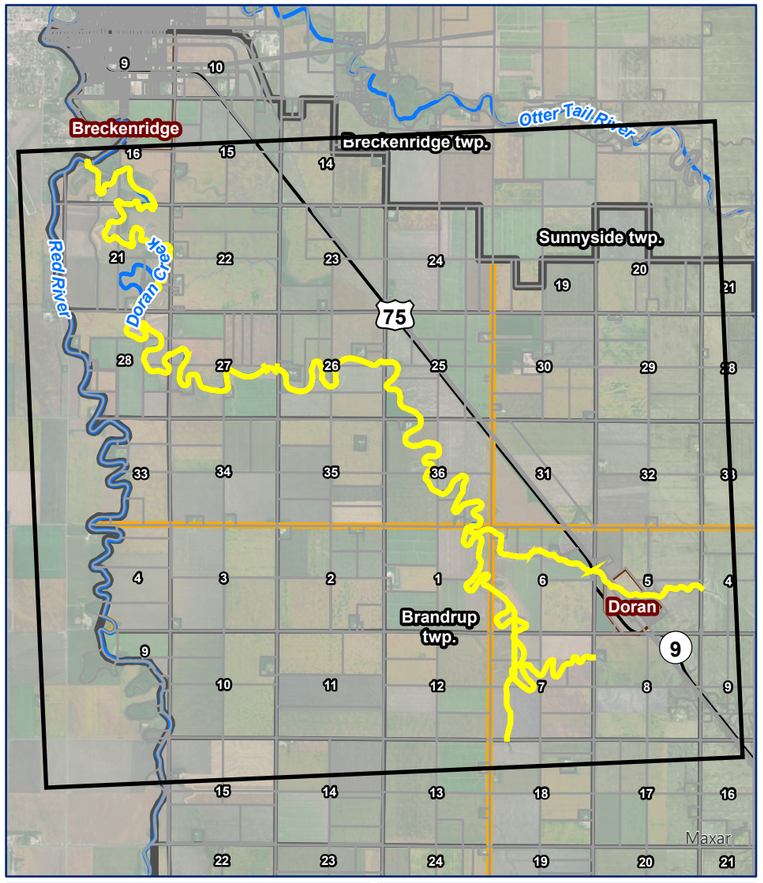
Figures

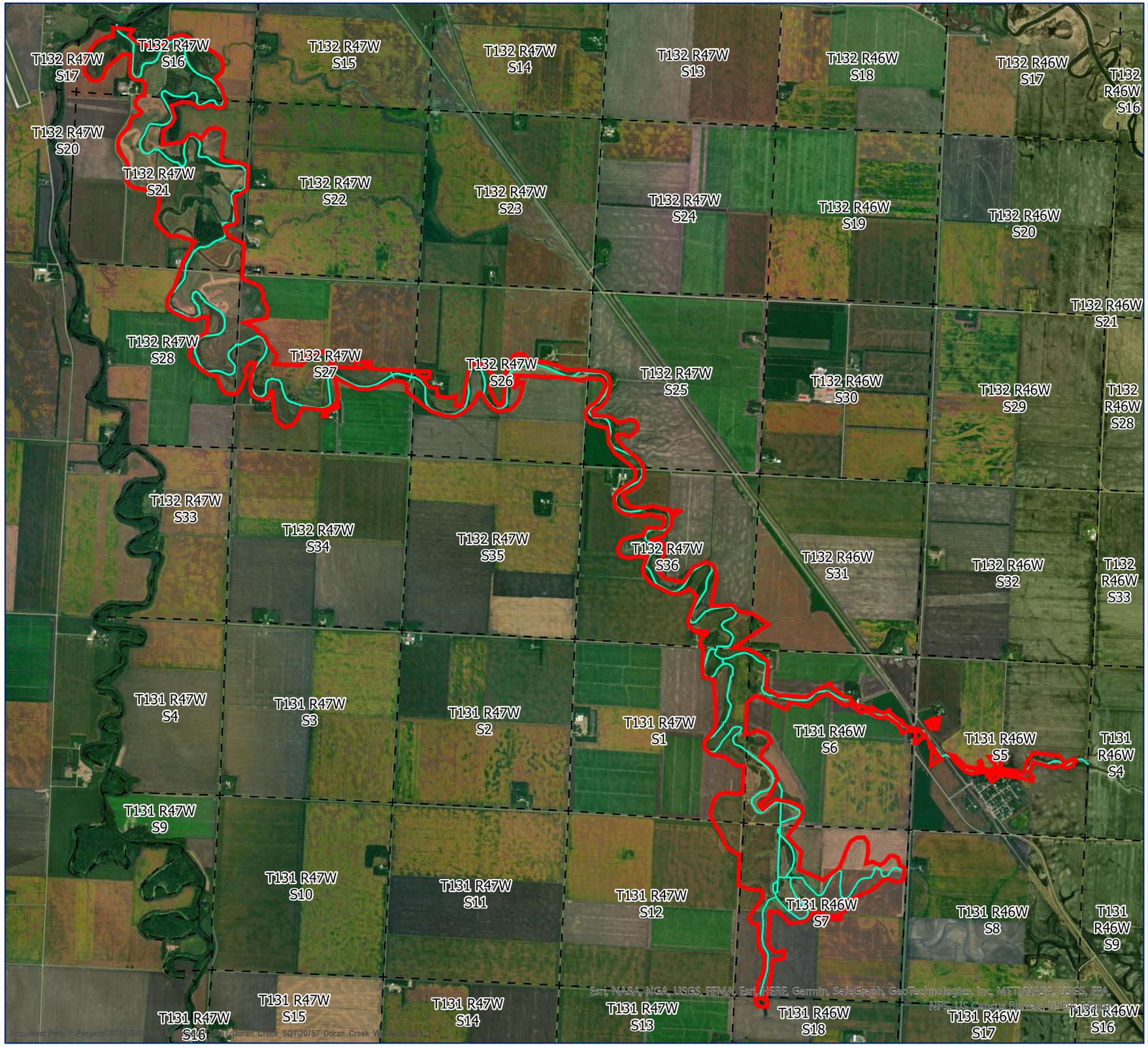
Doran Creek Stream Rehabilitation

Figure 1: Project Location

Legend

- Doran Creek Project Area
- Project Extent
- PLSS





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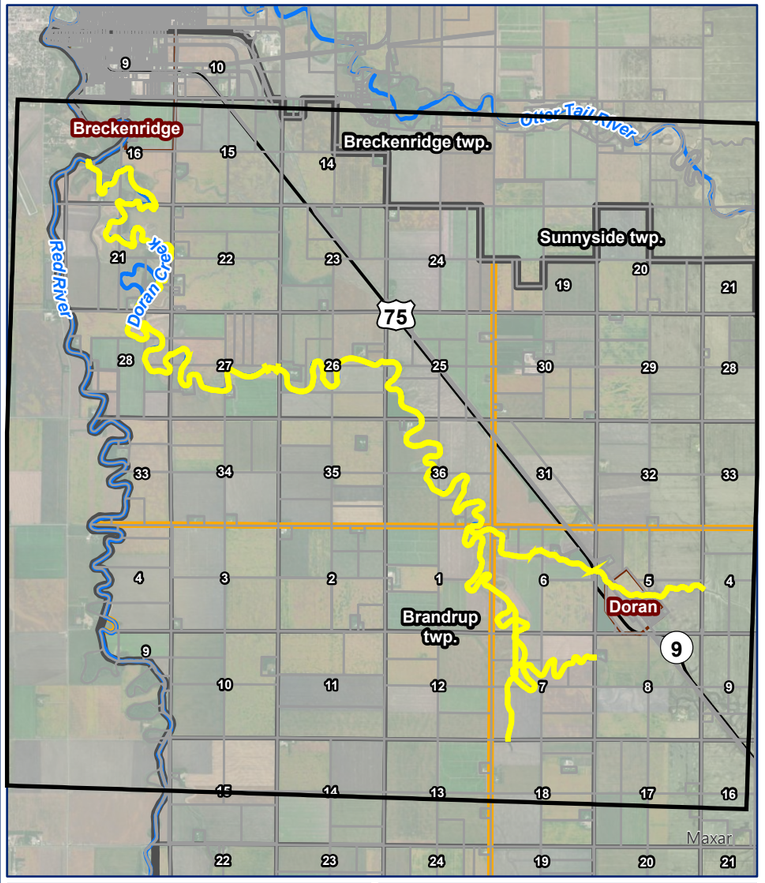
moore engineering, inc.

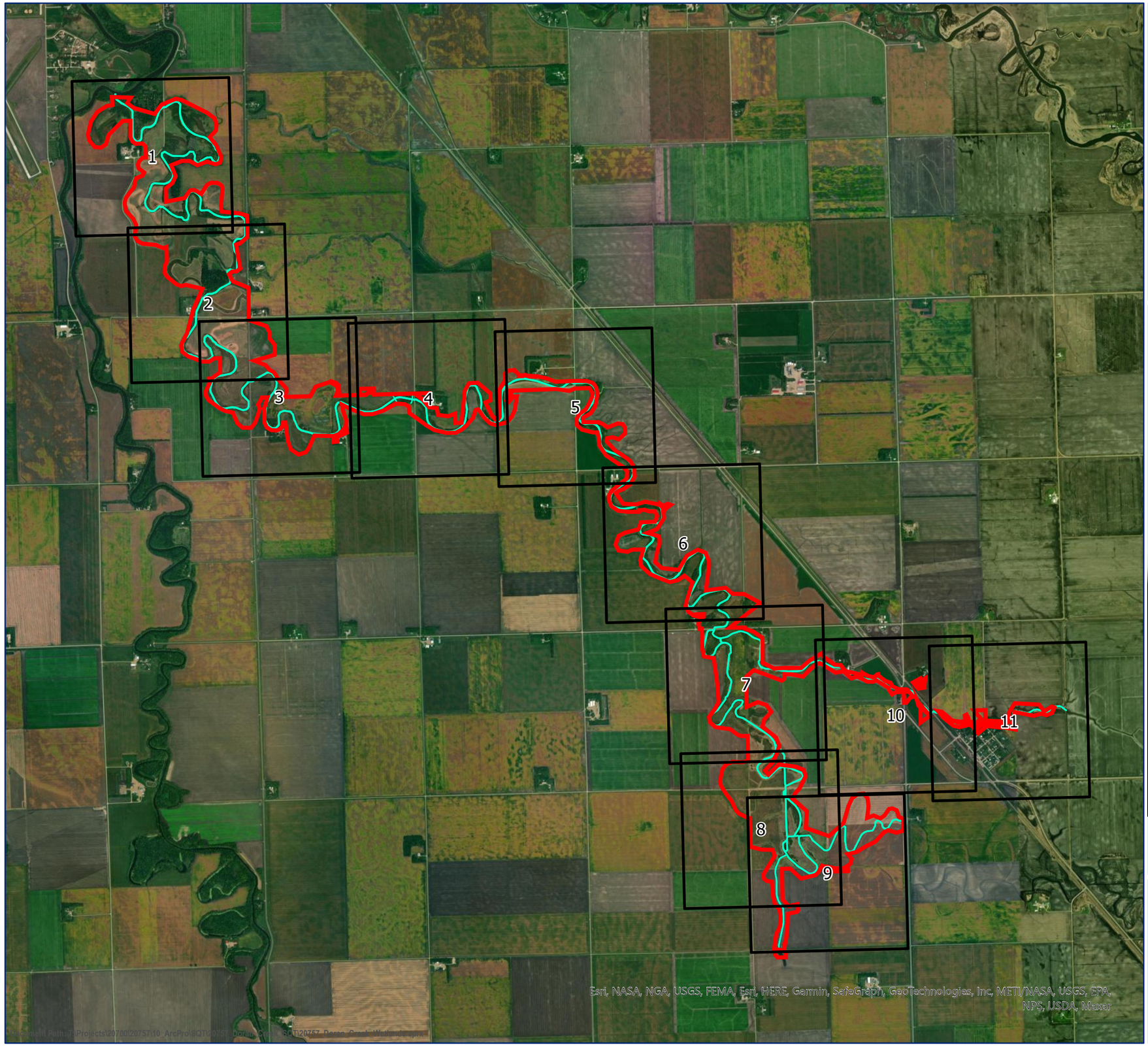
Doran Creek Stream Rehabilitation

Figure 2: Project Overview

Legend

- Project Detail Maps
- Doran Creek Project Area
- Doran Creek Channel
- trs





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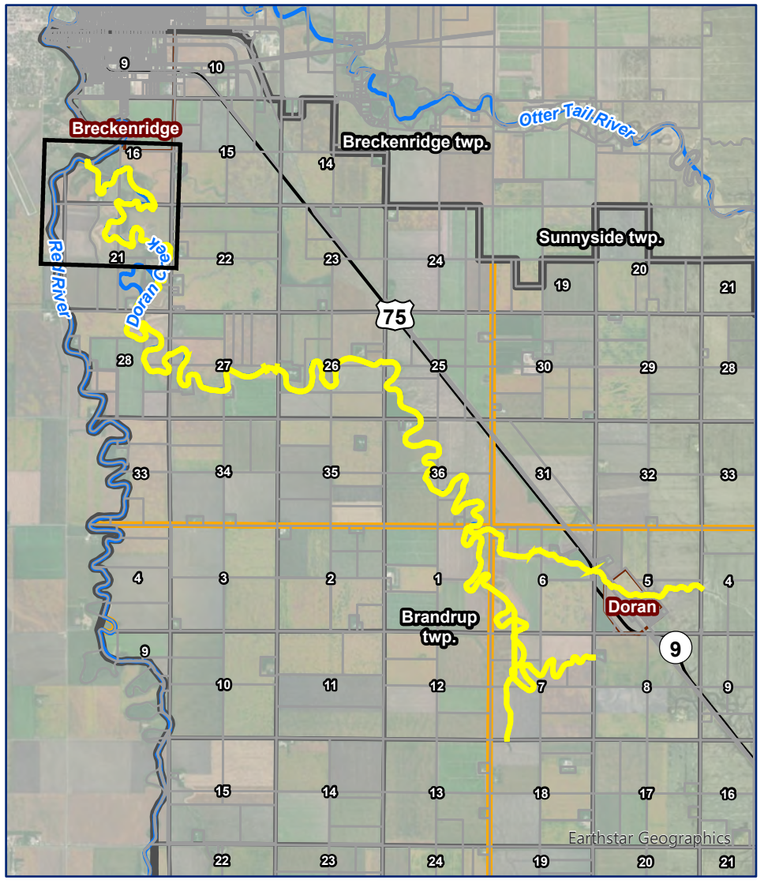
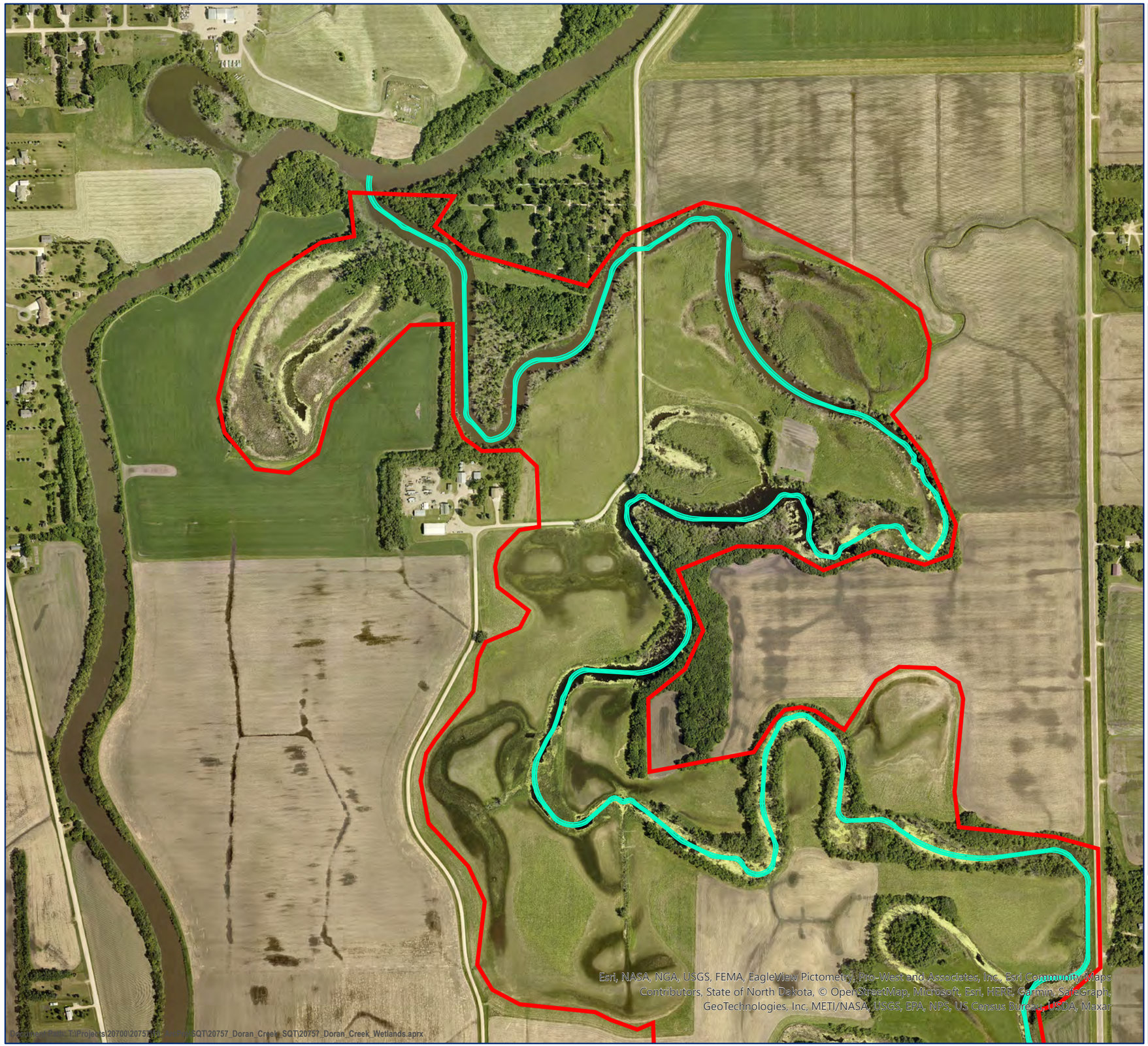
Doran Creek Stream Rehabilitation

Figure 3: Project Detail

Legend

- Doran Creek Project Area
- Doran Creek Channel





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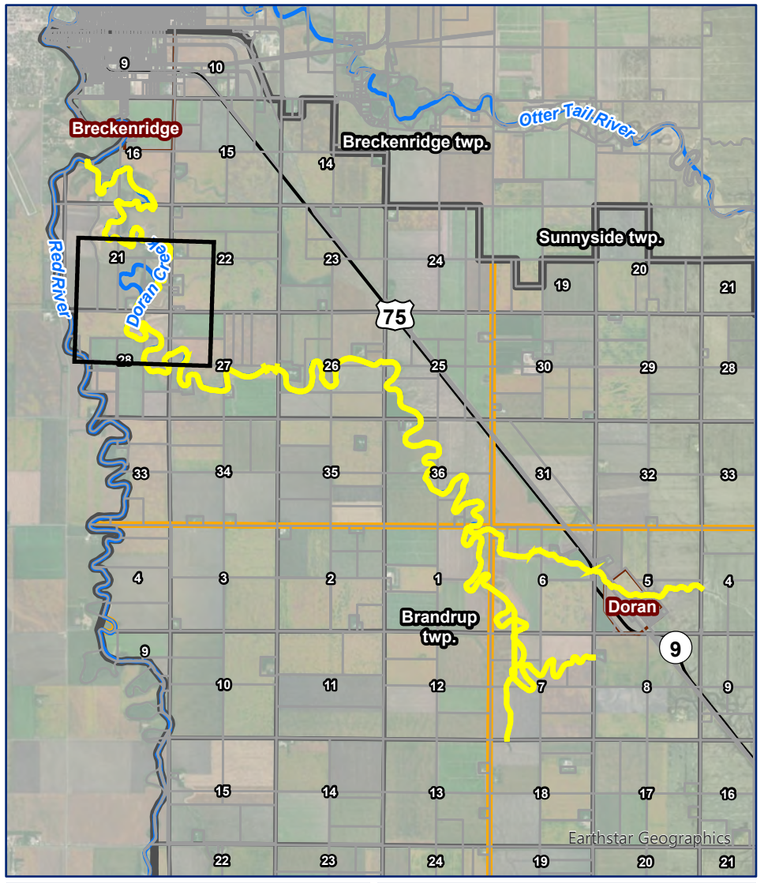
moore engineering, inc.

Doran Creek Stream Rehabilitation

Figure 3: Project Detail

Legend

- Doran Creek Project Area
- Doran Creek Channel



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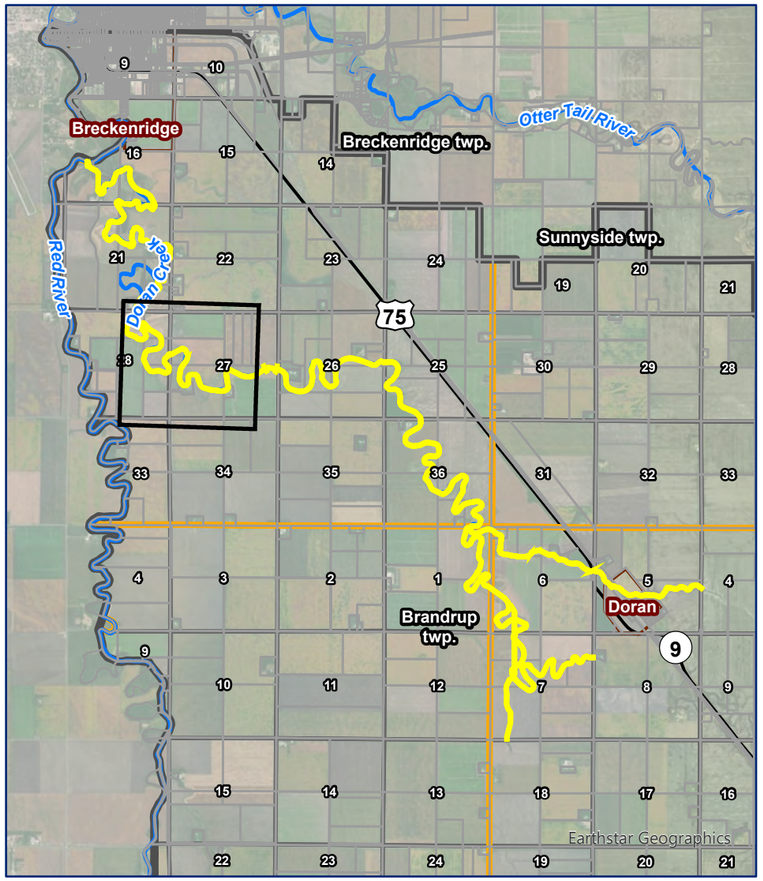
moore engineering, inc.

Doran Creek Stream Rehabilitation

Figure 3: Project Detail

Legend

- Doran Creek Project Area
- Doran Creek Channel



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Bois de Sioux Watershed District

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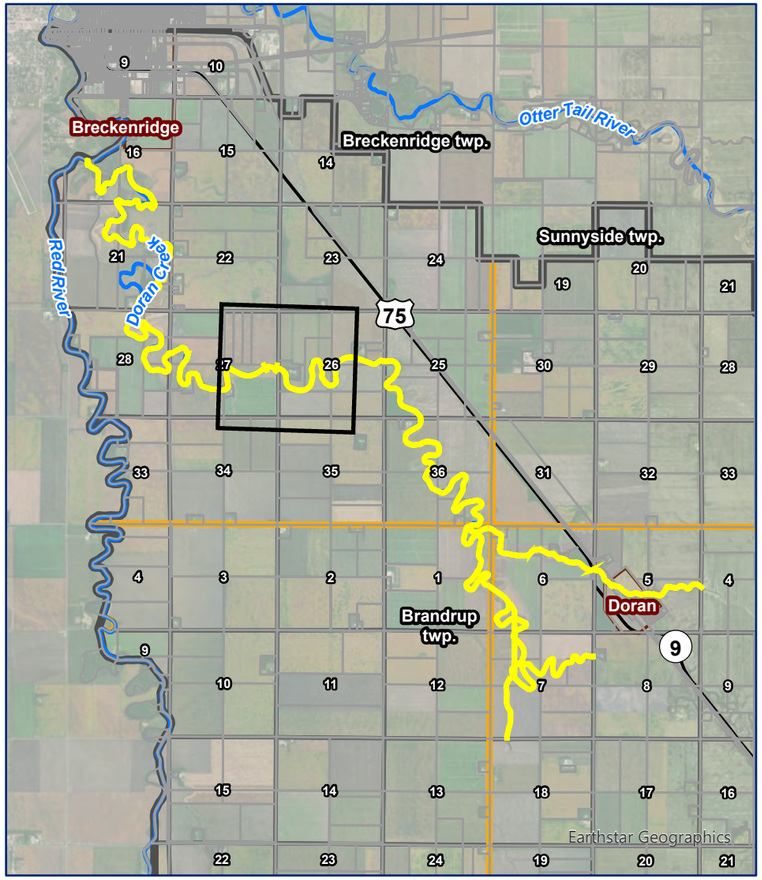
Doran Creek Stream Rehabilitation

Figure 3: Project Detail

Legend

- Doran Creek Project Area
- Doran Creek Channel



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Bois de Sioux Watershed District

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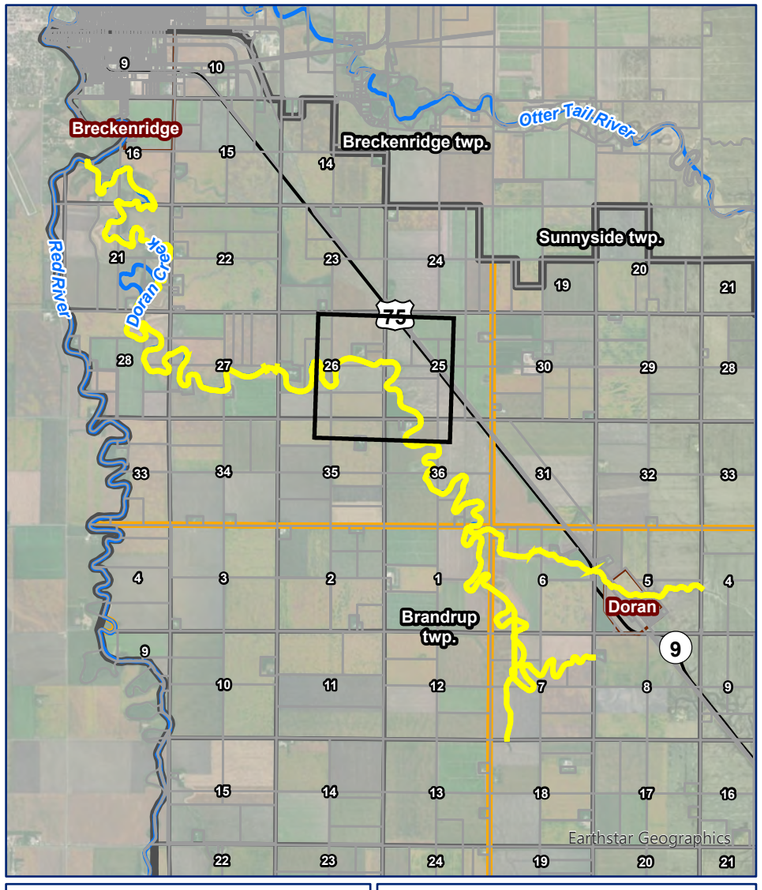
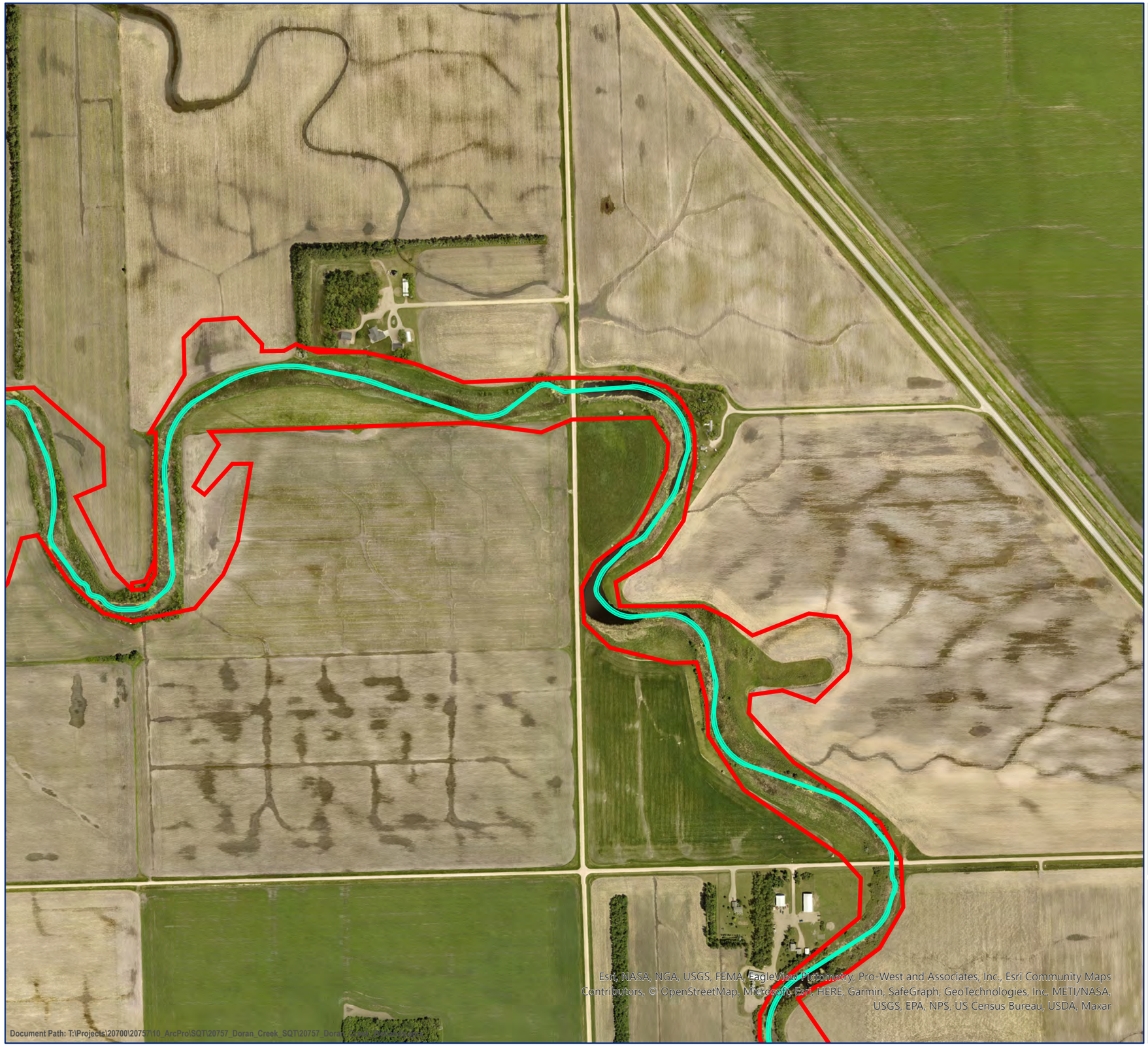
Doran Creek Stream Rehabilitation

Figure 3: Project Detail

Legend

- Doran Creek Project Area
- Doran Creek Channel





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Bois de Sioux Watershed District

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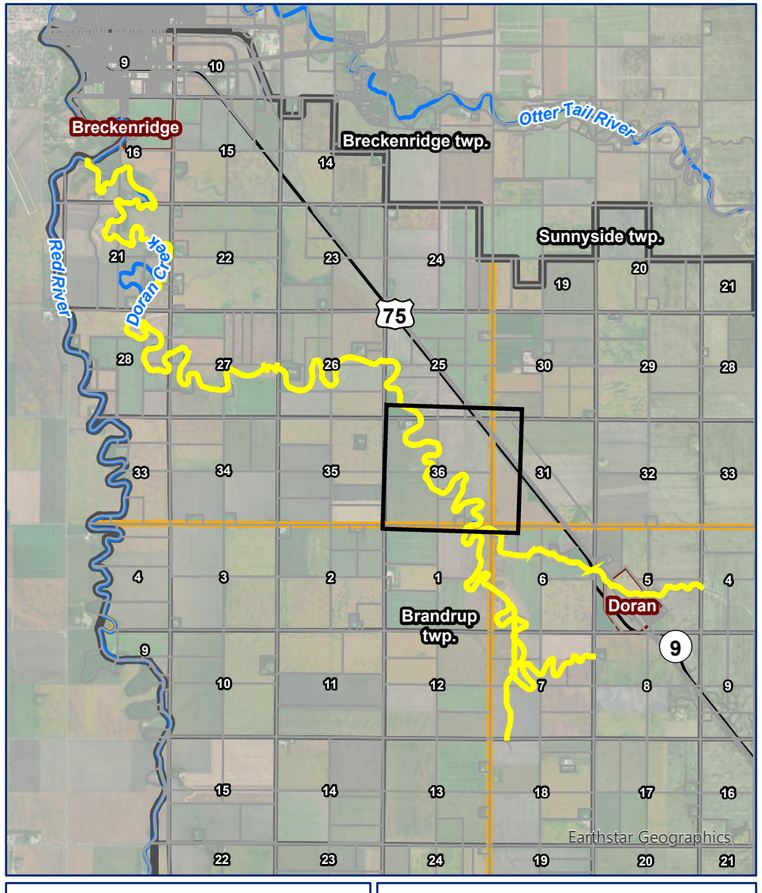
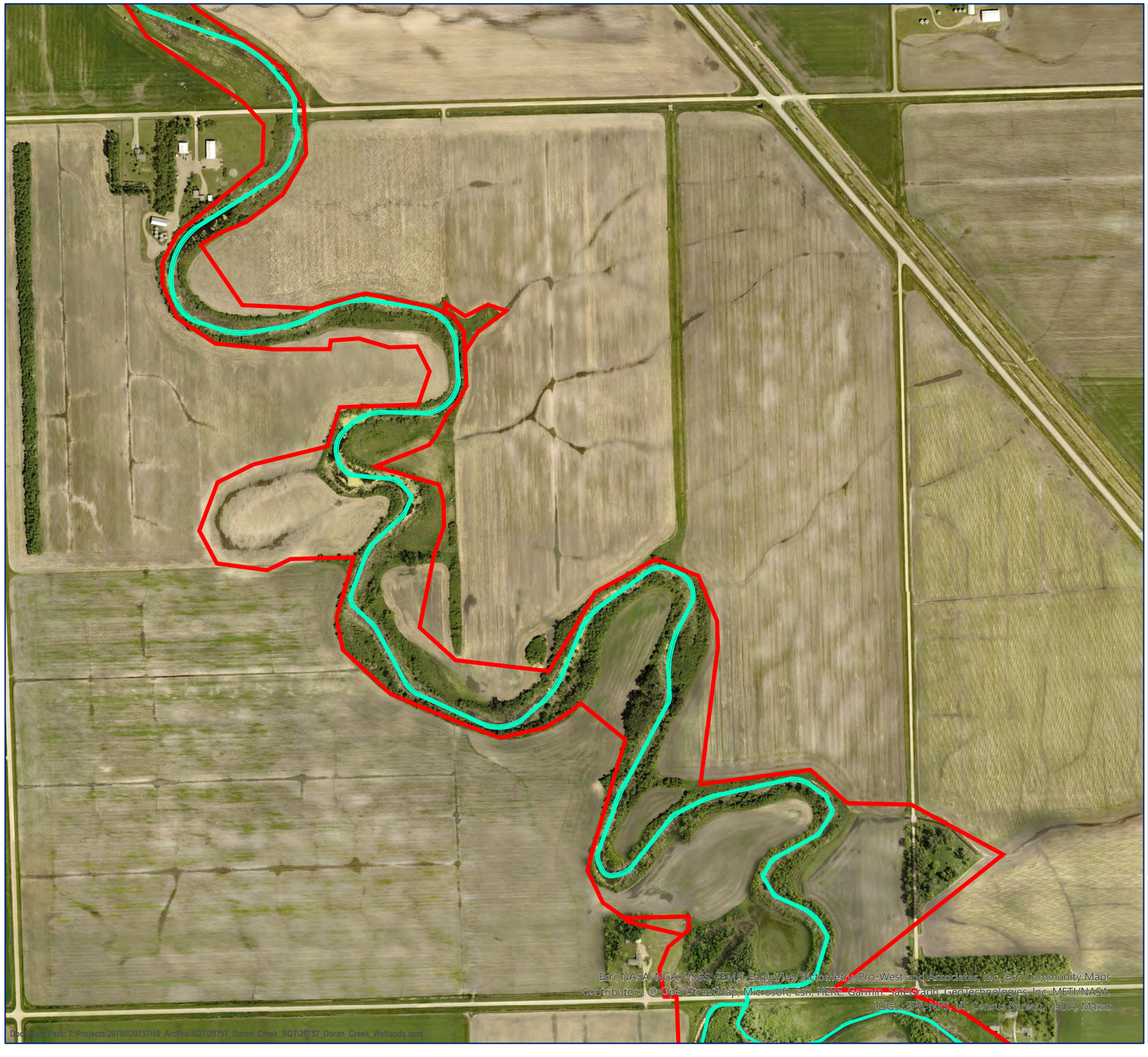
Doran Creek Stream Rehabilitation

Figure 3: Project Detail

Legend

- Doran Creek Project Area
- Doran Creek Channel





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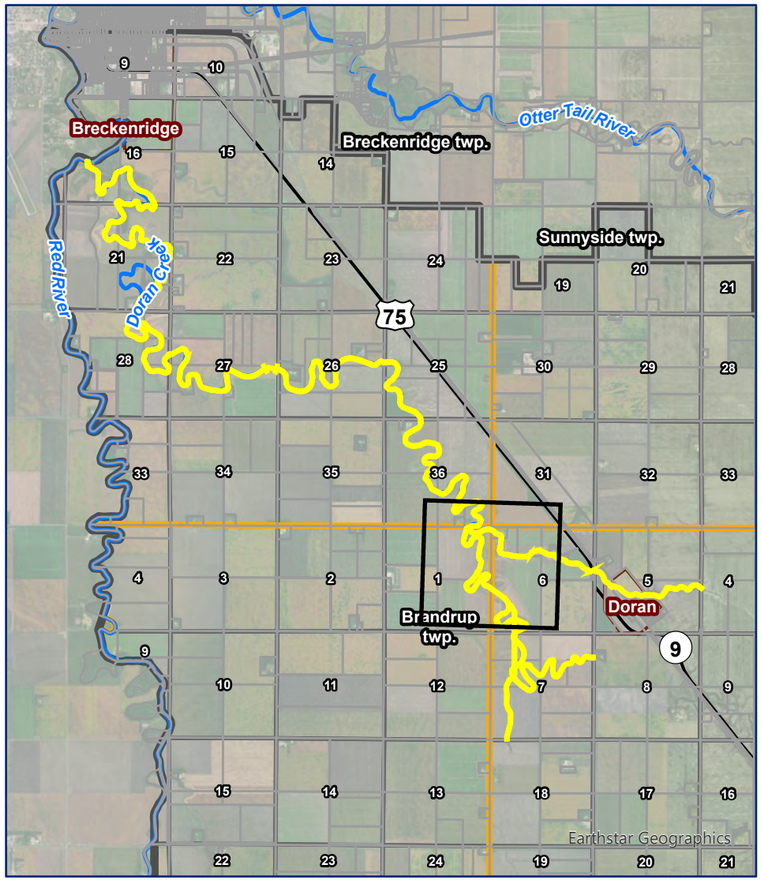
Doran Creek Stream Rehabilitation

Figure 3: Project Detail

Legend

- Doran Creek Project Area
- Doran Creek Channel



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moore engineering, inc.

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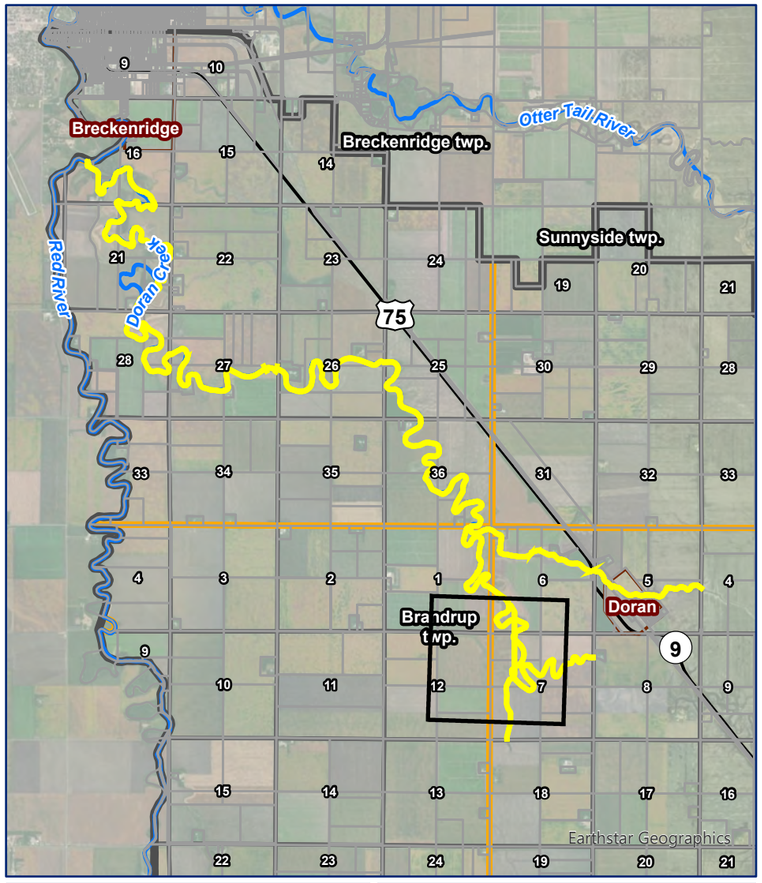
Doran Creek Stream Rehabilitation

Figure 3: Project Detail

Legend

- Doran Creek Project Area
- Doran Creek Channel



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Bois de Sioux Watershed District

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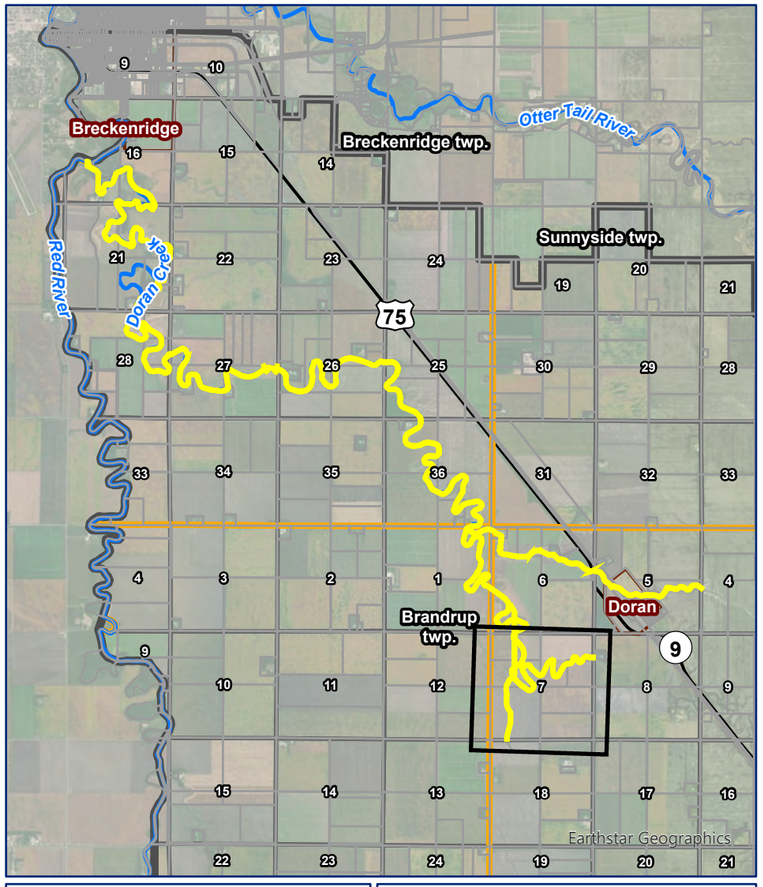
Doran Creek Stream Rehabilitation

Figure 3: Project Detail

Legend

- Doran Creek Project Area
- Doran Creek Channel



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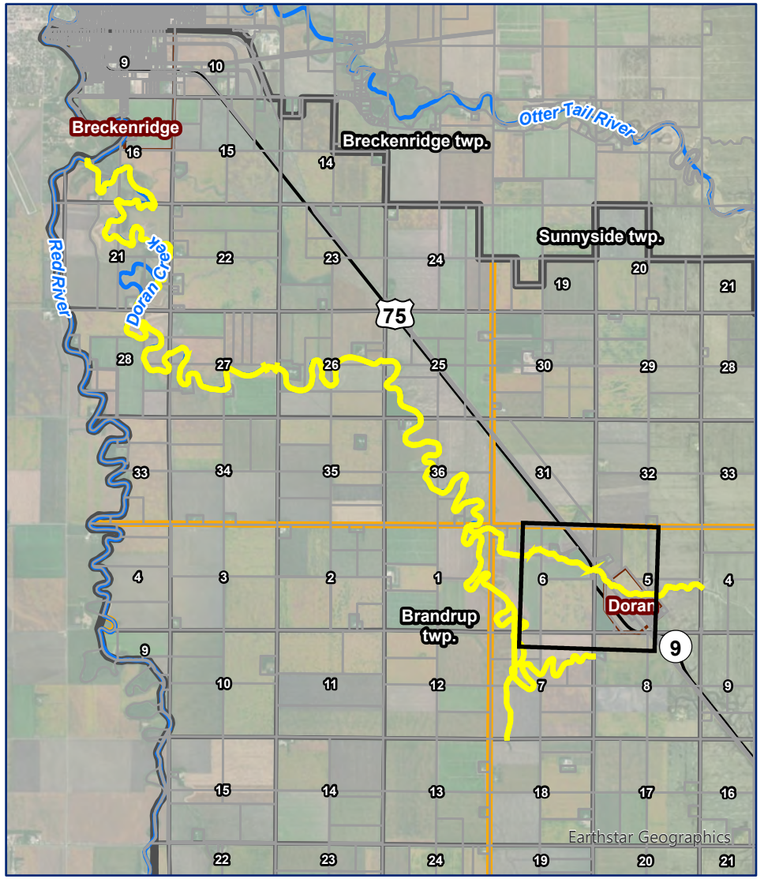
Doran Creek Stream Rehabilitation

Figure 3: Project Detail

Legend

- Doran Creek Project Area
- Doran Creek Channel



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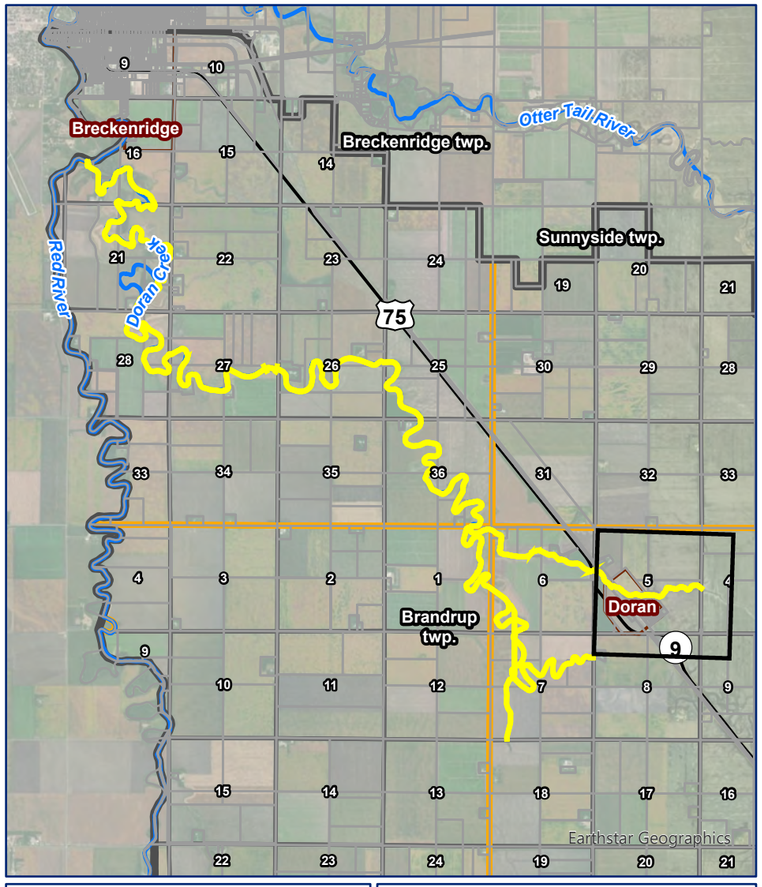
Doran Creek Stream Rehabilitation

Figure 3: Project Detail

Legend

- Doran Creek Project Area
- Doran Creek Channel



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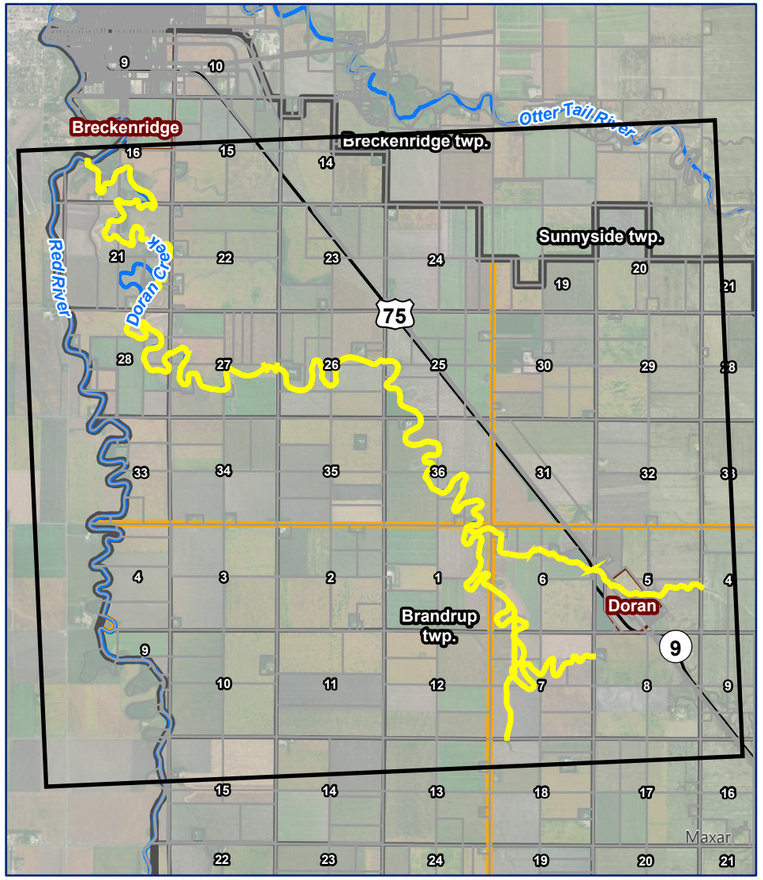
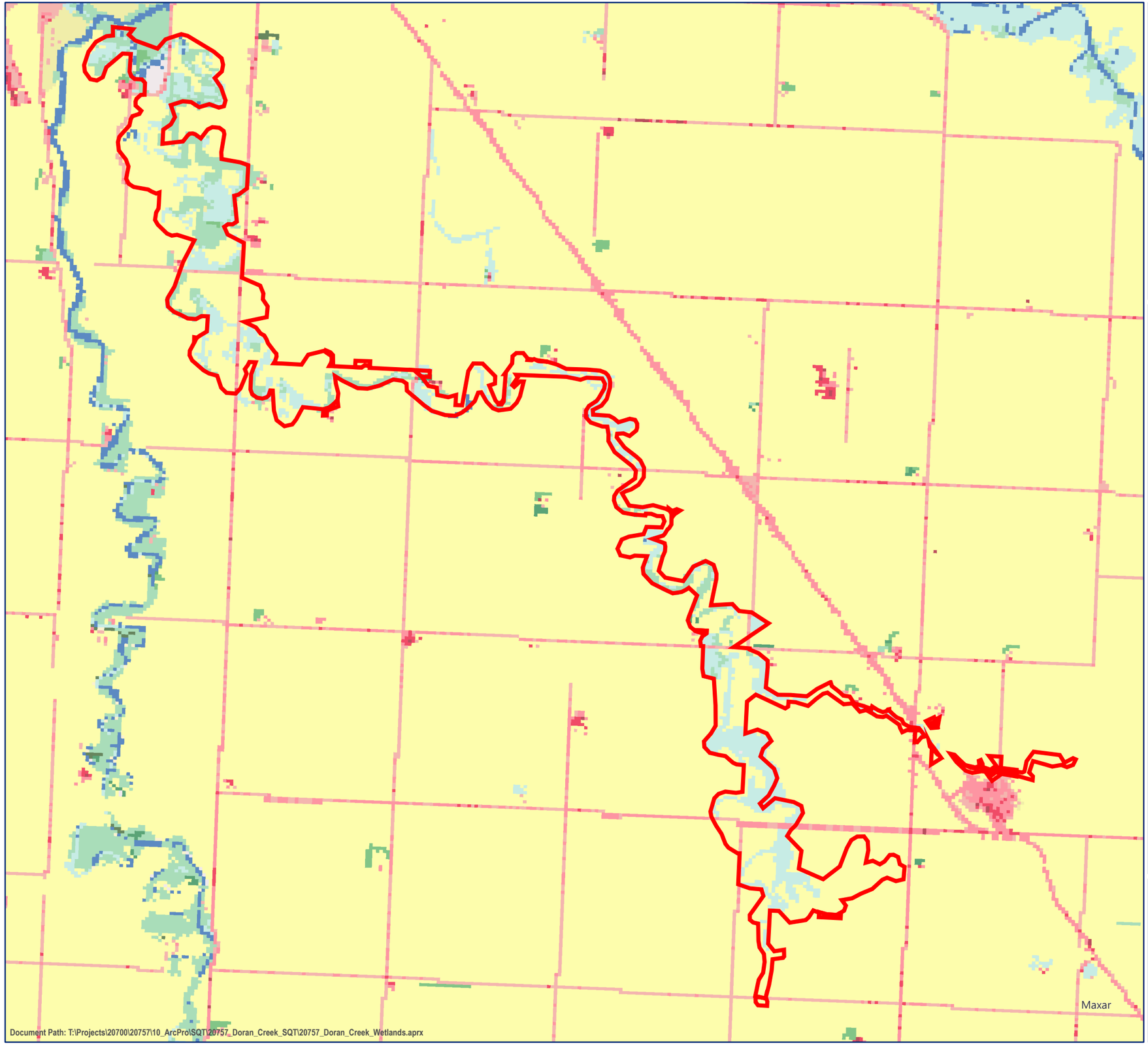
Doran Creek Stream Rehabilitation

Figure 4: 2019 NLCD Landcover Data

Legend

- Doran Creek Project Area
- USA NLCD Land Cover
- ClassName
- Open Water
- Developed Open Space
- Developed Low Intensity
- Developed Medium Intensity
- Developed High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands





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Doran Creek Stream Rehabilitation

Figure 5: NASS Cropland Data (2023)

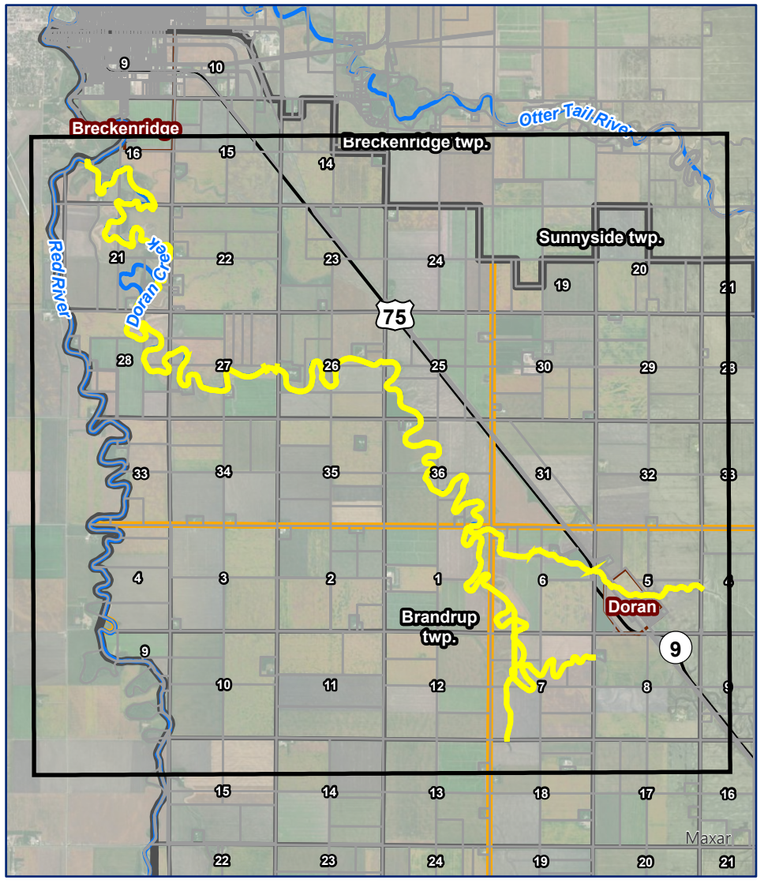
Legend

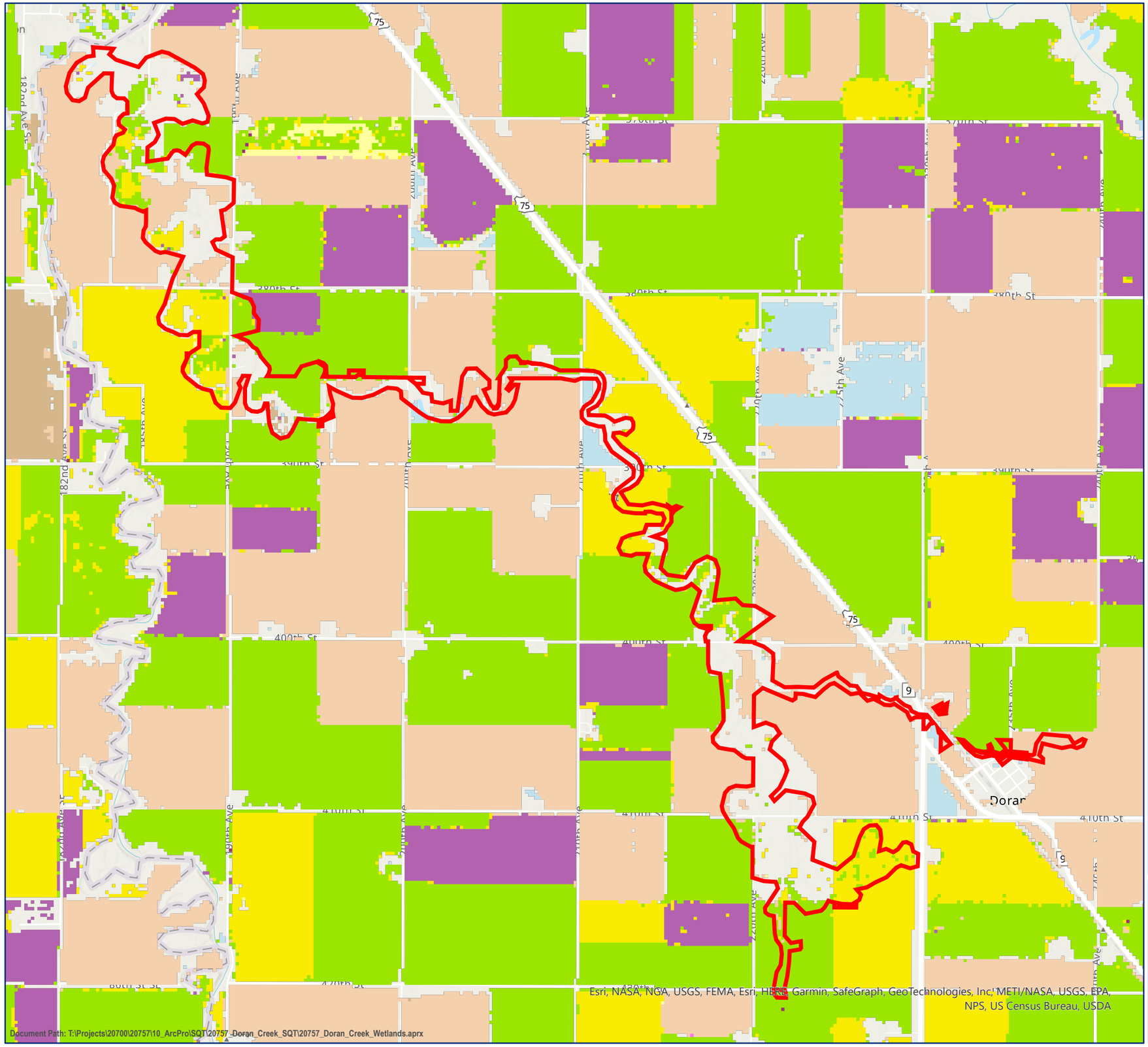
- MapbookBounds
- Doran Creek Project Area
- Project Extent

USA Cropland

Class_Name

- Uncultivated
- Corn
- Soybeans
- Sunflower
- Barley
- Spring Wheat
- Winter Wheat
- Rye
- Oats
- Alfalfa
- Other Hay/Non Alfalfa
- Sugarbeets
- Dry Beans
- Fallow/Idle Cropland





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Doran Creek Stream Rehabilitation

Figure 6: Public Lands

Legend

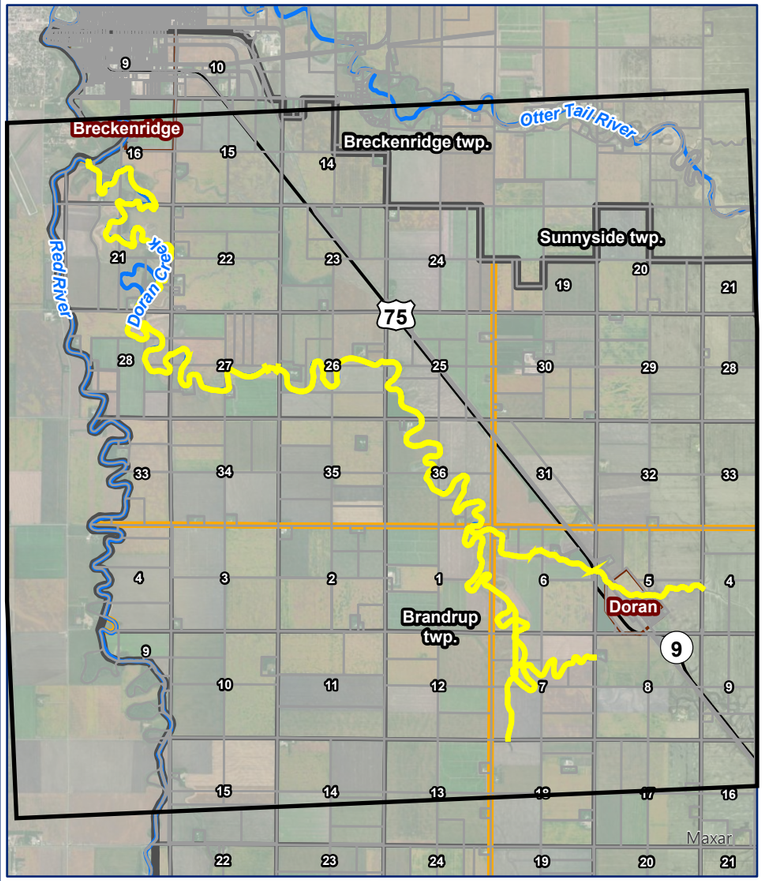
- Doran Creek Project Area
- DNR State Trails
- BWSR RIM Conservation Easements
- DNR SNA Boundaries
- DNR WMA Boundaries

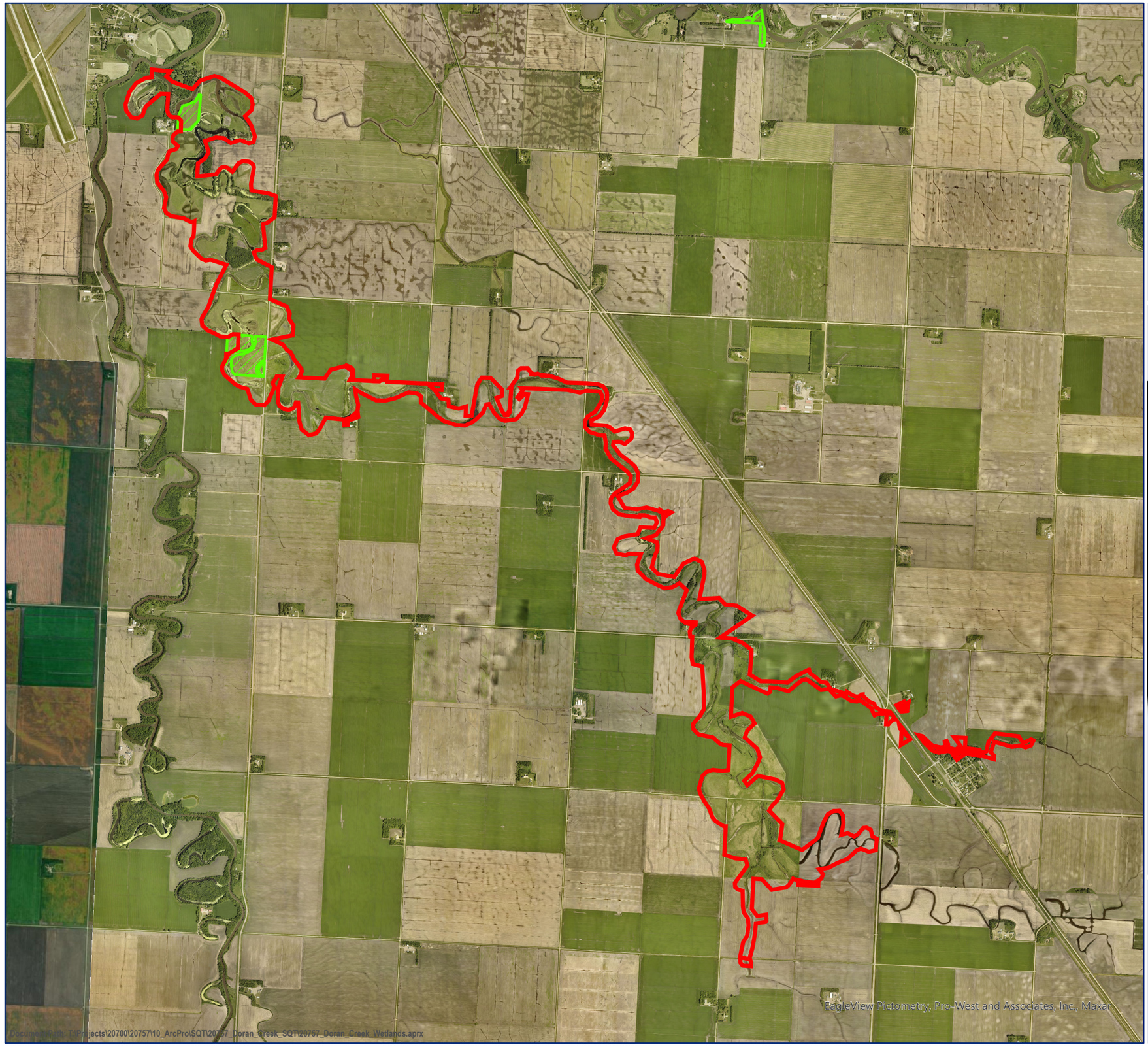
USFWS Realty

- Fee
- Secondary
- Easement
- Lease
- Agreement
- Partial Interest
- Permit

Federal Land

- Unknown
- BIA
- BLM
- DOD
- FWS
- NPS
- USFS





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Doran Creek Stream Rehabilitation

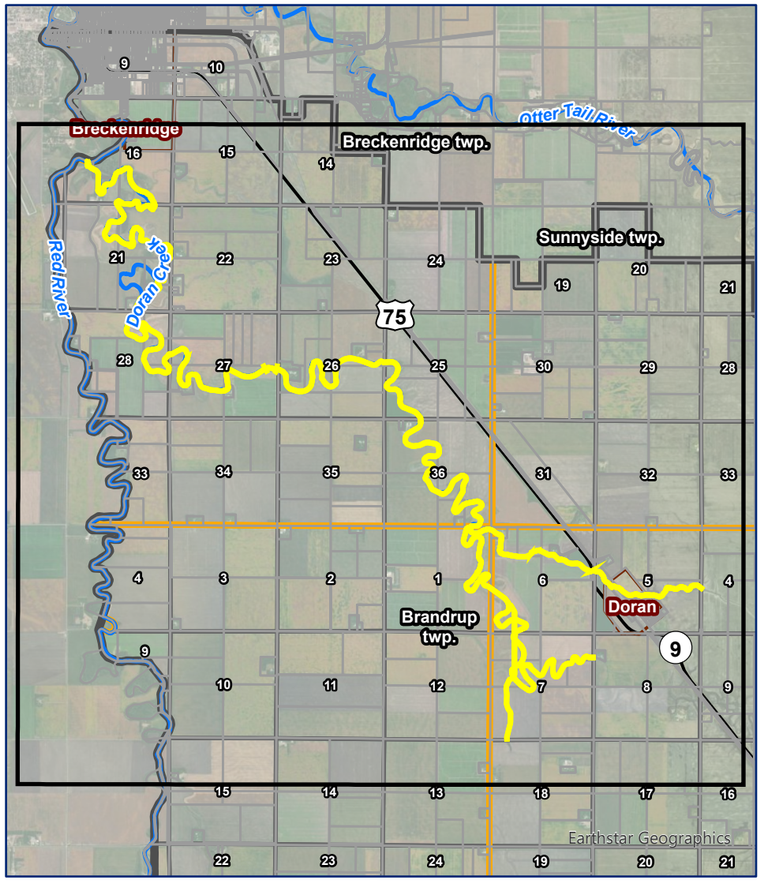
Figure 7: Prime Farmland

Legend

- Doran Creek Project Area

Farmland Class

- All areas are prime farmland
- Farmland of statewide importance
- Not prime farmland
- Prime farmland if drained



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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

Figure 8: Wilkin County Zoning

Legend

- Doran Creek Project Area
- Project Extent
- 100-Year Floodplain

Zoning Districts - City of Breckenridge

- Agricultural
- Residential
- <all other values>

Zoning Districts - Wilkin County

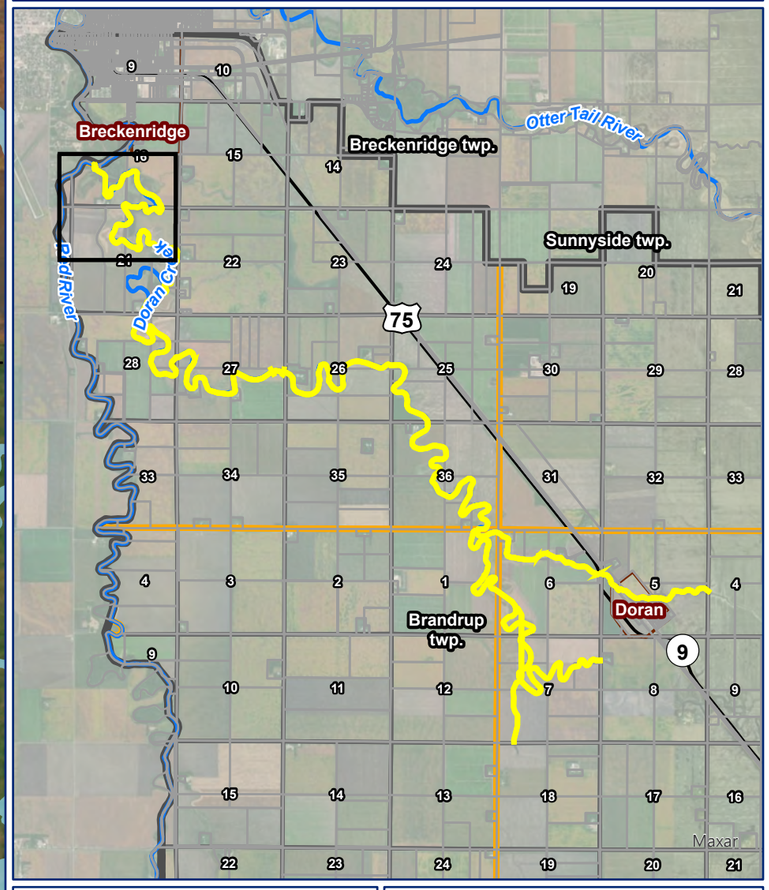
- Commercial - Industrial

T132 R47W S17

T132 R47W S16

T132 R47W S20

T132 R47W S21



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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

Figure 8: Wilkin County Zoning

T132 R47W S21

T132 R47W S22

T132 R47W S28

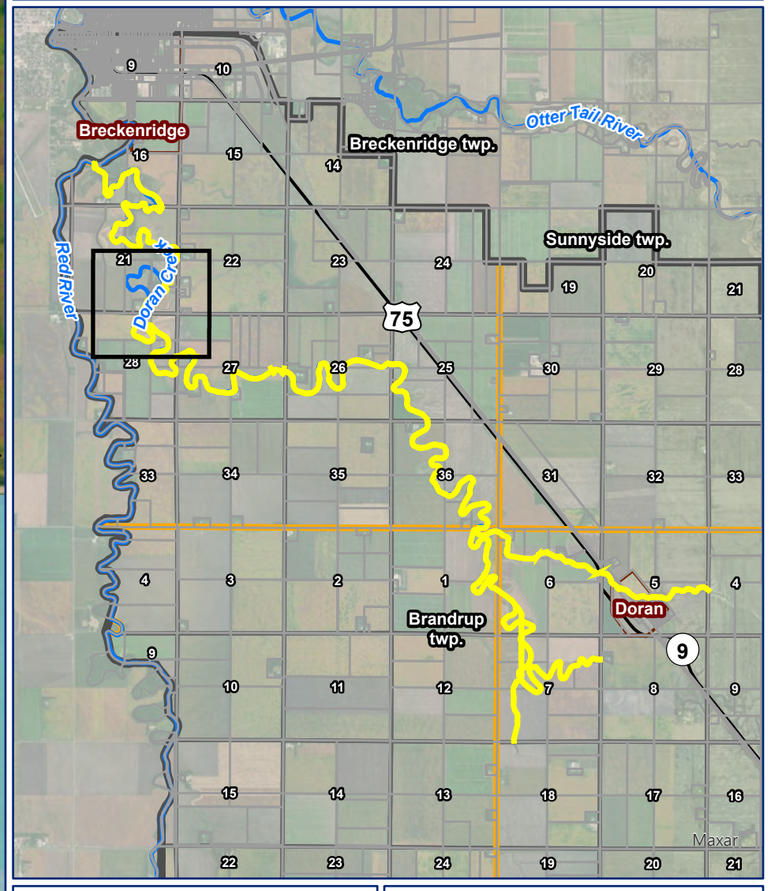
T132 R47W S27

Legend

- Doran Creek Project Area
- Project Extent
- 100-Year Floodplain
- Residential
- <all other values>

Zoning Districts - Wilkin County

- Commercial - Industrial



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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

Figure 8: Wilkin County Zoning

Legend

- Doran Creek Project Area
- Project Extent
- 100-Year Floodplain
- Residential
- <all other values>

Zoning Districts - Wilkin County

- Commercial - Industrial

T132 R47W S28

T132 R47W S27

T132 R47W S33

T132 R47W S34

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community, Esri Community Maps Contributors, State of North Dakota, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Maxar

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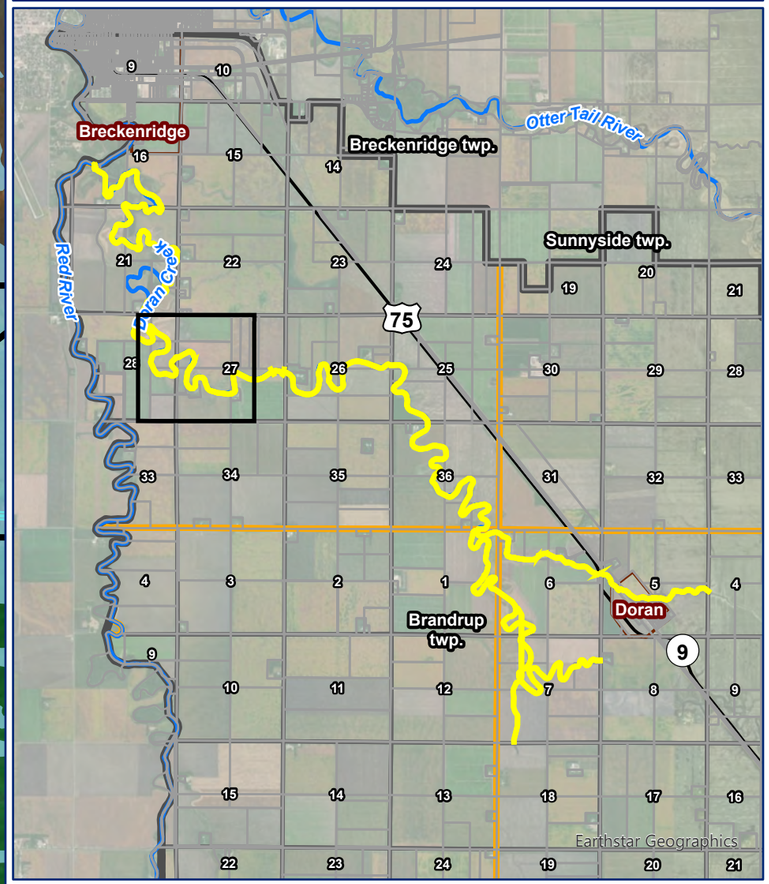

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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

Figure 8: Wilkin County Zoning

Legend

- Doran Creek Project Area
- Project Extent
- 100-Year Floodplain
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Zoning Districts - Wilkin County

- Commercial - Industrial

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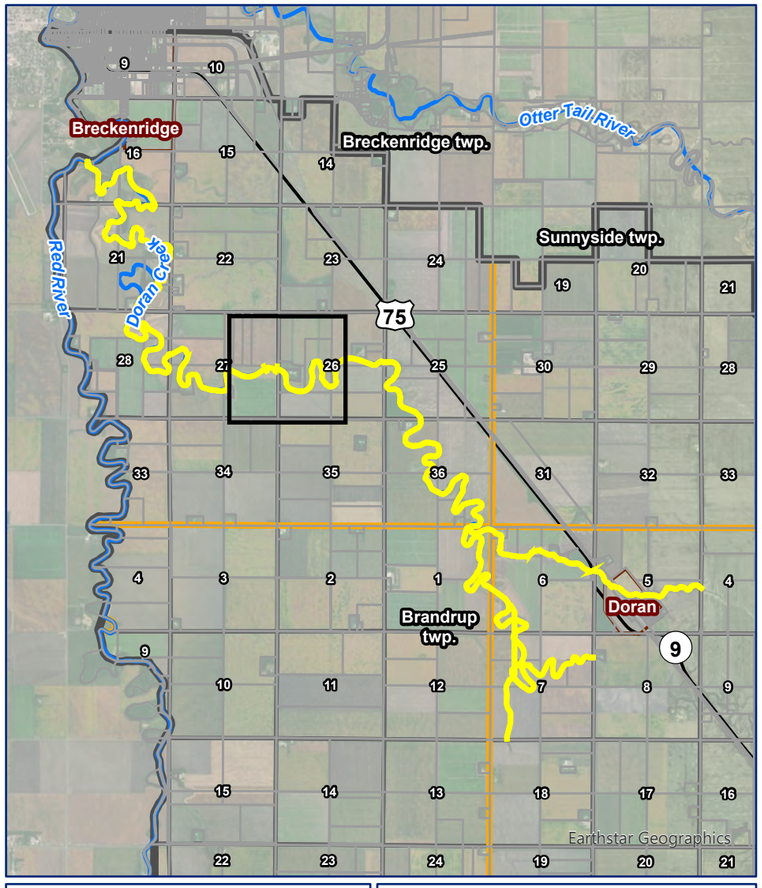

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Bois de Sioux Watershed District

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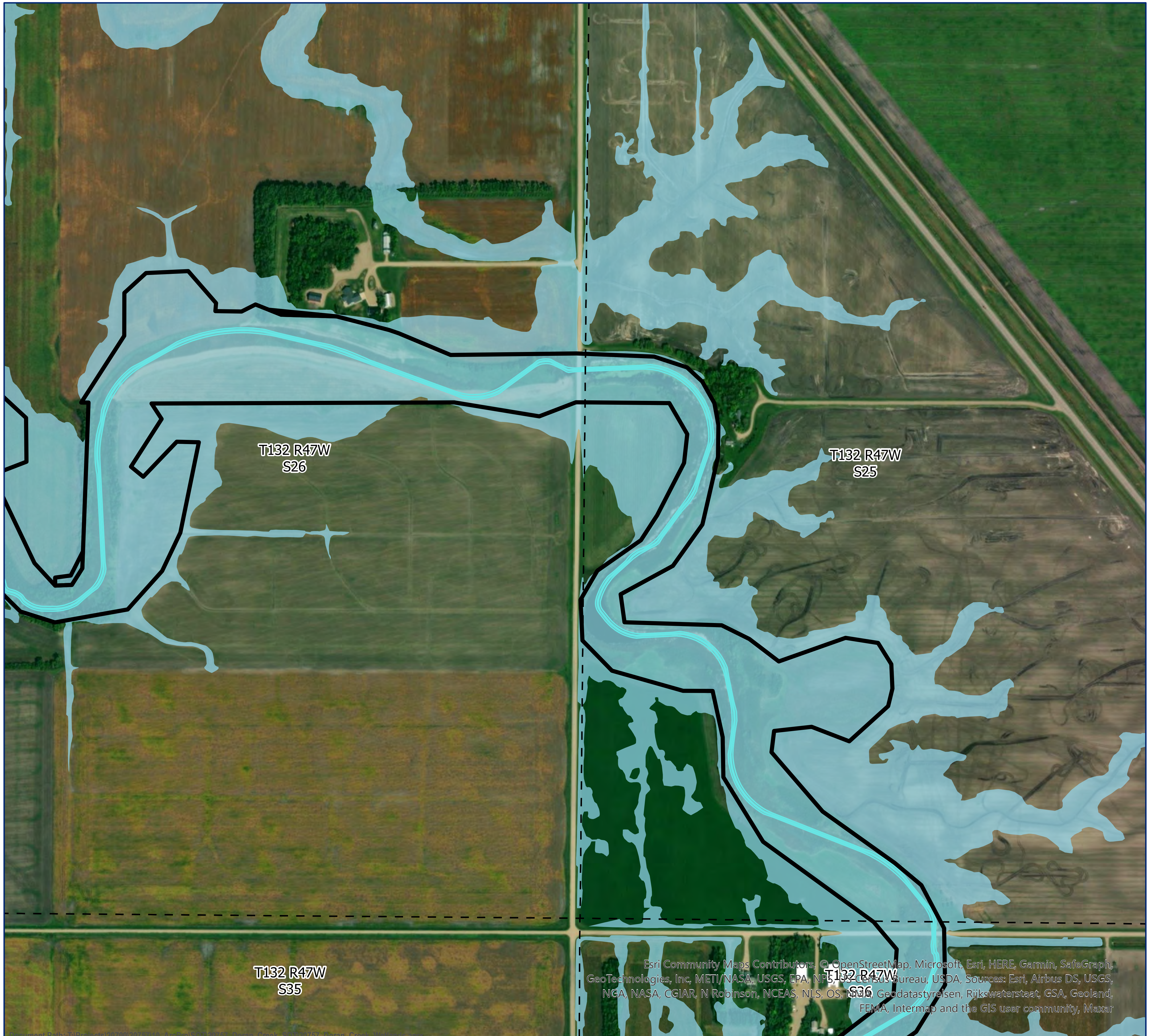
Doran Creek Stream Rehabilitation

Figure 8: Wilkin County Zoning



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Legend

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Zoning Districts - Wilkin County

- Commercial - Industrial
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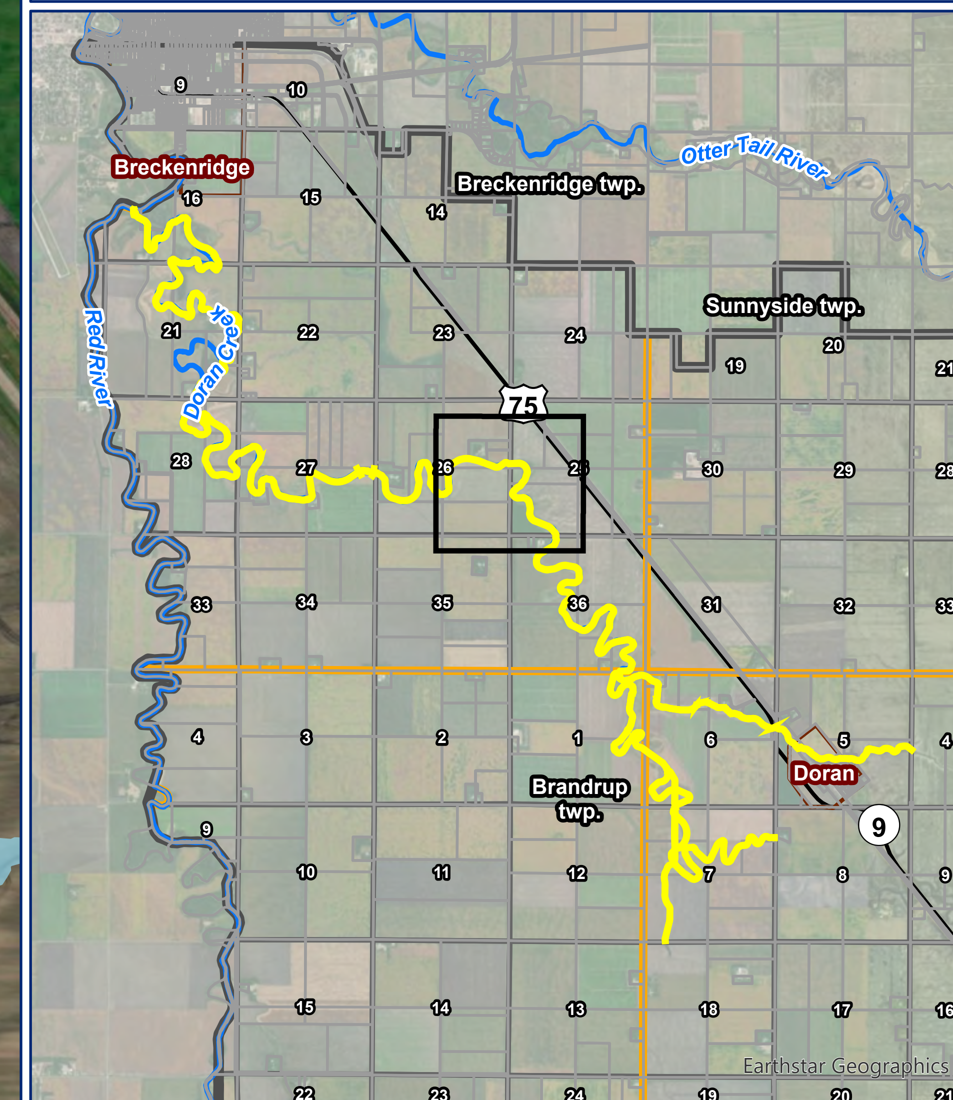

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Bois de Sioux Watershed District

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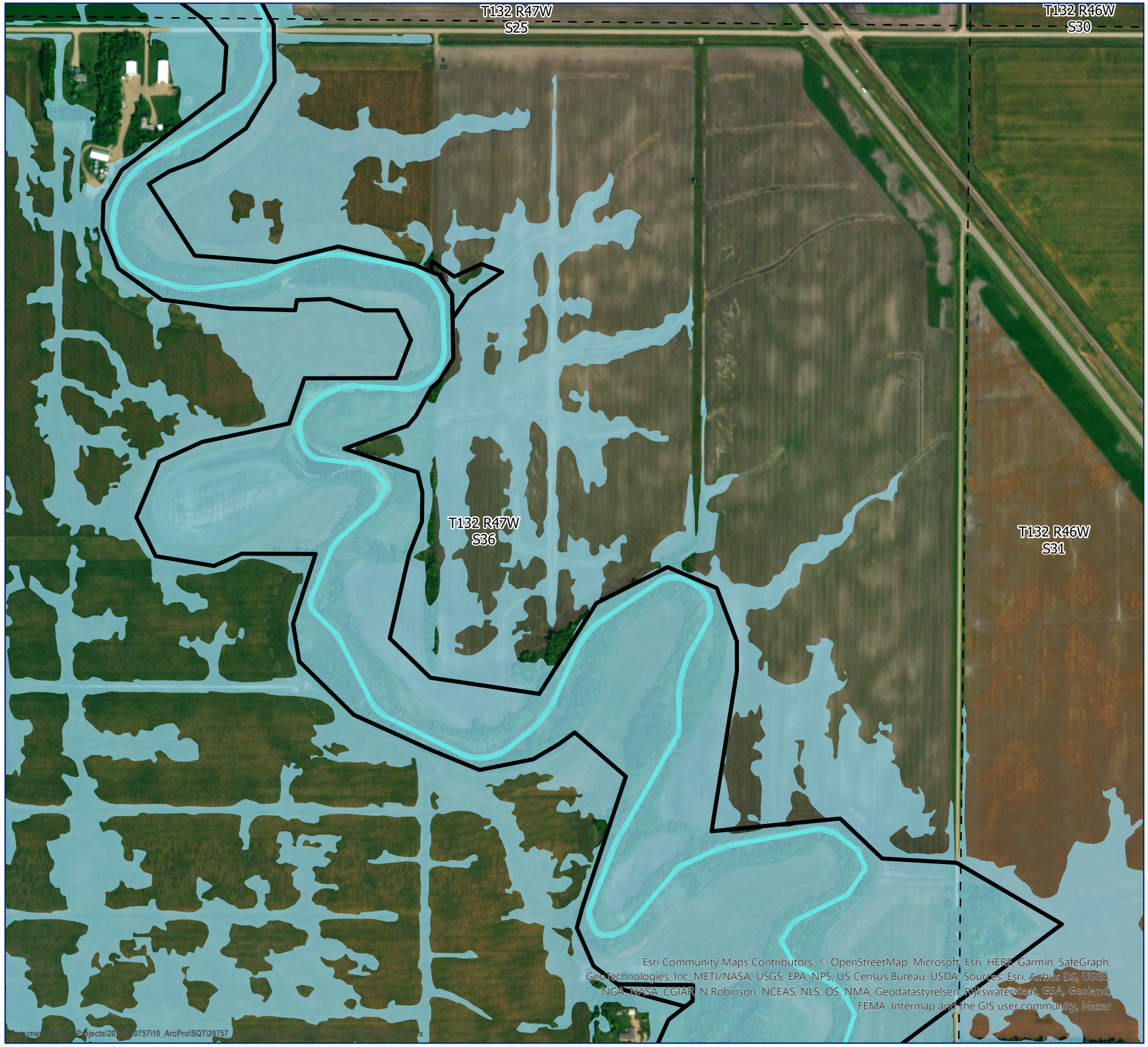
Doran Creek Stream Rehabilitation

Figure 8: Wilkin County Zoning



Legend

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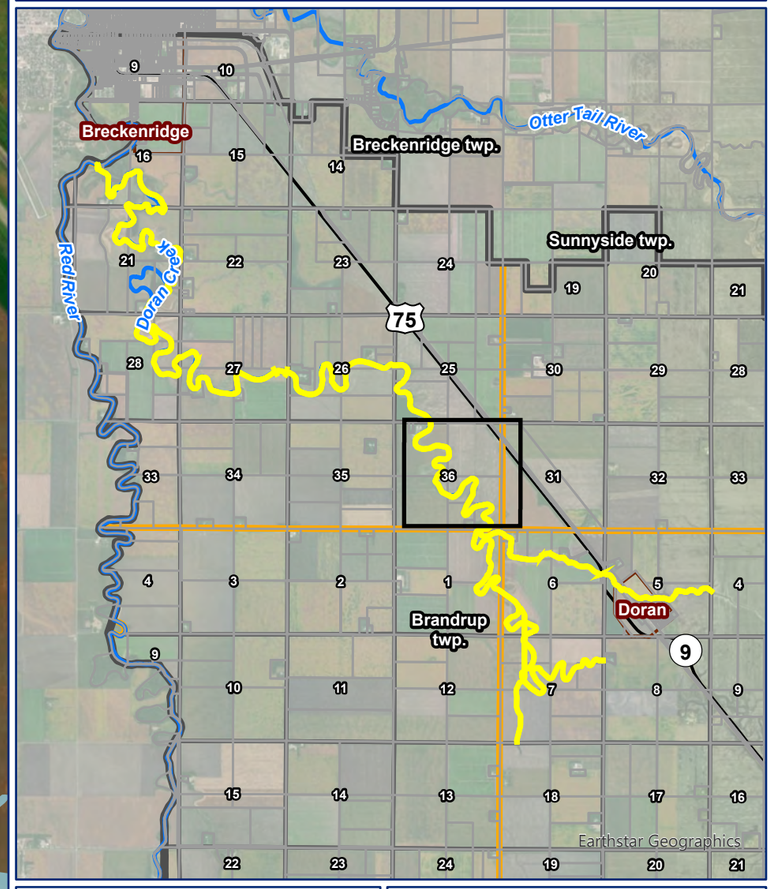
- <all other values>

Zoning Districts - Wilkin County

- Commercial - Industrial



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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

Figure 8: Wilkin County Zoning

Legend

- Doran Creek Project Area
- Project Extent
- 100-Year Floodplain
- Residential
- <all other values>

Zoning Districts - Wilkin County

- Commercial - Industrial

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T131 R47W
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T131 R46W
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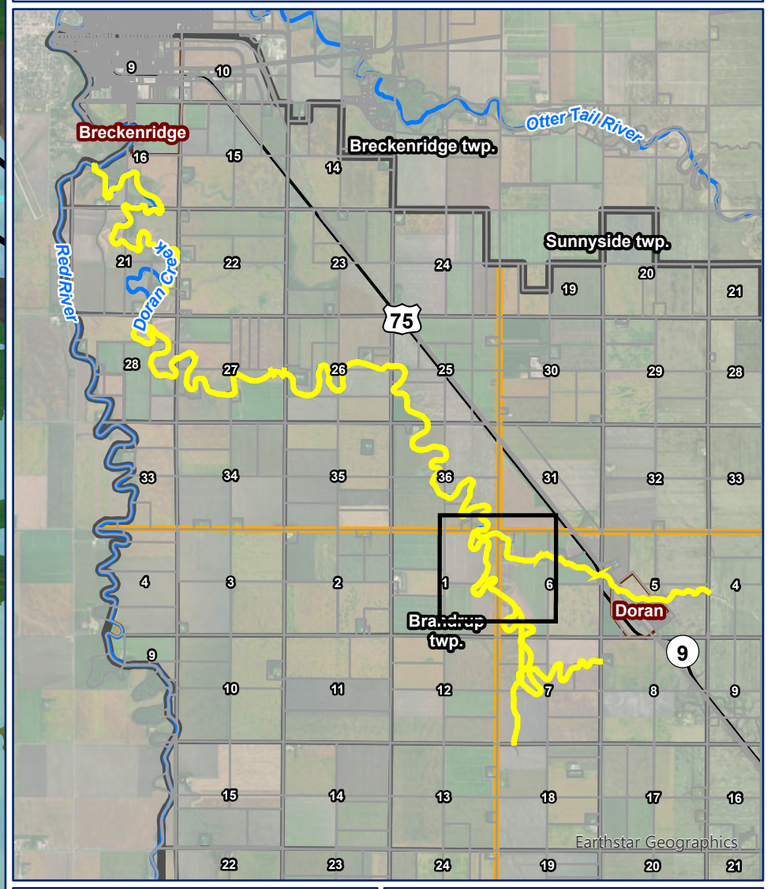

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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

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- Project Extent
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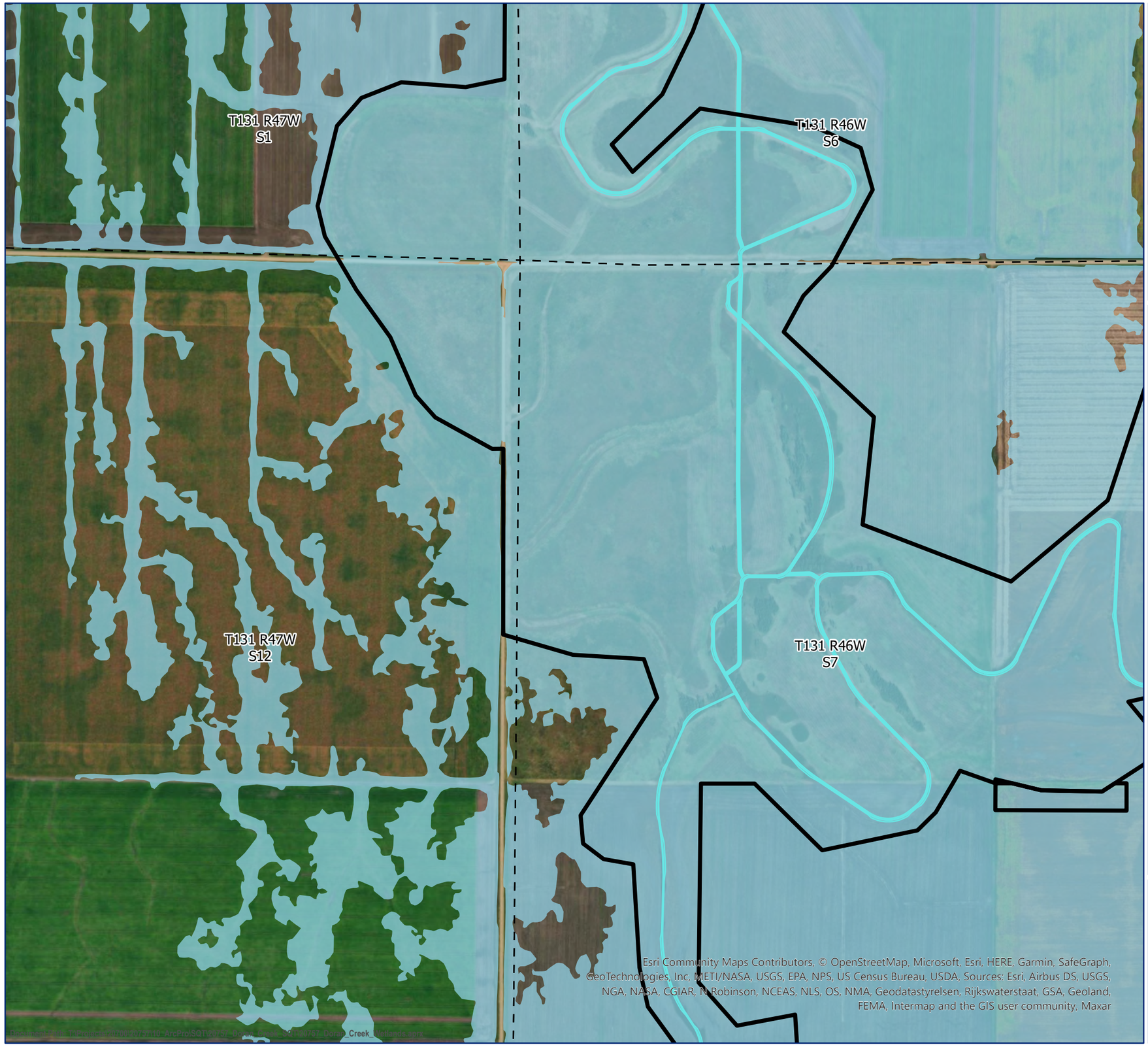
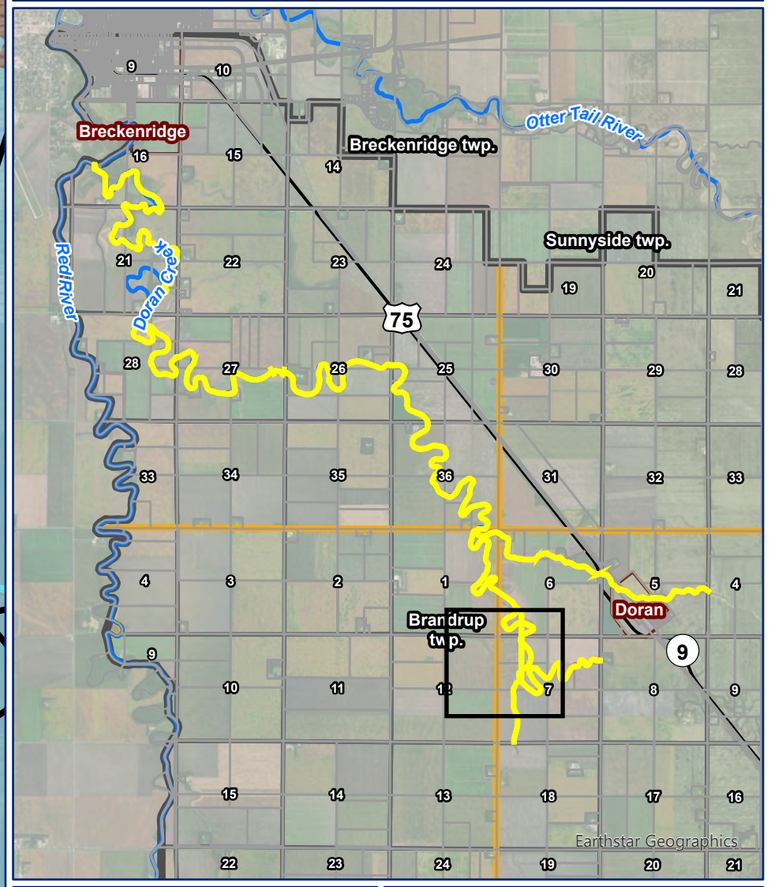
Zoning Districts - Wilkin County

- Commercial - Industrial





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Doran Creek Stream Rehabilitation

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Zoning Districts - Wilkin County

- Commercial - Industrial

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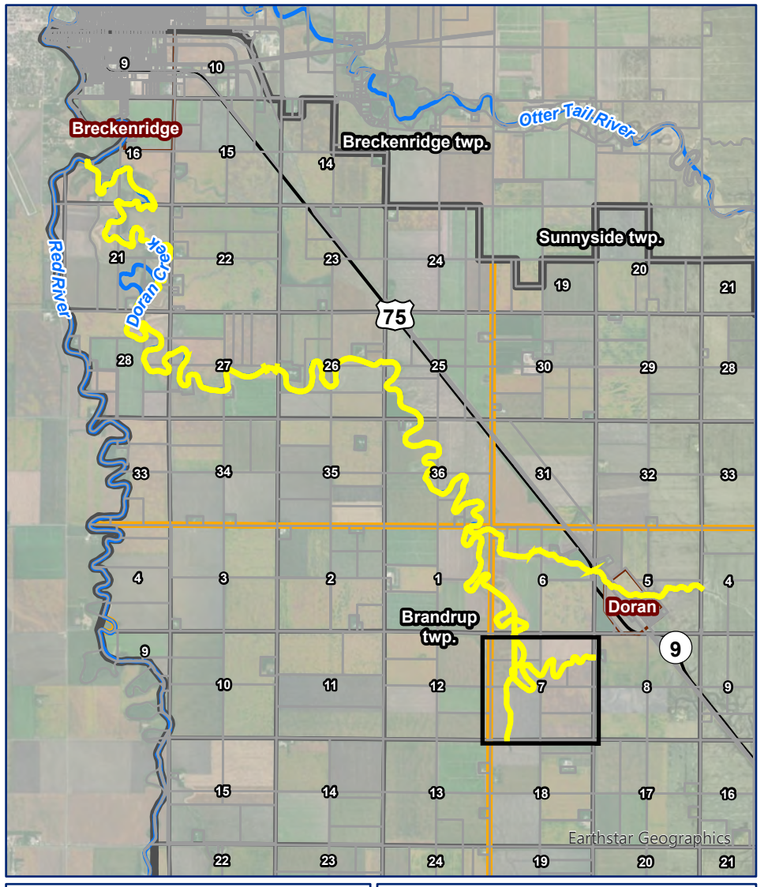
T131 R47W S13

T131 R46W S18

T131 R46W S17



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Bois de Sioux Watershed District

moore engineering, inc.

Doran Creek Stream Rehabilitation

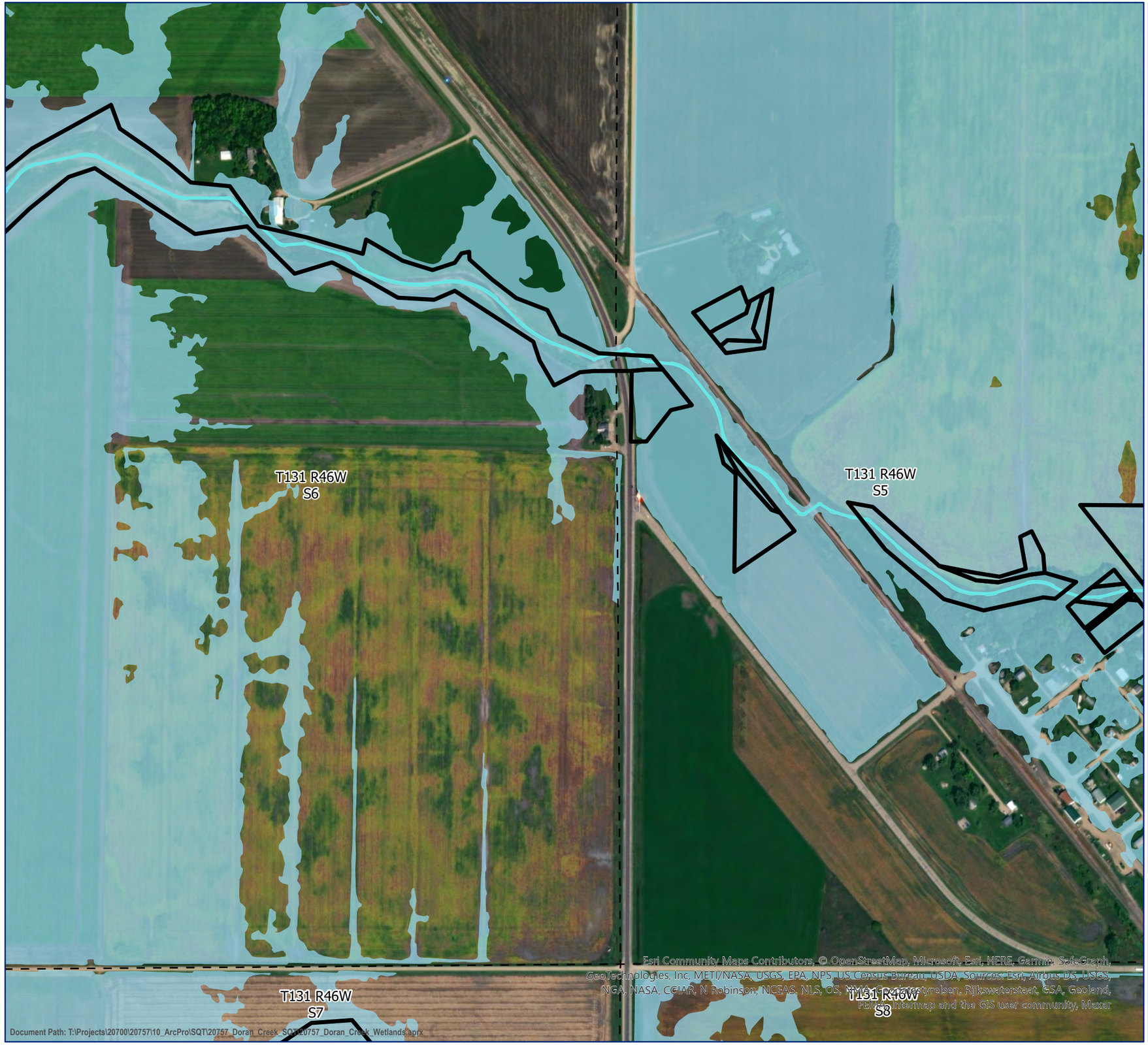
Figure 8: Wilkin County Zoning

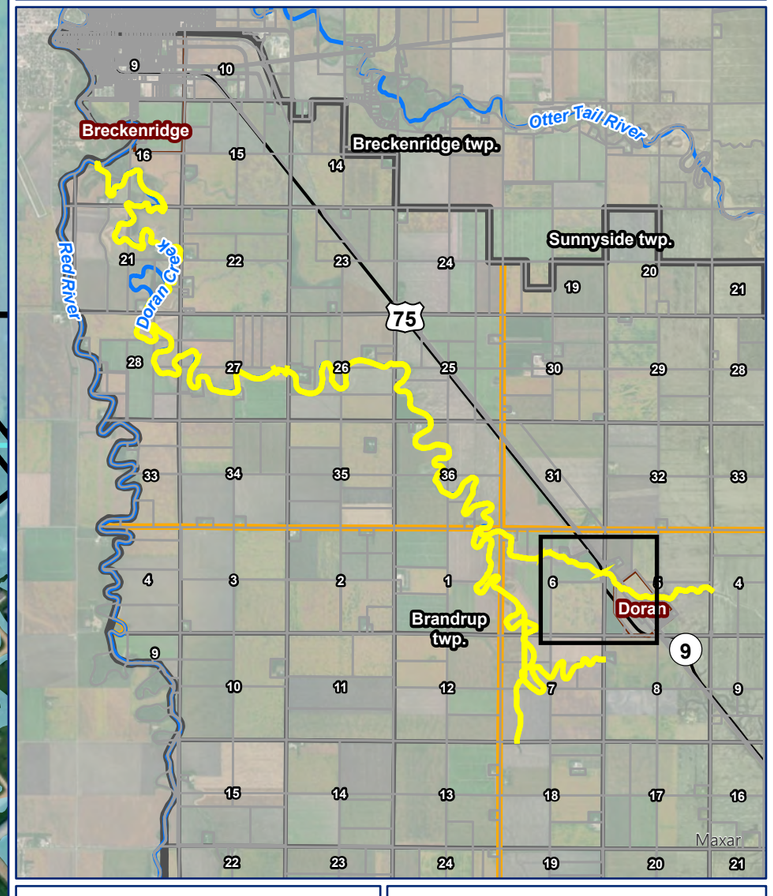
Legend

- Doran Creek Project Area
- Project Extent
- 100-Year Floodplain
- Residential
- <all other values>

Zoning Districts - Wilkin County

- Commercial - Industrial





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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

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Legend

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Zoning Districts - Wilkin County

- Commercial - Industrial

T131 R46W S5

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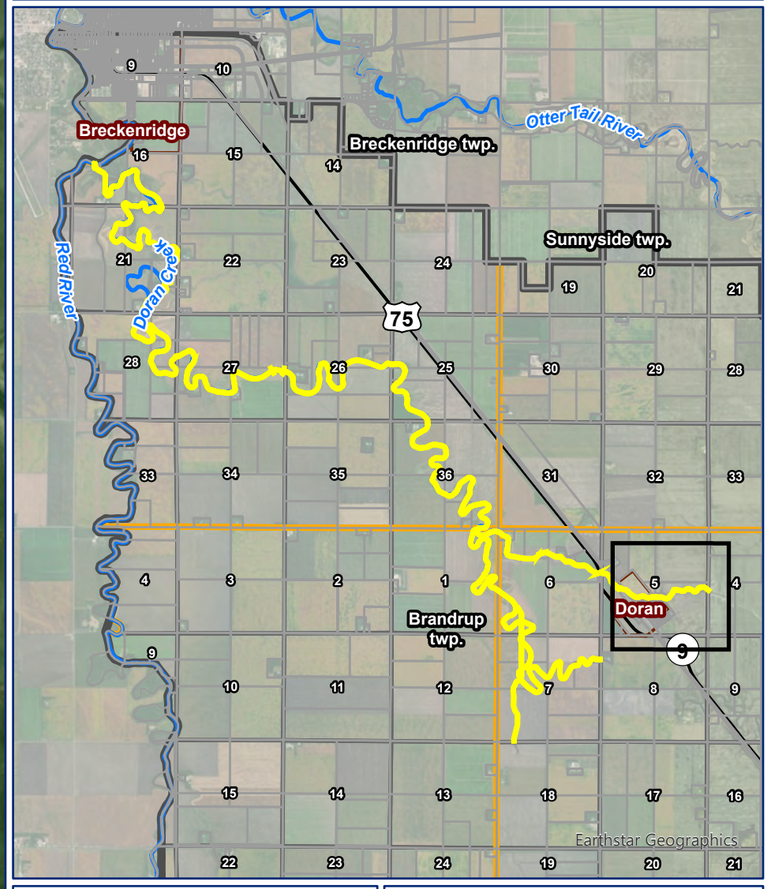

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Bois de Sioux Watershed District

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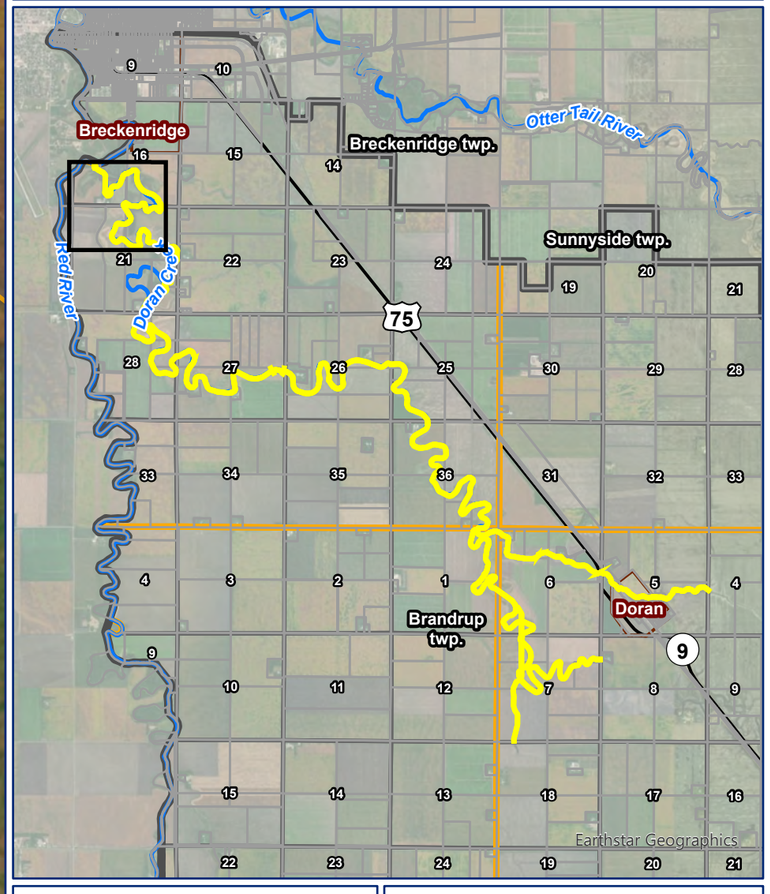
Doran Creek Stream Rehabilitation

Figure 9: SSURGO Data

Legend

- Doran Creek Project Area
- Soil Map Units



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moore engineering, inc.

Doran Creek Stream Rehabilitation

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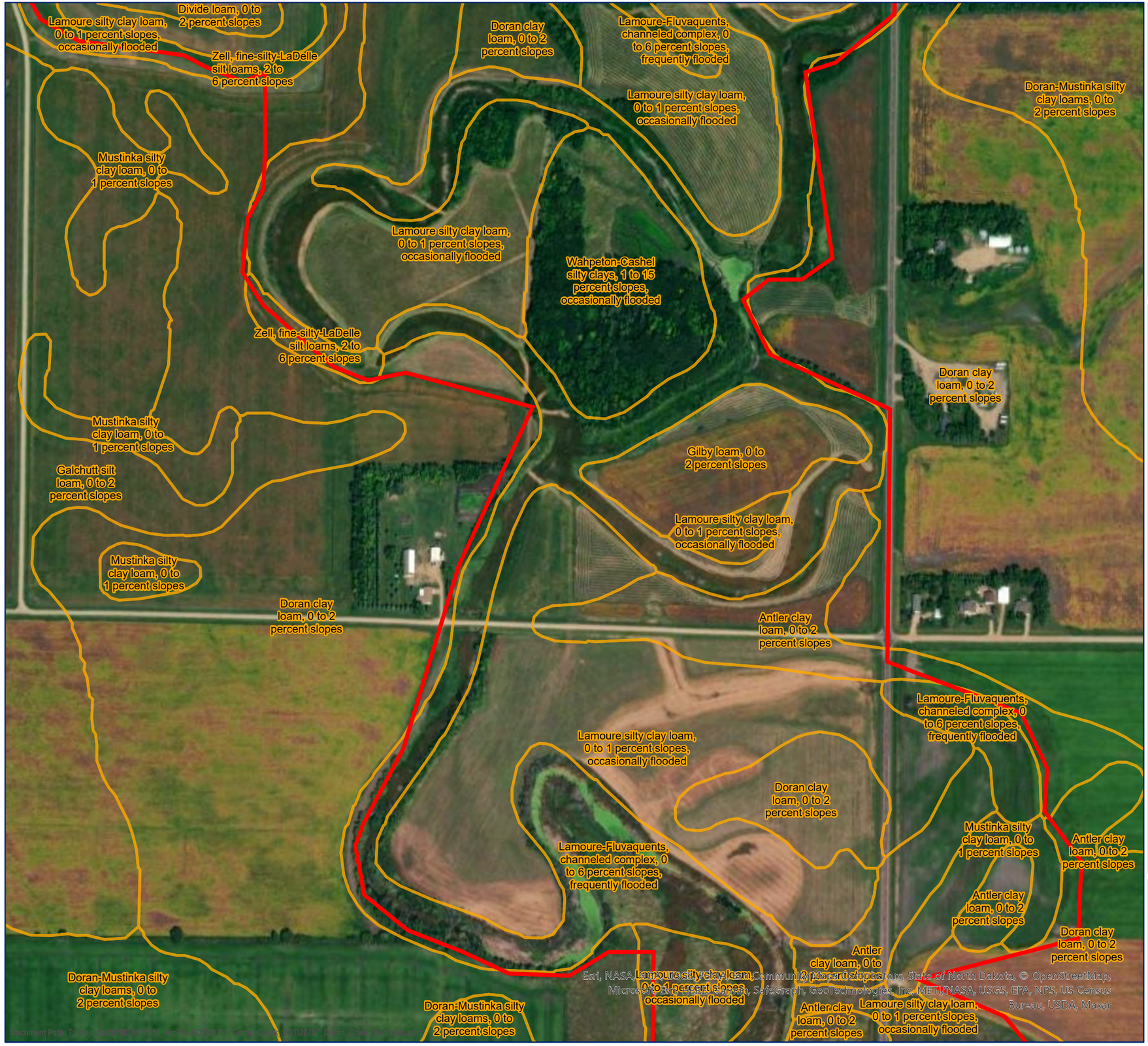

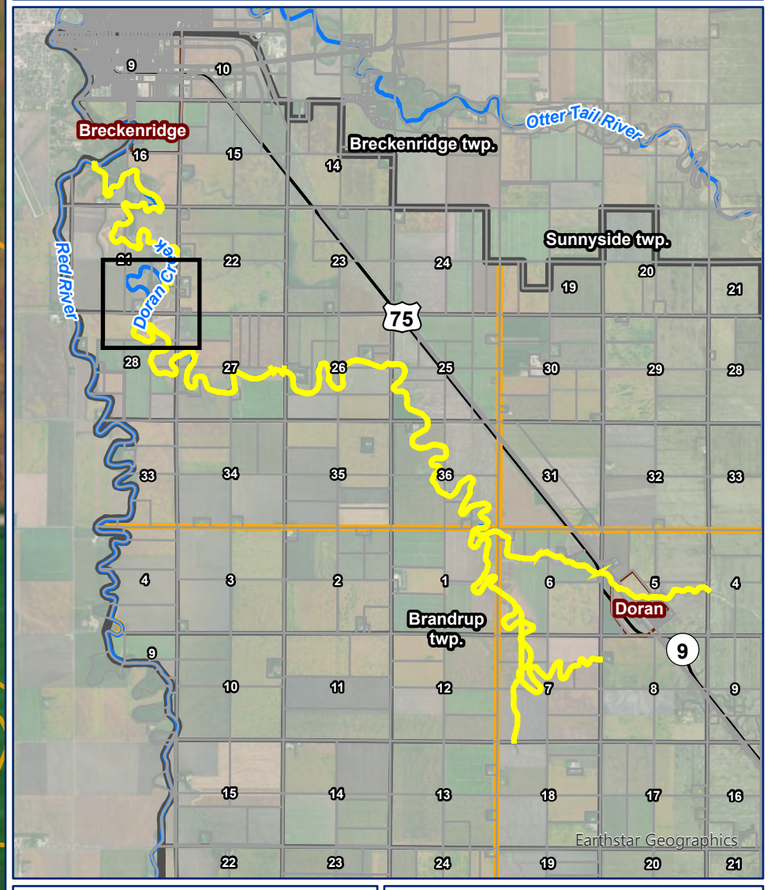

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Doran Creek Stream Rehabilitation

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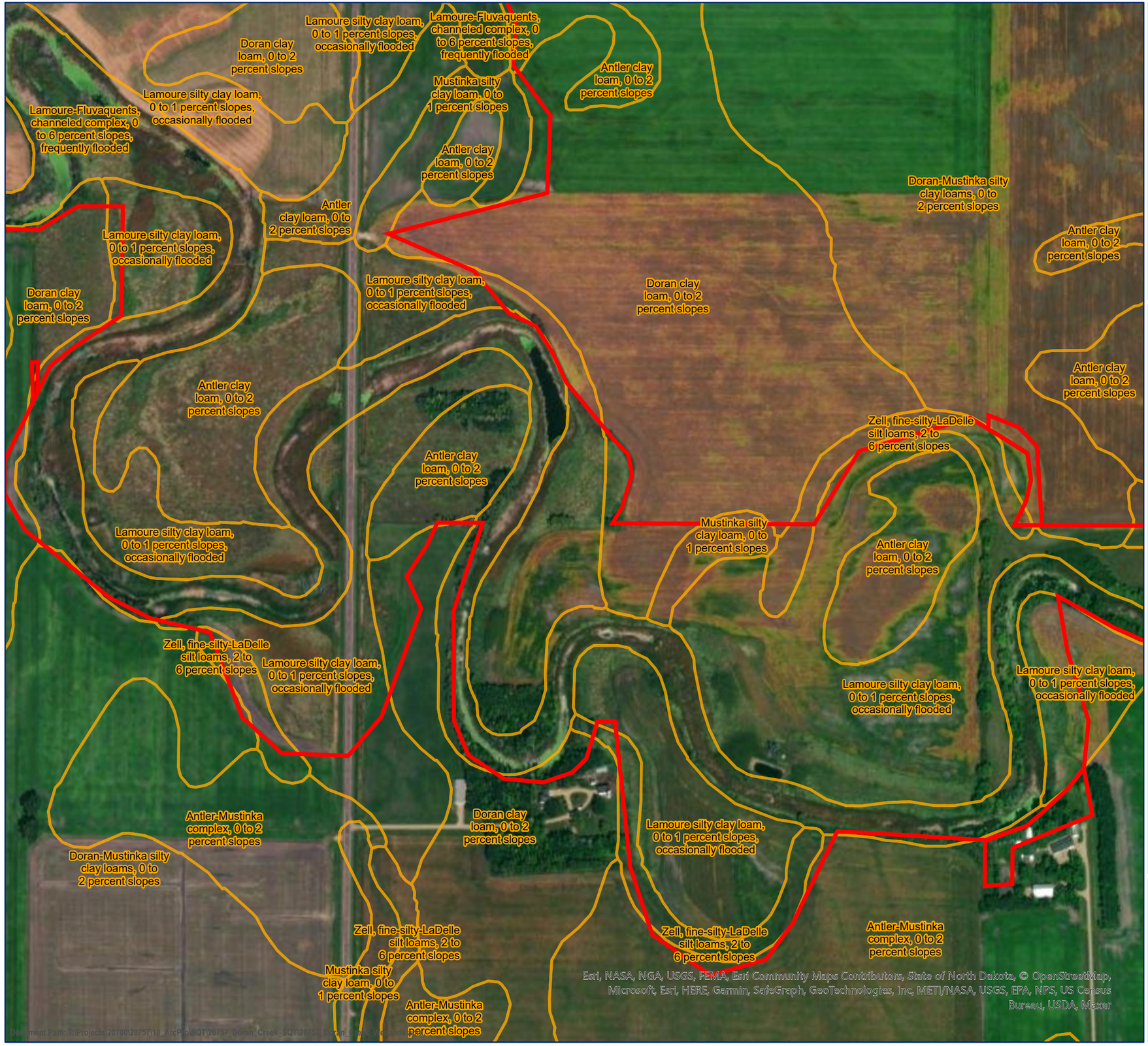

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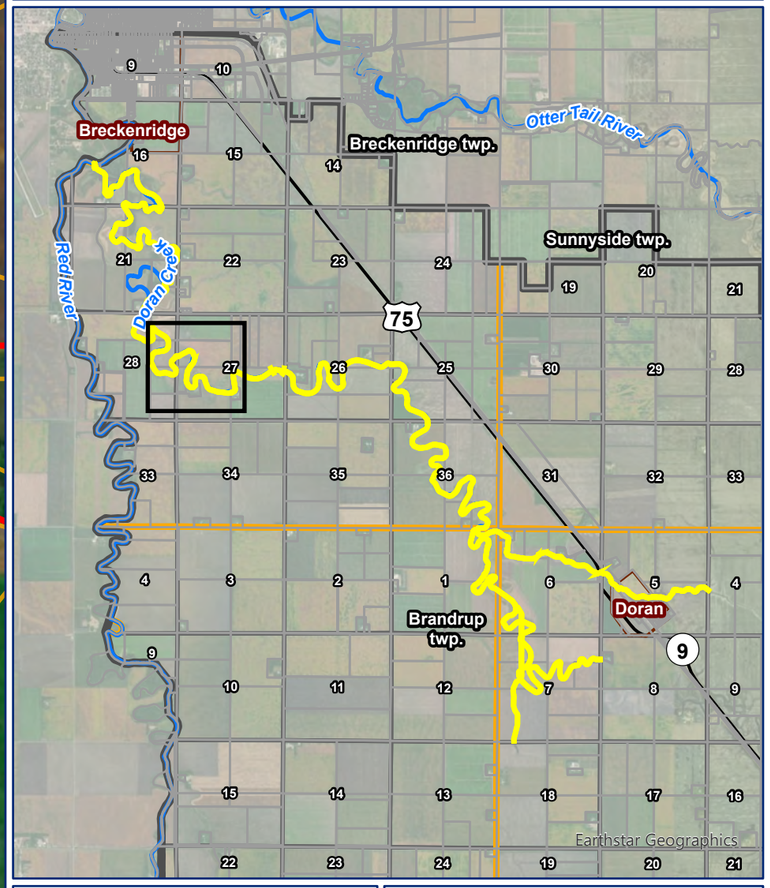

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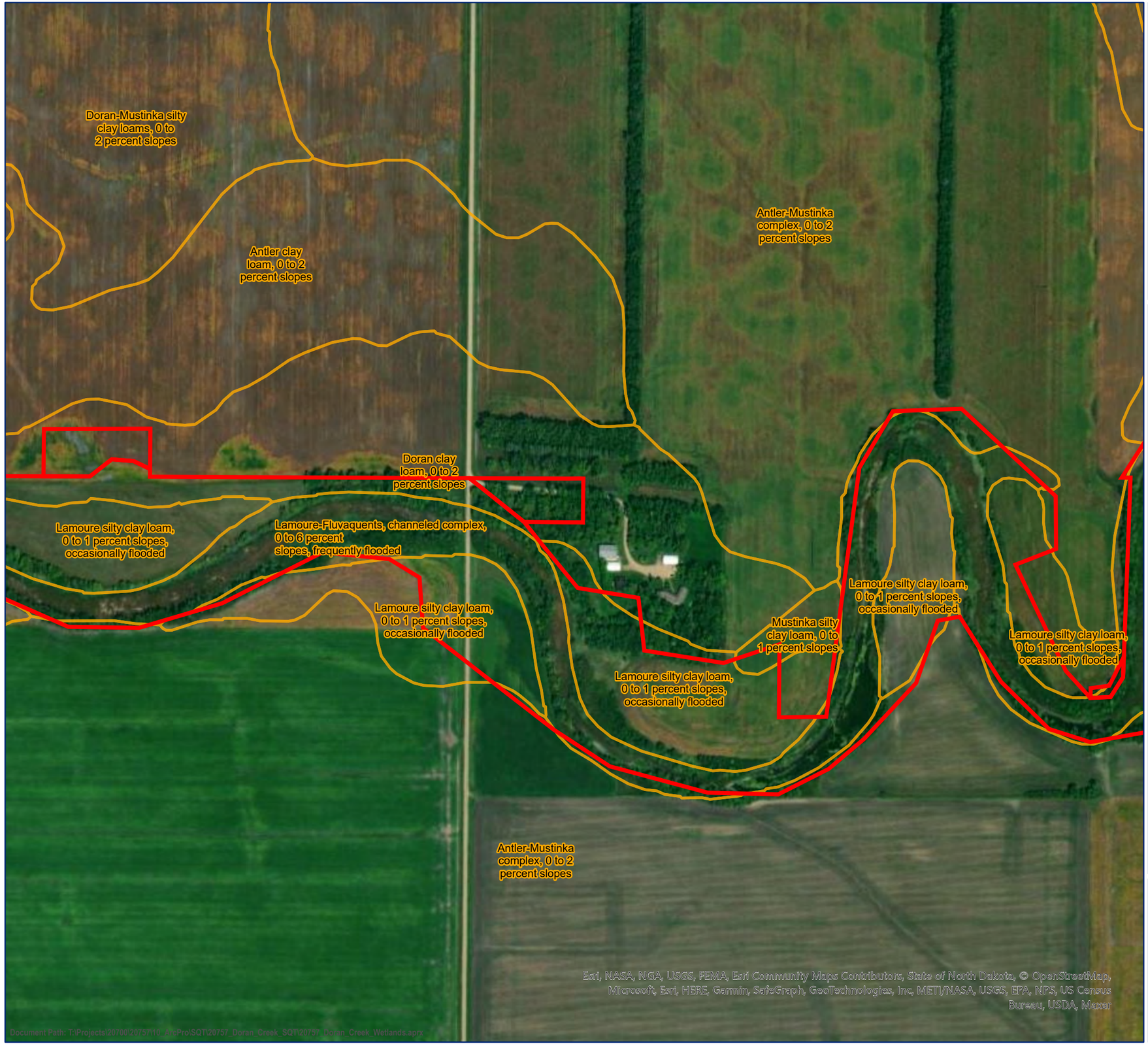

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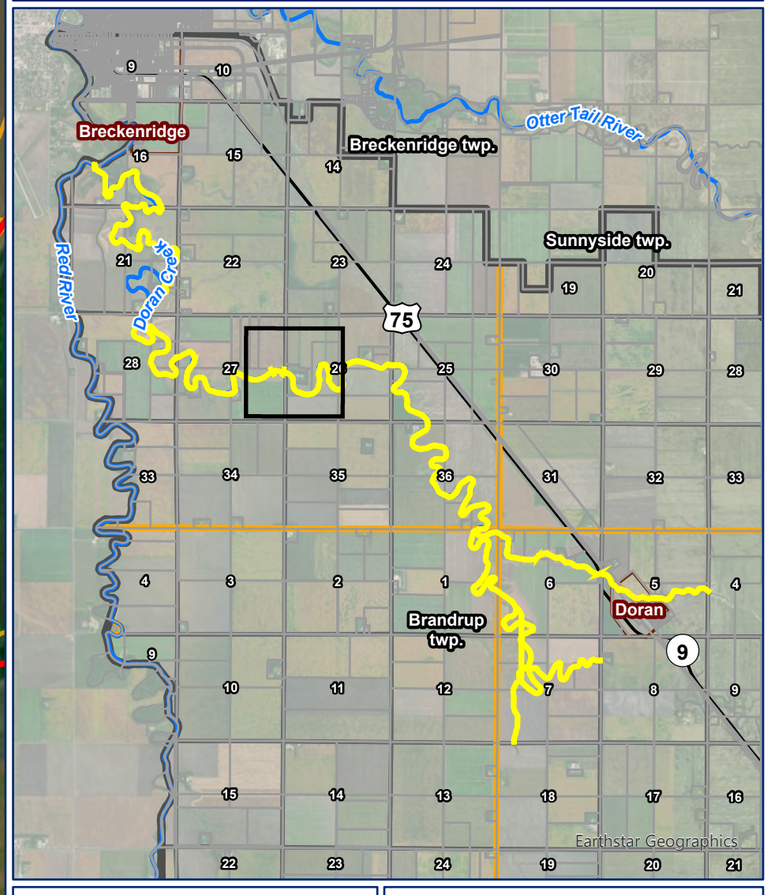

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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

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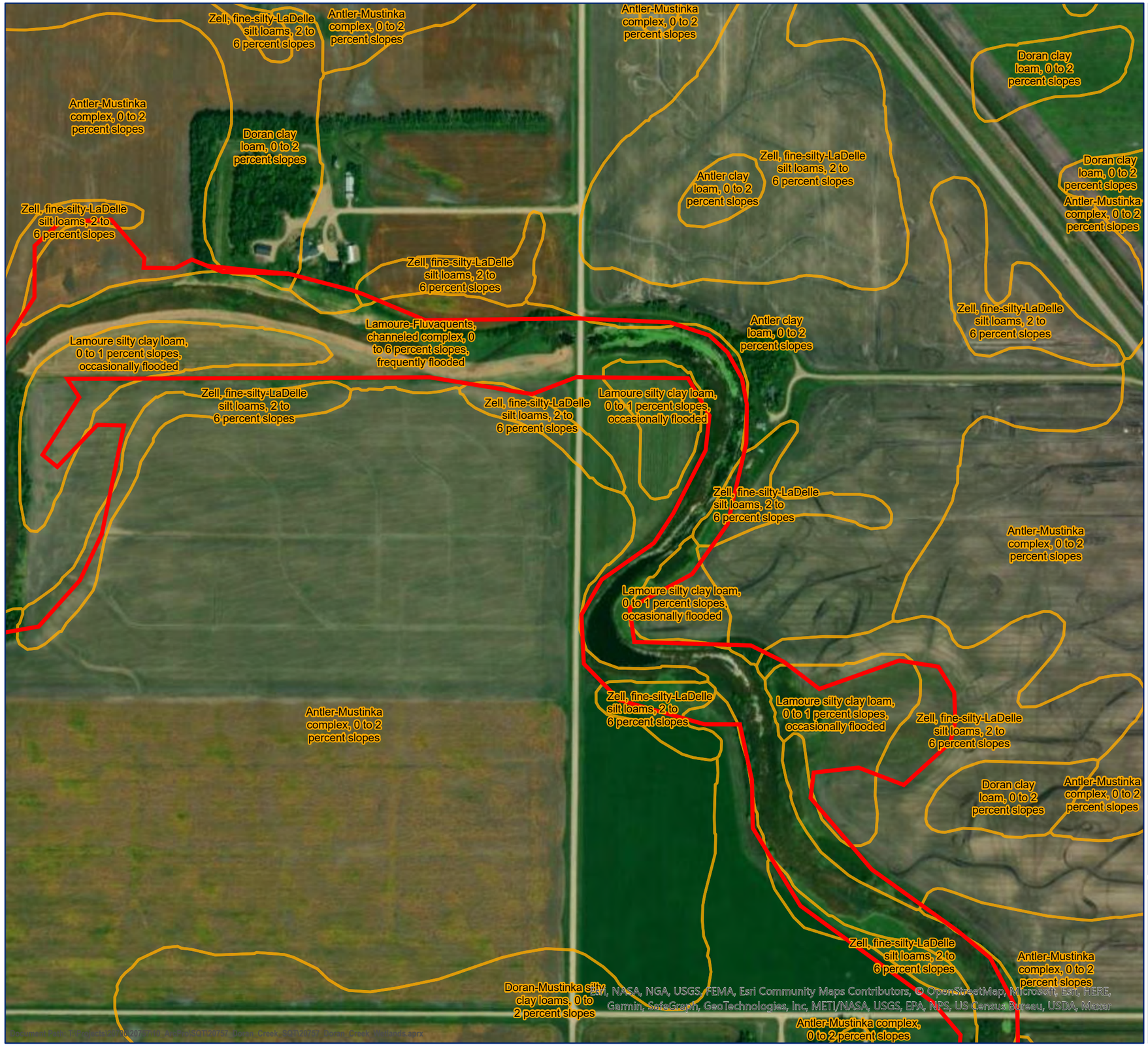

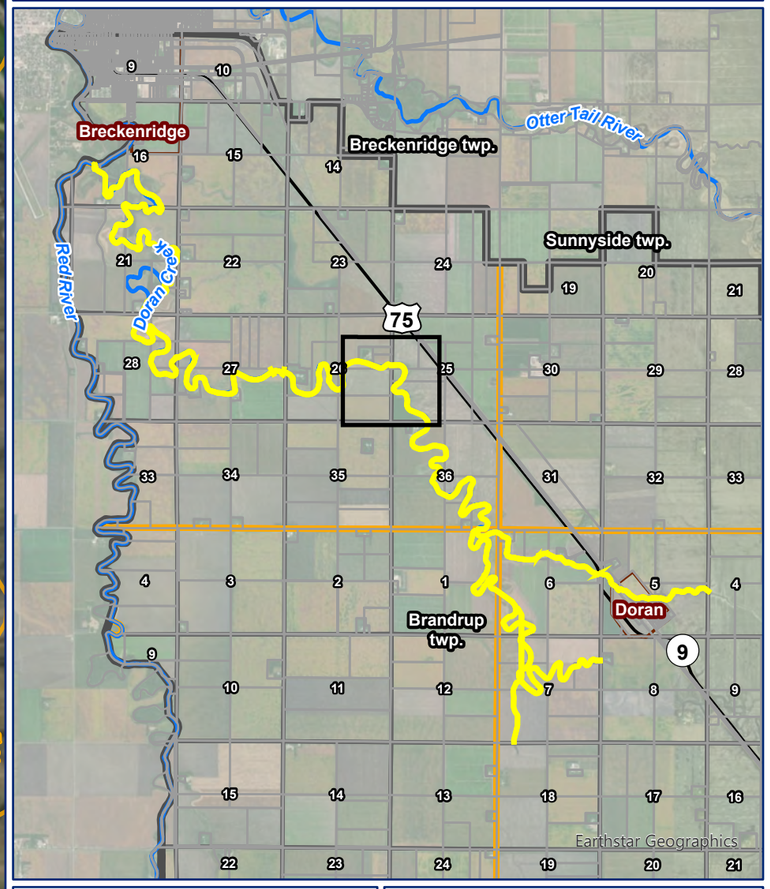

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Doran Creek Stream Rehabilitation

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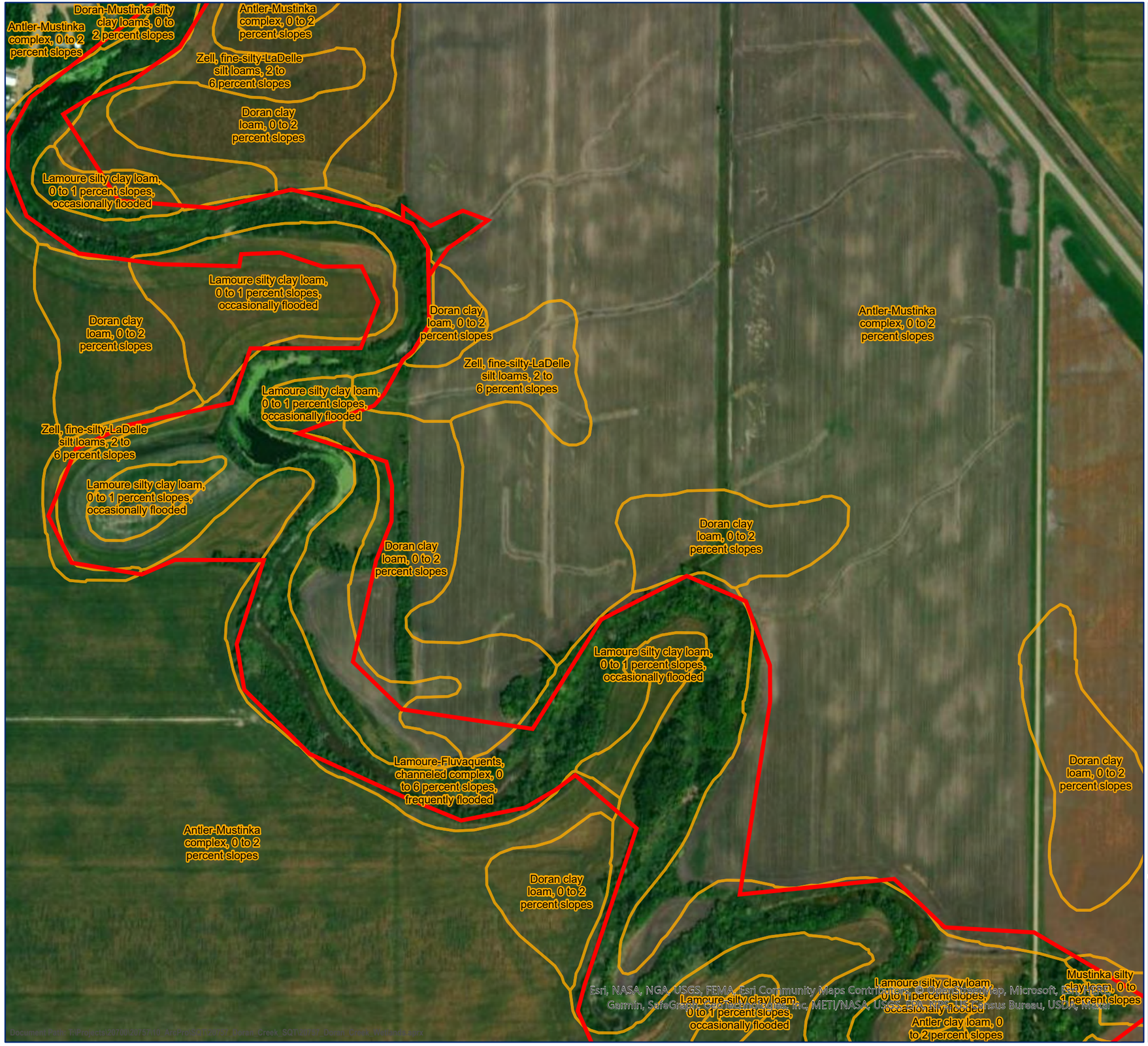

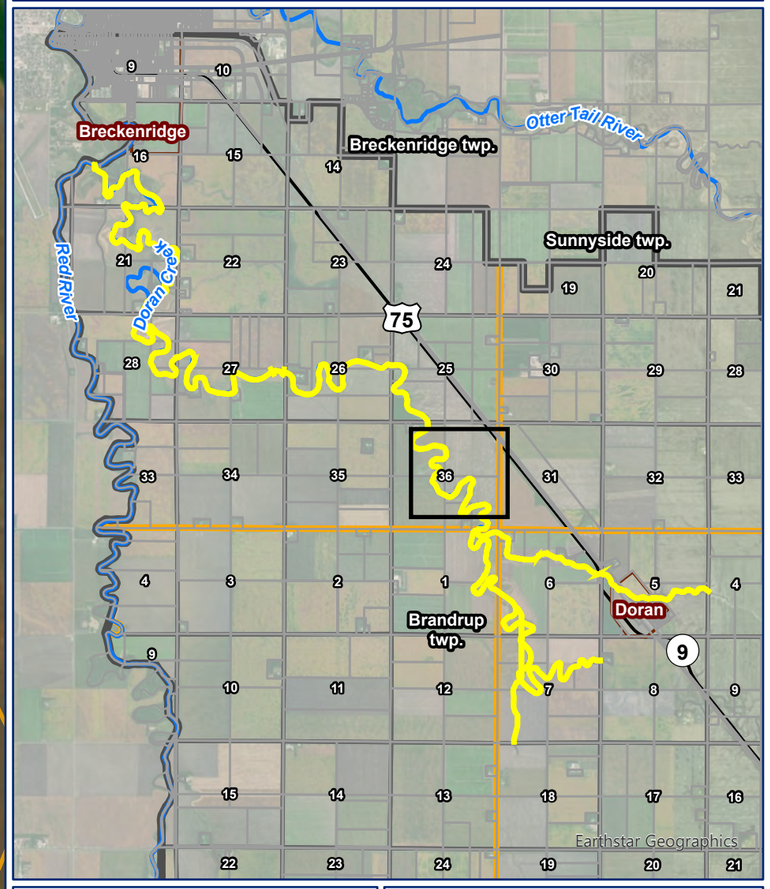

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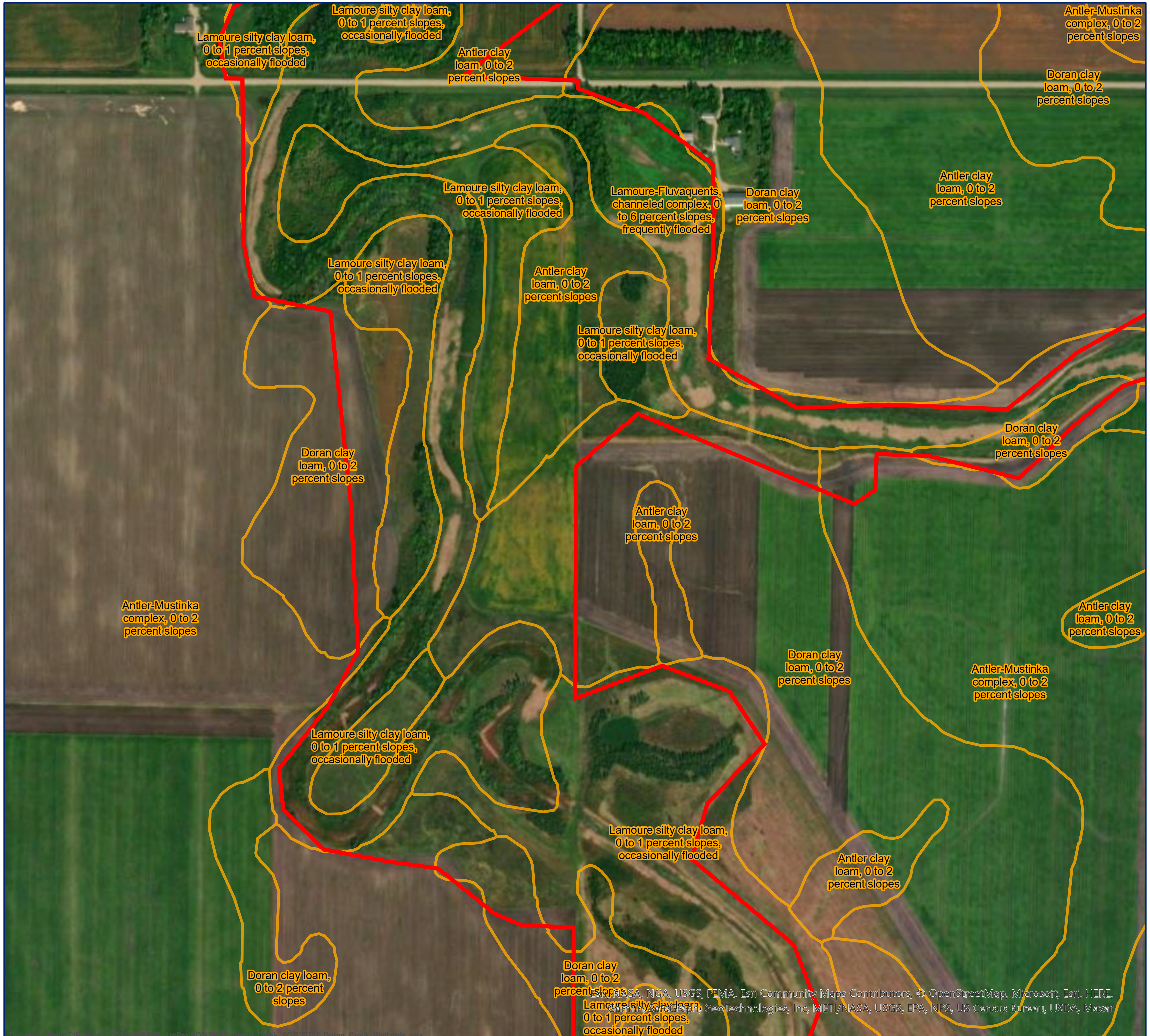

Doran Creek Stream Rehabilitation

Figure 9: SSURGO Data

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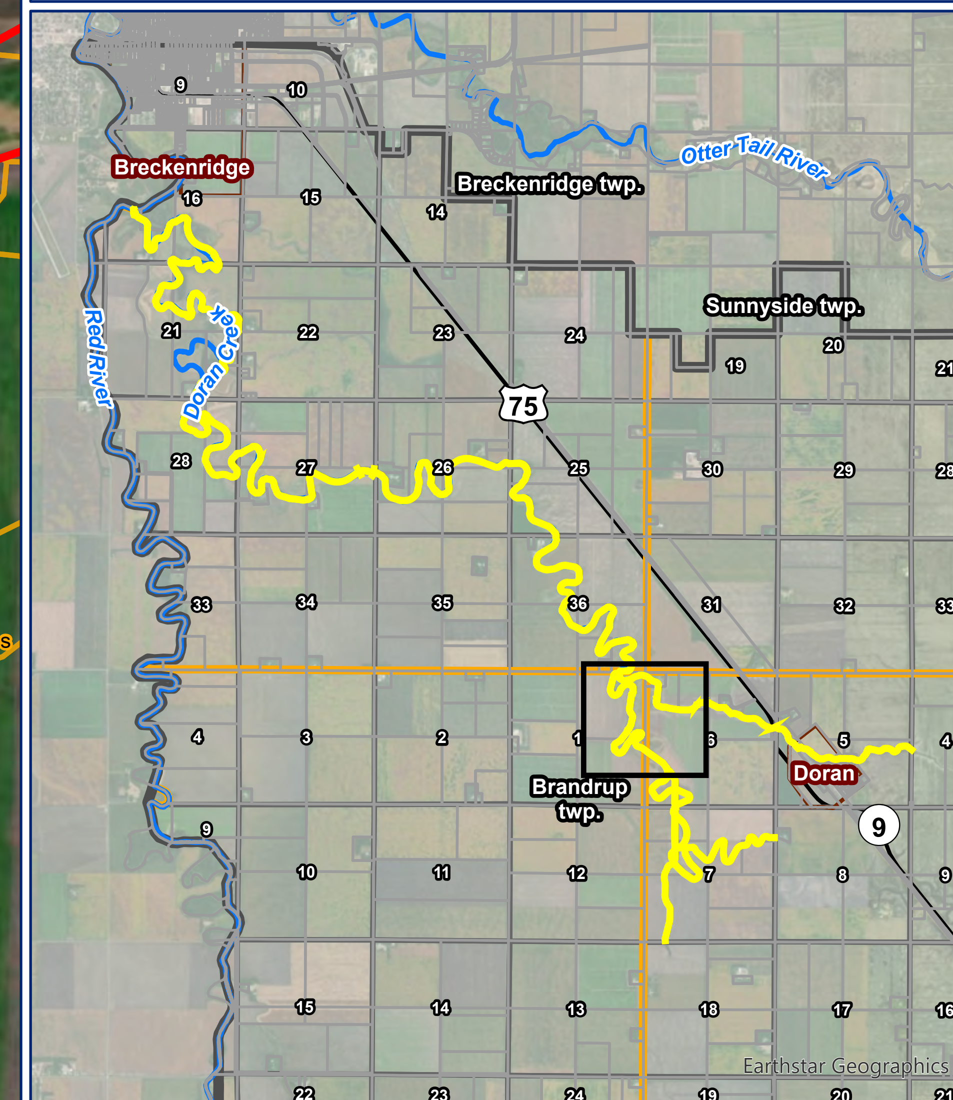

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Bois de Sioux Watershed District

moore engineering, inc.

Doran Creek Stream Rehabilitation

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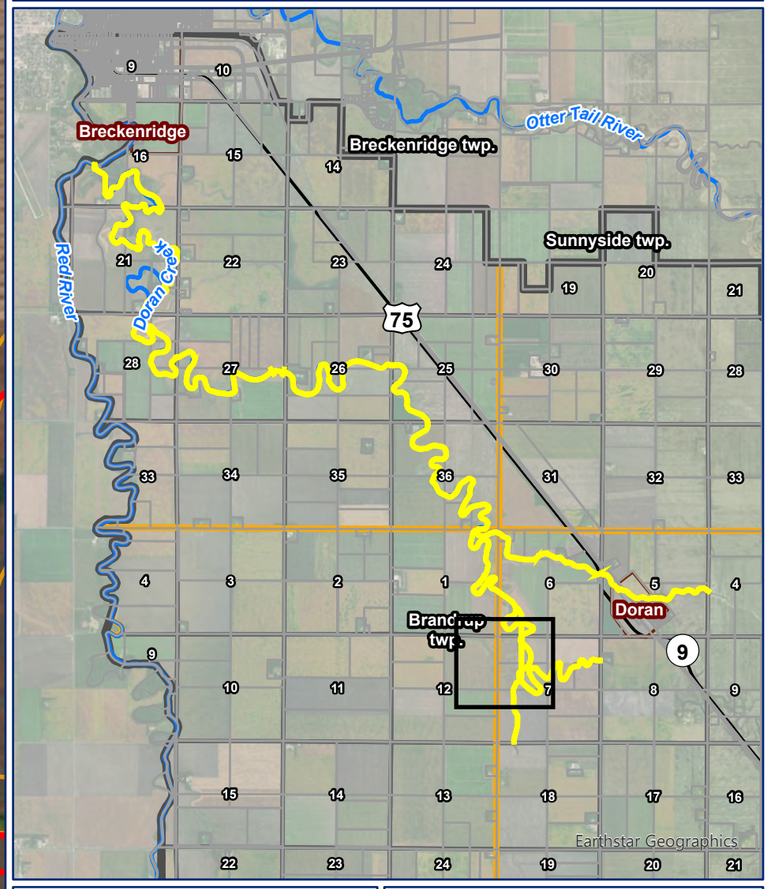

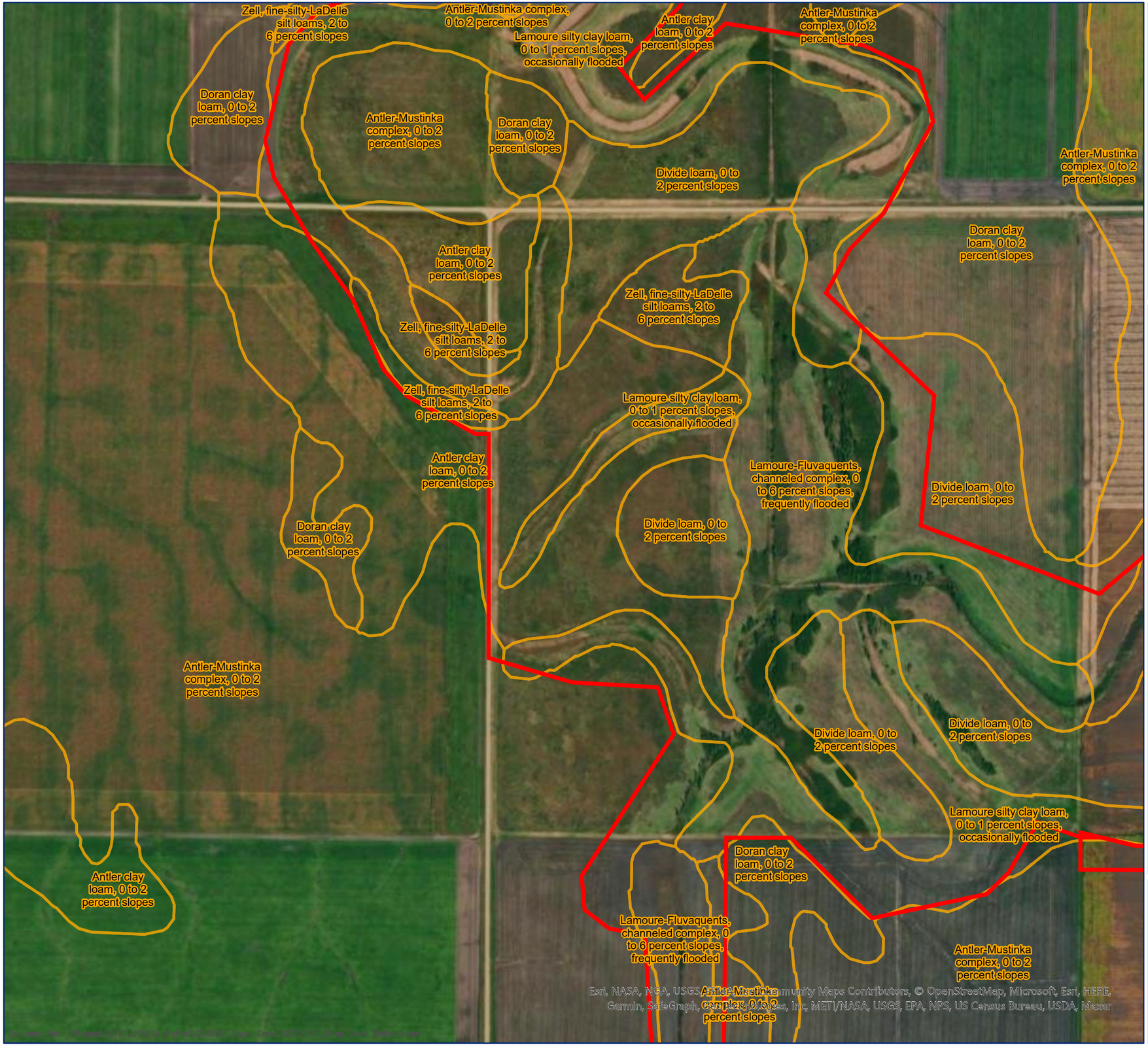

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Doran Creek Stream Rehabilitation

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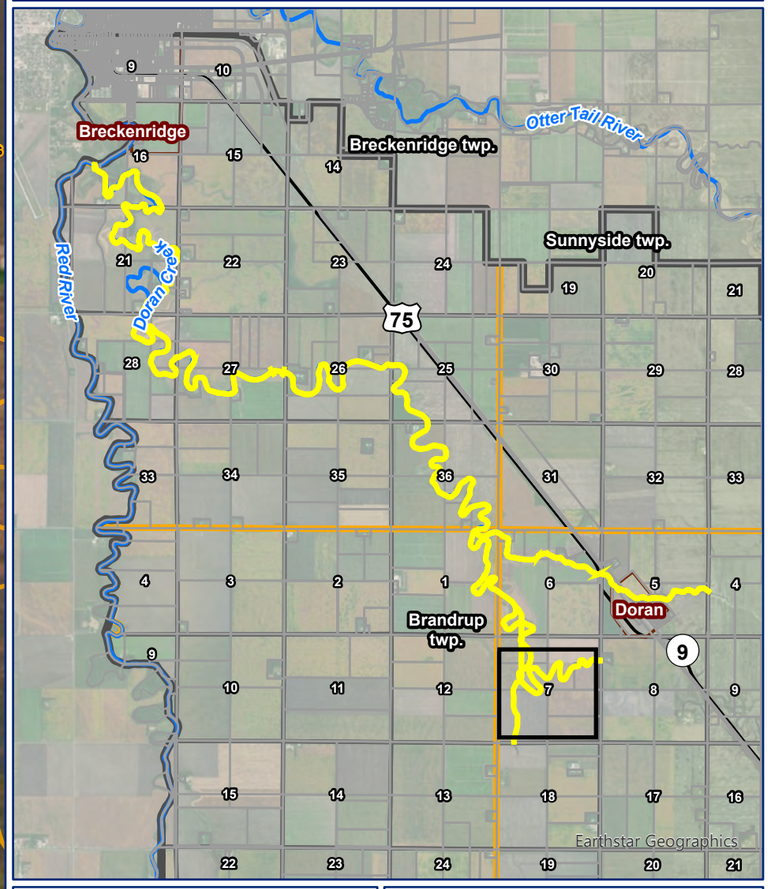

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Doran Creek Stream Rehabilitation

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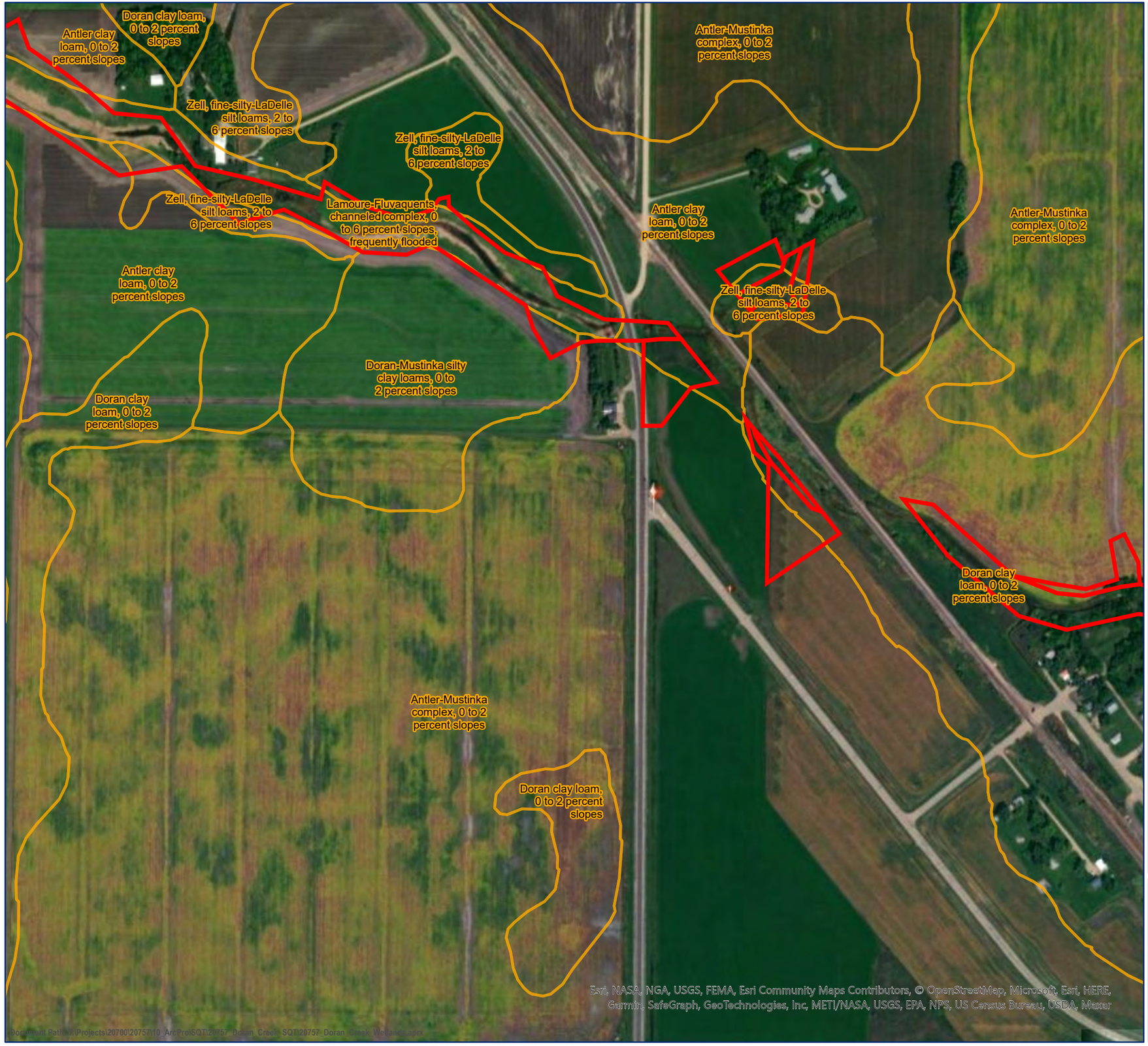

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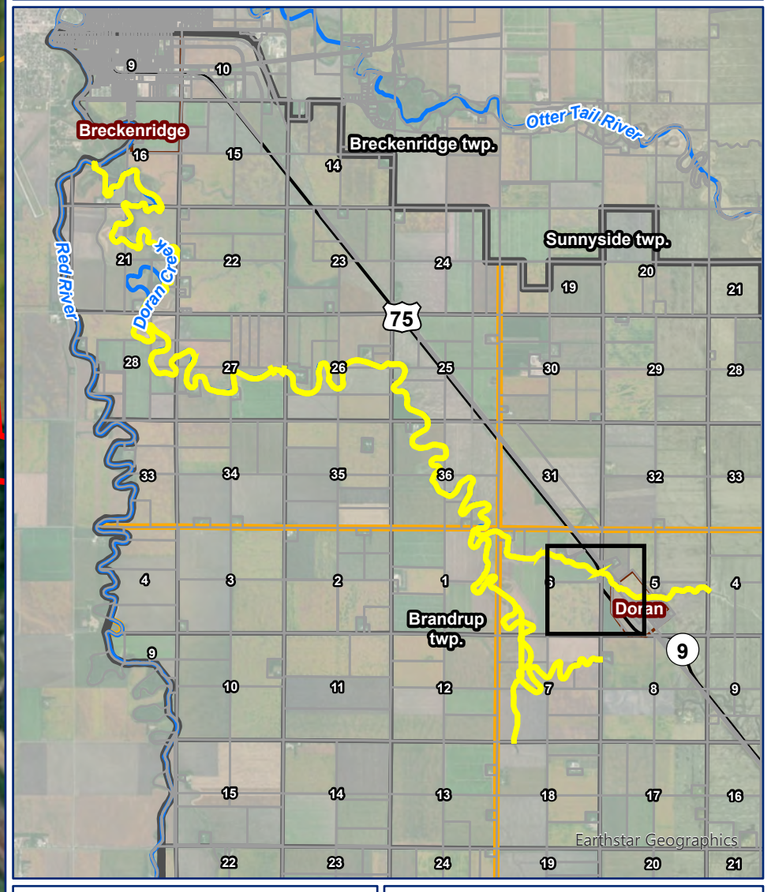

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Doran Creek Stream Rehabilitation

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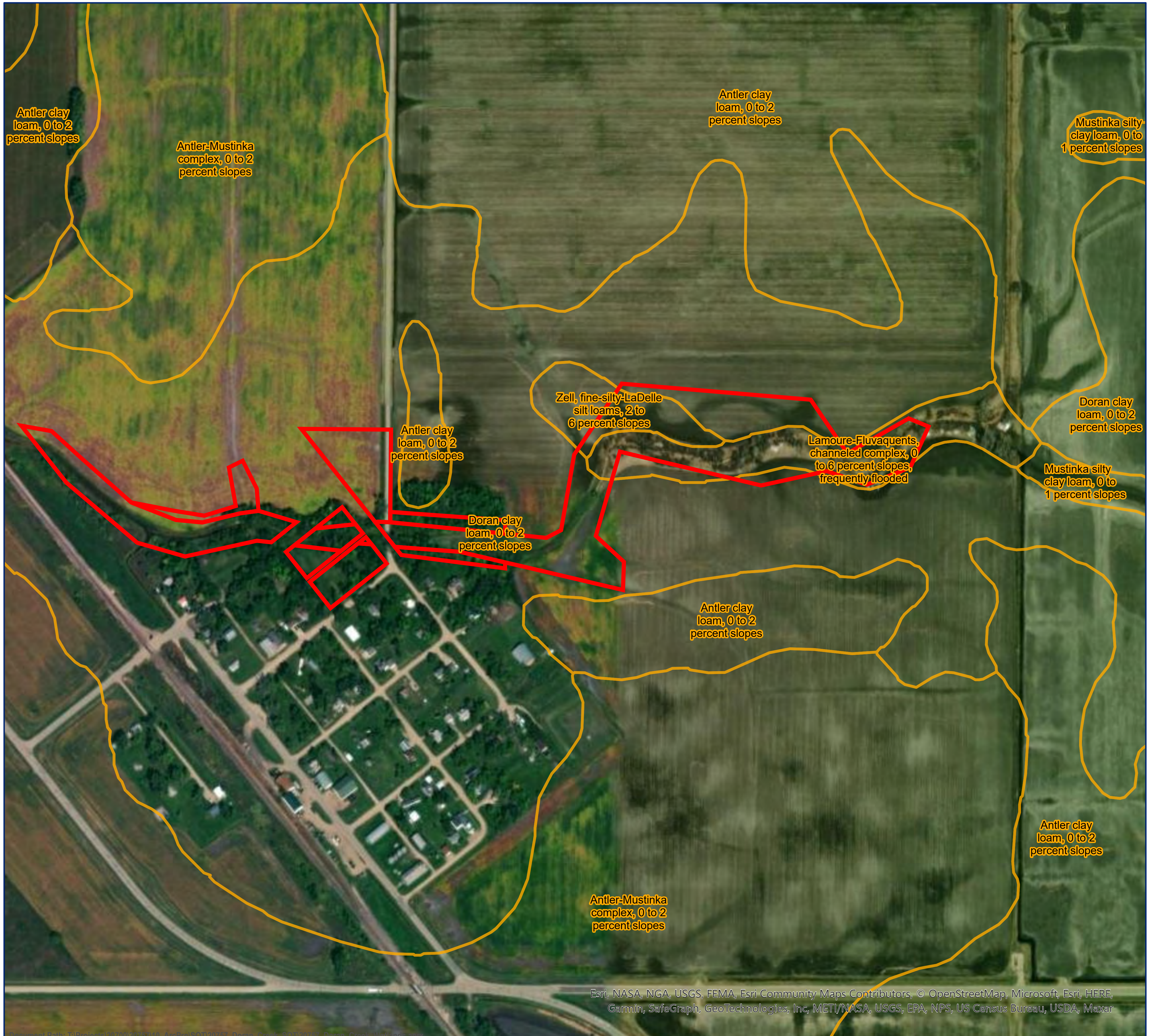

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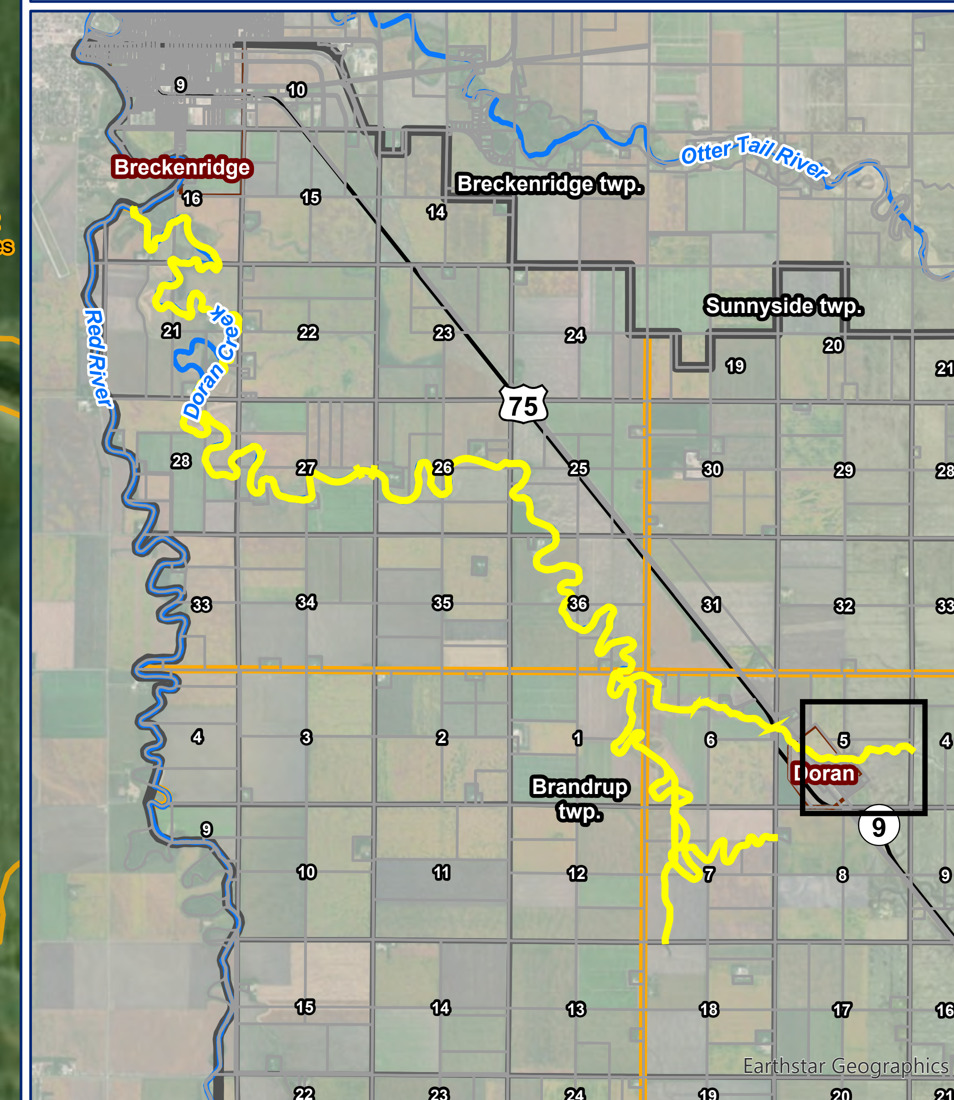

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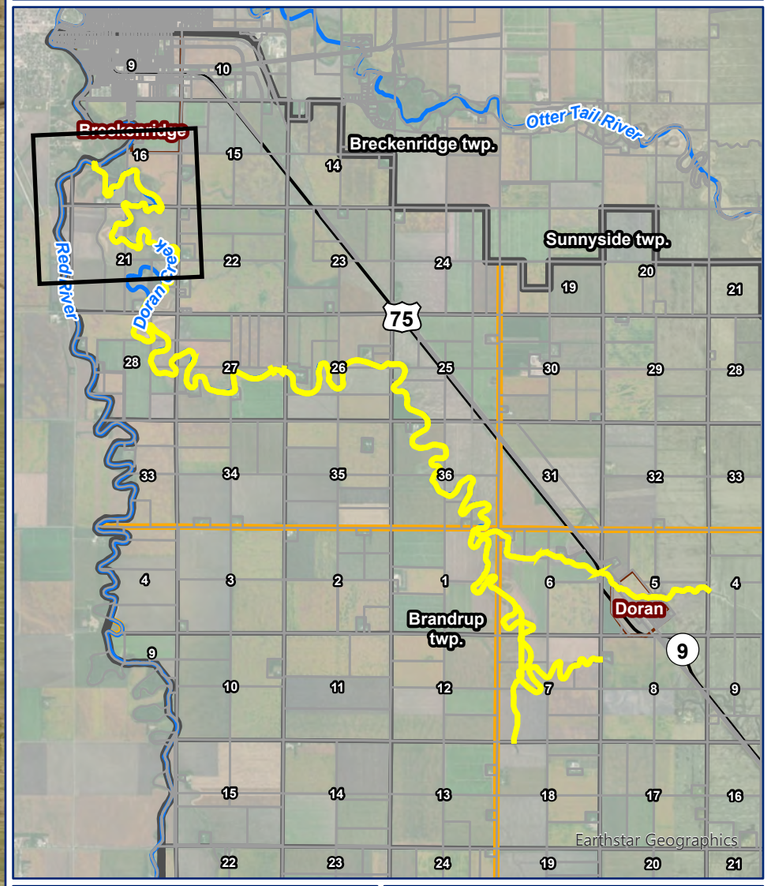
Doran Creek Stream Rehabilitation

Figure 10: Surface Waters

Legend

- MapbookBounds
- Doran Creek Project Area
- PWI Watercourses
- Calcareous Fens
- Trout Streams
- 2018 303(d) Streams
- 2018 303(d) Lakes
- 2018 303(d) Wetlands
- PWI Basins
- Migratory Waterfowl Feeding & Resting Areas
- Designated Wildlife Lakes



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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

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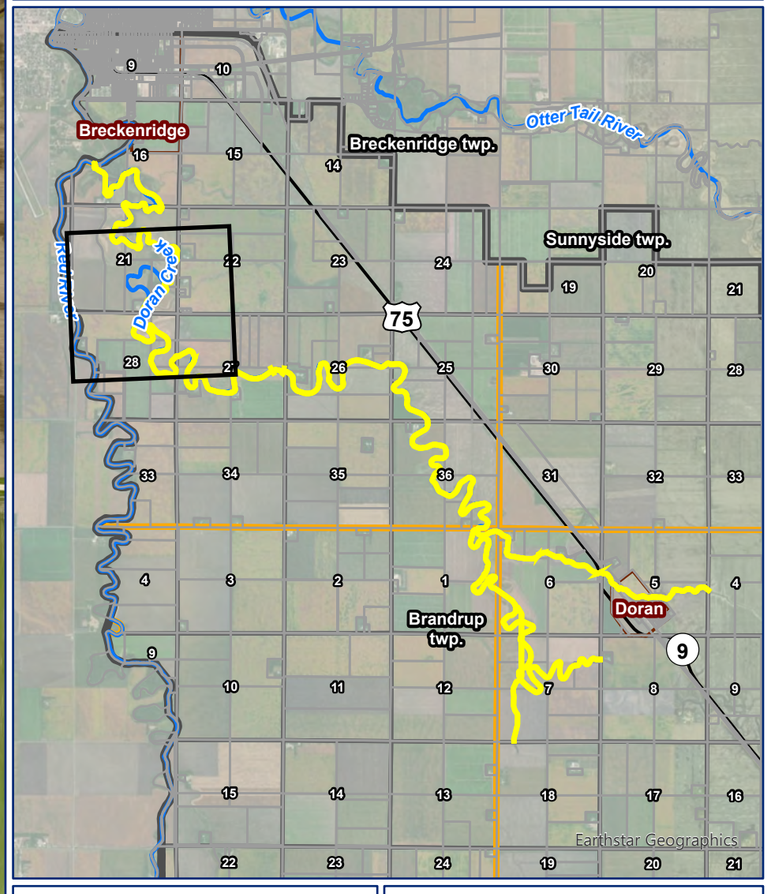

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Doran Creek Stream Rehabilitation

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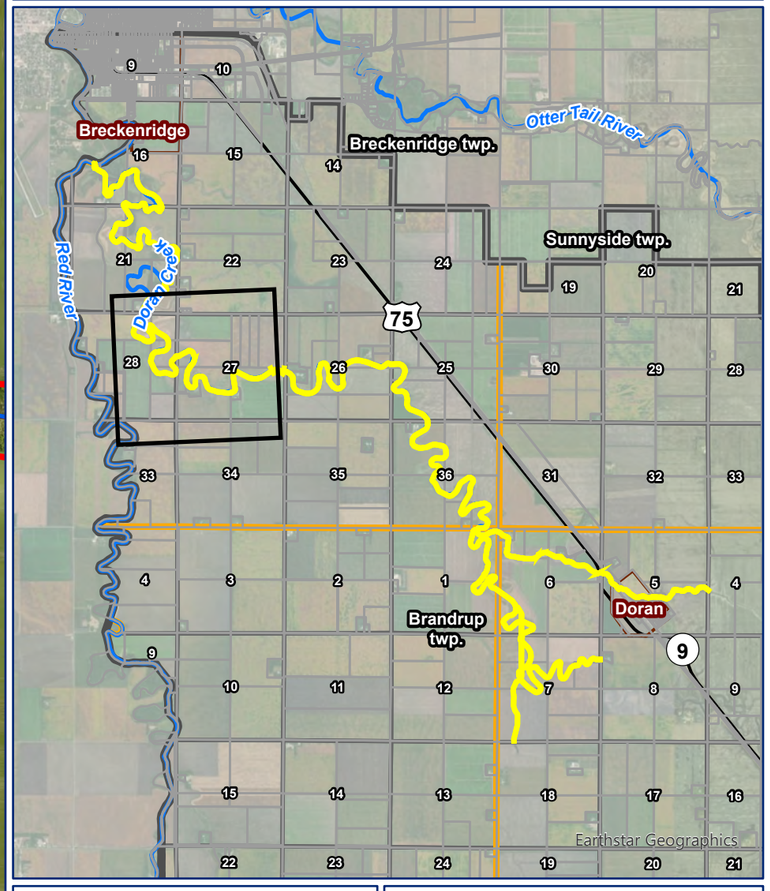

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Doran Creek Stream Rehabilitation

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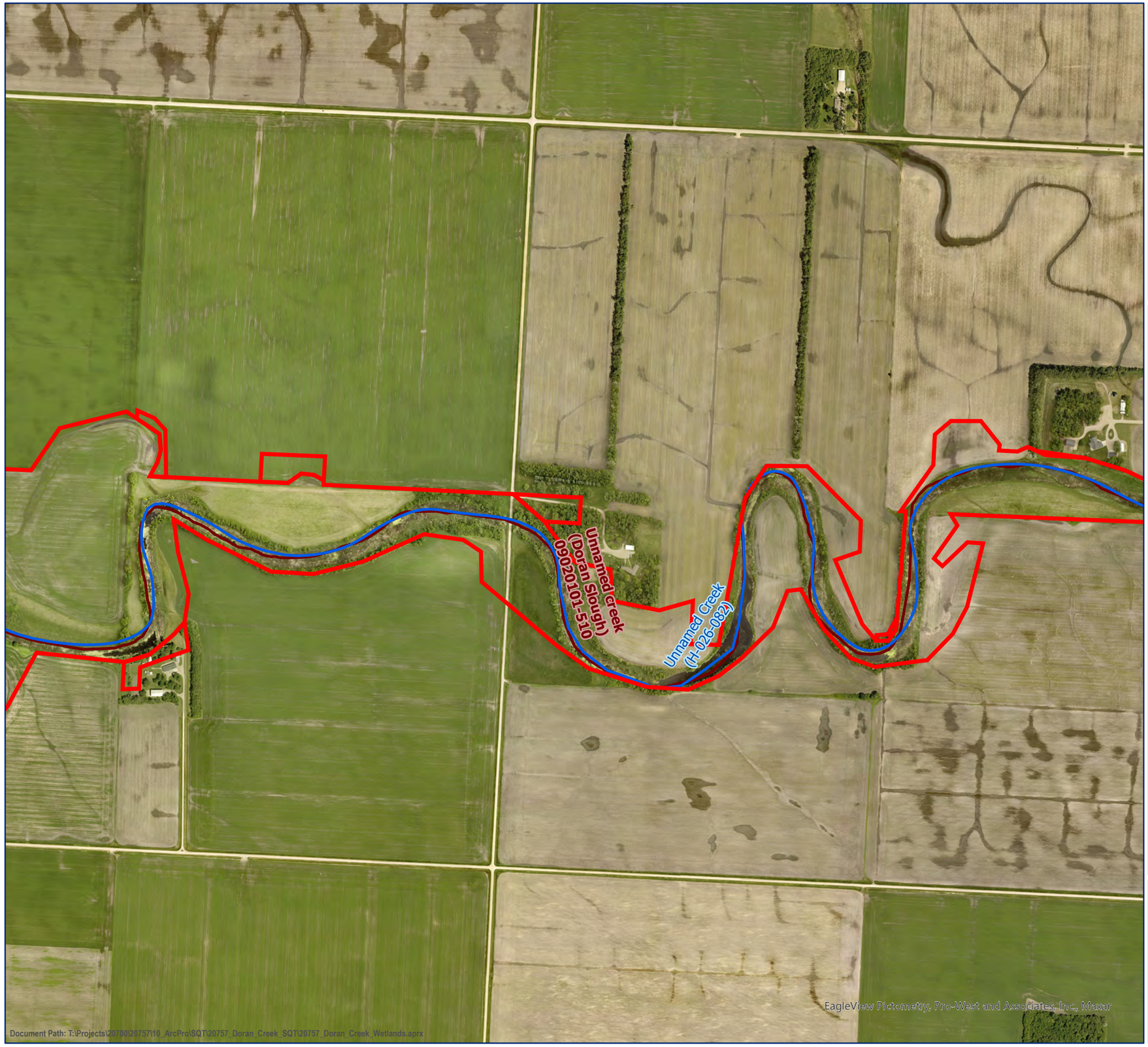

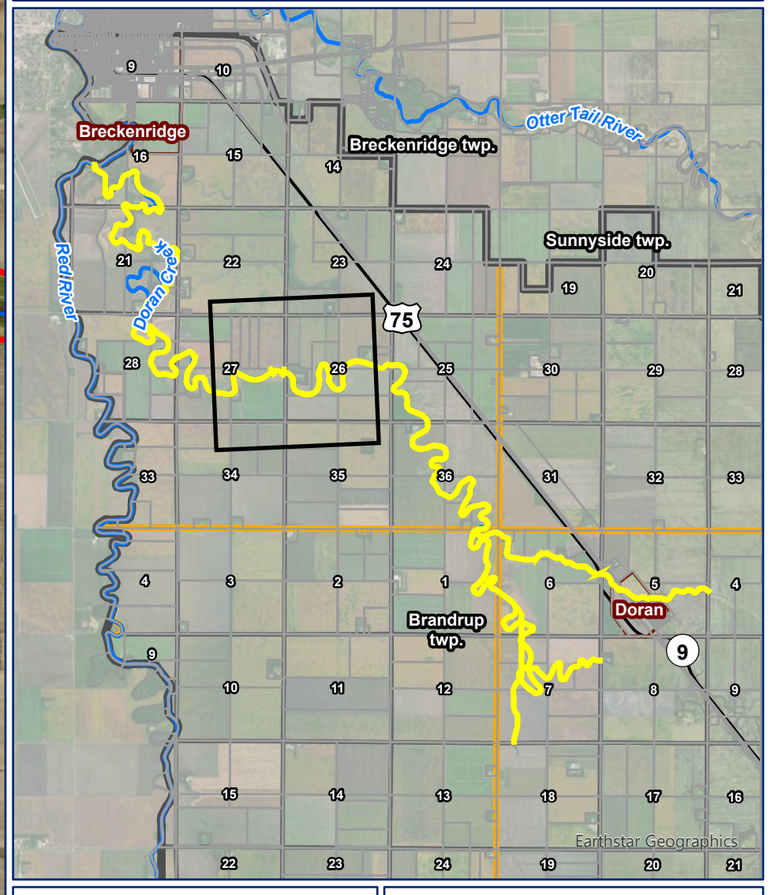

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Bois de Sioux Watershed District

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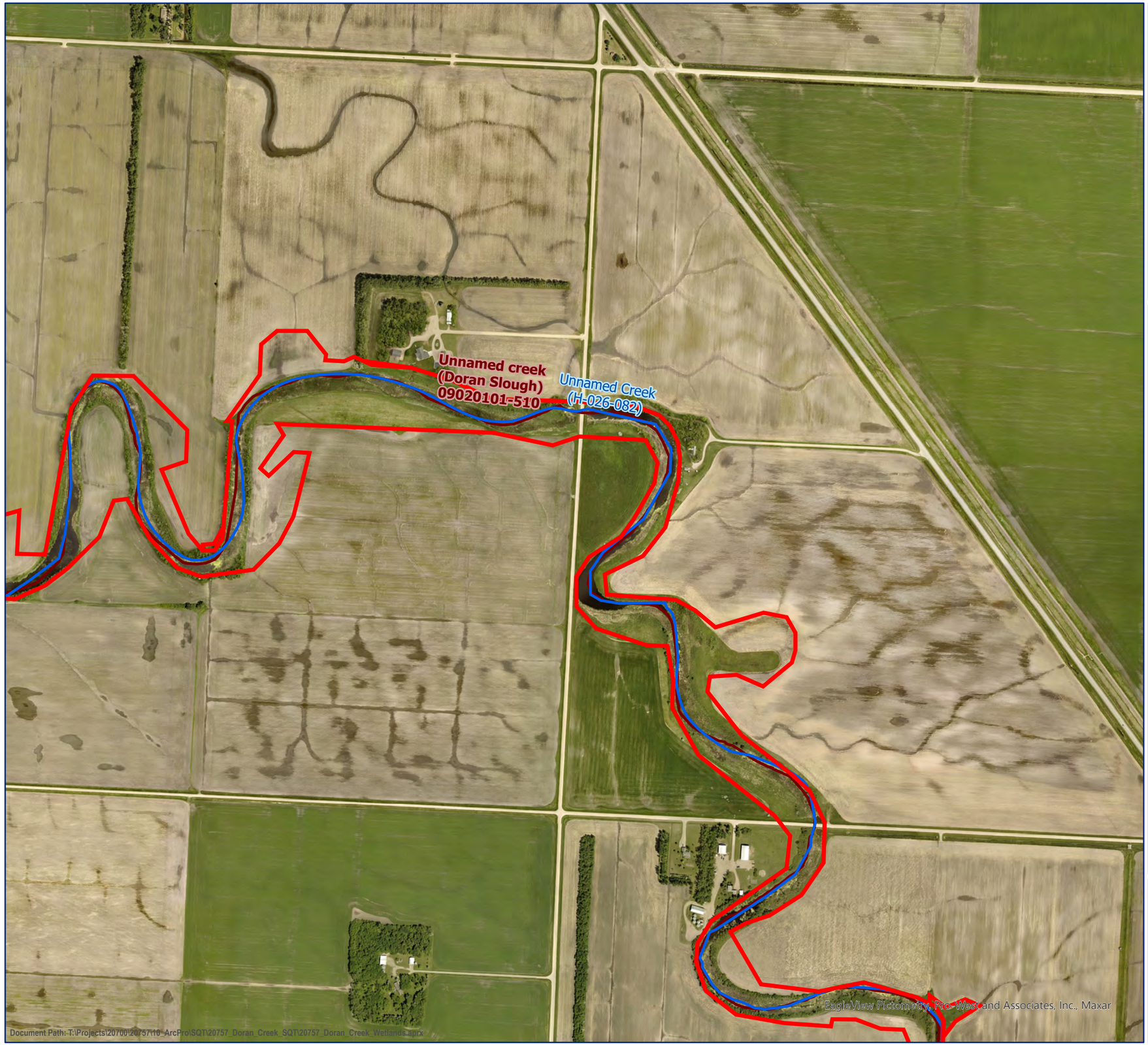
Doran Creek Stream Rehabilitation

Figure 10: Surface Waters



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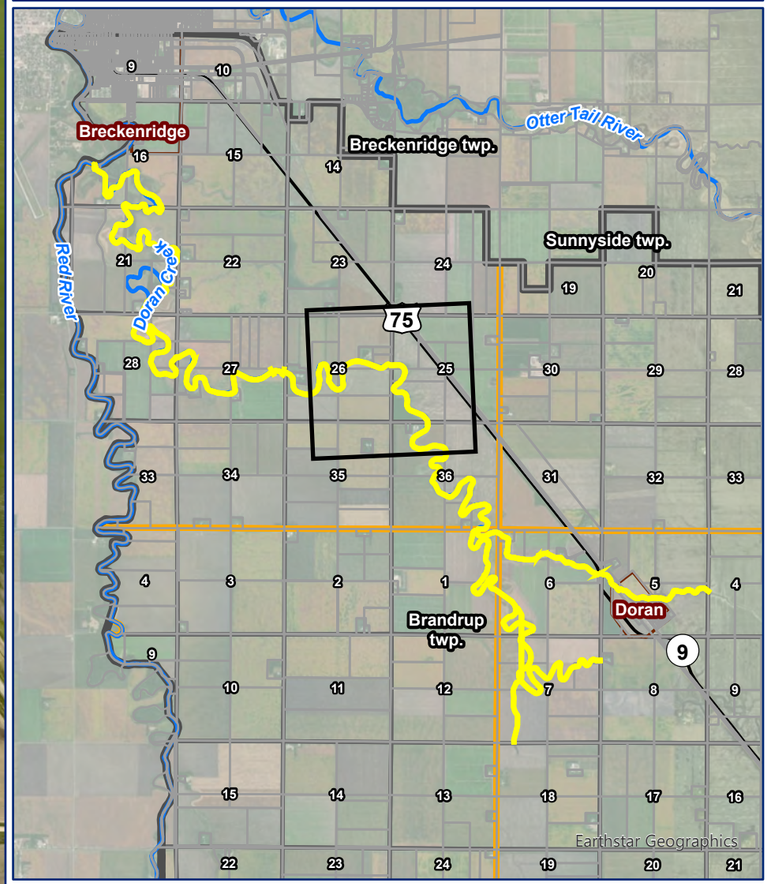

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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

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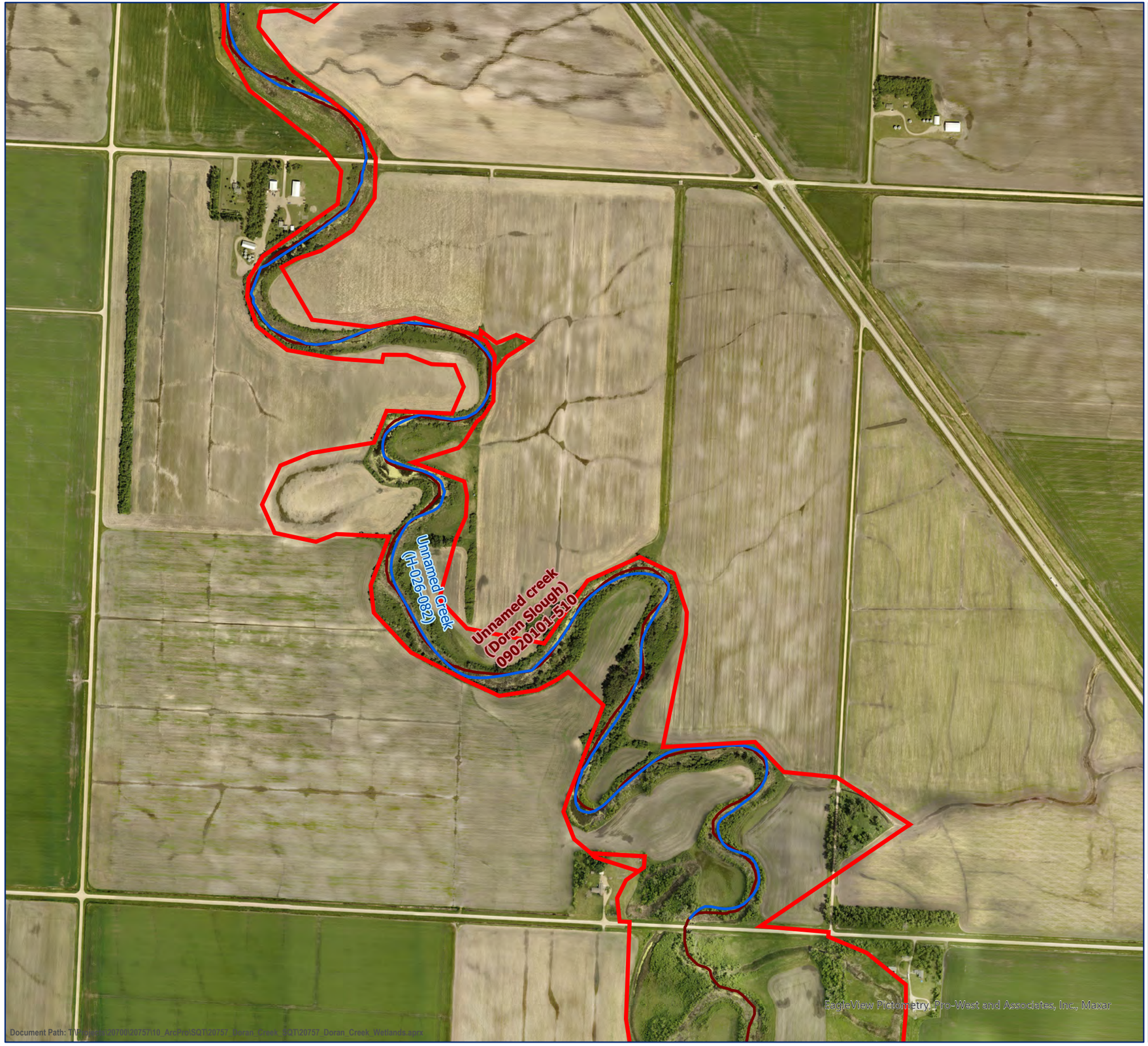

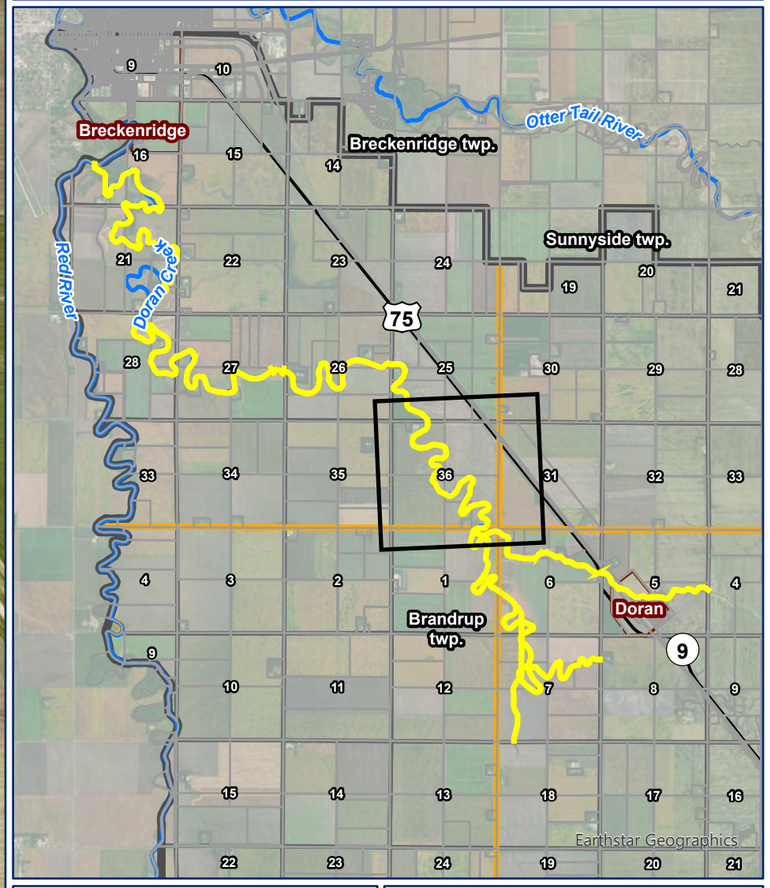

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Doran Creek Stream Rehabilitation

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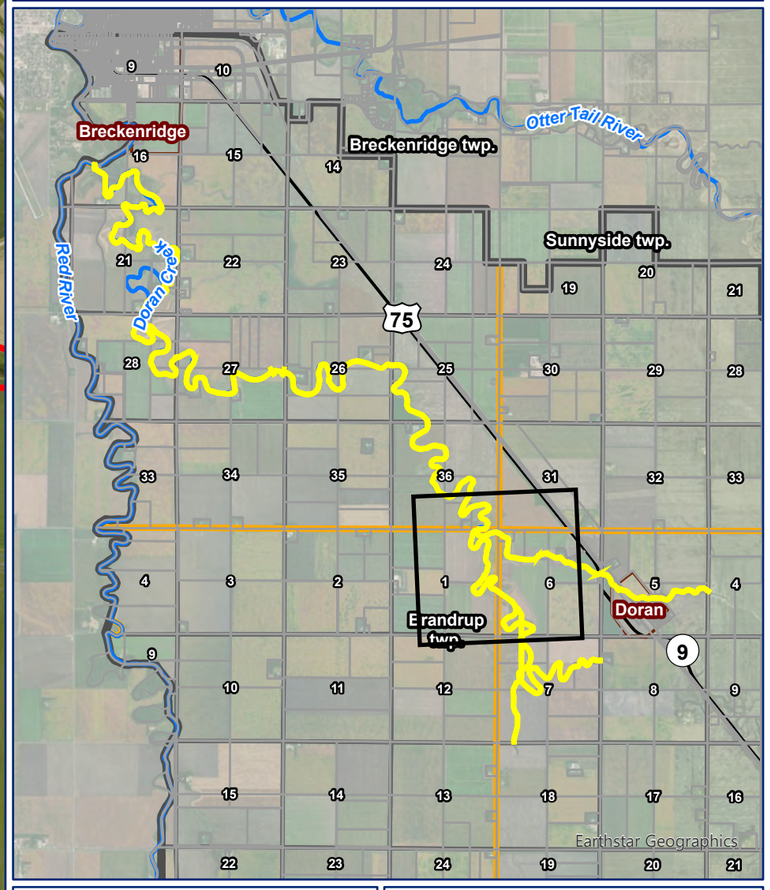

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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

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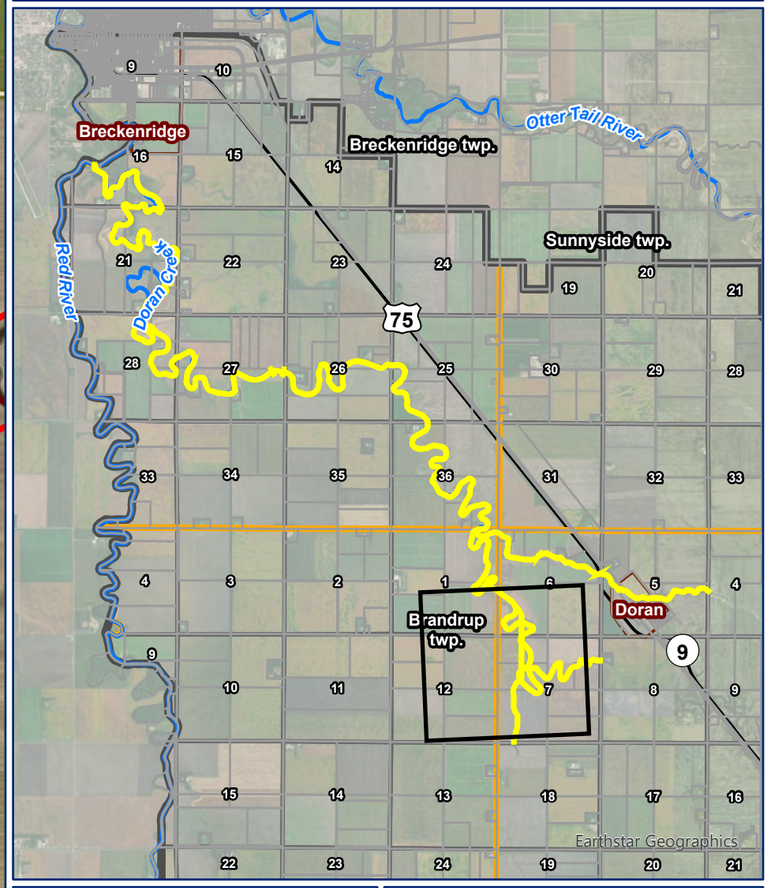

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Doran Creek Stream Rehabilitation

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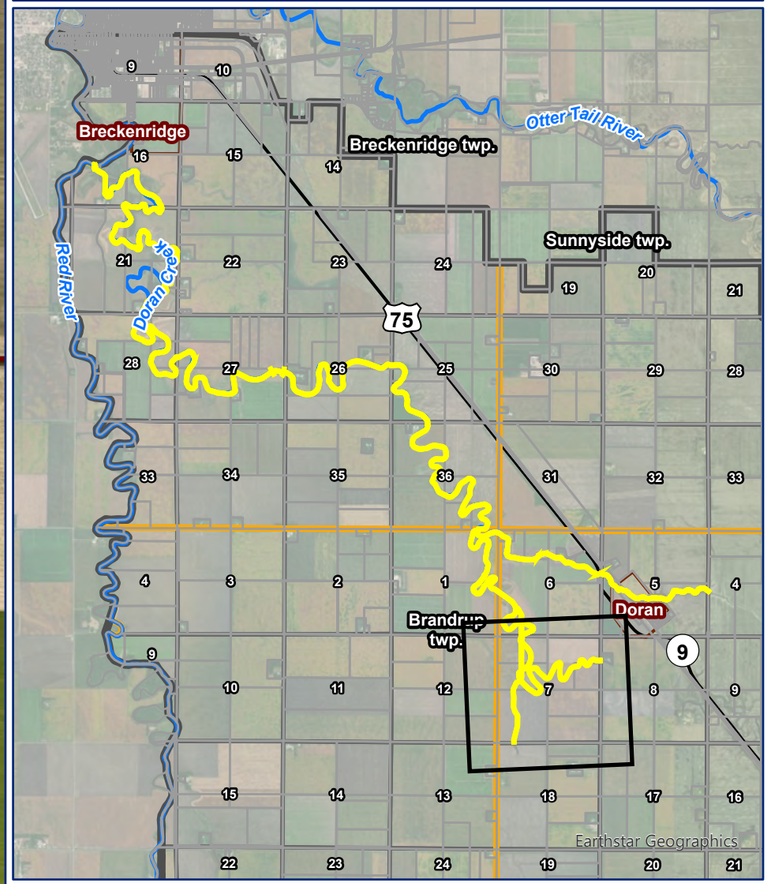

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Doran Creek Stream Rehabilitation

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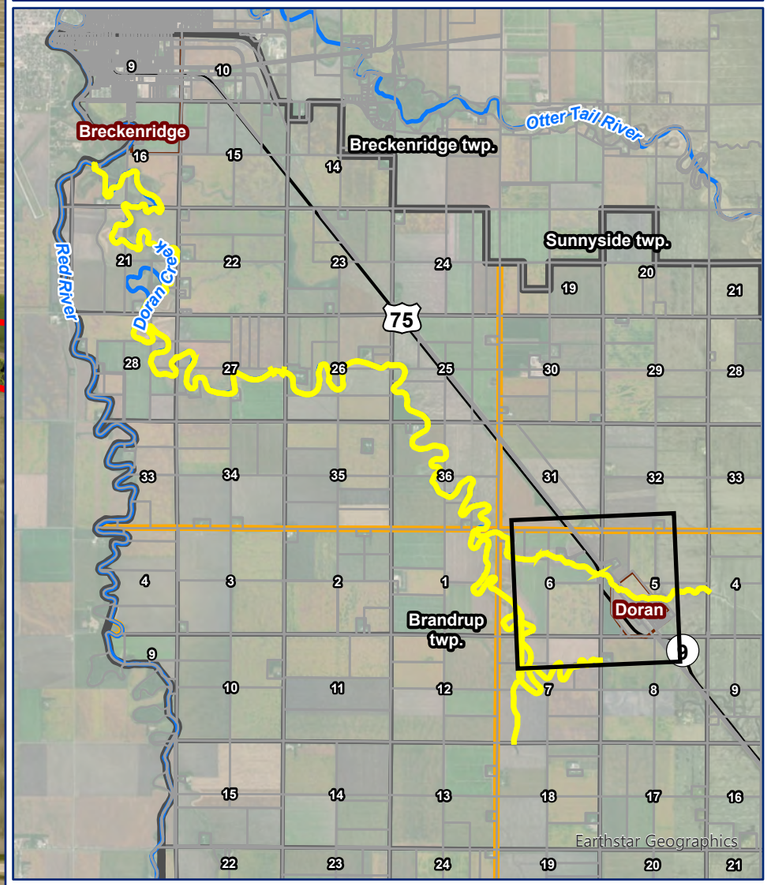

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Doran Creek Stream Rehabilitation

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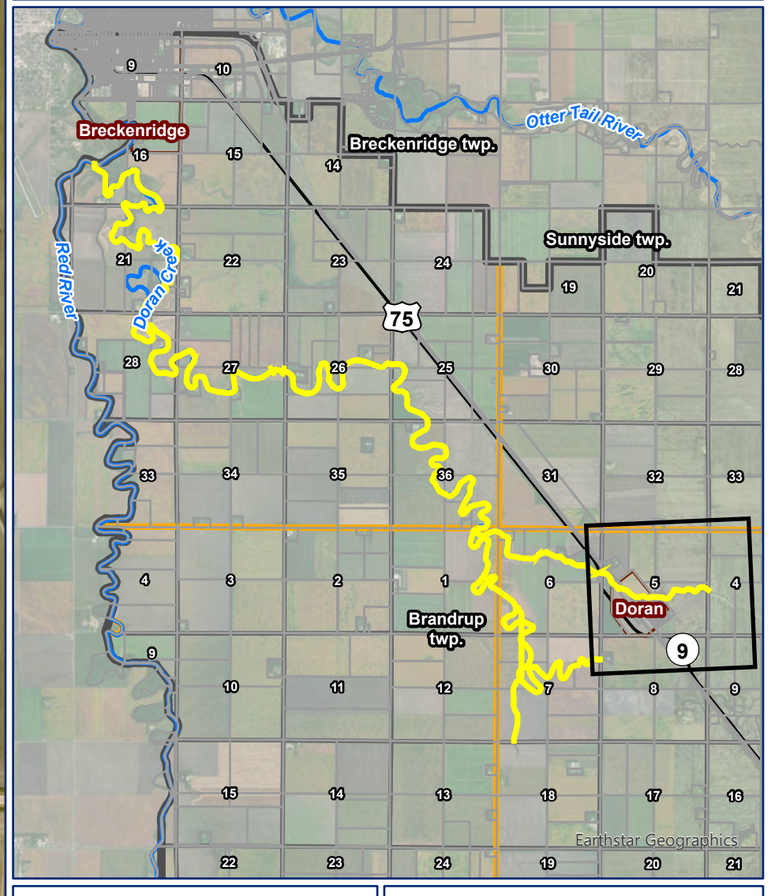

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Bois de Sioux Watershed District

moore engineering, inc.

Doran Creek Stream Rehabilitation

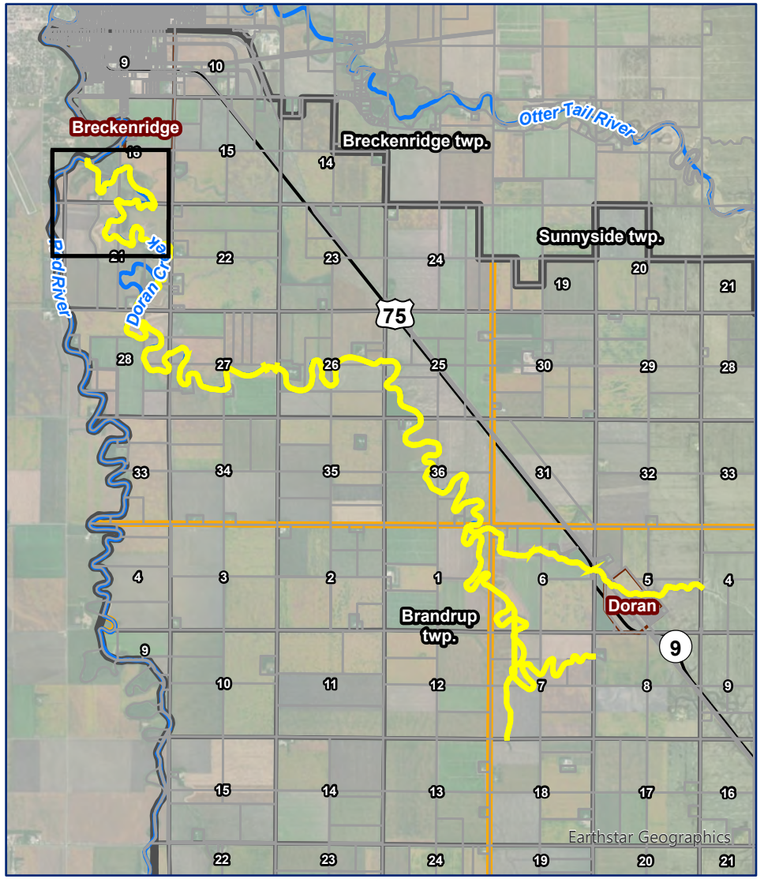
Figure 11: NWI and Estimated Desktop Wetlands

Legend

- Doran Creek Project Area
- Doran Creek Channel
- Preliminary Desktop Wetlands
- 2-yr 24-hr Inundation Boundary
- 5-yr 24-hr Inundation Boundary

NWI Wetlands

- Marine
- Estuarine
- Palustrine
- Riverine
- Lacustrine



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EagleView Pictometry, Pro-West and Associates, Inc., Maxar

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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

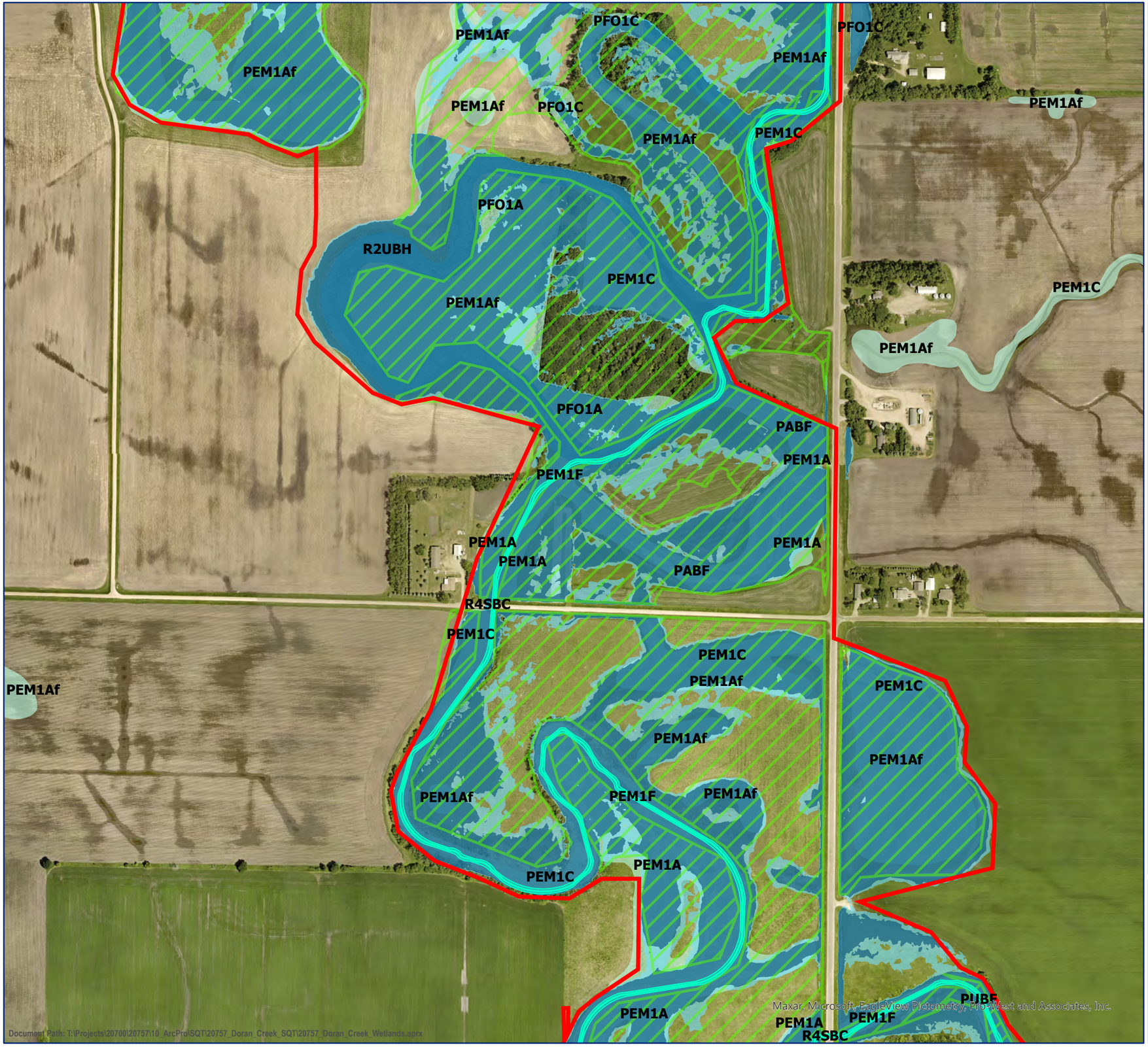
Figure 11: NWI and Estimated Desktop Wetlands

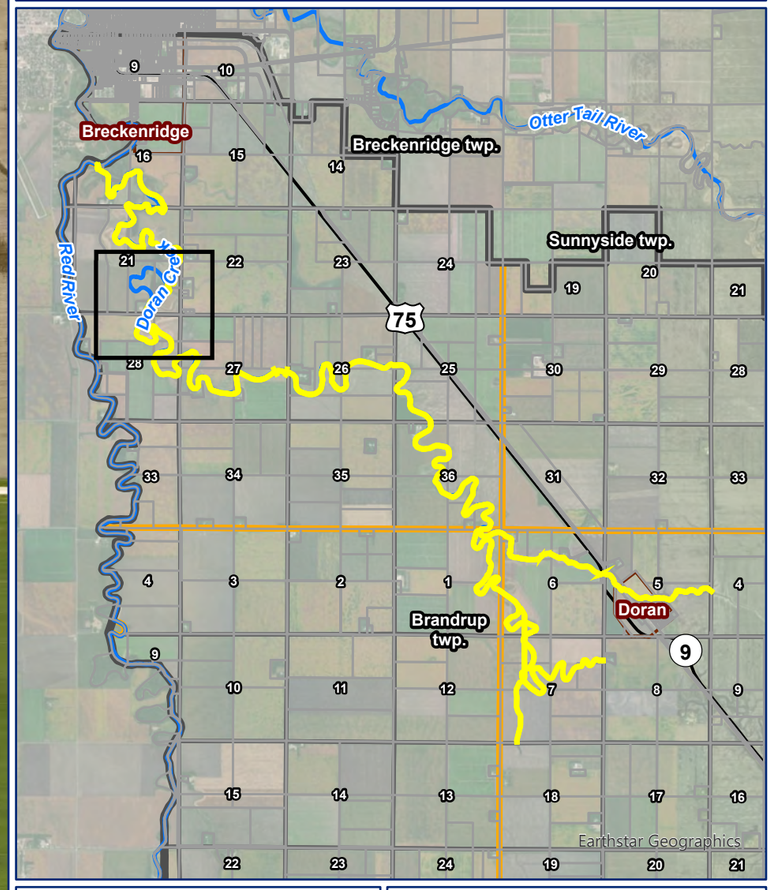
Legend

- Doran Creek Project Area
- Doran Creek Channel
- Preliminary Desktop Wetlands
- 2-yr 24-hr Inundation Boundary
- 5-yr 24-hr Inundation Boundary

NWI Wetlands

- Marine
- Estuarine
- Palustrine
- Riverine
- Lacustrine





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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

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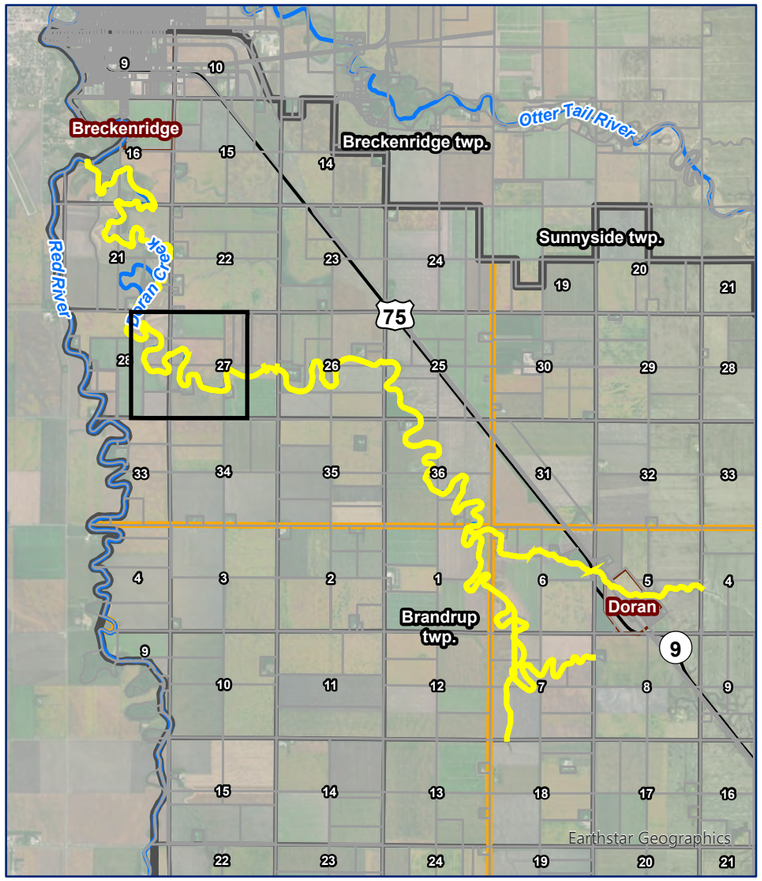

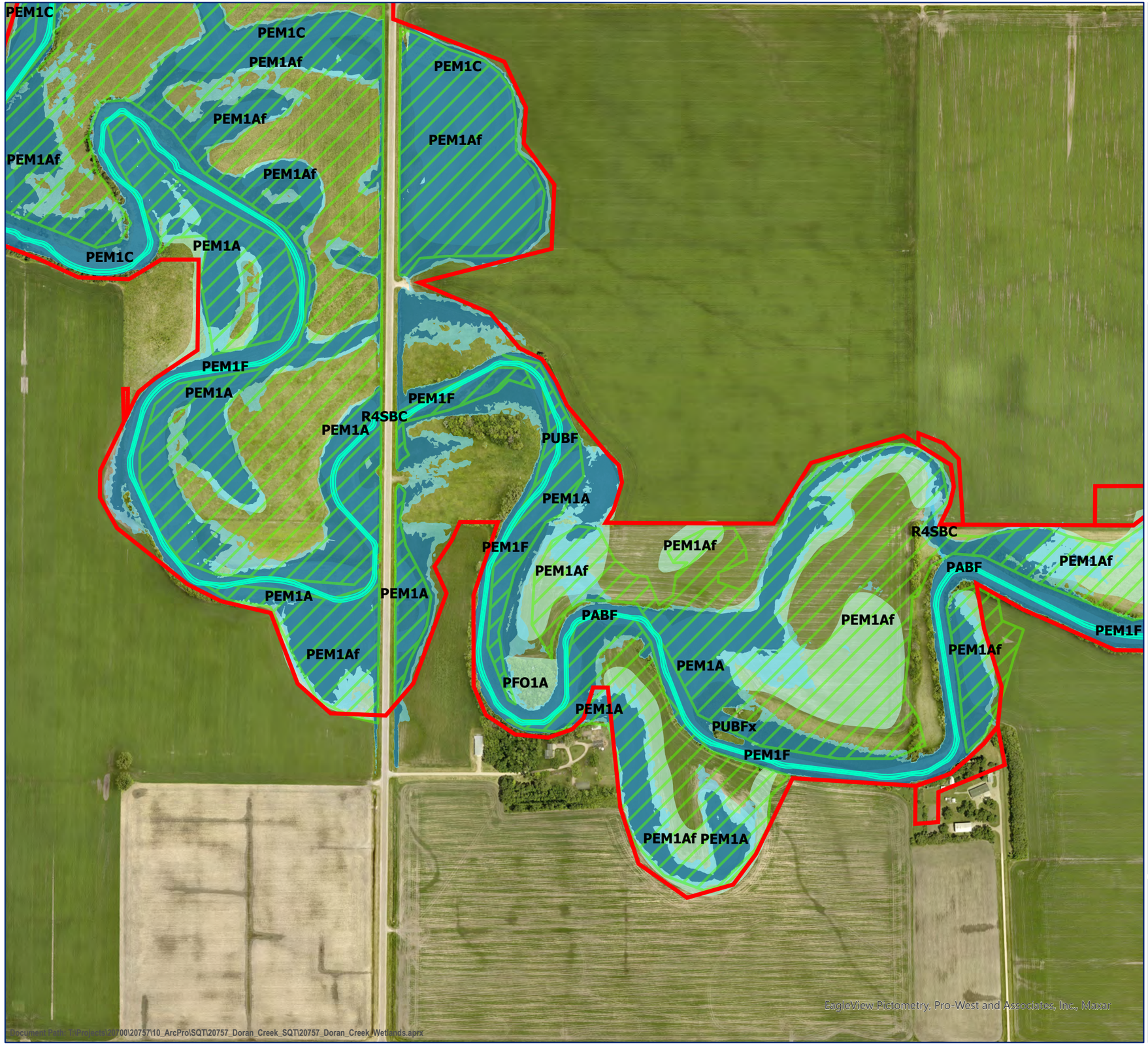

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moore engineering, inc.

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Doran Creek Stream Rehabilitation

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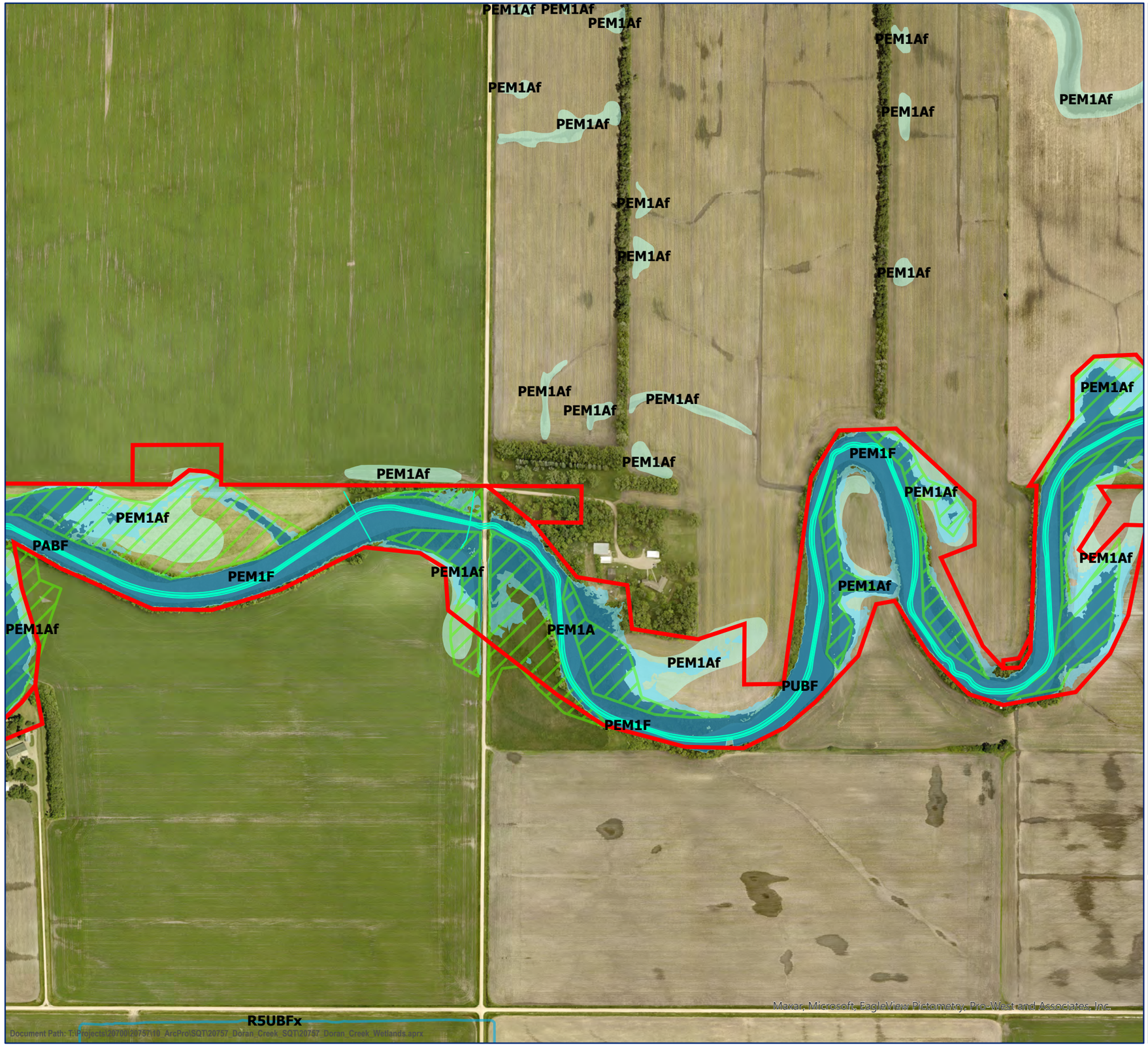

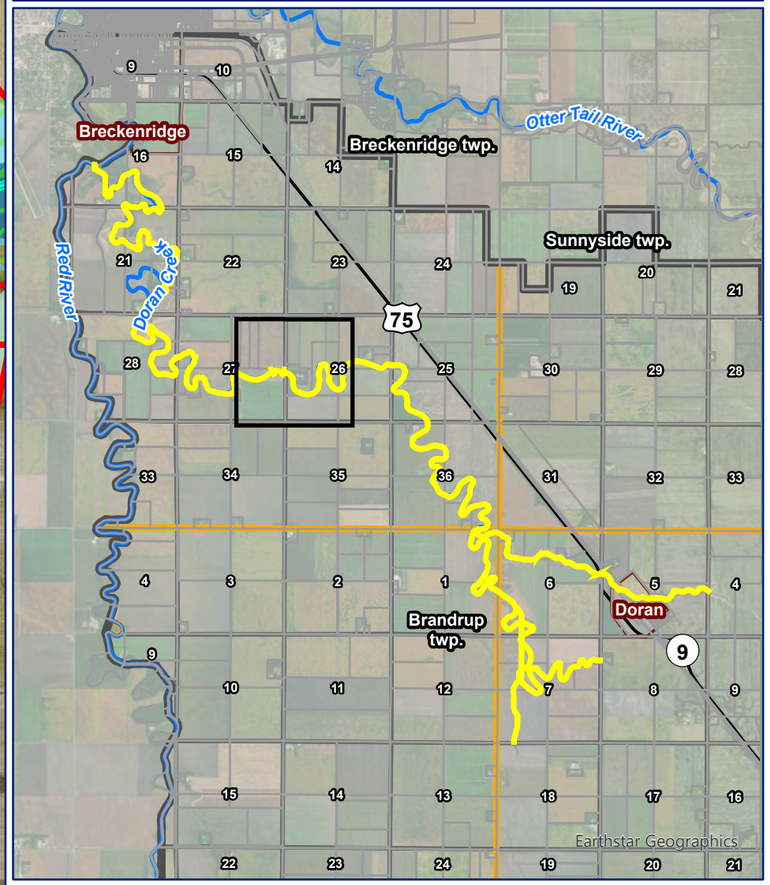

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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

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EagleView Technology, Pro-West and Associates, Inc., Maxar

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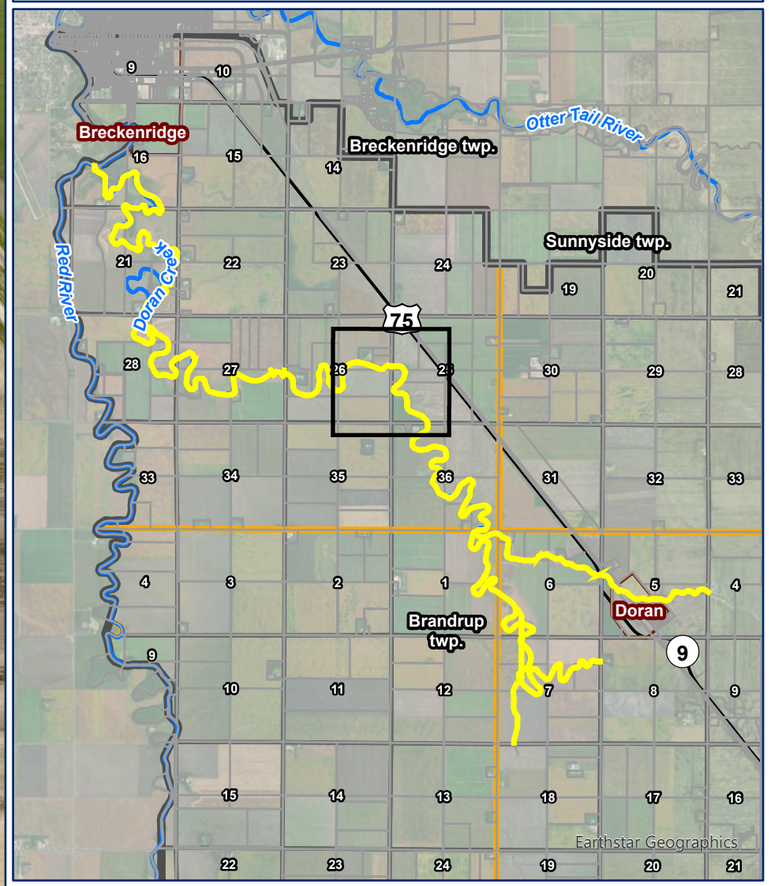

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Doran Creek Stream Rehabilitation

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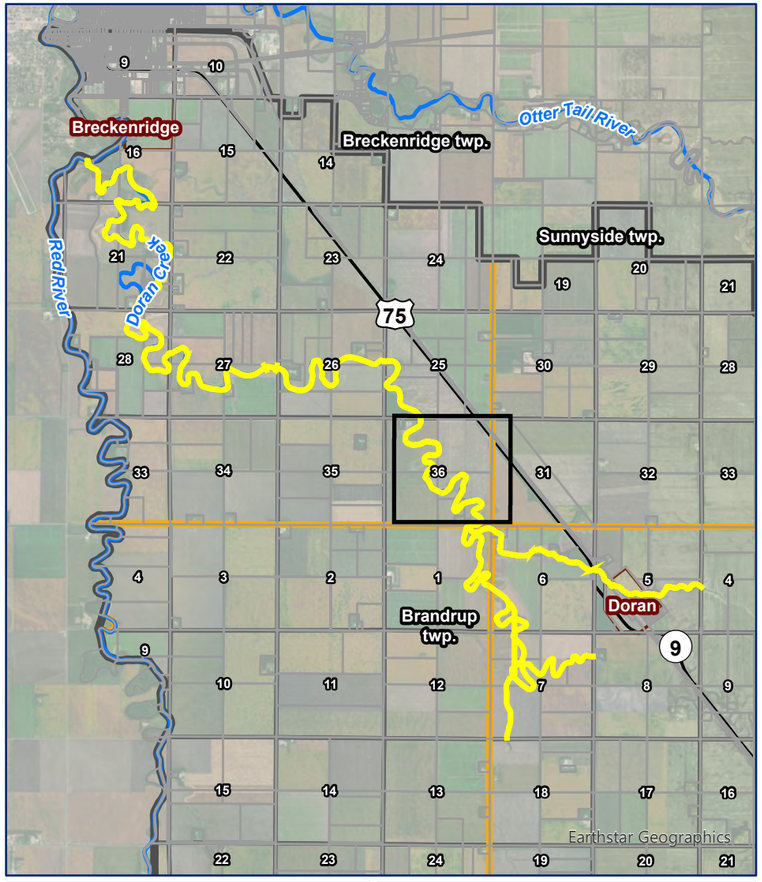

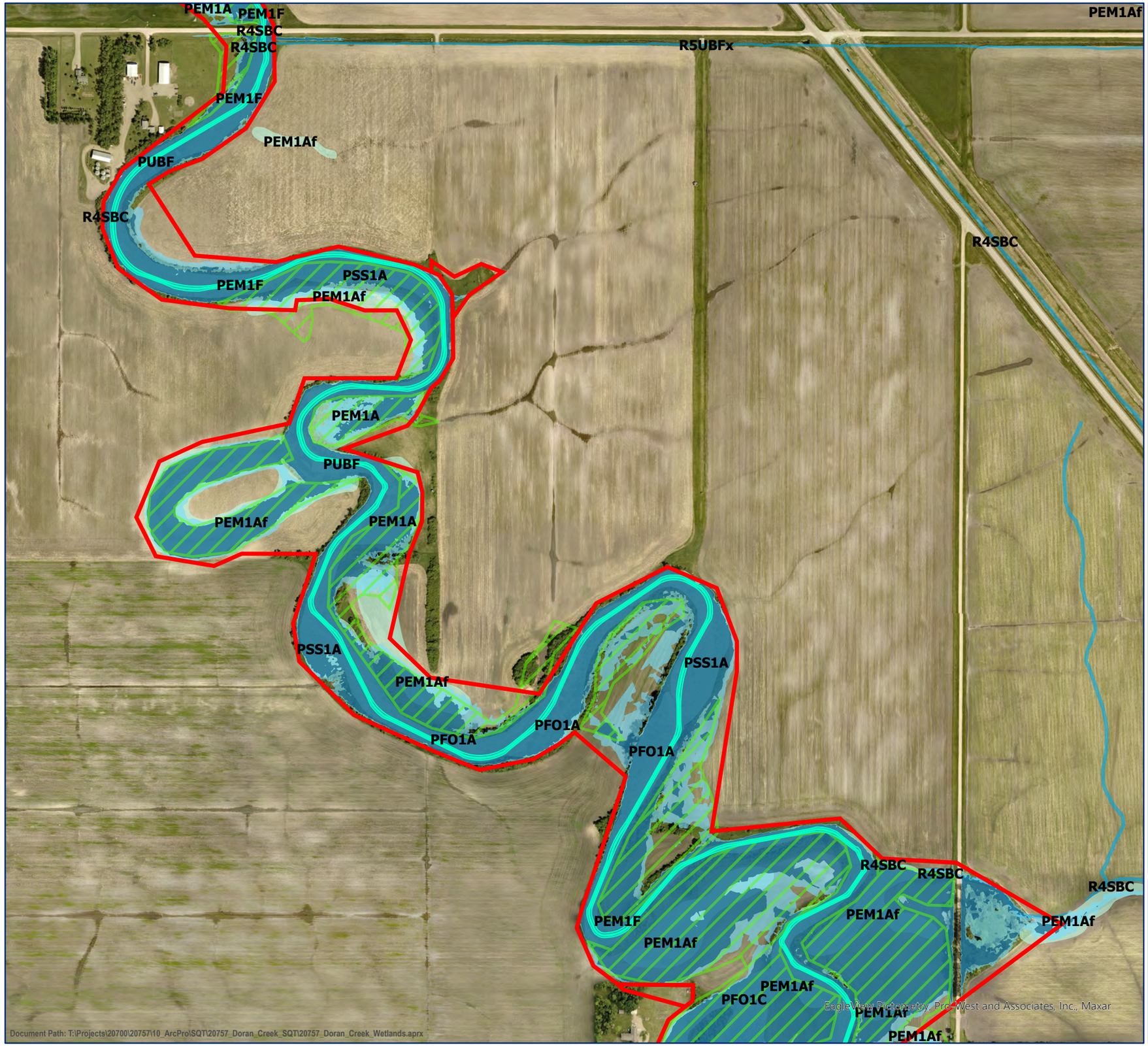

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Doran Creek Stream Rehabilitation

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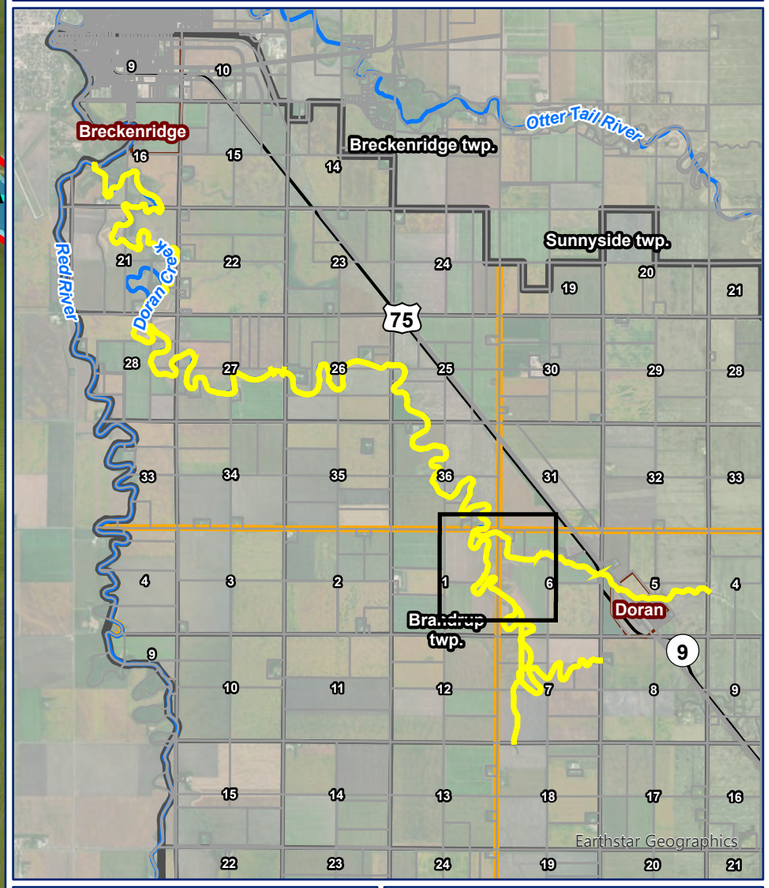

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Doran Creek Stream Rehabilitation

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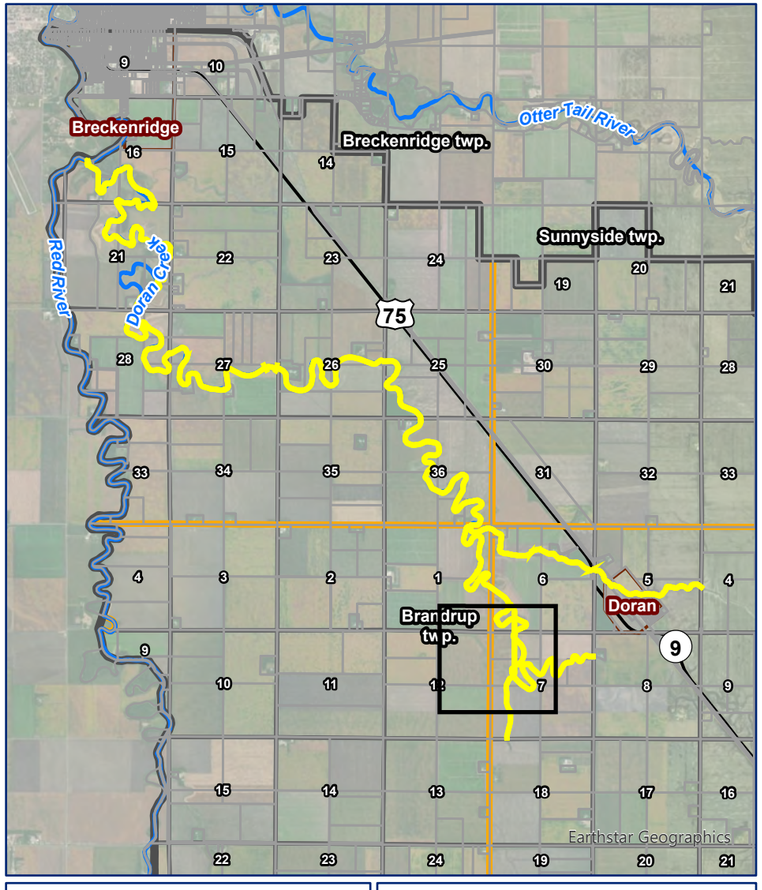

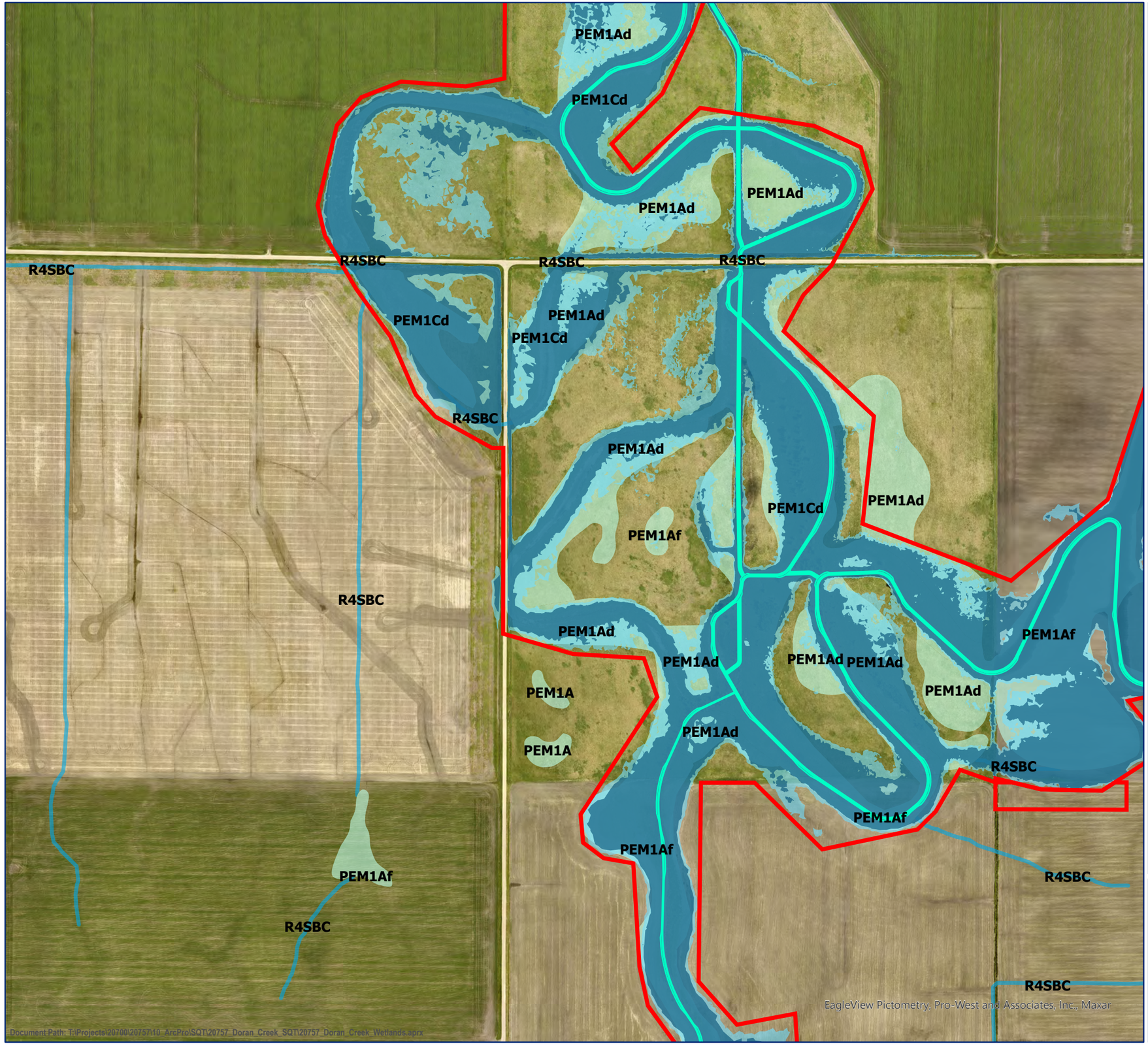

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Doran Creek Stream Rehabilitation

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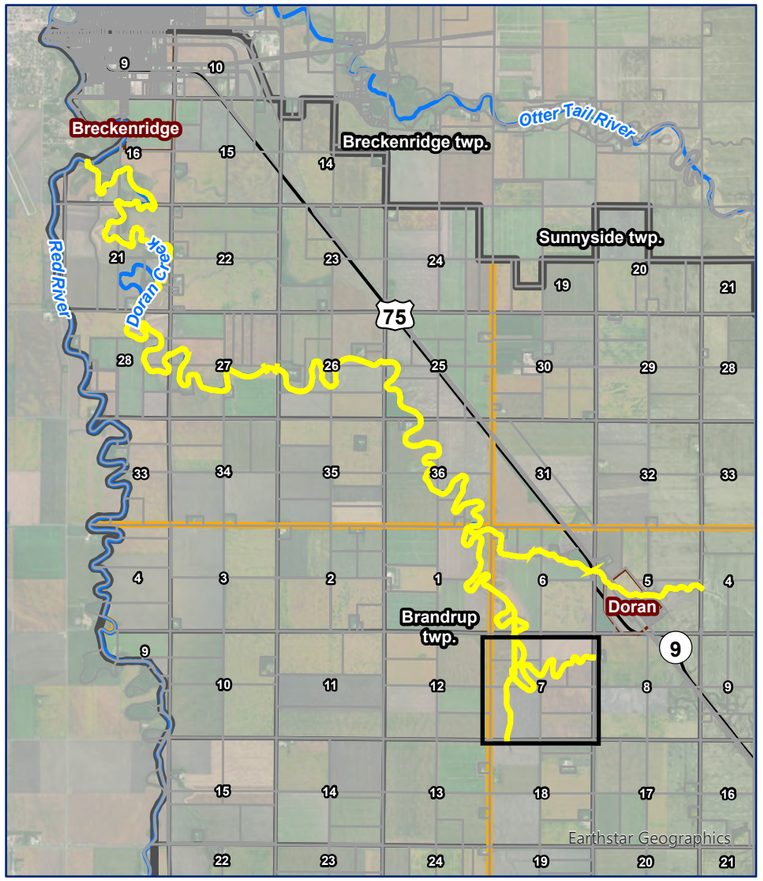

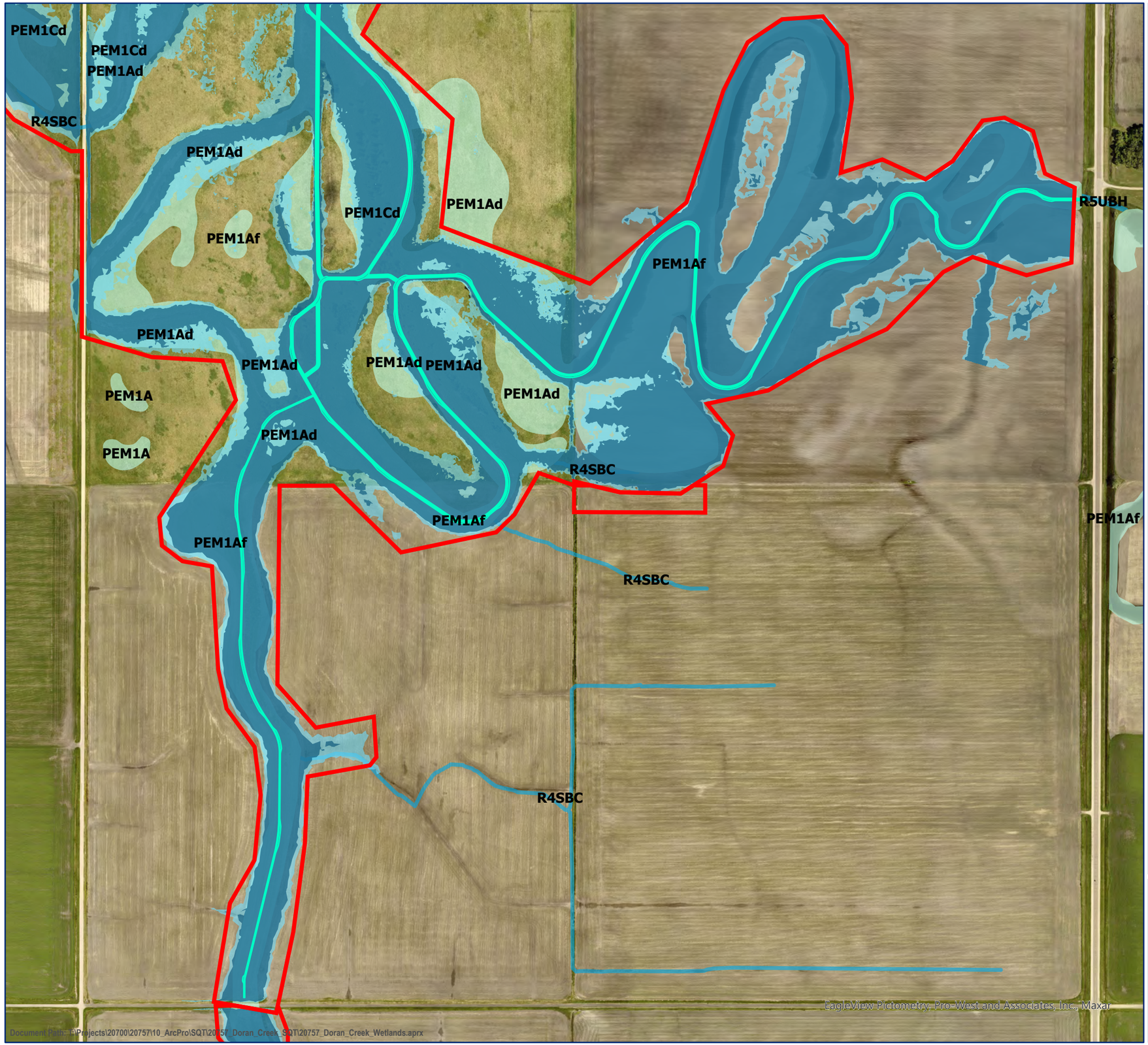

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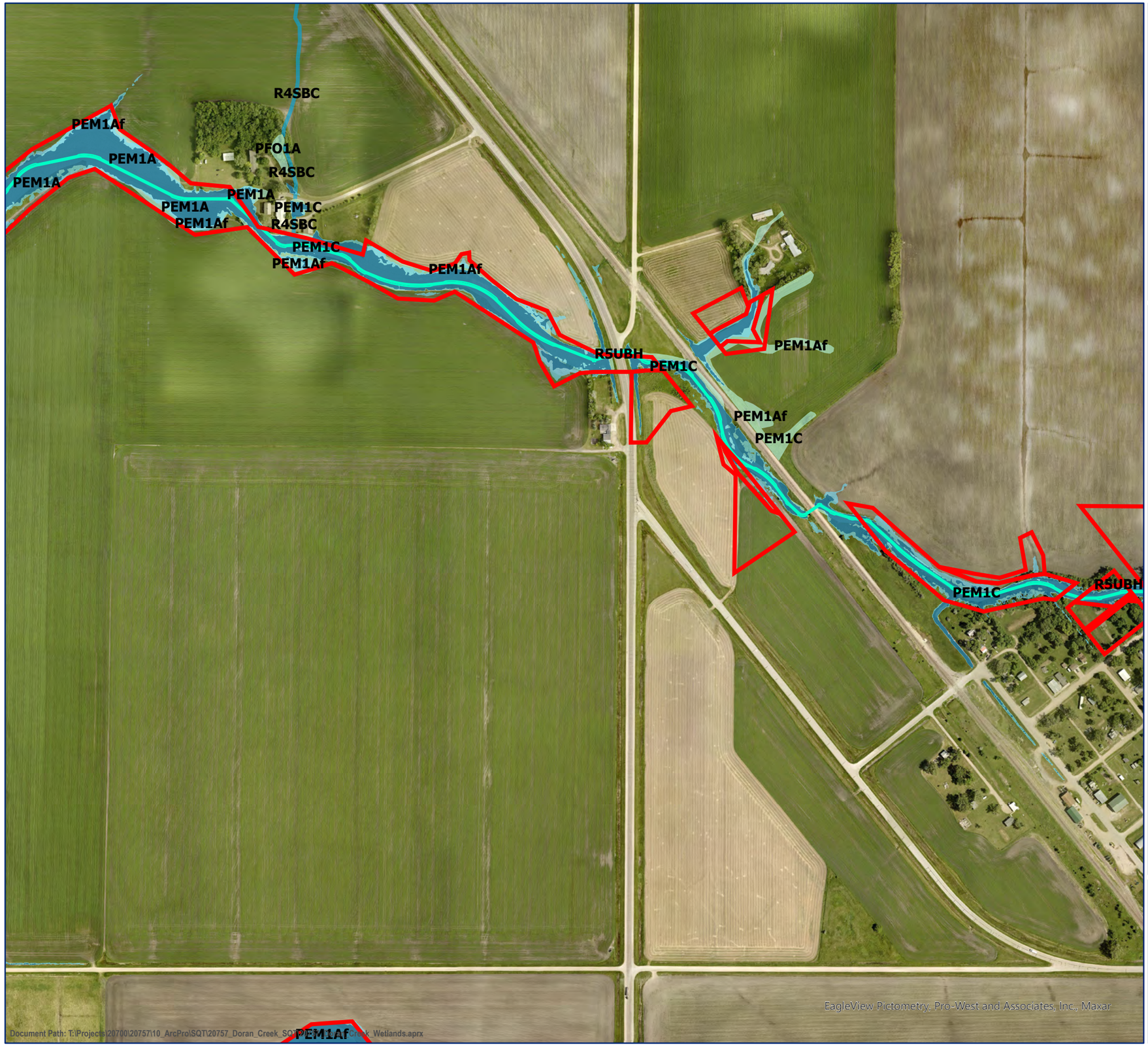

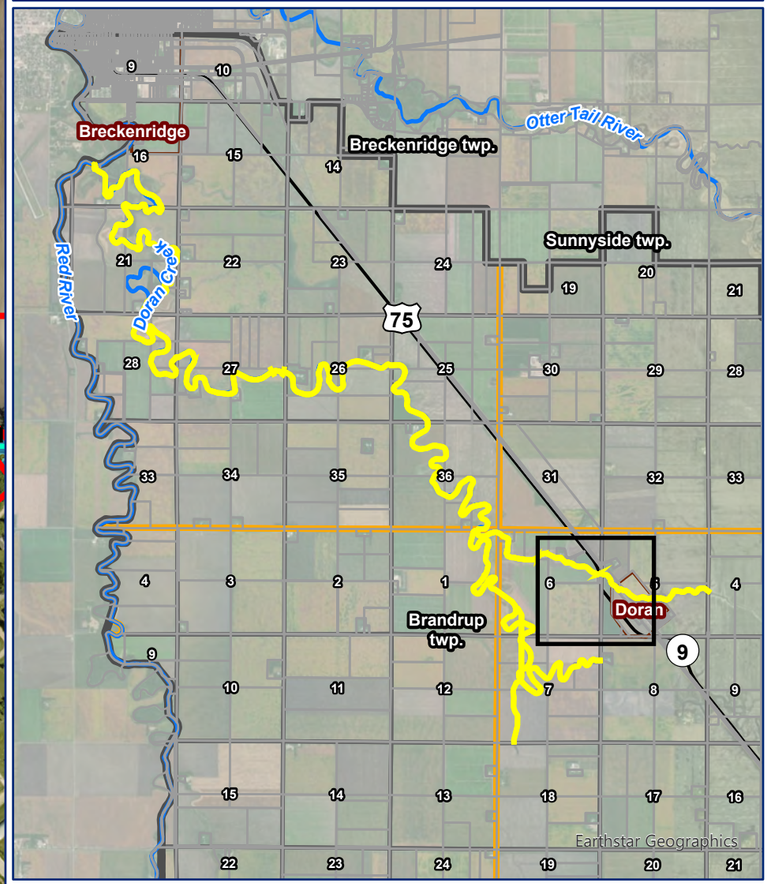

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Bois de Sioux Watershed District

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Doran Creek Stream Rehabilitation

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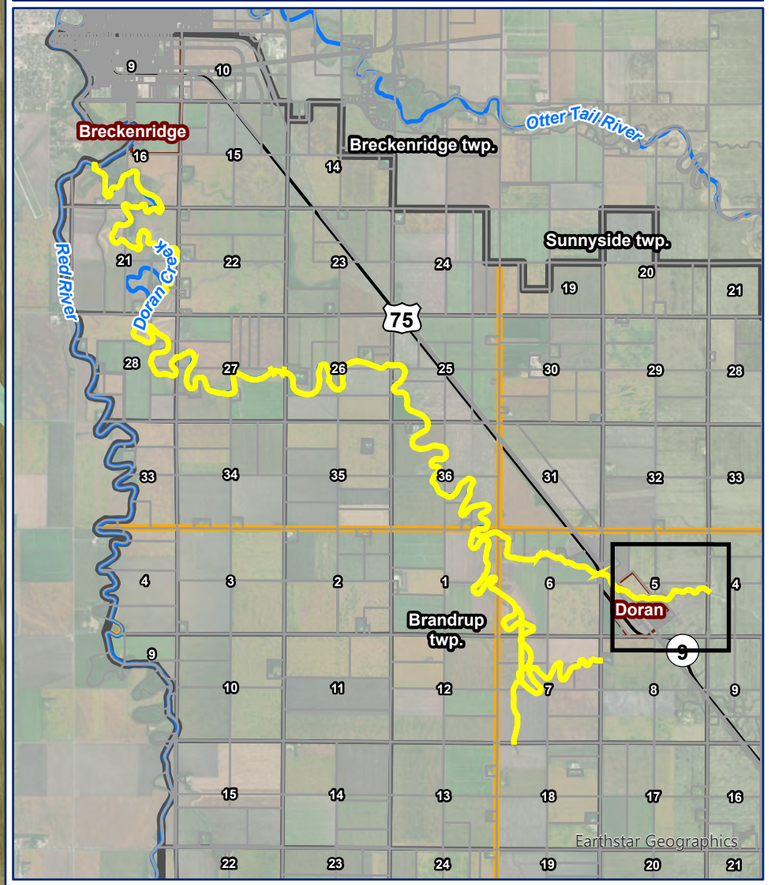

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Bois de Sioux Watershed District

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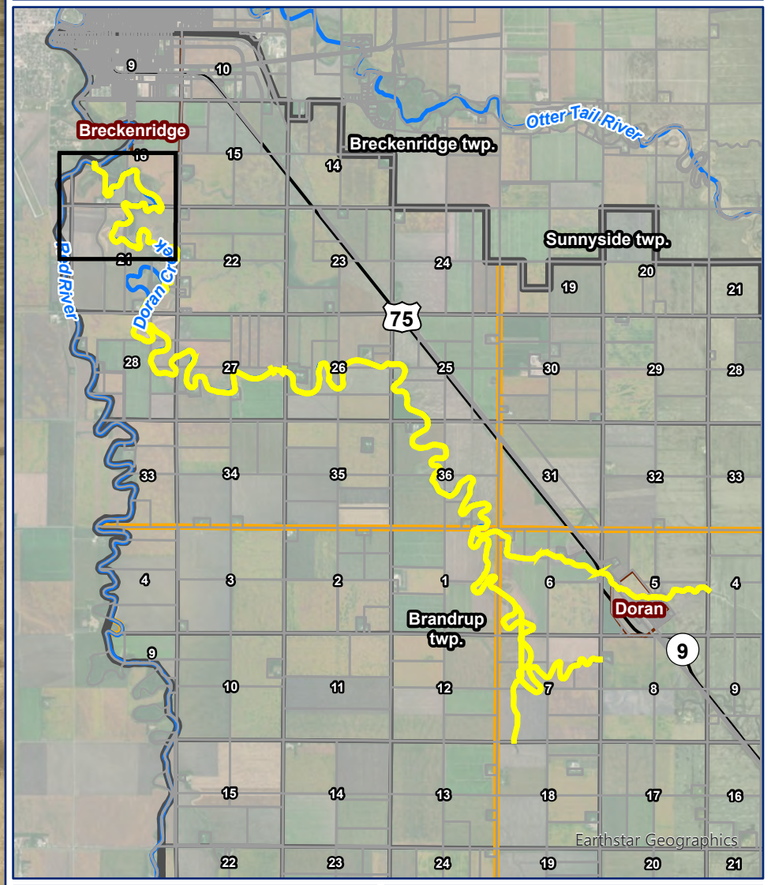
Doran Creek Stream Rehabilitation

Figure 12: Groundwater Wells and MWI

Legend

- Groundwater Monitoring Wells Installed
- 1-Mile Radius
- Minnesota Well Index Within 1-Mile
- Doran Creek Project Area



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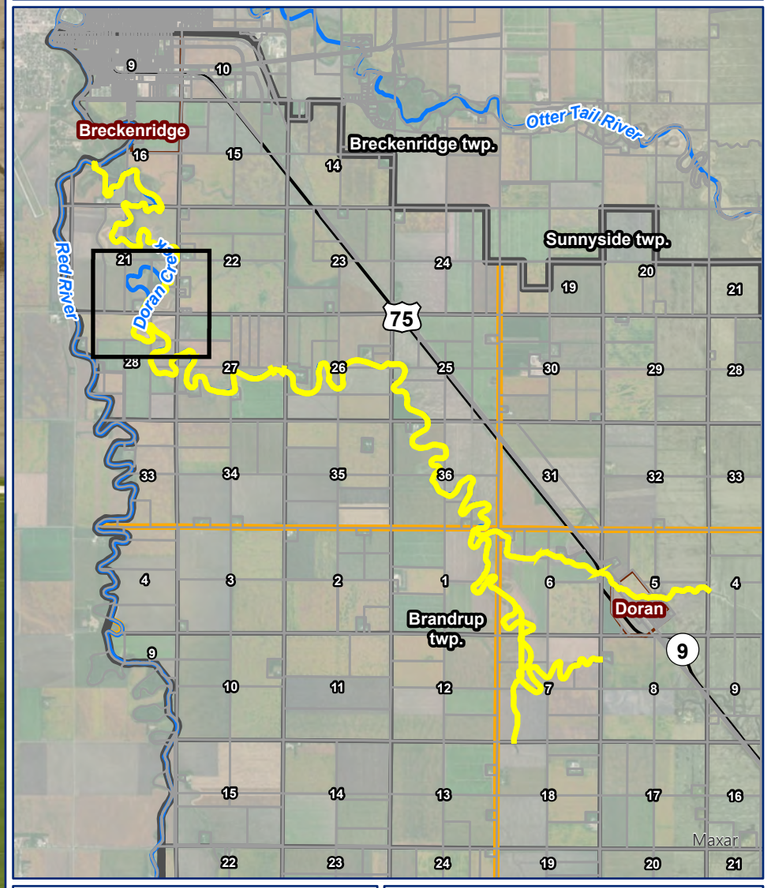

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Doran Creek Stream Rehabilitation

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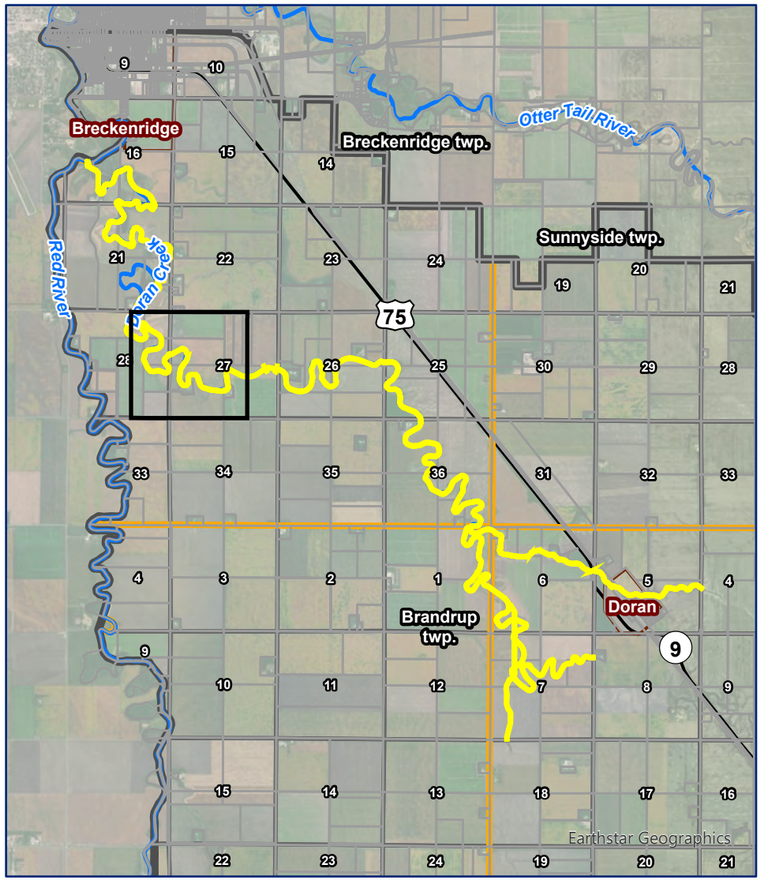

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Doran Creek Stream Rehabilitation

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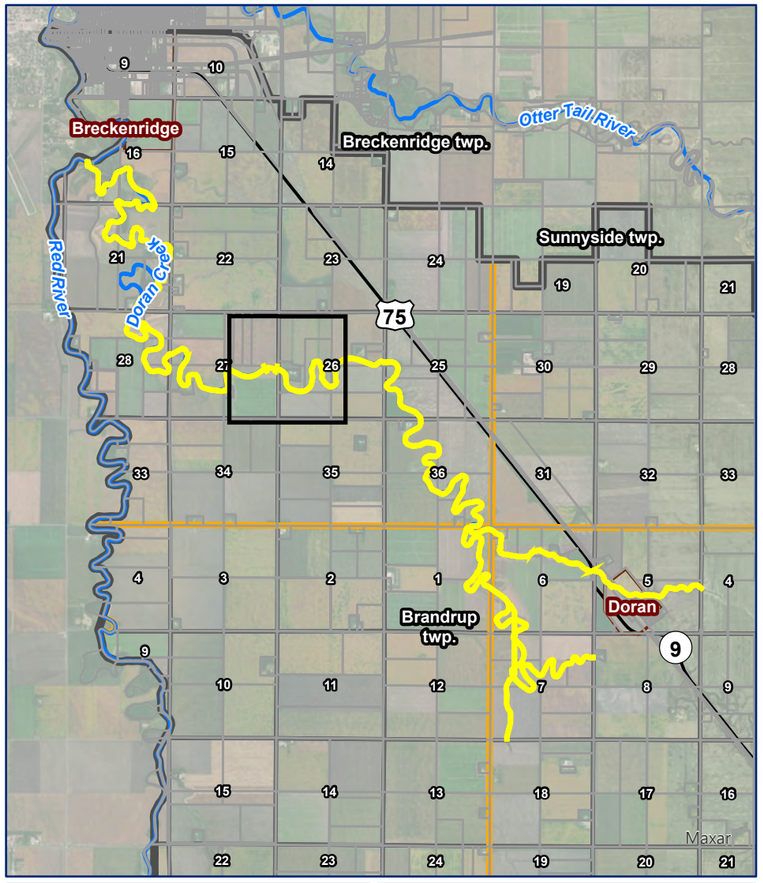

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Bois de Sioux Watershed District

moore engineering, inc.

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Doran Creek Stream Rehabilitation

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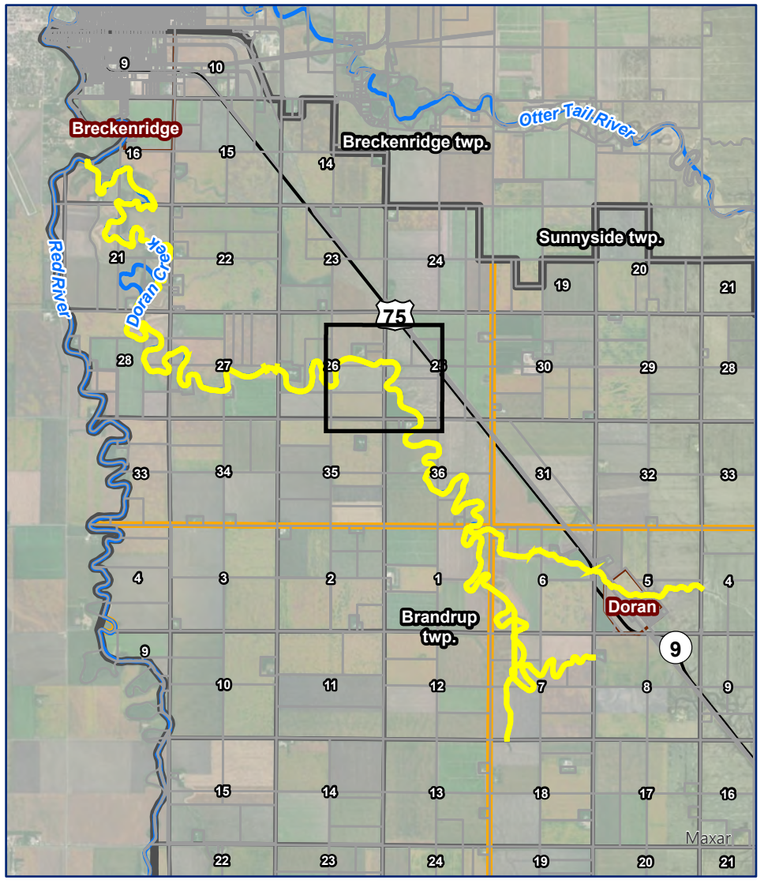

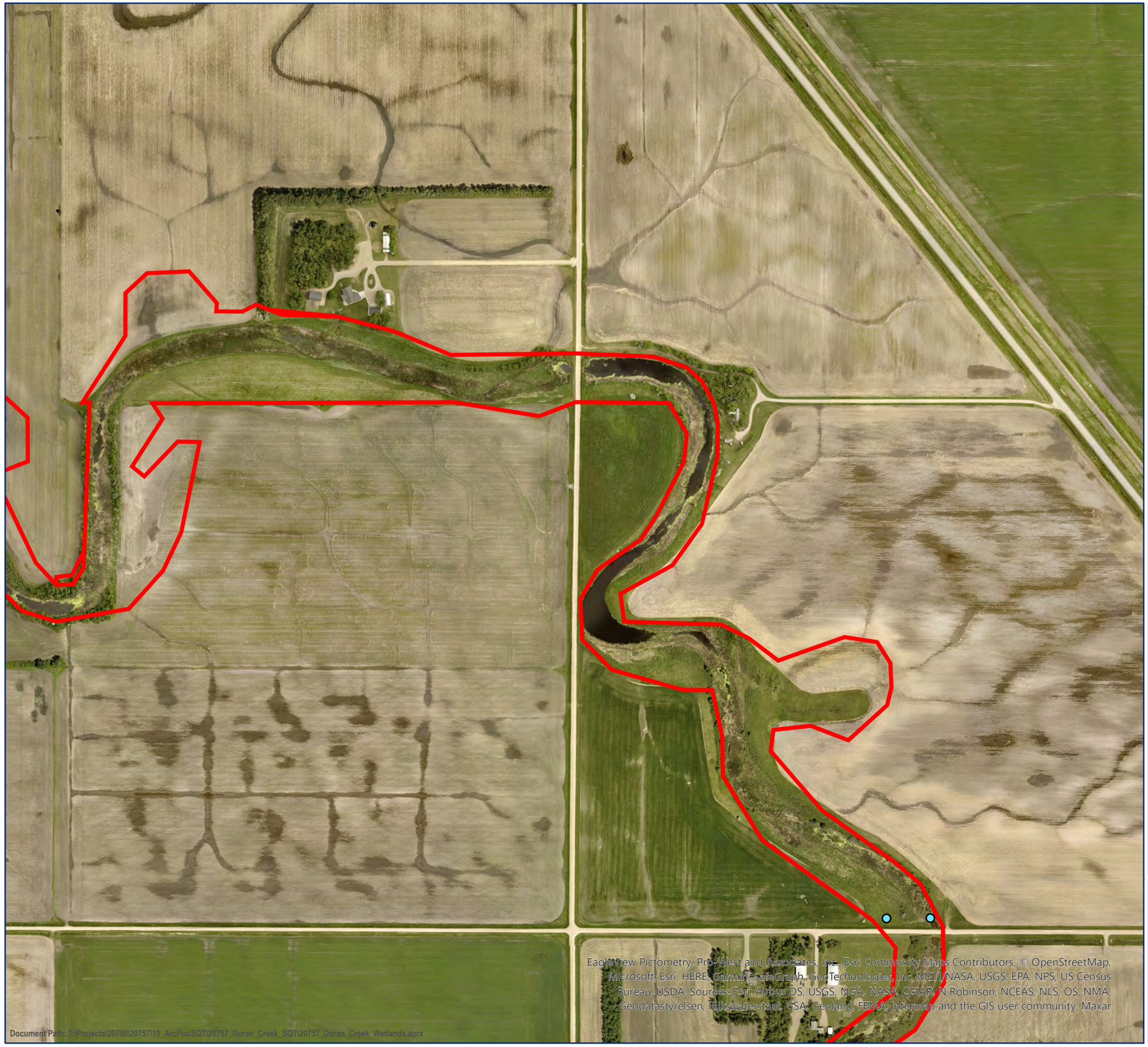

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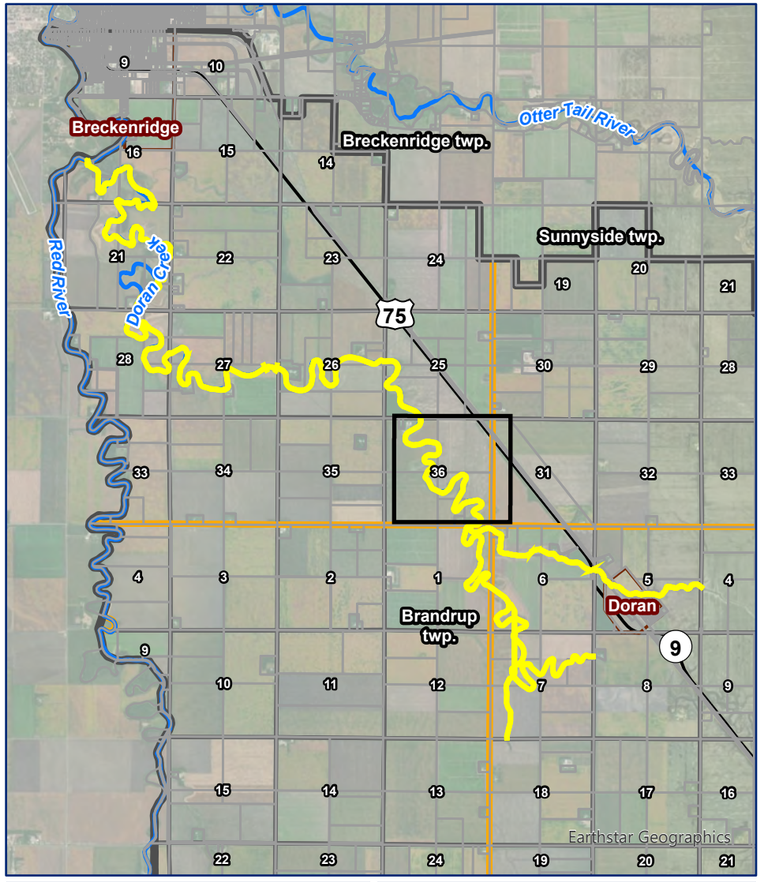

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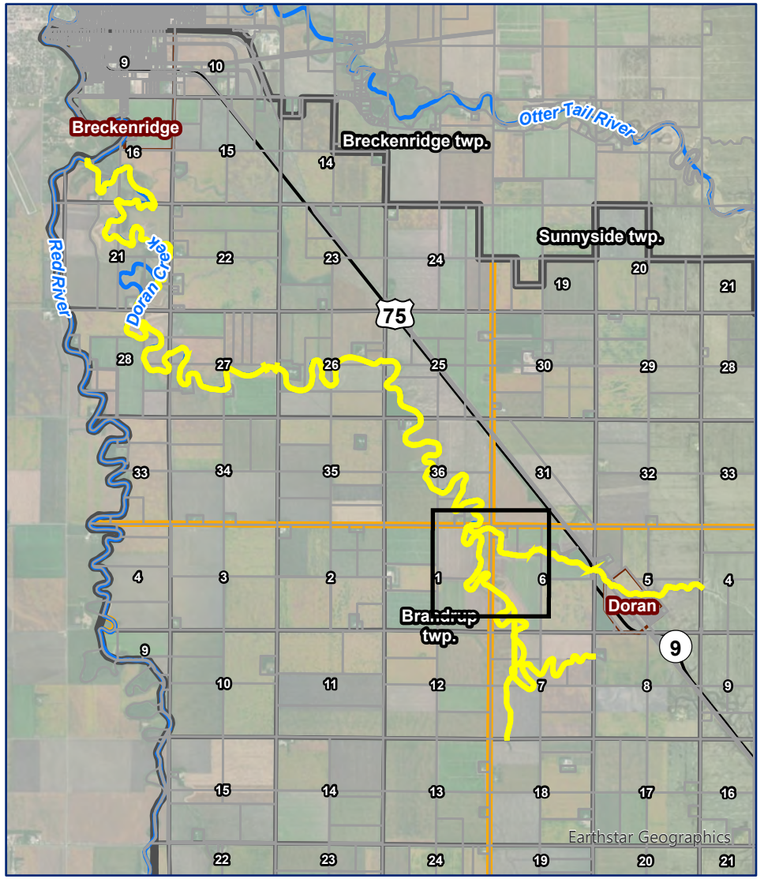

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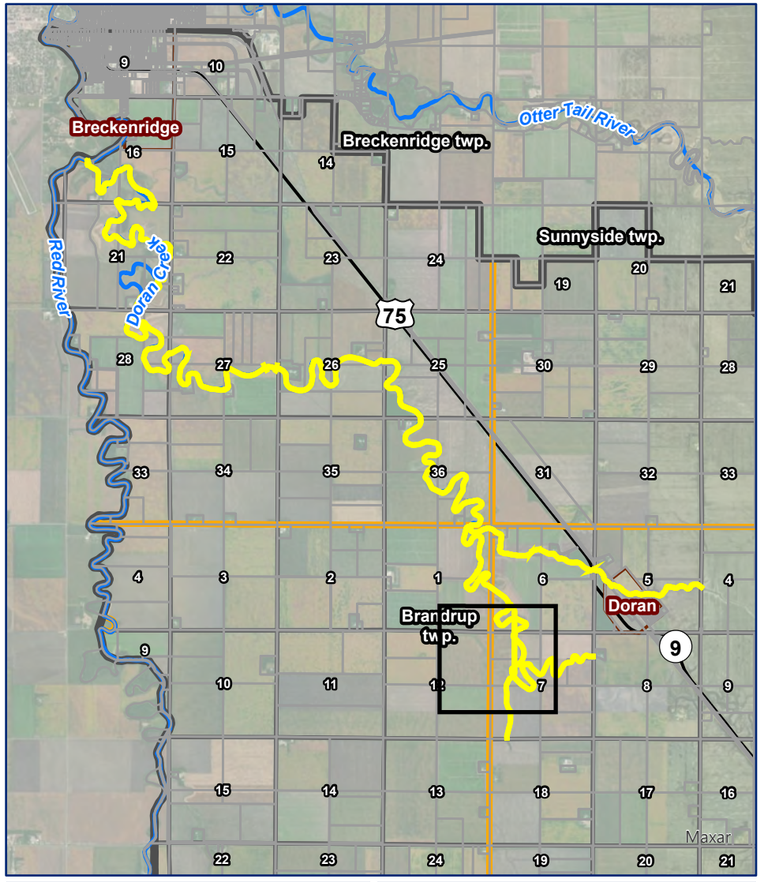

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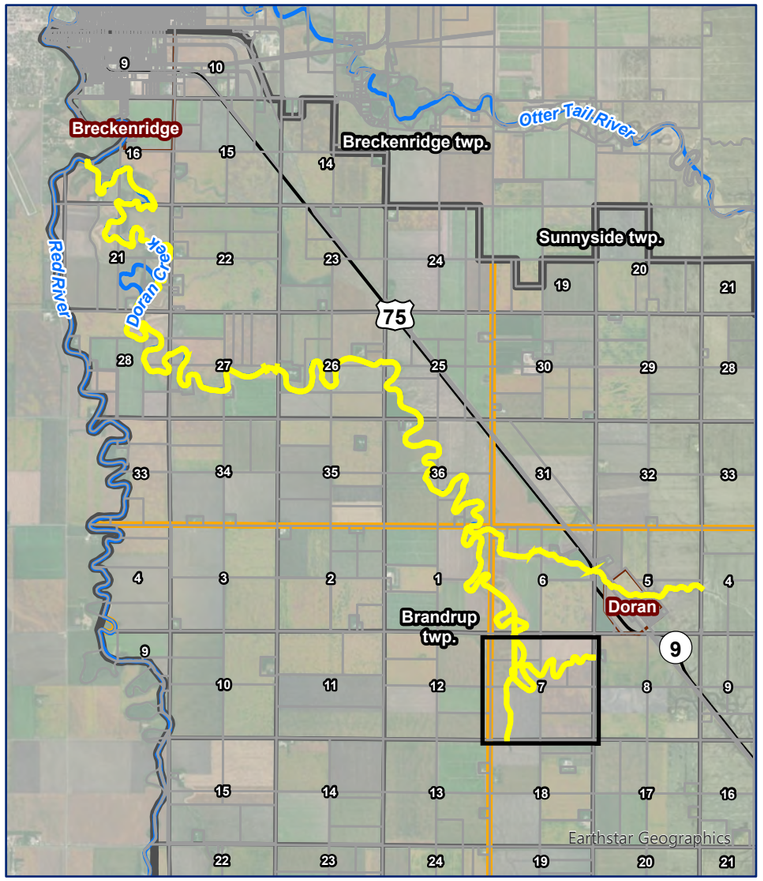

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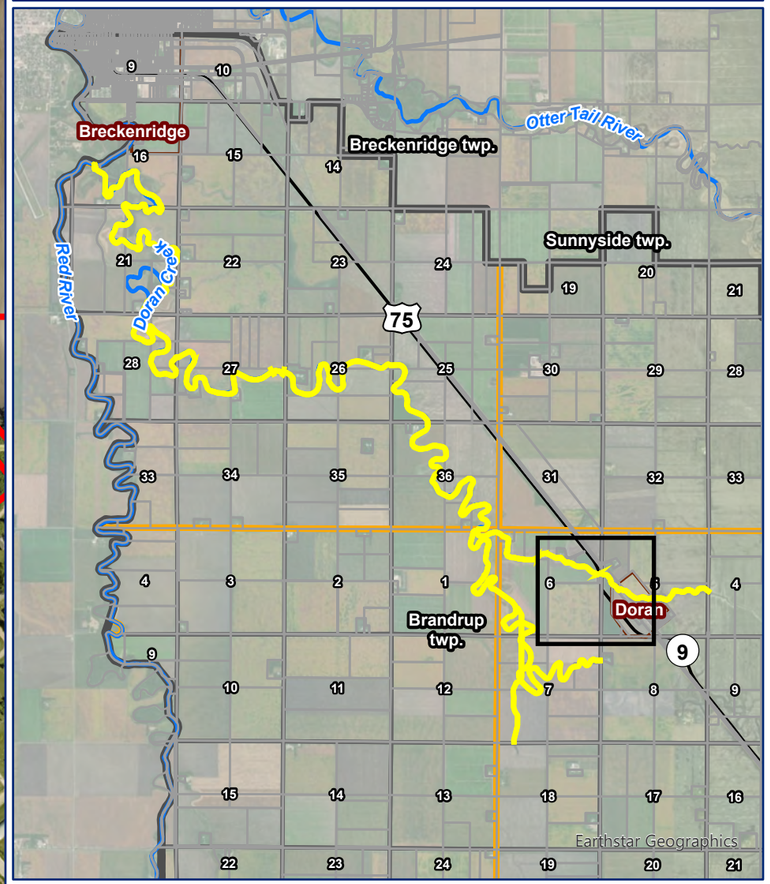

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Doran Creek Stream Rehabilitation

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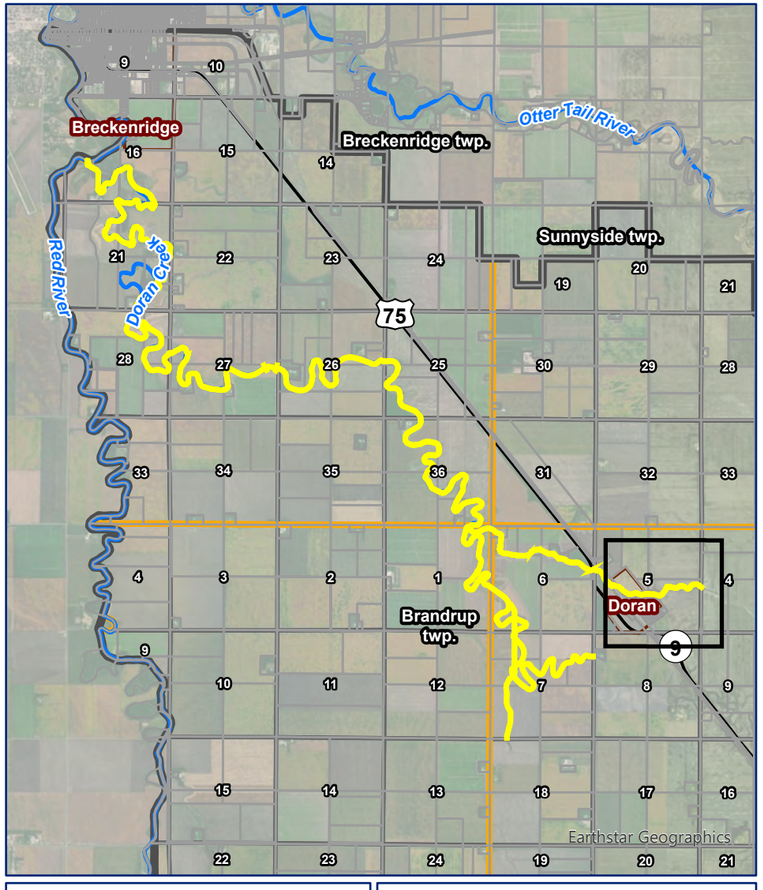

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Doran Creek Stream Rehabilitation

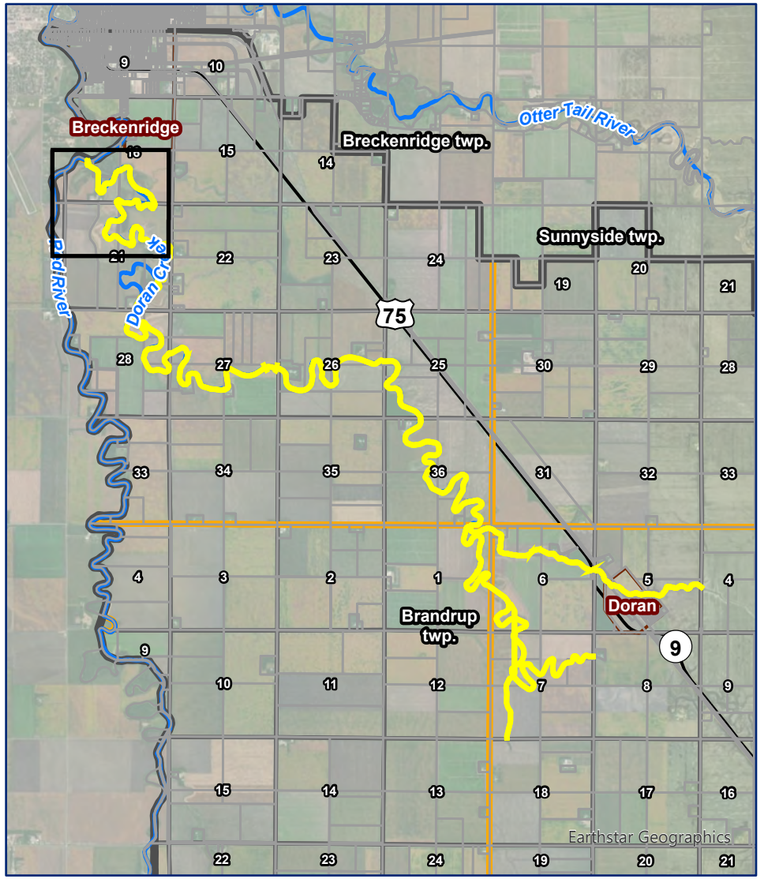
Figure 13: MPCA WIMN Sites

Legend

- Doran Creek Project Area

WIMN Sites

- Air Quality
- Environmental Review
- Feedlots
- Hazardous Waste
- Investigation and Cleanup
- Multiple Programs
- SSTS
- Solid Waste
- Stormwater
- Tanks
- Water Quality



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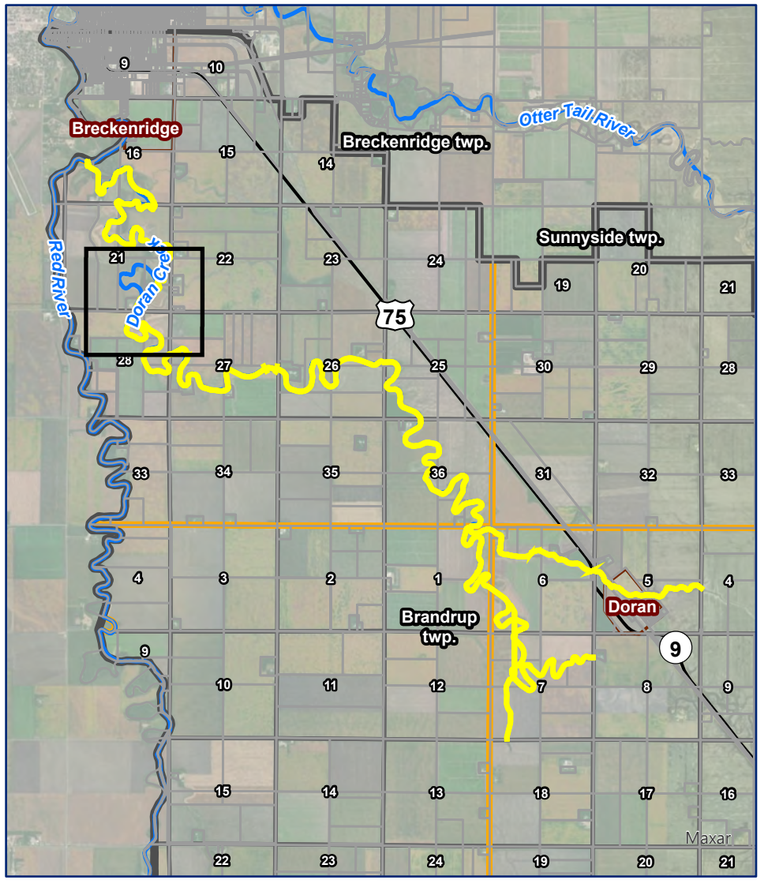

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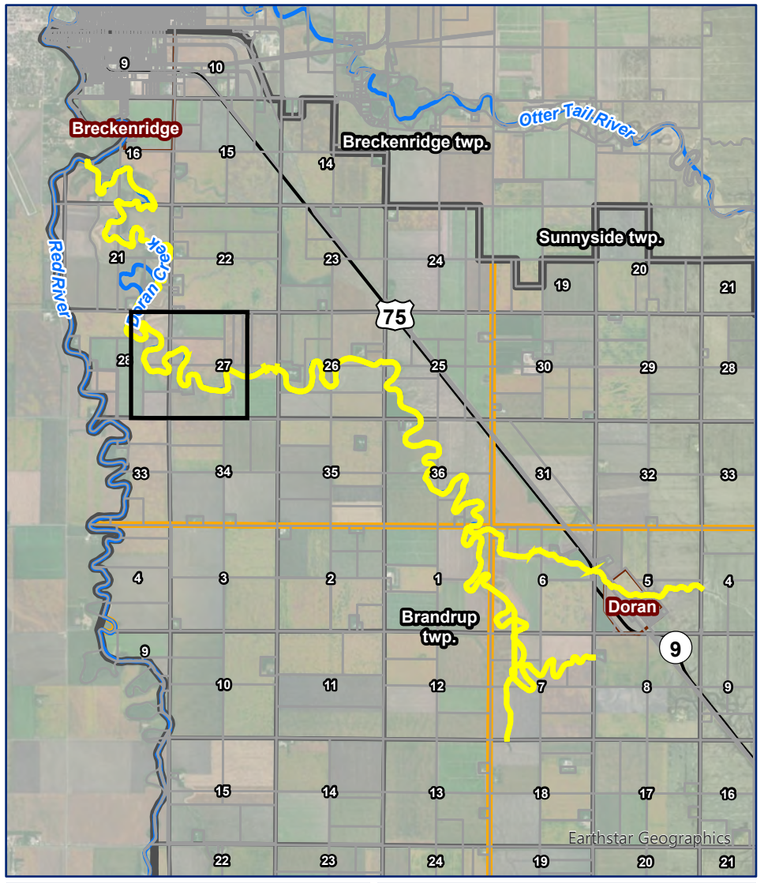

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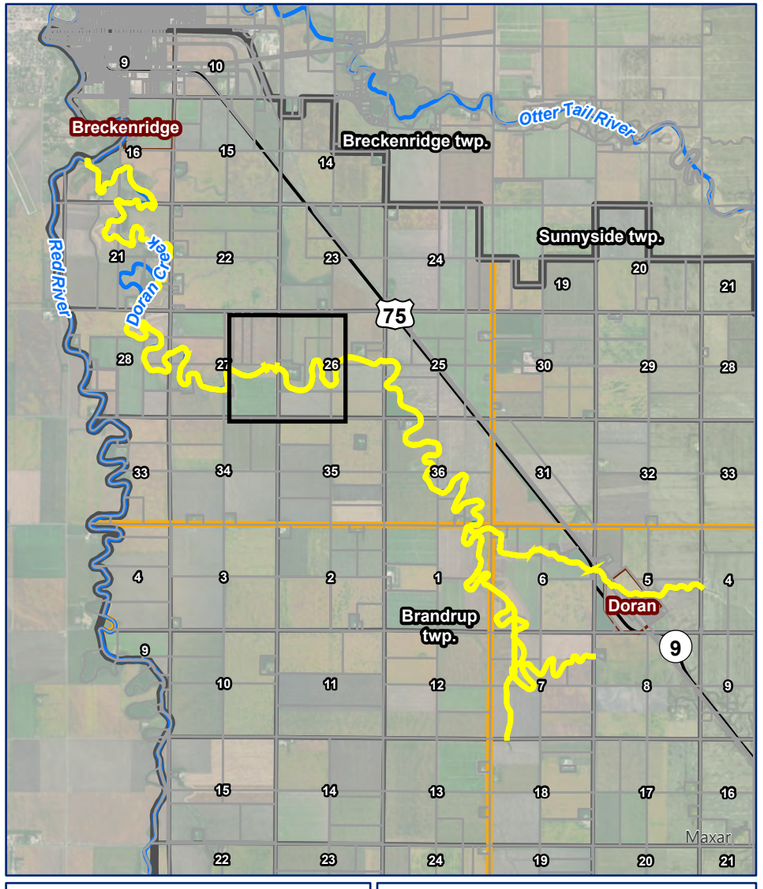

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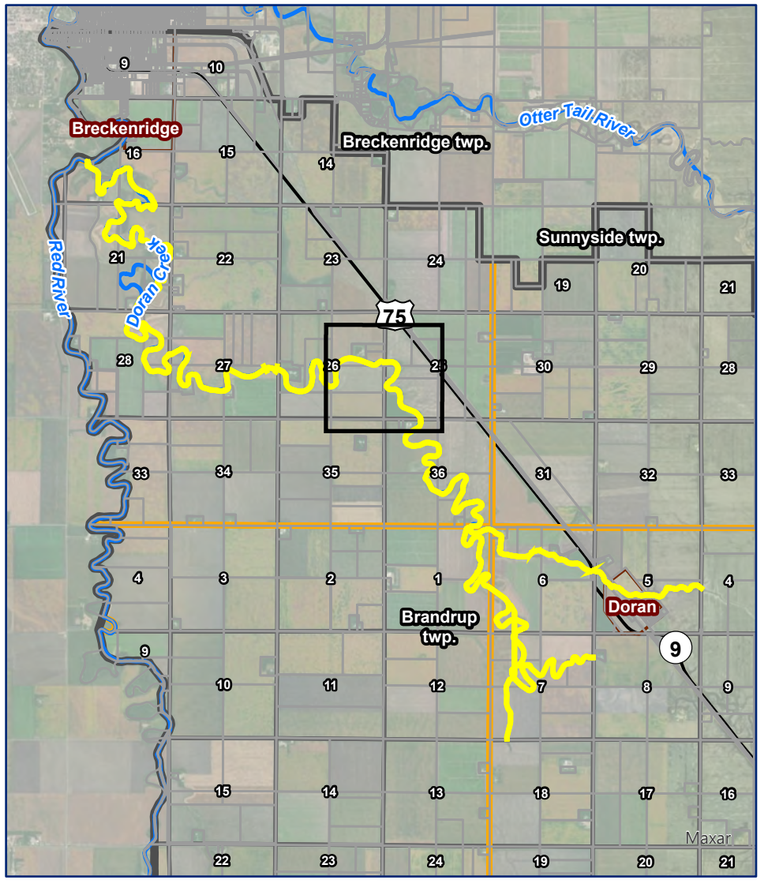
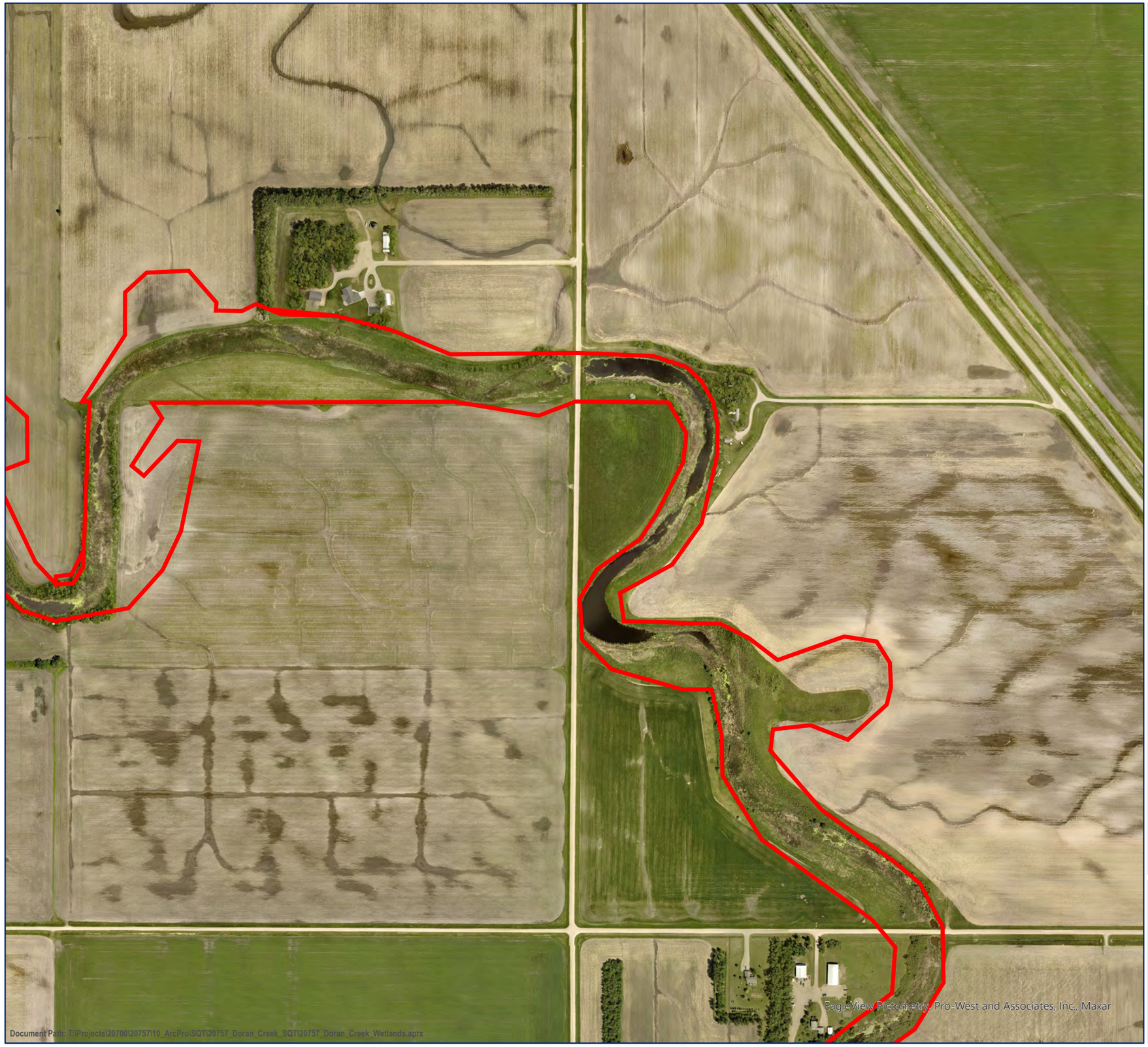
Legend

- Doran Creek Project Area

WIMN Sites

- Air Quality
- Environmental Review
- Feedlots
- Hazardous Waste
- Investigation and Cleanup
- Multiple Programs
- SSTS
- Solid Waste
- Stormwater
- Tanks
- Water Quality





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Bois de Sioux Watershed District

moore engineering, inc.

Doran Creek Stream Rehabilitation

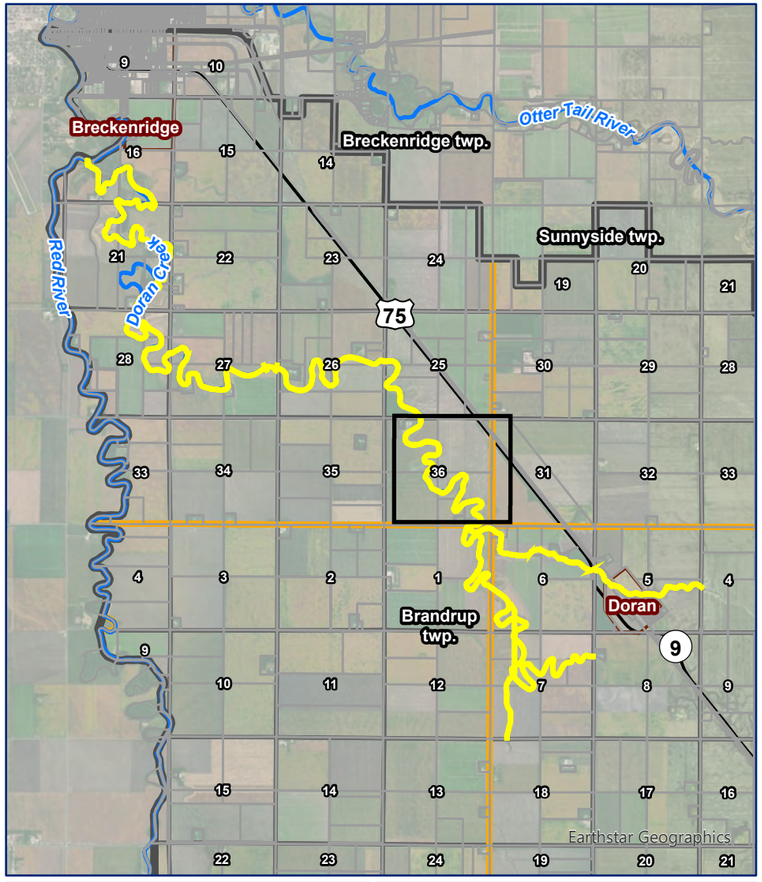
Figure 13: MPCA WIMN Sites

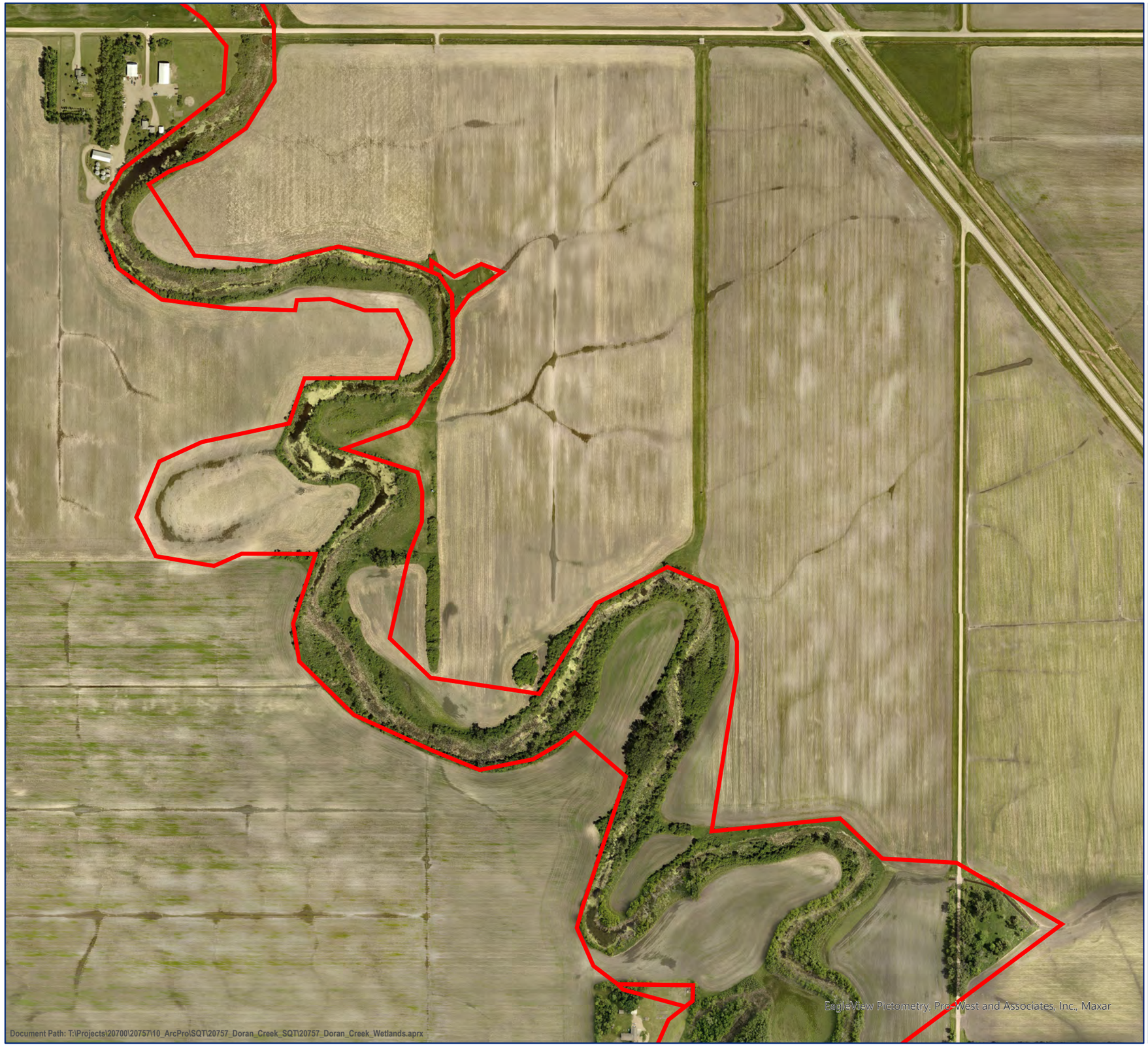
Legend

- Doran Creek Project Area

WIMN Sites

- Air Quality
- Environmental Review
- Feedlots
- Hazardous Waste
- Investigation and Cleanup
- Multiple Programs
- SSTS
- Solid Waste
- Stormwater
- Tanks
- Water Quality





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Bois de Sioux Watershed District

moore engineering, inc.

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Doran Creek Stream Rehabilitation

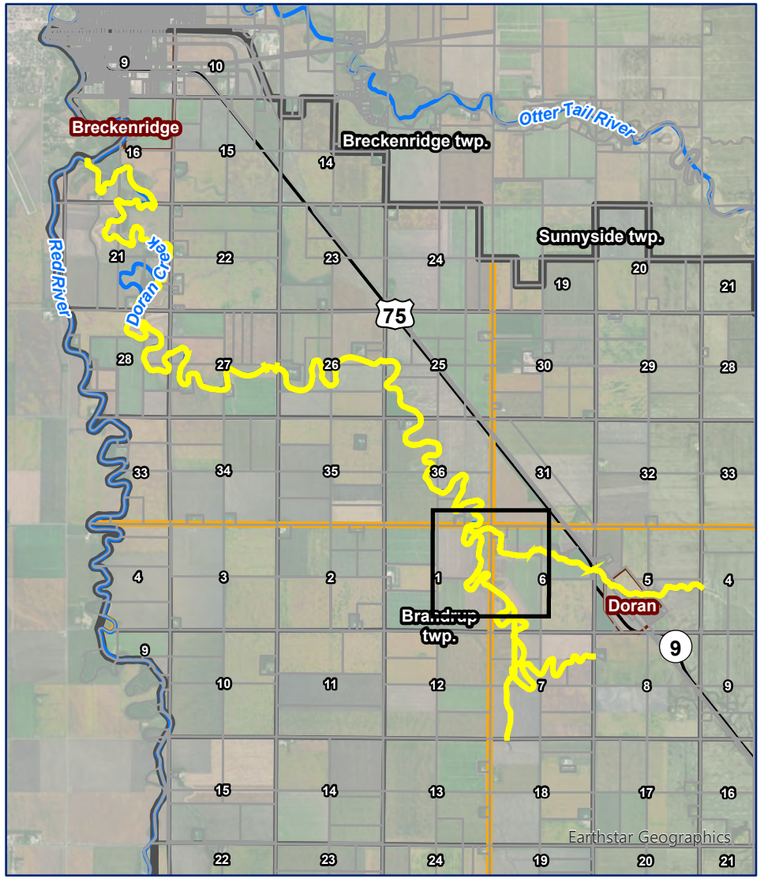
Figure 13: MPCA WIMN Sites

Legend

- Doran Creek Project Area

WIMN Sites

- Air Quality
- Environmental Review
- Feedlots
- Hazardous Waste
- Investigation and Cleanup
- Multiple Programs
- SSTS
- Solid Waste
- Stormwater
- Tanks
- Water Quality



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Bois de Sioux Watershed District

moore engineering, inc.

Doran Creek Stream Rehabilitation

Figure 13: MPCA WIMN Sites

Legend

- Doran Creek Project Area

WIMN Sites

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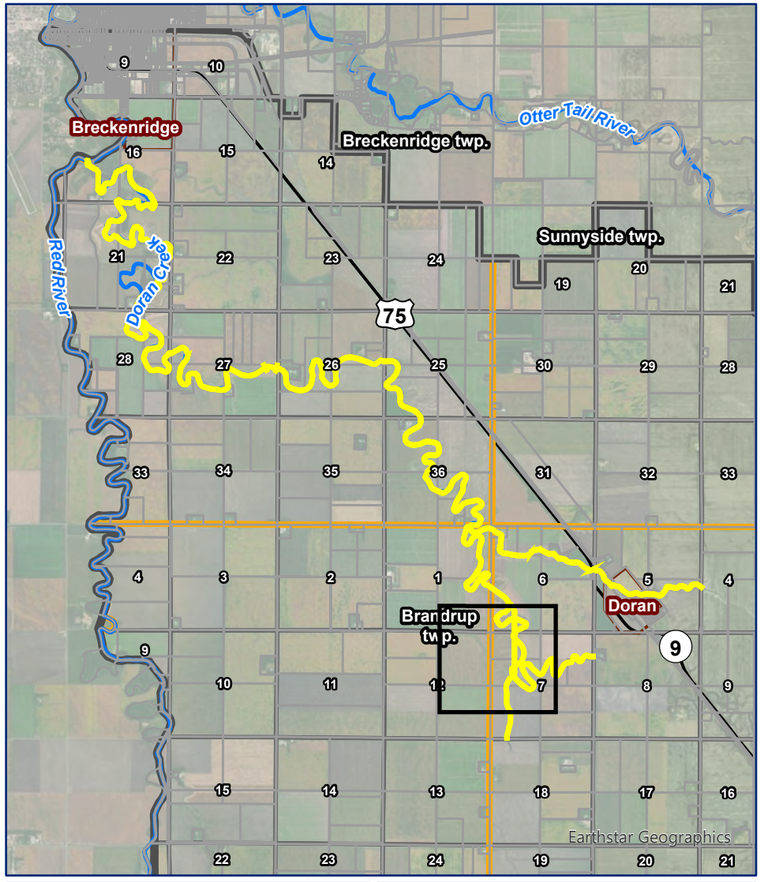
- SSTS
- Solid Waste
- Stormwater
- Tanks
- Water Quality



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Bois de Sioux Watershed District

moore engineering, inc.

Doran Creek Stream Rehabilitation

Figure 13: MPCA WIMN Sites

Legend

- Doran Creek Project Area

WIMN Sites

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- Multiple Programs
- SSTS
- Solid Waste
- Stormwater
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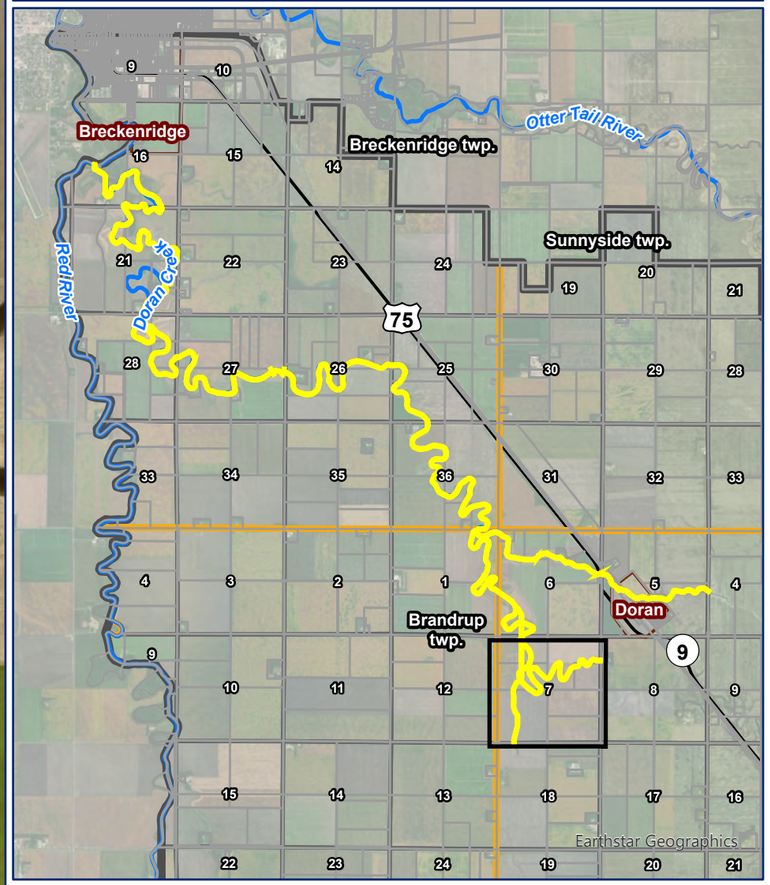

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Bois de Sioux Watershed District

moore engineering, inc.

Doran Creek Stream Rehabilitation

Figure 13: MPCA WIMN Sites

Legend

- Doran Creek Project Area

WIMN Sites

- Air Quality
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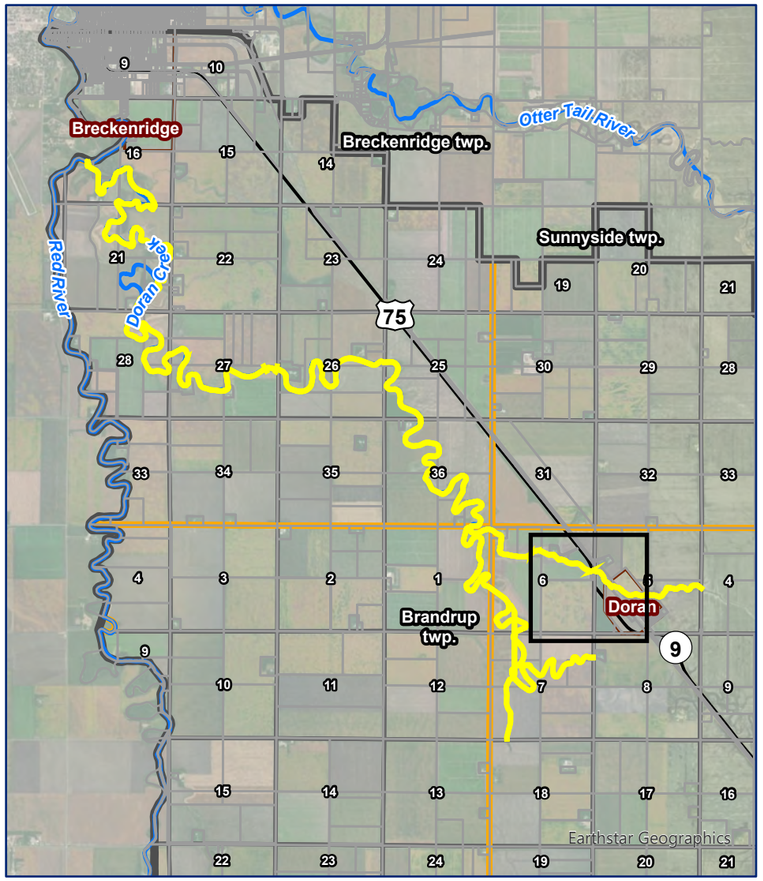
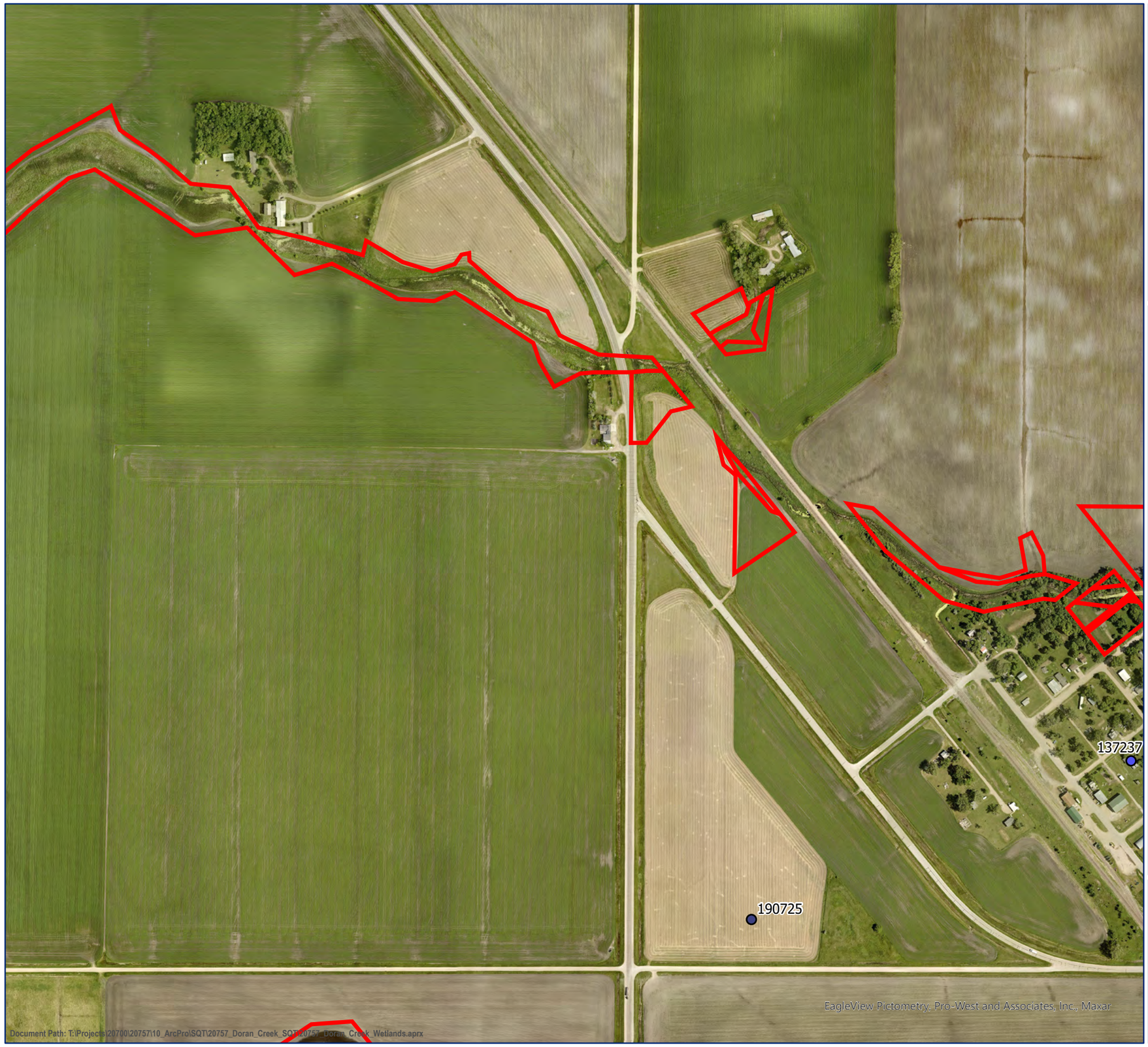
- Feedlots
- Hazardous Waste
- Investigation and Cleanup
- Multiple Programs
- SSTS
- Solid Waste
- Stormwater
- Tanks
- Water Quality





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Bois de Sioux Watershed District

moore engineering, inc.

Doran Creek Stream Rehabilitation

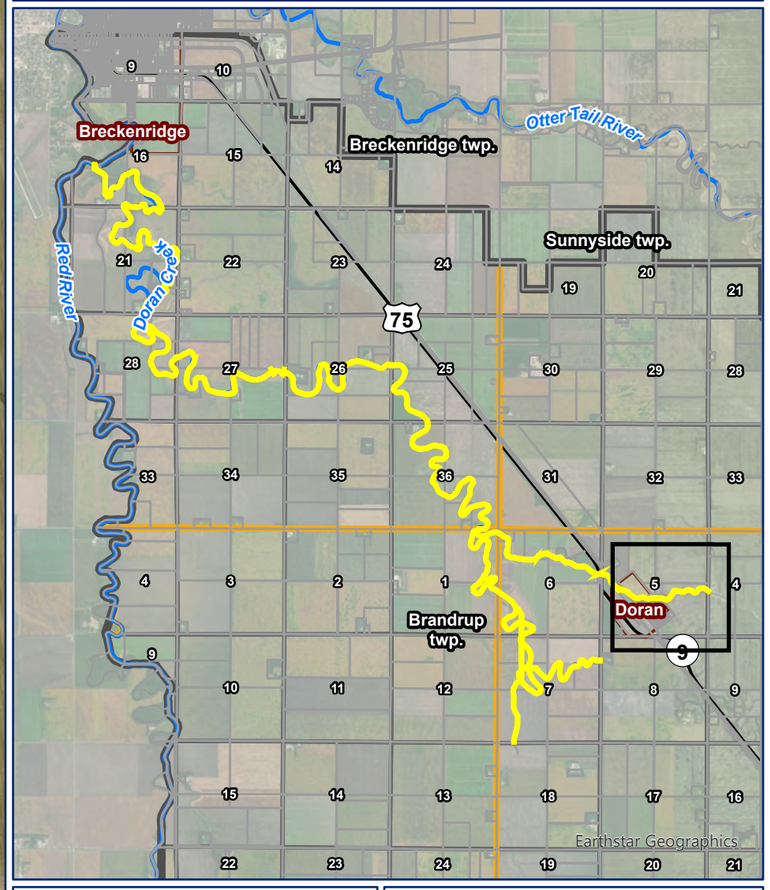
Figure 13: MPCA WIMN Sites

Legend

- Doran Creek Project Area

WIMN Sites

- Air Quality
- Environmental Review
- Feedlots
- Hazardous Waste
- Investigation and Cleanup
- Multiple Programs
- SSTS
- Solid Waste
- Stormwater
- Tanks
- Water Quality



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Bois de Sioux Watershed District

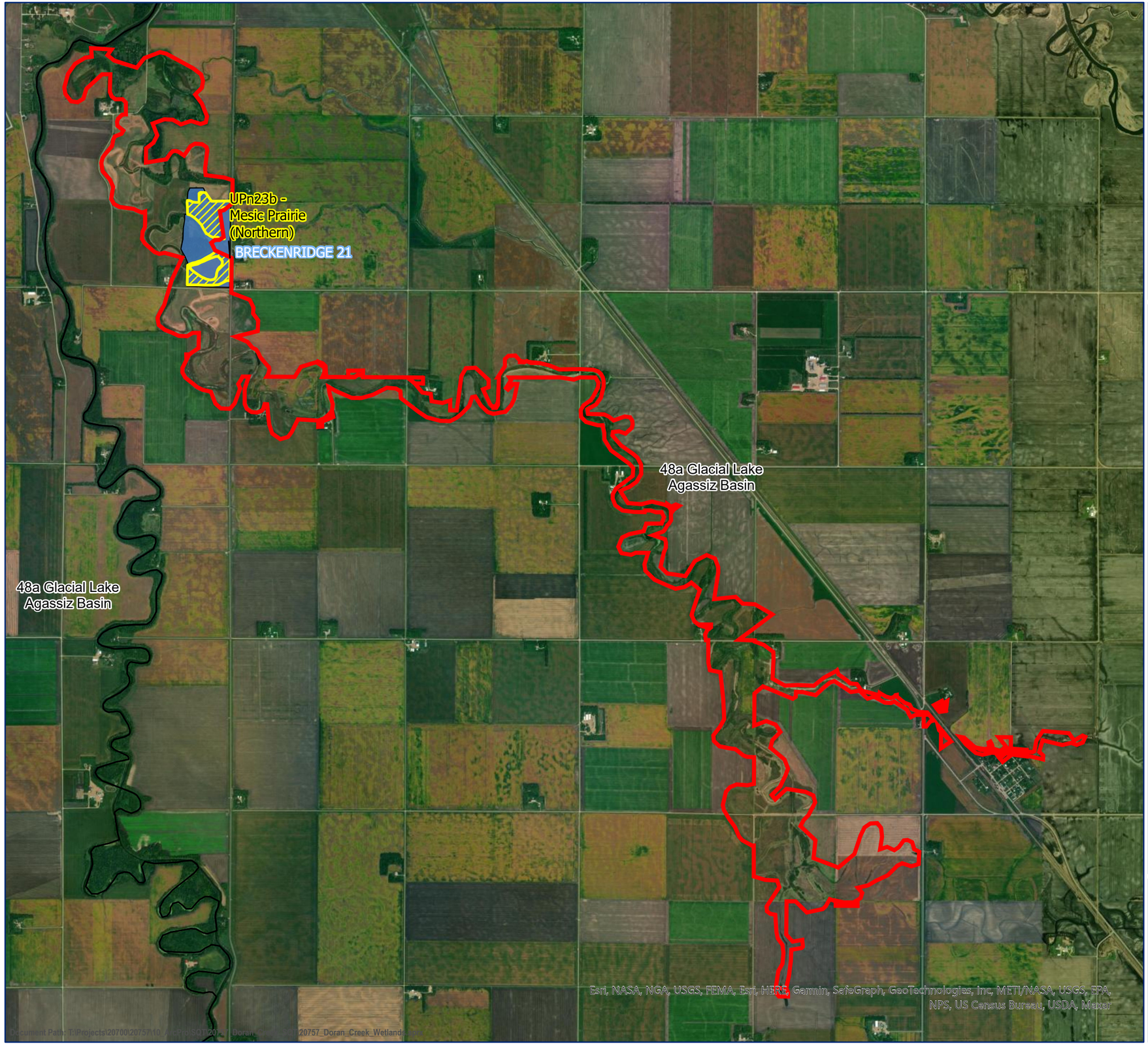
moore engineering, inc.

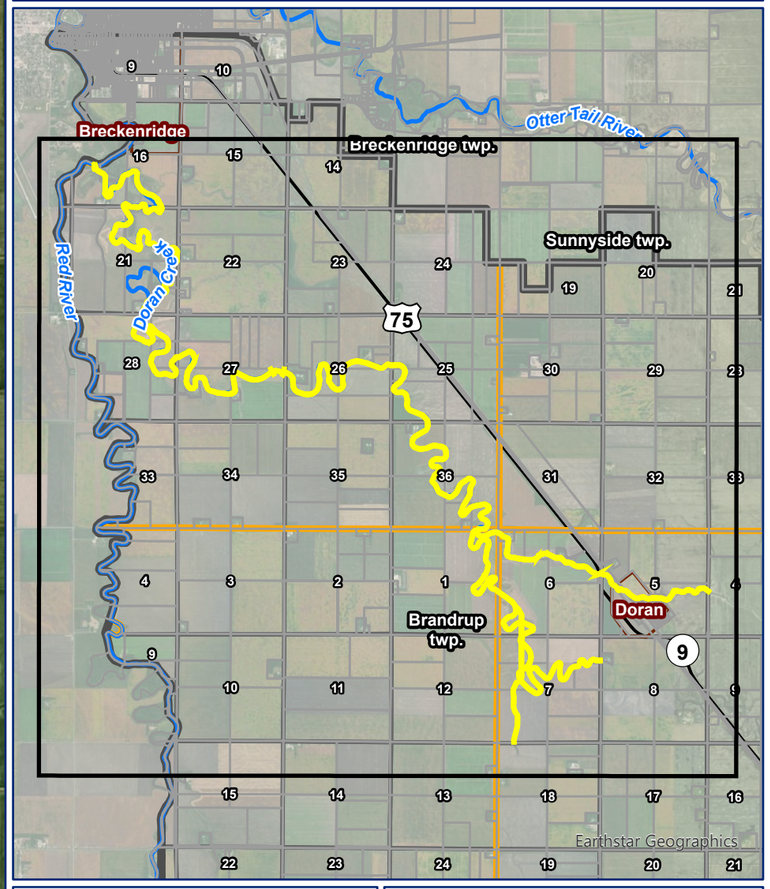
Doran Creek Stream Rehabilitation

Figure 14: Ecological Data

Legend

- Doran Creek Project Area
- United States EPA Ecoregions of the U.S. _ Level IV
- DNR Native Plant Communities
- MCBS Sites of Biodiversity Significance





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Feet

Bois de Sioux
Watershed District

moore
engineering, inc.

Attachment 1
Well Log Reports

Minnesota Unique Well Number

113678

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031

Entry Date 07/03/1991
Update Date 03/24/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
LANGSETH,	132	47	W	16	CDCCAD

Elevation 961 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W RR 2 BRECKENRIDGE MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	25	YELLOW	SOFT
CLAY	25	65	BLUE	SOFT
SAND LENS	65	90	GRAY	MEDIUM
CLAY	90	210	BLUE	MEDIUM
CLAY	210	240	BLUE	HARD
CLAY	240	262	BLUE	HARD
SAND LENS	262	270	WHITE	HARD

Remarks

Well Depth	Depth Completed	Date Well Completed
270 ft.	270 ft.	06/26/1979

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Threaded
Drive Shoe? Yes ☒ No ☐ **Above/Below** 1 ft.

Casing Diameter		Weight	
4	in. To 264 ft.	11	lbs./ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
3 in.	12	6 ft.	262 ft.	270 ft.

Static Water Level
20 ft. land surface Measure 06/26/1979

Pumping Level (below land surface)

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
cuttings	0	0 ft.	ft.
bentonite	0	0 ft.	ft.

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 06/28/1979
Manufacturer's name GOULDS
Model Number 25SL HP 1 Volt 230
Length of drop pipe 160 ft Capacity 25 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock Cretaceous undiff. Aquifer
Last Strat Cretaceous undiff. Depth to Bedrock 262 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - NAD83, Zone 15, Meters X 223219 Y 5126982
Unique Number Verification Information from Input Date 09/21/1994

Angled Drill Hole

Well Contractor
Falk Bros Well Co. 91204 FALK, J.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

113691

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031

Entry Date 04/17/1988
Update Date 06/02/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
LARSON,	131	47	W	13	DADDAC

Elevation 971 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W RR 1 CAMPBELL MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	1	BLACK	SOFT
CLAY	1	15	YELLOW	SOFT
CLAY	15	48	BLUE	MEDIUM
SAND LENS	48	50	GRAY	SOFT
SHALE	50	135	BLACK	HARD
SHALE & ROCKS	135	225	BLUE	MEDIUM
SAND LENS	225	250	WHITE	HARD

Remarks
PLASTIC CASING.

Well Depth 250 ft. **Depth Completed** 250 ft. **Date Well Completed** 08/12/1985

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☒ No ☐ **Above/Below** 1 ft.

Casing Diameter		Weight
4	in. To 236 ft.	lbs./ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
3 in.	10	8 ft.	236 ft.	244 ft.

Static Water Level
2 ft. land surface Measure 08/12/1985

Pumping Level (below land surface)

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
cuttings	0	10 ft.	30 ft.
bentonite	0	30 ft.	230 ft.

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 08/12/1985
Manufacturer's name PIONEER
Model Number A1012C HP 0.5 Volt 230
Length of drop pipe 100 ft Capacity 12 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock Cretaceous undiff. Aquifer Cretaceous,
Last Strat Cretaceous undiff. Depth to Bedrock 225 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - NAD83, Zone 15, Meters X 228708 Y 5117454
Unique Number Verification Plat Book Input Date 09/21/1994

Angled Drill Hole

Well Contractor
FALK, J.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Well Index Report **113691** Printed on 04/19/2023
HE-01205-15

Minnesota Unique Well Number

129748

County Wilkin
Quad Doran
Quad ID 202B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/08/1991
Update Date 02/14/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
VALLEY	131	46	W	5	BDADCA

Elevation 976 ft. **Elev. Method** Calc from DEM (USGS 7.5 min or equiv.)

Address

C/W B.N.RIGHT OF WAY DORAN MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	43	YELLOW	M.HARD
CLAY & GRAVEL &	43	68	GRAY	HARD
SANDY CLAY	68	73	GRAY	M.SOFT
WATER SAND	73	80	GRAY	SOFT

Remarks

Well Depth 80 ft. **Depth Completed** 80 ft. **Date Well Completed** 03/22/1978

Drill Method Jetted **Drill Fluid**

Use industrial **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Threaded

Drive Shoe? Yes ☐ No ☒ **Above/Below** 1 ft.

Casing Diameter 2 in. To 68 ft. **Weight** 3.75 lbs./ft.

Open Hole From 68 ft. To 80 ft.

Screen? ☐ **Type** **Make**

Static Water Level

3 ft. land surface Measure 03/22/1978

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☒ 12 in. above grade

☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☐ Yes ☒ No ☐ Not Specified

Nearest Known Source of Contamination

54 feet Northwes Direction Septic tank/drain field Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☒ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer Quat. buried

Last Strat sand-gray Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)

System UTM - NAD83, Zone 15, Meters X 231187 Y 5120289

Unique Number Verification Information from Input Date 09/21/1994

Angled Drill Hole

Well Contractor

Vorwerk Well Co. 84092 VORWERK, P.

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

129749

County Wilkin
Quad Doran
Quad ID 202B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/17/1988
Update Date 06/02/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
SEGOR, GREG	131	46	W	5	DBCBDD

Elevation 971 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	12	YELLOW	
CLAY & GRAVEL	12	36		
CLAY	36	74	GRAY	
CLAY	74	79	GRAY	SOFT
SAND	79	94	GRAY	

Remarks

WELL FLOWED.

Well Depth 94 ft. **Depth Completed** 94 ft. **Date Well Completed** 03/17/1978

Drill Method Jetted **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Threaded

Drive Shoe? Yes ☐ No ☐ **Above/Below** 1 ft.

Casing Diameter 2 in. To 79 ft. **Weight** lbs./ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** **Make** HOME MADE

Diameter	Slot/Gauze	Length	Set	
1.3 in.		16 ft.	78 ft.	94 ft.

Static Water Level

-5 ft. land surface Measure 03/17/1978

Pumping Level (below land surface)

-2 ft. hrs. Pumping at 8 g.p.m.

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade

☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☐ Yes ☒ No ☐ Not Specified

Nearest Known Source of Contamination

75 feet Southwes Direction Septic tank/drain field Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP 0 Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer Quat. buried

Last Strat sand-gray Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)

System UTM - NAD83, Zone 15, Meters X 231334 Y 5120598

Unique Number Verification Information from Input Date 09/21/1994

Angled Drill Hole

Well Contractor

Vorwerk Well Co. 84092

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

175722

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/17/1988
Update Date 02/14/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
KLEIN, DAROLD	132	47	W	21	DCDCBC

Elevation 960 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W RR 2 BRECKENRIDGE MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	15	YELLOW	SOFT
CLAY	15	25	BLUE	SOFT
SAND LENS	25	60	GRAY	SOFT
SHALE	60	200	BLUE	HARD
SHALE	200	238	BLUE	HARD
SAND LENS	238	255	WHITE	MEDIUM

Remarks

Well Depth	Depth Completed	Date Well Completed
255 ft.	252 ft.	05/05/1982

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☒ No ☐ **Above/Below** 1 ft.

Casing Diameter	Weight	Hole Diameter
4 in. To 246 ft.	lbs./ft.	6.2 in. To 255 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
3 in.	20	6 ft.	246 ft.	252 ft.

Static Water Level
30 ft. land surface Measure 05/06/1983

Pumping Level (below land surface)

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount		From	To
cuttings	0		0 ft.	ft.
neat cement	2	Cubic yards	0 ft.	ft.

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 05/09/1982
Manufacturer's name GOULDS
Model Number 25EL HP 1 Volt 230
Length of drop pipe 140 ft Capacity 25 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock Cretaceous undiff. Aquifer
Last Strat Cretaceous undiff. Depth to Bedrock 238 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - NAD83, Zone 15, Meters X 223692 Y 5125340
Unique Number Verification Information from Input Date 09/21/1994

Angled Drill Hole

Well Contractor
Falk Bros Well Co. 91204 FALK, J.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

136397

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/17/1988
Update Date 02/14/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
RICHARDS,	132	47	W	22	CCCCCB

Elevation 965 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W BRECKENRIDGE MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	2	BLACK	SOFT
CLAY	2	28	YELLOW	SOFT
CLAY	28	160	GRAY	SOFT
SHALE	160	200	BLUE	MEDIUM
SHALE	200	236	BLUE	MEDIUM
SAND	236	241	WHITE	SOFT

Remarks

Well Depth 241 ft. **Depth Completed** 241 ft. **Date Well Completed** 08/02/1976

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Threaded
Drive Shoe? Yes ☐ No ☒ **Above/Below** 1 ft.

Casing Diameter **Weight**
4 in. To 236 ft. 11 lbs./ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
2 in.	10	4 ft.	236 ft.	240 ft.

Static Water Level
15 ft. land surface Measure 08/02/1976

Pumping Level (below land surface)
100 ft. 2 hrs. Pumping at 20 g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
bentonite	0	8 ft.	230 ft.

Nearest Known Source of Contamination
75 feet Northeas Direction Septic tank/drain field Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 08/17/1976
Manufacturer's name RED JACKET
Model Number 50BVC HP 0.5 Volt 230
Length of drop pipe 147 ft Capacity 10 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock Aquifer Quat. buried
Last Strat sand-white Depth to Bedrock ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - NAD83, Zone 15, Meters X 224304 Y 5125284
Unique Number Verification Information from Input Date 09/21/1994

Angled Drill Hole

Well Contractor

Licensee Business	Lic. or Reg. No.	Name of Driller
Robertson Well Co.	26144	WAGNER, W.

Minnesota Unique Well Number

144711

County Wilkin
Quad Doran
Quad ID 202B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 01/18/1991
Update Date 06/02/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
BURHAUS,	131	46	W	5	CADCAC

Elevation 975 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W DORAN MN 56530

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	2	BLACK	
CLAY	2	40	YELLOW	SOFT
CLAY & ROCKS	40	68	GRAY	HARD
SANDY CLAY	68	73	GRAY	SOFT
WATER SAND	73	80	GRAY	HARD

Remarks

PVC CASING

Well Depth 80 ft. **Depth Completed** 80 ft. **Date Well Completed** 07/16/1987

Drill Method **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? **Yes** ☐ **No** ☐ **From** **To**

Casing Type Single casing **Joint**

Drive Shoe? **Yes** ☐ **No** ☐ **Above/Below** 0 ft.

Casing Diameter **Weight**

4 in. To 68 ft. lbs./ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set
2 in.	25	5 ft.	75 ft. 80 ft.

Static Water Level

6 ft. land surface Measure 07/16/1987

Pumping Level (below land surface)

7 ft. 2 hrs. Pumping at 6 g.p.m.

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Nearest Known Source of Contamination

75 feet North Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP 0 Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer Quat. buried

Last Strat sand-gray Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)

System UTM - NAD83, Zone 15, Meters X 231159 Y 5120551

Unique Number Verification Input Date 09/21/1994

Angled Drill Hole

Well Contractor

Vorwerk Well Co. 84092 VORWERK, P.

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

175707

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/17/1988
Update Date 02/14/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
LEINER,	131	46	W	18	BCBCCA

Elevation 971 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W RR 1 CAMPBELL MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	10	YELLOW	SOFT
SHALE	10	50	BLUE	SOFT
SHALE	50	120	BLUE	HARD
SHALE	120	200	BLUE	MEDIUM
SHALE	200	225	BLUE	MEDIUM
SAND LENS	225	249	WHITE	MEDIUM

Remarks

Well Depth 249 ft. **Depth Completed** 246 ft. **Date Well Completed** 07/31/1980

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☒ No ☐ **Above/Below** 0 ft.

Casing Diameter	Weight	Hole Diameter
4 in. To 236 ft.	lbs./ft.	6 in. To 249 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
3 in.	10	10 ft.	236 ft.	246 ft.

Static Water Level

4 ft. land surface Measure 07/31/1980

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount		From	To
cuttings	0		0 ft.	ft.
neat cement	2	Cubic yards	0 ft.	236 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 08/06/1980

Manufacturer's name GOULDS

Model Number 2S51 HP 1 Volt 230

Length of drop pipe 160 ft Capacity 30 g.p. Typ Submersible

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Cretaceous undiff. Aquifer Cretaceous,
Last Strat Cretaceous undiff. Depth to Bedrock 225 ft
Located by Minnesota Geological Survey
Locate Method Digitization (Screen) - Map (1:24,000) (15 meters or
System UTM - NAD83, Zone 15, Meters X 228853 Y 5117992
Unique Number Verification Name on mailbox Input Date 09/21/1994

Angled Drill Hole

Well Contractor

Falk Bros Well Co. 91204 FALK, J.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

175722

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/17/1988
Update Date 02/14/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
KLEIN, DAROLD	132	47	W	21	DCDCBC

Elevation 960 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W RR 2 BRECKENRIDGE MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	15	YELLOW	SOFT
CLAY	15	25	BLUE	SOFT
SAND LENS	25	60	GRAY	SOFT
SHALE	60	200	BLUE	HARD
SHALE	200	238	BLUE	HARD
SAND LENS	238	255	WHITE	MEDIUM

Remarks

Well Depth	Depth Completed	Date Well Completed
255 ft.	252 ft.	05/05/1982

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☒ No ☐ **Above/Below** 1 ft.

Casing Diameter	Weight	Hole Diameter
4 in. To 246 ft.	lbs./ft.	6.2 in. To 255 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
3 in.	20	6 ft.	246 ft.	252 ft.

Static Water Level
30 ft. land surface Measure 05/06/1983

Pumping Level (below land surface)

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount		From	To
cuttings	0		0 ft.	ft.
neat cement	2	Cubic yards	0 ft.	ft.

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 05/09/1982
Manufacturer's name GOULDS
Model Number 25EL HP 1 Volt 230
Length of drop pipe 140 ft Capacity 25 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock Cretaceous undiff. Aquifer
Last Strat Cretaceous undiff. Depth to Bedrock 238 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - NAD83, Zone 15, Meters X 223692 Y 5125340
Unique Number Verification Information from Input Date 09/21/1994

Angled Drill Hole

Well Contractor
Falk Bros Well Co. 91204 FALK, J.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

221753

County Wilkin
Quad Doran
Quad ID 202B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/17/1988
Update Date 06/02/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
DORAN	131	46	W	5	CDDCA

Elevation 975 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	20	GRAY	
CLAY	20	45	BLUE	
SAND & WATER	45	47		

Remarks

WELL FLOWED

Well Depth 47 ft. **Depth Completed** 47 ft. **Date Well Completed** 10/01/1943

Drill Method **Drill Fluid**

Use other (specify in remarks) **Status** Active

Well Hydrofractured? **Yes** ☐ **No** ☐ **From** **To**

Casing Type Single casing **Joint**

Drive Shoe? **Yes** ☒ **No** ☐ **Above/Below** 0 ft.

Casing Diameter **Weight**

6 in. To 46 ft. lbs./ft.

Open Hole From 46 ft. To 47 ft.

Screen? ☐ **Type** **Make**

Static Water Level

0 ft. land surface Measure 10/01/1943

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade

☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☐ Yes ☐ No ☒ Not Specified

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP 0 Volt

Length of drop pipe ft Capacity 4 g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer Quat. buried

Last Strat sand Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)

System UTM - NAD83, Zone 15, Meters X 231205 Y 5120140

Unique Number Verification Other, note in Input Date 09/21/1994

Angled Drill Hole

Well Contractor

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

221767

County Wilkin
Quad Doran
Quad ID 202B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/17/1988
Update Date 06/02/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
LAKEN, PALMER	131	46	W	5	CACDAB

Elevation 972 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	20	YELLOW	
CLAY	20	45	BLUE	
SAND & GRAVEL NO	45	55		
SAND SHALE	55	73	GRAY	
QUICK SAND	73	85		
HEAVY SAND	85	90	GRAY	
GRAVEL	90	93		

Remarks

Well Depth 93 ft. **Depth Completed** 93 ft. **Date Well Completed** 00/00/1955

Drill Method Cable Tool **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**

Drive Shoe? Yes ☐ No ☐ **Above/Below** 0 ft.

Casing Diameter **Weight**

3 in. To 89 ft. lbs./ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** **Make**

Diameter	Slot/Gauze	Length	Set	
3 in.		3 ft.	89 ft.	92 ft.

Static Water Level

-3 ft. land surface Measure 00/00/1929

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☐ Yes ☐ No ☒ Not Specified

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP 0 Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer Quat. buried

Last Strat gravel (+larger) Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)

System UTM - NAD83, Zone 15, Meters X 231051 Y 5120557

Unique Number Verification Input Date 09/21/1994

Angled Drill Hole

Well Contractor

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

224266

County Wilkin
Quad Doran
Quad ID 202B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 01/01/1980
Update Date 07/24/2019
Received Date

Well Name	Township	Range	Dir	Section	Subsection
RRVD 23	131	46	W	6	ACBBAB

Elevation 970 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
SILTY TILL &	0	12	YEL/BRN	
SILTY TILL &	12	24	GRAY	
GRAVEL	24	43		
TILL & DOMINANT	43	56	GRAY	
GRAVEL	56	69		
TILL & DOMINANT	69	97	GRAY	
SILTY TILL &	97	110	DK. GRY	
GRAVEL	110	115		
SILTY TILL &	115	142	DK. GRY	
GRAVEL OF IGN.	142	154		
SILTY TILL &	154	204	DK. GRY	
VERY CLAYEY TILL &	204	238		
COARSE TO FINE	238	254		
SHALE &	254	300	DK. GRY	
WHITE TO LIGHT GRAY	300	304	WHT/GRY	
KAOL. PISOL. CLAY &	304	370	WHT/GRY	
INSITU HIGHLY	370	395		
MEDIUM GRAINED	395	418	BLU/GRY	

Remarks

CORED FROM 280-295, 305-315, 398-408, AND 408-418 FT.
W.L. MOORE178 PRELIMARY REPORT. CORE + GAMMA LOG. M.G.S. NO.1483.

GAMMA LOGGED 9/16/77.

Well Depth	Depth Completed	Date Well Completed
418 ft.	418 ft.	09/19/1977

Drill Method **Drill Fluid**

Use test well **Status** Sealed

Well Hydrofractured? **Yes** ☐ **No** ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? **Yes** ☐ **No** ☐ **Above/Below** 0 ft.

Casing Diameter **Weight**
6 in. To 178 ft. lbs./ft.

Open Hole From ft. To ft.

Screen? ☐ **Type** **Make**

Static Water Level

Pumping Level (below land surface)

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☐ Yes ☒ No ☐ Not Specified

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name
Model Number HP 0 Volt
Length of drop pipe ft Capacity g.p. Typ

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock Cretaceous undiff. Aquifer
Last Strat Precambrian crystaline Depth to Bedrock 254 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - NAD83, Zone 15, Meters X 229957 Y 5121340
Unique Number Verification Other, note in Input Date 09/21/1994

Angled Drill Hole

Well Contractor

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Well Index Report | **224266** | Printed on 04/19/2023 HE-01205-15

Minnesota Unique Well Number

243412

County Wilkin
Quad Doran
Quad ID 202B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 05/30/1991
Update Date 06/02/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
DORAN	131	46	W	5	CDDABA

Elevation 975 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	1		
CLAY	1	20	YELLOW	
CLAY	20	45	BLUE	
SAND & GRAVEL NO	45	55		
SANDY SHALE	55	73	GRAY	
QUICK SAND	73	85		
HEAVEING HEAVY	85	90	GRAY	
GRAVEL	90	93		

Remarks

WELL FLOWED AT 4 GPM.

Well Depth 93 ft. **Depth Completed** 93 ft. **Date Well Completed** 09/30/1924

Drill Method **Drill Fluid**

Use commercial **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**

Drive Shoe? Yes ☒ No ☐ **Above/Below** 0 ft.

Casing Diameter **Weight**

6 in. To 93 ft. lbs./ft.

Open Hole From 0 ft. To 93 ft.

Screen? ☐ **Type** **Make**

Static Water Level

0 ft. land surface Measure 09/30/1924

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade

☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☐ Yes ☐ No ☒ Not Specified

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP 0 Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer Quat. buried

Last Strat gravel (+larger) Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitization (Screen) - Map (1:24,000) (15 meters or

System UTM - NAD83, Zone 15, Meters X 231206 Y 5120256

Unique Number Verification Other, note in Input Date 06/02/2000

Angled Drill Hole

Well Contractor

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

416262

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 05/30/1991
Update Date 08/11/2020
Received Date

Well Name	Township	Range	Dir	Section	Subsection
WIENTZEMA,	132	47	W	35	AACCDA

Elevation 970 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W BRECKENRIDGE MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	1	BLACK	SOFT
CLAY	1	15	YELLOW	SOFT
CLAY	15	240	BLUE	MEDIUM
SAND LENS	240	243	GRAY	MEDIUM
ROCK	243	246		HARD
CLAY	246	260	BLUE	HARD
ROCK	260	263		HARD
SAND LENS	263	271	GRAY	MEDIUM

Remarks

Well Depth 271 ft. **Depth Completed** 270 ft. **Date Well Completed** 12/20/1987

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☒ No ☐ **Above/Below** 1 ft.

Casing Diameter	Weight	Hole Diameter
4 in. To 264 ft.	lbs./ft.	6.2 in. To 271 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set
3 in.	18	6 ft.	264 ft. 270 ft.

Static Water Level

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement	1 Cubic yards	15 ft.	35 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 12/21/1987

Manufacturer's name GOULDS

Model Number 25EL10412 HP 1 Volt 230

Length of drop pipe 140 ft Capacity 25 g.p. Typ Submersible

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer

Last Strat sand-gray Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)

System UTM - NAD83, Zone 15, Meters X 227047 Y 5123130

Unique Number Verification Other, note in Input Date 09/21/1994

Angled Drill Hole

Well Contractor

Falk Bros Well Co. 91204 FALK, V.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

416264

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 01/31/1991
Update Date 04/25/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
JIRAK, TIM	132	47	W	25	AADDBB

Elevation 971 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W BRECKENRIDGE MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	1	BLACK	SOFT
CLAY	1	15	YELLOW	SOFT
CLAY	15	55	BLUE	MEDIUM
SAND LENS	55	75	GRAY	MEDIUM
CLAY	75	200	BLUE	MEDIUM
CLAY	200	218	BLUE	MEDIUM
SAND LENS	218	245	WHITE	HARD

Remarks

Well Depth 245 ft. **Depth Completed** 240 ft. **Date Well Completed** 04/05/1988

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☐ No ☐ **Above/Below** 1 ft.

Casing Diameter	Weight	Hole Diameter
4 in. To 234 ft.	lbs./ft.	6.2 in. To 245 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
3 in.	12	6 ft.	234 ft.	240 ft.

Static Water Level

3 ft. land surface Measure 04/07/1988

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model 6PS

☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement	0	0 ft.	ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 04/11/1988

Manufacturer's name GOULDS

Model Number 25EL HP 1 Volt 230

Length of drop pipe 140 ft Capacity 25 g.p. Typ Submersible

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Cretaceous undiff. Aquifer
Last Strat Cretaceous undiff. Depth to Bedrock 218 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - NAD83, Zone 15, Meters X 229047 Y 5124684
Unique Number Verification Information from Input Date 09/21/1994

Angled Drill Hole

Well Contractor

FALK, J.

Licensee Business | Lic. or Reg. No. | Name of Driller

Minnesota Well Index Report | **416264** | Printed on 04/19/2023 HE-01205-15

Minnesota Unique Well Number

416277

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/08/1991
Update Date 02/14/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
BETSCH, LEIGH	132	47	W	33	ABCDCC

Elevation 961 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W RR 2 BRECKENRIDGE MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	1	BLACK	SOFT
CLAY	1	18	YELLOW	SOFT
CLAY	18	55	BLUE	MEDIUM
SAND LENS	55	105	GRAY	MEDIUM
CLAY	105	220	BLUE	MEDIUM
CLAY	220	242	BLUE	MEDIUM
SAND LENS	242	260	GRAY	MEDIUM

Remarks

Well Depth 260 ft. **Depth Completed** 255 ft. **Date Well Completed** 03/18/1990

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☐ No ☐ **Above/Below** 0 ft.

Casing Diameter	Weight	Hole Diameter
4 in. To 249 ft.	lbs./ft.	6.2 in. To 260 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set
3 in.	15	6 ft.	249 ft. 255 ft.

Static Water Level

6 ft. land surface Measure 03/19/1990

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer BAKER Model 6PS

☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount		From	To
neat cement	2	Cubic yards	20 ft.	230 ft.
cuttings	0.5	Cubic yards	230 ft.	260 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 03/21/1990

Manufacturer's name GOULDS

Model Number 7EH05412 HP 0.5 Volt 230

Length of drop pipe 100 ft Capacity 12 g.p. Typ Submersible

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer Quat. buried

Last Strat sand-gray Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)

System UTM - NAD83, Zone 15, Meters X 223514 Y 5123268

Unique Number Verification Information from Input Date 09/21/1994

Angled Drill Hole

Well Contractor

Falk Bros Well Co. 91204 FALK, J.

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

462459

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/08/1991
Update Date 03/24/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
LECHLEITER,	132	47	W	24	CCBBAD

Elevation 970 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W RR 2 BRECKENRIDGE MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	5	BLACK	SOFT
CLAY	5	55	BROWN	MEDIUM
DIRTY CLAYEY SAND	55	61	BROWN	SOFT
SHALE	61	166	BLUE	HARD
HARD ROCK LEDGE	166	171		HARD
TIGHT FINE SAND	171	250		SOFT

Remarks

Well Depth 250 ft. **Depth Completed** 250 ft. **Date Well Completed** 05/10/1990

Drill Method Non-specified Rotary **Drill Fluid** Water

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Welded
Drive Shoe? Yes ☐ No ☐ **Above/Below** 2 ft.

Casing Diameter	Weight	Hole Diameter
4 in. To 223 ft.	lbs./ft.	9 in. To 250 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** plastic **Make** TIMCO

Diameter	Slot/Gauze	Length	Set	
4 in.	12	15 ft.	223 ft.	248 ft.

Static Water Level

1 ft. land surface Measure 05/10/1990

Pumping Level (below land surface)

150 ft. 24 hrs. Pumping at 20 g.p.m.

Wellhead Completion

Pitless adapter manufacturer MAAS Model
☒ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement	0	10 ft.	50 ft.

Nearest Known Source of Contamination

120 feet North Direction Septic tank/drain field Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 05/11/1990
Manufacturer's name JACUZZI
Model Number 7BS HP 0.75 Volt 220
Length of drop pipe 200 ft Capacity 20 g.p. Typ Submersible

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Cretaceous undiff. Aquifer
Last Strat Cretaceous undiff. Depth to Bedrock 171 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - NAD83, Zone 15, Meters X 227632 Y 5125474
Unique Number Verification Information from Input Date 09/21/1994

Angled Drill Hole

Well Contractor

Licensee Business	Lic. or Reg. No.	Name of Driller
Boart Longyear Drilling	49588	SWANDAL, S.

Minnesota Unique Well Number

113691

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031

Entry Date 04/17/1988
Update Date 06/02/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
LARSON,	131	47	W	13	DADDAC

Elevation 971 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W RR 1 CAMPBELL MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	1	BLACK	SOFT
CLAY	1	15	YELLOW	SOFT
CLAY	15	48	BLUE	MEDIUM
SAND LENS	48	50	GRAY	SOFT
SHALE	50	135	BLACK	HARD
SHALE & ROCKS	135	225	BLUE	MEDIUM
SAND LENS	225	250	WHITE	HARD

Remarks
PLASTIC CASING.

Well Depth 250 ft. **Depth Completed** 250 ft. **Date Well Completed** 08/12/1985

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☒ No ☐ **Above/Below** 1 ft.

Casing Diameter		Weight
4	in. To 236 ft.	lbs./ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
3 in.	10	8 ft.	236 ft.	244 ft.

Static Water Level
2 ft. land surface Measure 08/12/1985

Pumping Level (below land surface)

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
cuttings	0	10 ft.	30 ft.
bentonite	0	30 ft.	230 ft.

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 08/12/1985
Manufacturer's name PIONEER
Model Number A1012C HP 0.5 Volt 230
Length of drop pipe 100 ft Capacity 12 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock Cretaceous undiff. Aquifer Cretaceous,
Last Strat Cretaceous undiff. Depth to Bedrock 225 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - NAD83, Zone 15, Meters X 228708 Y 5117454
Unique Number Verification Plat Book Input Date 09/21/1994

Angled Drill Hole

Well Contractor
FALK, J.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Well Index Report **113691** Printed on 04/19/2023
HE-01205-15

Minnesota Unique Well Number

723401

County Wilkin
Quad Doran
Quad ID 202B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/22/2010
Update Date 04/03/2014
Received Date 03/26/2010

Well Name	Township	Range	Dir	Section	Subsection
LIENEN, LAURA	131	46	W	5	DCBBDB

Elevation 976 ft. **Elev. Method** Calc from DEM (USGS 7.5 min or equiv.)

Address

Well 907 CHRISTIANA AV DORAN MN 56522

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	3	BLACK	SOFT
CLAY	3	40	YELLOW	SOFT
CLAY	40	80	BLUE	SOFT
CLAY	80	85	BLUE	HARD
WATER SAND	85	101	GRAY	

Remarks

GEOLOGICAL HARDNESS OF MATERIAL-SAND YELLOW LOOSE-
"CLAY YELLOW FIRM
"SAND WHITE LOOSE

Well Depth	Depth Completed	Date Well Completed
101 ft.	101 ft.	06/24/2009

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☒ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☐ No ☒ **Above/Below**

Casing Diameter	Weight	Hole Diameter
4 in. To 91 ft.	lbs./ft.	7.5 in. To 100 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** plastic **Make** EVER FLO

Diameter	Slot/Gauze	Length	Set	
4 in.	18	10 ft.	91 ft.	101 ft.

Static Water Level

1 ft. land surface Measure 06/24/2009

Pumping Level (below land surface)

10 ft. 1 hrs. Pumping at 20 g.p.m.

Wellhead Completion

Pitless adapter manufacturer MONITOR Model 5P5 MECH
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement	5 Sacks	5 ft.	81 ft.

Nearest Known Source of Contamination

50 feet Northeas Direction Septic tank/drain field Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 06/24/2009
Manufacturer's name GOULDS
Model Number TCT HP 0.5 Volt 110
Length of drop pipe 20 ft Capacity 10 g.p. Typ Submersible

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous

First Bedrock Aquifer
Last Strat Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method GPS SA Off (averaged) (15 meters)
System UTM - NAD83, Zone 15, Meters X 231332 Y 5120407
Unique Number Verification Info/GPS from data Input Date 11/05/2009

Angled Drill Hole

Well Contractor

Wieber Well Drilling 2110 WIEBER, D.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

723404

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/20/2005
Update Date 01/28/2009
Received Date 02/06/2006

Well Name	Township	Range	Dir	Section	Subsection
LAWYSETH,	132	47	W	16	CDCDCA

Elevation 961 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Well 3717 185TH AV BRECKENRIDGE MN 56520

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOPSOIL	0	4	BLACK	SOFT
YELLOW CLAY	4	50	YELLOW	MEDIUM
BLUE CLAY MIX	50	120	BLU/GRY	MEDIUM
CLAY	120	290	GRAY	HARD
SAND	290	310	WHITE	HARD

Remarks

SAMPLE PASSED

Well Depth	Depth Completed	Date Well Completed
310 ft.	310 ft.	06/27/2005

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☒ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☐ No ☒ **Above/Below**

Casing Diameter	Weight	Hole Diameter
5 in. To 290 ft.	lbs./ft.	8.5 in. To 290 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** mixed **Make** EVER-FLO

Diameter	Slot/Gauze	Length	Set	
2 in.	12	20 ft.	290 ft.	310 ft.

Static Water Level

25 ft. land surface Measure 06/20/2005

Pumping Level (below land surface)

220 ft. 3 hrs. Pumping at 5 g.p.m.

Wellhead Completion

Pitless adapter manufacturer MONITOR Model 5X6

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount		From	To
bentonite	20	Sacks	100 ft.	290 ft.
neat cement	15	Sacks	ft.	100 ft.

Nearest Known Source of Contamination

200 feet Northeas Direction Septic tank/drain field Type

Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 06/25/2005

Manufacturer's name GOULD

Model Number SGS HP 0.75 Volt 240

Length of drop pipe 260 ft Capacity 5 g.p. Typ Submersible

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous

First Bedrock Cretaceous undiff. Aquifer Cretaceous,
Last Strat Cretaceous undiff. Depth to Bedrock 290 ft
Located by Minnesota Department of Health
Locate Method GPS SA Off (averaged) (15 meters)
System UTM - NAD83, Zone 15, Meters X 223299 Y 5126946
Unique Number Verification Input Date 08/31/2005

Angled Drill Hole

Well Contractor

Wieber Well Co. 91400 WIEBER, D.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Well Index Report | **723404** | Printed on 04/19/2023 HE-01205-15

Minnesota Unique Well Number

723414

County Wilkin
Quad Doran
Quad ID 202B

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031

Entry Date 04/22/2010
Update Date 04/08/2014
Received Date 03/26/2010

Well Name	Township	Range	Dir	Section	Subsection
ENKERS,	132	46	W	32	DCCCBB

Elevation 976 ft. **Elev. Method** Calc from DEM (USGS 7.5 min or equiv.)

Address

Well 2352 400 ST DORAN MN 56562

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	2	BLACK	SOFT
CLAY	2	15	YELLOW	SOFT
CLAY	15	90	BLUE	HARD
SAND	90	112	GRAY	HARD
CLAY	112	117	BLACK	HARD
CLAY	117	243	BLACK	HARD
SAND	243	265	WHITE	HARD

Remarks

WELL NOT COMPLETED YET
OLD WELL STILL IN USE

Well Depth 265 ft. **Depth Completed** 265 ft. **Date Well Completed** 06/15/2009

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☒ **From** **To**

Casing Type Step down **Joint**
Drive Shoe? Yes ☐ No ☒ **Above/Below**

Casing Diameter	Weight	Hole Diameter
in. To ft.	lbs./ft.	8.5 in. To ft.
21 in. To ft.	lbs./ft.	

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
2 in.	12	10 ft.	255 ft.	265 ft.

Static Water Level

1 ft. land surface Measure 02/15/2009

Pumping Level (below land surface)

10 ft. 1 hrs. Pumping at 15 g.p.m.

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement	20 Sacks	6 ft.	255 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☒ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous

First Bedrock Aquifer
Last Strat Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method GPS SA Off (averaged) (15 meters)
System UTM - NAD83, Zone 15, Meters X 231358 Y 5121758
Unique Number Verification Info/GPS from data Input Date 11/05/2009

Angled Drill Hole

Well Contractor

Wieber Well Drilling 2110 WIEBER, D.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

723416

County Wilkin
Quad Doran
Quad ID 202B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/09/2007
Update Date 10/22/2015
Received Date 09/11/2006

Well Name	Township	Range	Dir	Section	Subsection
DELL, BRUCE	131	46	W	5	DCBCBD

Elevation 976 ft. **Elev. Method** Calc from NED (Natl.Elev.Dataset-30m)

Address

C/W 904 2ND ST DORAN MN 56522

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOPSOIL	0	1	BLACK	
YELLOW CLAY	1	20		
SOFT YELLOW CLAY	20	40		
GRAY CLAY	40	60		
CLAY	60	70		
SAND LENSES / CLAY	70	80		
GOOD SAND CLEAN	80	90		

Remarks

Well Depth 90 ft. **Depth Completed** 90 ft. **Date Well Completed** 04/30/2006

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☐ No ☐ **Above/Below**

Casing Diameter	Weight
4 in. To 80 ft.	lbs./ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** plastic **Make** EVER-FLO

Diameter	Slot/Gauze	Length	Set	
4 in.	20	ft.	80 ft.	90 ft.

Static Water Level
3 ft. land surface Measure 04/30/2006

Pumping Level (below land surface)
10 ft. 1 hrs. Pumping at 10 g.p.m.

Wellhead Completion
Pitless adapter manufacturer MONITOR Model SPS QUICK
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement	4 Sacks	50 ft.	70 ft.

Nearest Known Source of Contamination
100 feet Direction Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 04/03/2006
Manufacturer's name GOULDS
Model Number 106S HP 0.5 Volt 220
Length of drop pipe 10 ft Capacity 15 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☒ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous
First Bedrock Aquifer
Last Strat Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method GPS SA Off (averaged) (15 meters)
System UTM - NAD83, Zone 15, Meters X 231305 Y 5120330
Unique Number Verification Info/GPS from data Input Date 06/19/2006

Angled Drill Hole

Well Contractor
Wieber Well Drilling 2110 WIEBER, D.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

727117

County Wilkin
Quad Doran
Quad ID 202B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 09/12/2006
Update Date 02/02/2015
Received Date 06/29/2006

Well Name	Township	Range	Dir	Section	Subsection
MARTIN,	131	46	W	5	DCBCCB

Elevation 975 ft. **Elev. Method** LiDAR 1m DEM (MNDNR)

Address

C/W 902 2ND ST DORAN MN 56522

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOPSOIL	0	2	BLACK	SOFT
YELLOW CLAY	2	16	YELLOW	SOFT
CLAY	16	53	GRAY	SOFT
SAND COARSE	53	57	GRAY	
CLAY	57	77	BLUE	HARD
SAND	77	100	GRAY	HARD

Remarks

FLOWS AT 10 GPM.

Well Depth 100 ft. **Depth Completed** 94 ft. **Date Well Completed** 06/01/2006

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☒ **From** **To**

Casing Type Single casing **Joint**

Drive Shoe? Yes ☐ No ☐ **Above/Below**

Casing Diameter	Weight	Hole Diameter
4 in. To 90 ft.	lbs./ft.	7 in. To 0 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set
in.	12	4 ft.	90 ft. 94 ft.

Static Water Level

-1 ft. land surface Measure 06/01/2006

Pumping Level (below land surface)

30 ft. 1 hrs. Pumping at 30 g.p.m.

Wellhead Completion

Pitless adapter manufacturer MONITOR Model QUICKCOVER

☐ Casing Protection ☒ 12 in. above grade

☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement	4 Sacks	6 ft.	40 ft.

Nearest Known Source of Contamination

60 feet Southeas Direction Septic tank/drain field Type

Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 06/14/2006

Manufacturer's name GOUILDS

Model Number 10LS HP 0.5 Volt 230

Length of drop pipe 40 ft Capacity 10 g.p. Typ Submersible

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous

First Bedrock Aquifer

Last Strat Depth to Bedrock ft

Located by Minnesota Department of Health

Locate Method GPS SA Off (averaged) (15 meters)

System UTM - NAD83, Zone 15, Meters X 231291 Y 5120321

Unique Number Verification Info/GPS from data Input Date 06/19/2006

Angled Drill Hole

Well Contractor

Falk Drilling, Inc. 2154 FALK, N.

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

780726

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/16/2010
Update Date 11/28/2012
Received Date 02/02/2011

Well Name	Township	Range	Dir	Section	Subsection
LOMMEL, STEVE	132	47	W	28	BBB

Elevation 962 ft. **Elev. Method** Calc from DEM (USGS 7.5 min or equiv.)

Address

C/W 3821 183RD AV BRECKENRIDGE MN 56520

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOPSOIL	0	4	BLACK	SOFT
CLAY	4	30	YELLOW	MEDIUM
CLAY	30	40	GRAY	MEDIUM
GRAVEL	40	95	YELLOW	HARD
CLAY	95	170	DARK	HARD
CLAY	170	260	DARK	V.HARD
SAND	260	270	WHITE	HARD

Remarks

GROUTING INFO: MATERIAL= CEMENT 100-260.

Well Depth	Depth Completed	Date Well Completed
270 ft.	270 ft.	07/14/2010

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☒ **From** **To**

Casing Type Step down **Joint**
Drive Shoe? Yes ☐ No ☒ **Above/Below**

Casing Diameter	Weight	Hole Diameter
5 in. To 260 ft.	lbs./ft.	9 in. To 260 ft.
5 in. To 220 ft.	lbs./ft.	

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
2 in.	12	10 ft.	260 ft.	270 ft.

Static Water Level

9 ft. land surface Measure 07/10/2010

Pumping Level (below land surface)

160 ft. 2 hrs. Pumping at 8 g.p.m.

Wellhead Completion

Pitless adapter manufacturer MONITOR Model 6PS QUICK

☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
bentonite	10 Sacks	6 ft.	100 ft.
well grouted, type unknown	20 Sacks	100 ft.	260 ft.

Nearest Known Source of Contamination

200 feet South Direction Septic tank/drain field Type

Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 07/14/2010

Manufacturer's name GOULDS

Model Number SGS HP 0.75 Volt 240

Length of drop pipe 220 ft Capacity 5 g.p. Typ Submersible

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous

First Bedrock Aquifer

Last Strat Depth to Bedrock ft

Located by Minnesota Department of Health

Locate Method GPS SA Off (averaged) (15 meters)

System UTM - NAD83, Zone 15, Meters X 222885 Y 5124865

Unique Number Verification Info/GPS from data Input Date 09/01/2010

Angled Drill Hole

Well Contractor

Wieber Well Drilling 2110 WIEBER, D.

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

780728

County Wilkin
Quad Doran
Quad ID 202B

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031

Entry Date 01/25/2012
Update Date 09/20/2012
Received Date 02/02/2012

Well Name	Township	Range	Dir	Section	Subsection
QUINN, JOHN	131	46	W	5	DCBBDA

Elevation 976 ft. **Elev. Method** Calc from DEM (USGS 7.5 min or equiv.)

Address

C/W 909 2ND ST DORAN MN 56522

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOPSOIL	0	3	BLACK	SOFT
CLAY	3	40	YELLOW	MEDIUM
CLAY	40	80	GRAY	MEDIUM
SAND	80	100	GRAY	HARD
CLAY	100	243	BLU/BLK	HARD
SAND	243	260	WHITE	HARD

Remarks

N-PASSED, B-FAILED. WAITING FOR SAMPLE RETEST.

Well Depth	Depth Completed	Date Well Completed
260 ft.	260 ft.	12/06/2011

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☒ **From** **To**

Casing Type Step down **Joint**
Drive Shoe? Yes ☐ No ☒ **Above/Below**

Casing Diameter	Weight	Hole Diameter
5 in. To 200 ft.	lbs./ft.	8.5 in. To 243 ft.
5 in. To 250 ft.	lbs./ft.	

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
2 in.	12	15 ft.	245 ft.	260 ft.

Static Water Level

-3 ft. land surface Measure 09/06/2011

Pumping Level (below land surface)

20 ft. 2 hrs. Pumping at 20 g.p.m.

Wellhead Completion

Pitless adapter manufacturer MONITOR Model 6PS MECH
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement	24 Sacks	ft.	243 ft.

Nearest Known Source of Contamination

75 feet North Direction Septic tank/drain field Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 12/06/2011
Manufacturer's name GOULDS
Model Number 10GS05 HP 0.5 Volt 240
Length of drop pipe 40 ft Capacity 10 g.p. Typ Submersible

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous

First Bedrock Aquifer
Last Strat Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method GPS SA Off (averaged) (15 meters)
System UTM - NAD83, Zone 15, Meters X 231370 Y 5120411
Unique Number Verification Info/GPS from data Input Date 09/16/2011

Angled Drill Hole

Well Contractor

Licensee Business	Lic. or Reg. No.	Name of Driller
Wieber Well Drilling	2110	WIEBER, D.

Minnesota Unique Well Number

784401

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 11/18/2011
Update Date 02/23/2015
Received Date 07/21/2011

Well Name	Township	Range	Dir	Section	Subsection
PAZDERNIK,	132	47	W	33	DBD

Elevation 965 ft. **Elev. Method** Calc from NED (Natl.Elev.Dataset-30m)

Address

C/W 3951 190TH AV BRECKENRIDGE MN 56520

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	2		
CLAY	2	25	YELLOW	
CLAY	25	49	BLUE	
SAND	49	54	GRAY	

Remarks

NAME OF DRILLER-L/N UNCLEAR

Well Depth 54 ft. **Depth Completed** 54 ft. **Date Well Completed** 07/14/2011

Drill Method Non-specified Rotary **Drill Fluid** Qwik gel

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**

Drive Shoe? Yes ☐ No ☐ **Above/Below**

Casing Diameter	Weight
4 in. To ft.	lbs./ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
4 in.	15	5 ft.	49 ft.	54 ft.

Static Water Level

10 ft. land surface Measure 07/14/2011

Pumping Level (below land surface)

ft. hrs. Pumping at 15 g.p.m.

Wellhead Completion

Pitless adapter manufacturer MONITOR Model

☐ Casing Protection ☐ 12 in. above grade

☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
bentonite		ft. 49	ft.

Nearest Known Source of Contamination

120 feet Northwes Direction Septic tank/drain field Type

Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name SCHAEFER

Model Number HP 3 Volt 230

Length of drop pipe 30 ft Capacity 12 g.p. Typ Submersible

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous

First Bedrock Aquifer

Last Strat Depth to Bedrock ft

Located by Minnesota Department of Health

Locate Method GPS SA Off (averaged) (15 meters)

System UTM - NAD83, Zone 15, Meters X 223538 Y 5122823

Unique Number Verification Info/GPS from data Input Date 09/16/2011

Angled Drill Hole

Well Contractor

Licensee Business	Lic. or Reg. No.	Name of Driller
Waskosky Well Drilling	1581	JANITE, D.

Minnesota Unique Well Number

791326

County Wilkin
Quad South Of
Quad ID 203A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 06/07/2013
Update Date 01/30/2014
Received Date 12/07/2012

Well Name	Township	Range	Dir	Section	Subsection
VALLEY LAKE	132	47	W	26	CBACBC

Elevation 966 ft. **Elev. Method** Calc from NED (Natl.Elev.Dataset-30m)

Address

C/W 3850 200TH AV BRECKENRIDGE MN 56520
C/W MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	2	BLACK	
SANDY CLAY(ROCKY)	2	22	RED	
SANDY CLAY	22	44	GRAY	
SAND	44	46		
SANDY CLAY/ROCKY	46	129	BLUE	HARD
SAND	129	130		
CLAY/STICKY SHALE	130	238	GRY/BLK	
SAND	238	252		
CLAY	252	260	GRAY	

Remarks

Well Depth 260 ft. **Depth Completed** 252 ft. **Date Well Completed** 11/13/2012

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☒ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☐ No ☐ **Above/Below**

Casing Diameter	Weight	Hole Diameter
0 in. To ft.	lbs./ft.	7.7 in. To 50 ft.
4 in. To 240 ft.	0 lbs./ft.	6.2 in. To 260 ft.

Open Hole From 252 ft. To 260 ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
4 in.	10	12 ft.	240 ft.	252 ft.

Static Water Level
5 ft. land surface Measure 11/13/2012

Pumping Level (below land surface)
135 ft. 1 hrs. Pumping at 65 g.p.m.

Wellhead Completion
Pitless adapter manufacturer MONITOR Model 7PS45
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
bentonite	6 Sacks	ft.	50 ft.

Nearest Known Source of Contamination
150 feet Southeas Direction Sewer Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 11/20/2012
Manufacturer's name MEYER
Model Number HP 1 Volt 230
Length of drop pipe 177 ft Capacity 20 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous
First Bedrock Aquifer
Last Strat Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method GPS SA Off (averaged) (15 meters)
System UTM - NAD83, Zone 15, Meters X 226090 Y 5124215
Unique Number Verification Info/GPS from data Input Date 06/21/2013

Angled Drill Hole

Well Contractor
LTP Enterprises, Inc. 2157 FLUEGGE
Licensee Business Lic. or Reg. No. Name of Driller

Attachment 2
Minnesota Conservation Explorer Report

DEPARTMENT OF NATURAL RESOURCES

Formal Natural Heritage Review - Cover Page

See next page for results of review. A draft watermark means the project details have not been finalized and the results are not official.

Project Name: Doran Creek Stream Rehabilitation Project

Project Proposer: Bois de Sioux Watershed District (BdSWD)

Project Type: Natural Resource Management, Water Resources

Project Type Activities: Waterbody or watercourse impacts (e.g., dewatering, discharge, excavation, fill, runoff, sedimentation);Wetland impacts (e.g., dewatering, discharge, excavation, fill, runoff, sedimentation)

TRS: T131 R46 S18, T131 R46 S5, T131 R46 S6, T131 R46 S7, T131 R47 S1, T131 R47 S12, T132 R46 S31, T132 R47 S16, T132 R47 S21, T132 R47 S22, T132 R47 S25, T132 R47 S26 +

County(s): Wilkin

DNR Admin Region(s): Northwest

Reason Requested: State EAW

Project Description: The proposed project would restore approximate 19.25 miles of Doran Creek by excavating accumulated sediment from the channel, recreating a natural floodplain, ...

Existing Land Uses: Doran Creek is located in a predominantly agricultural landscape. Review of the NLCD 2019 land cover types indicate that the channel itself is mapped as ...

Landcover / Habitat Impacted: Primarily streams, wetlands, and cropland will be impacted by the proposed project. The project will create in stream habitat and protect 1,300 acres of adjacent lands in conservation easement.

Waterbodies Affected: Doran Creek - excavation to remove accumulated sediment. Minor fill/grading Online wetlands - excavation to reconnect with main channel of Doran Creek, ...

Groundwater Resources Affected: Three groundwater monitoring wells were installed along Doran Creek in the Spring of 2021 to determine where groundwater is anticipated in relation to ...

Previous Natural Heritage Review: No

Previous Habitat Assessments / Surveys: No

SUMMARY OF AUTOMATED RESULTS

Category	Results	Response By Category
Project Details	No Comments	No Further Review Required
Ecologically Significant Area	Comments	MBS Sites - Recommendations Potential RNC - Will Require Consultation
State-Listed Endangered or Threatened Species	No Comments	No Further Review Required
State-Listed Species of Special Concern	No Comments	No Further Review Required

Category	Results	Response By Category
Federally Listed Species	No Records	Visit IPaC For Federal Review

DEPARTMENT OF NATURAL RESOURCES

Minnesota Department of Natural Resources
Division of Ecological & Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4025

July 6, 2023

Project ID: MCE #2023-00508

Meaghan Dietrich
Moore Engineering, Inc.
3315 Roosevelt Road, Suite 300
St. Cloud, MN 56301

RE: Automated Natural Heritage Review of the proposed Doran Creek Stream Rehabilitation Project
See Cover Page for location and project details.

Dear Meaghan Dietrich,

As requested, the above project has been reviewed for potential effects to rare features. Based on this review, the following rare features may be adversely affected by the proposed project:

Ecologically Significant Area

- The Minnesota Biological Survey (MBS) has identified one or more Sites of Biodiversity Significance within or adjacent to the project boundary. Sites of Biodiversity Significance have varying levels of native biodiversity and are ranked based on the relative significance of this biodiversity at a statewide level. Factors taken into account during the ranking process include the number of rare species documented within the site, the quality of the native plant communities in the site, the size of the site, and the context of the site within the landscape.

  High or Moderate MBS Site - One or more MBS Sites of Biodiversity Significance ranked High or Moderate may be impacted by the proposed project. Sites ranked as High contain very good quality occurrences of the rarest species, high quality examples of the rare native plant communities, and/or important functional landscapes. Sites ranked as Moderate contain occurrences of rare species and/or moderately disturbed native plant communities, and/or landscapes that have a strong potential for recovery. The DNR recommends that the project be designed to avoid impacts to these ecologically significant areas. Actions to avoid or minimize disturbance include, but are not limited to, the following recommendations:

  - Retain a buffer between proposed activities and the MBS Site,
  - Minimize project footprint within the MBS Site,
  - Operate wihin already-disturbed areas,
  - Minimize vehicular disturbance within the MBS Site,
  - Do not park equipment or stockpile supplies within the MBS Site,

- Do not place spoil within the MBS Site,
- Inspect and clean equipment prior to operating within the MBS Site, and follow other recommendations to prevent the spread of invasive species,
- Conduct the work under frozen ground conditions,
- Use effective erosion prevention and sediment control measures,
- Revegetate disturbed soil with native seed mixes suitable to the local habitat as soon after construction as possible,
- Use only weed-free mulches, topsoils, and seed mixes.

- One or more DNR Native Plant Communities have been identified within or adjacent to the proposed project (for a list of all the native plant community types, please run a Conservation Planning Report; spatial data can be viewed on the Explore Page). DNR Native Plant Community types and subtypes are given a Conservation Status Rank that reflects the relative rarity and endangerment of the community type in Minnesota. Conservation Status Ranks range from S1 (critically imperiled) to S5 (secure, common, widespread, and abundant).

  Rare Native Plant Communities - One or more rare native plant communities may be impacted by the proposed project. Native plant communities with a Conservation Status Rank of S1 to S3 are considered rare in the state, and the DNR recommends avoidance of these ecologically significant areas .In addition, please note that native plant communities with a conservation status rank of S1 to S3 may qualify as Rare Natural Communities under the Wetland Conservation Act (WCA). If the proposed project includes a wetland replacement plan under WCA, please contact your DNR Regional Ecologist for further evaluation. For technical guidance on Rare Natural Communities, please visit WCA Program Guidance and Information.

State-Listed Endangered or Threatened Species

No state-listed endangered or threatened species have been documented in the vicinity of the project.

State-Listed Species of Special Concern

No state-listed species of special concern have been documented in the vicinity of the project.

Federally Listed Species

The Natural Heritage Information System does not contain any records for federally listed species within one mile of the proposed project. Please note, however, that not all federally listed species are tracked within the NHIS. To ensure compliance with federal law, please conduct a federal regulatory review using the U.S. Fish and Wildlife Service's online Information for Planning and Consultation (IPaC) tool.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location and the project description provided on the cover page. If project details change or construction has not occurred within one year, please resubmit the project for review.

The Natural Heritage Review does not constitute project approval by the Department of Natural Resources. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. For information on the environmental review process or other natural resource concerns, you may contact your DNR Regional Environmental Assessment Ecologist.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources.

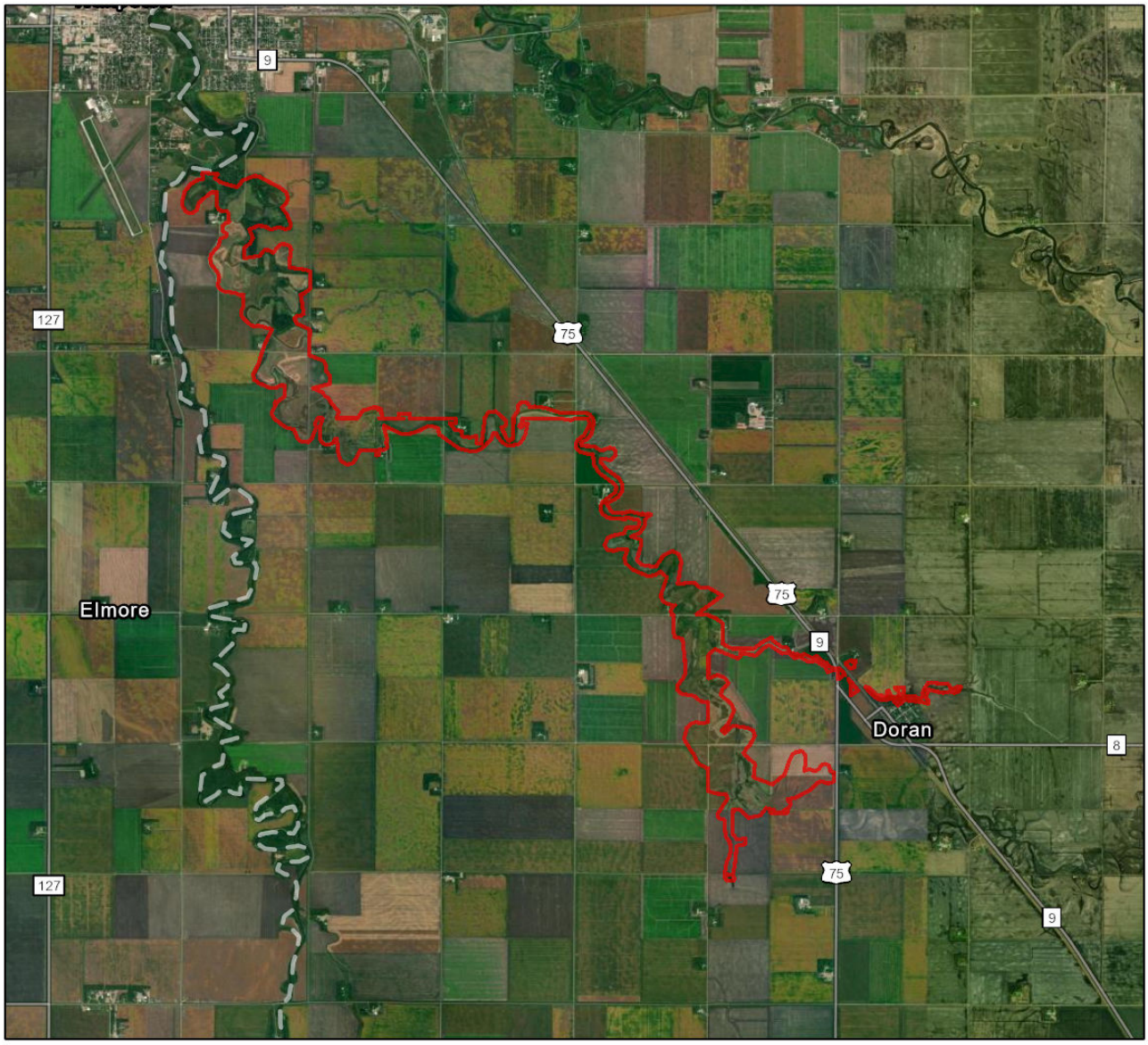
Sincerely,

Jim Drake Jim Drake
Natural Heritage Review Specialist
James.F.Drake@state.mn.us

Links: USFWS Information for Planning and Consultation (IPaC) tool
Information for Planning and Consultation (IPaC) tool
DNR Regional Environmental Assessment Ecologist Contact Info
https://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html

Doran Creek Stream Rehabilitation Project

Aerial Imagery With Locator Map



N
W E
S

0 0.5 1 2 3 4 Miles

Project Boundary

Project Type: Natural Resource Management, Water Resources

Project Size (acres): 1,385.98

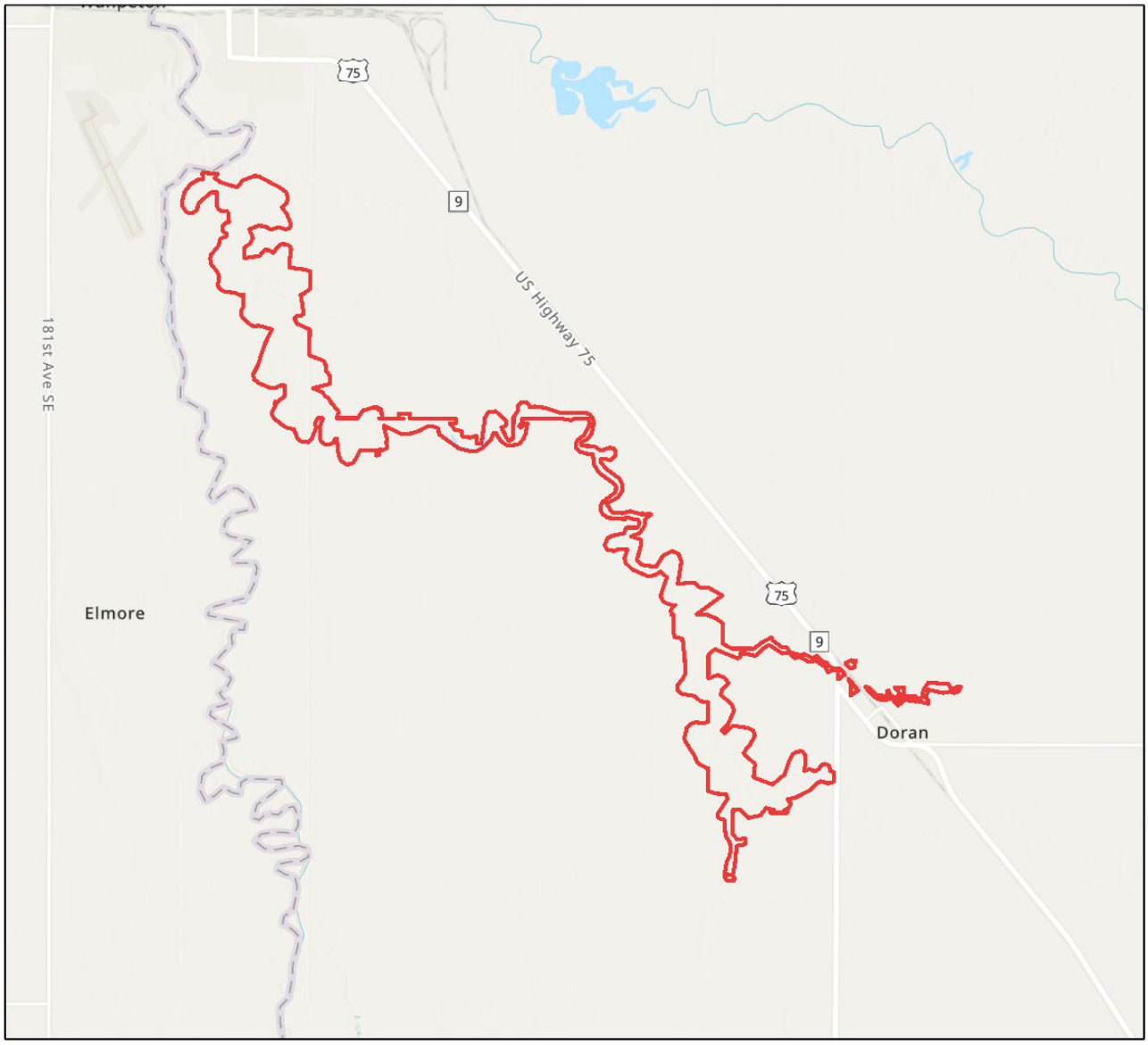
County(s): Wilkin

TRS: T131 R46 S18, T131 R46 S5, T131 R46 S6, T131 R46 S7, T131 R47 S1 +

Earthstar Geographics
Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

Doran Creek Stream Rehabilitation Project

USA Topo Basemap With Locator Map



N
W E
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0 0.5 1 2 3 4 Miles

Project Boundary

Project Type: Natural Resource Management, Water Resources

Project Size (acres): 1,385.98

County(s): Wilkin

TRS: T131 R46 S18, T131 R46 S5, T131 R46 S6, T131 R46 S7, T131 R47 S1 +

Esri, NASA, NGA, USGS
Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

Attachment 3
Phase 1A Literature Review

IN SITU
Archaeological Consulting

7630 Executive Drive
Eden Prairie, MN 55344
Ph: 952-658-8891
Web: www.insitucrm.com

January 12, 2024

Meaghan Dietrich
Environmental Scientist II
Moore Engineering, Inc.
2 Carlson Parkway N, Suite 110
Plymouth, MN 55447
(612) 699-0410
meaghan.dietrich@mooreengineeringinc.com

Subject: **Phase IA Literature Review for the Doran Creek Development Project, Wilkin County, Minnesota.**
Public Version

Dear Ms. Dietrich,

This report presents the results of a Phase IA Cultural Resource Literature Review conducted by In Situ Archaeological Consulting, LLC (In Situ) for a development project within Wilkin County, Minnesota. The proposed project area encompasses approximately 21 miles in total length and is located within the legal locations listed in Table 1.

Table 1: Legal Locations of the Proposed Project Area

Township (T)	Range (R)	Section(s)
131 North	46 West	4, 5, 6, 7
131 North	47 West	1
132 North	47 West	16, 21, 25, 26, 27, 28, 36

The proposed project area is located on privately owned land consisting of forested and grassy areas with marshlands interspersed throughout. The literature review was conducted by In Situ staff on January 4, 2023, using files maintained by the Minnesota Office of the State Archaeologist (OSA) and Minnesota State Historic Preservation Office (SHPO). The literature review will assist the client in identifying the locations of previous cultural resources, locations on the National Register of Historic Places (NRHP), previous cultural resource inventories, and the potential for cultural resources within and around the project area. This cultural resource assessment was performed for the project in preparation for a Section 404 permit that will trigger Section 106 of the National Historic Preservation Act. In addition, this cultural resource assessment is being completed as part of an Environmental Assessment Worksheet (EAW) for the project. Therefore, the cultural resource assessment is subject to review by the United States Army Corps of Engineers (USACE) and the Minnesota SHPO. The investigation was necessary to identify any sites or properties and to evaluate them for the NRHP pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 [36 CFR 800]).

BACKGROUND RESEARCH

A literature review consisted of identifying any previously recorded archaeological sites and architectural properties within a 2-mile study area surrounding the proposed project area (1 mile from each side of the project area). The task was completed using site data files and previous inventory files maintained by the Minnesota OSA and SHPO. In addition, background research was completed by reviewing NRHP data, historic maps, atlases, current aerial photographs, soil maps, topographic and geomorphic data, and other sources that might provide information for the locations of historic-era sites, areas of prior disturbance, etc. (Figures 1-21). The literature/records search revealed 11 previously recorded archaeological sites, nine previously recorded architectural resources, and two previous cultural resource surveys within the study area.

The data gathered revealed 11 previously recorded archaeological sites within the study area (Table 2). Of these sites, there are six prehistoric artifact scatter sites and five prehistoric isolated find sites. Two sites (21WL0075 and 21WL0076) are *not eligible* for the NRHP and the remaining sites are *unevaluated* for the NRHP. None of the sites are located within the proposed project area, however six sites are located adjacent (within 500 ft) to the proposed project.

Table 2: Previously Recorded Archaeological Sites within the Study Area.

Site	Legal Description	Cultural Affiliation	Site Type	NRHP Eligibility	Within Project Area
21WL0003	REDACTED	Unknown Prehistoric	Lithic Scatter	Unevaluated	No
21WL0075	REDACTED	Unknown Prehistoric	Artifact Scatter	Not Eligible	No; Adjacent
21WL0076	REDACTED	Unknown Prehistoric	Isolated Find	Not Eligible	No
21WL0081	REDACTED	Unknown Prehistoric	Isolated Find	Unevaluated	No; Adjacent
21WL0082	REDACTED	Prehistoric - Late Prehistoric	Artifact Scatter	Unevaluated	No; Adjacent
21WL0083	REDACTED	Prehistoric - Late Terminal Woodland	Artifact Scatter	Unevaluated	No; Adjacent
21WL0086	REDACTED	Unknown Prehistoric	Artifact Scatter	Unevaluated	No
21WL0087	REDACTED	Unknown Prehistoric	Isolated Find	Unevaluated	No
21WL0088	REDACTED	Unknown Prehistoric	Isolated Find	Unevaluated	No
21WL0097	REDACTED	Unknown Prehistoric	Isolated Find	Unevaluated	No; Adjacent
21WL0098	REDACTED	Prehistoric - Initial Woodland	Artifact Scatter	Unevaluated	No; Adjacent

The literature review revealed nine previously recorded architectural resources within the study area (Table 3). Of these resources, seven are *unevaluated* for the NRHP and two resources are *not eligible* for the NRHP. Three of these resources (WL-BKT-003, WL-ROD-001, and XX-ROD-020) overlap with the proposed project area.

Table 3: Previously Recorded Architectural Resources within the Study Area.				
Site Number	**Site Name/Type**	**Address/Location**	**NRHP Eligibility**	**Within Project Area**
WL-BKC-017	Northern Pacific Lumberyard Depot	xxx 5th St.	Unevaluated	No
WL-BKT-001	Township Hall	off U.S. Hwy. 75	Unevaluated	No
WL-BKT-003	Bridge No. 90036	CR 158 over Doran Slough	Unevaluated	Yes
WL-DRC-001	Brandrup Town Hall	xxx Atlantic Ave.	Unevaluated	No
WL-DRC-002	Catholic Church	NW Corner 1st St. & Christiania Ave	Unevaluated	No
WL-DRC-003	Doran Consolidated School	2xx Franklin Ave.	Unevaluated	No
WL-DRC-004	Post Office	xxx 4th St.	Unevaluated	No
WL-ROD-001	Trunk Highway 75 (North of Doran)	TH 75	Not Eligible	Yes
XX-ROD-020	Trunk Highway/U.S. Highway 75 (formerly Trunk Highway 6)	TH 75	Not Eligible	Yes

The records search revealed two previous cultural resource inventories/surveys that were completed within the Study Area (Table 4). The surveys were reported on in 2000 and 2022 and were completed in support of levee and statewide survey projects. One previous survey (Holley et. al. 2022) overlaps with portions of the project area.

Table 4: Previous Cultural Resource Surveys within the Study Area.				
Manuscript Number	**Title**	**Authors**	**Year**	**Within Project Area**
WL-99-01	Phase I CR Investigation of Proposed Levee Floodwall Alignments at the City of Breckenridge, Wilkin County, Minnesota.	Frank Florin and Barbara Mitchell	2000	No
Holley et. al. 2022	Statewide Survey of Historical and Archaeological Sites: The Archaeological Survey of Kittson and Wilkin Counties, Located in the Red River Valley of Minnesota	George R. Holley, Garry L. Running, Michael G. Michlovic, Abraham Ledezma, Craig M. Picka, Jackson S. Carr, DaKanya J. Roach, Mikayla S. Hed, Clara A. Gambill	2022	Yes

BASIC ENVIRONMENT OF THE PROJECT AREA

The physiography of the project area is located within Glacial Lake Agassiz. This area is characterized by relatively flat topography with the exception of beach ridges and breaks or slope along drainageways and streams. The flat topography results in poorly drained soils with a high organic-matter content (Wright 1972).

The major drainage in the county is the Bois de Sioux River, the Red River of the North, and their tributaries. The proposed project area is located along Doran Creek. In addition, there are marshlands scattered along the project area.

Seven specific soil series are present within the proposed project area. The most prevalent soil series within the project area consists of Lamoure-Fluvaquents, channeled complex, frequently flooded (I146B) (Natural Resources Conservation Service 2023). This soil is poorly drained and is located within flood plains. Table 4 summarizes the soils within the proposed project area.

Table 4: Summary of Soil Series within the Project Area.

Soil Series	Parent Material	Drainage	Slope	Landform
Lamoure-Fluvaquents, channeled complex, frequently flooded (I146B)	Silty alluvium	Poorly drained	0%–6%	Flood plains
Doran clay loam (I243A)	Clayey alluvium	Somewhat poorly drained	0%–2%	Till-floored lake plains
Wahpeton silty clay, occasionally flooded (I248B)	Clayey alluvium	Moderately well drained	2%–6%	Natural levees, stream terraces
Cashel silty clay, occasionally flooded (I293B)	Clayey alluvium	Somewhat poorly drained	0%–6%	Flood plains
Antler clay loam (I405A)	Silty glaciolacustrine deposits over loamy till	Somewhat poorly drained	0%–2%	Till-floored lake plains
Divide loam (I468A)	Loamy alluvium over sandy outwash	Somewhat poorly drained	0%–2%	Depressions
Lamoure silty clay loam, occasionally flooded (I478A)	Silty alluvium	Poorly drained	0%–1%	Flood plains

Source: Natural Resources Conservation Service (2023).

CULTURAL RESOURCE POTENTIAL

The project is located largely within wooded, grassy, and agricultural areas located along Doran Creek, which feeds into the Bois de Sioux River. Some of the wooded areas within the project area have been subject to clearing, agriculture, and rural development, but the area does not appear to have been subject to any considerable impacts. The project area consists of mostly fairly flat terrain near the creek. The creek provides a permanent water resource nearby the proposed project area. Sources of fresh water and landforms such as river terraces have high potential for archaeological sites (MNDOT 2002, MNDOT 2019). Long-term occupations sites are more likely to occur along permeant water sources, as more resources are readily available (Anderson and Smith 2003; MNDOT 2002; MNDOT 2019). In addition, six archaeological sites are located adjacent (within 500 ft) to the proposed project area. Due to these factors, the project area has a moderate to high potential for significant cultural resources.

REPORT SUMMARY

In Situ completed a Phase IA Cultural Resource Literature Review for the proposed Doran Creek Project in Wilkin County, Minnesota. Eleven preciously recorded archaeological sites, nine previously recorded historic structures, and two previous cultural resource surveys are located within the study area. None of the archaeological sites are located within the proposed project area, however six sites are located adjacent (within 500 ft) to the proposed project and three of the architectural resources overlap with the proposed project area. Of the surveys, one previous survey overlaps with portions of the project area.

The project is located largely within wooded, grassy, and agricultural areas located along Doran Creek, which feeds into the Bois de Sioux River. Some of the wooded area within the project area has been subject to clearing, agriculture, and rural development, but the area does not appear to have been subject to any considerable impacts. The project area consists of mostly fairly flat terrain near the creek. The creek provides a permanent water resource nearby the proposed project area. Sources of fresh water and landforms such as river terraces have high potential for archaeological sites (MNDOT 2002, MNDOT 2019). Long-term occupations sites are more likely to occur along permeant water sources, as more resources are readily available (Anderson and Smith 2003; MNDOT 2002; MNDOT 2019). In addition, six archaeological sites are located adjacent (within 500 ft) to the proposed project area.

Due to these factors, the project area has a moderate to high potential for significant cultural resources. It is the opinion of In Situ that a Phase I cultural resource management survey may be warranted for this project.

Please contact me at 952.658.8891 or aledezma@insitucrm.com should you have any further questions or concerns regarding the information assembled.

Sincerely,

Abraham Ledezma, M.S., RPA
Principal Investigator

Enclosures:

Figure 1:	Political Map
Figure 2:	Literature Review Topographic Map (Overview)
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Figure 7:	Literature Review Aerial Map (Overview)
Figures 8-16:	Literature Review Aerial Map (Detailed)
Figure 17:	Historical BLM GLO Plat Map (Overview)
Figures 18-21	Historical BLM GLO Plat Map (Detailed)

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2003 *Archaeology, History, and Predictive Modeling: Research at Fort Polk, 1972-2002*. University of Alabama Press, Tuscaloosa, Alabama.

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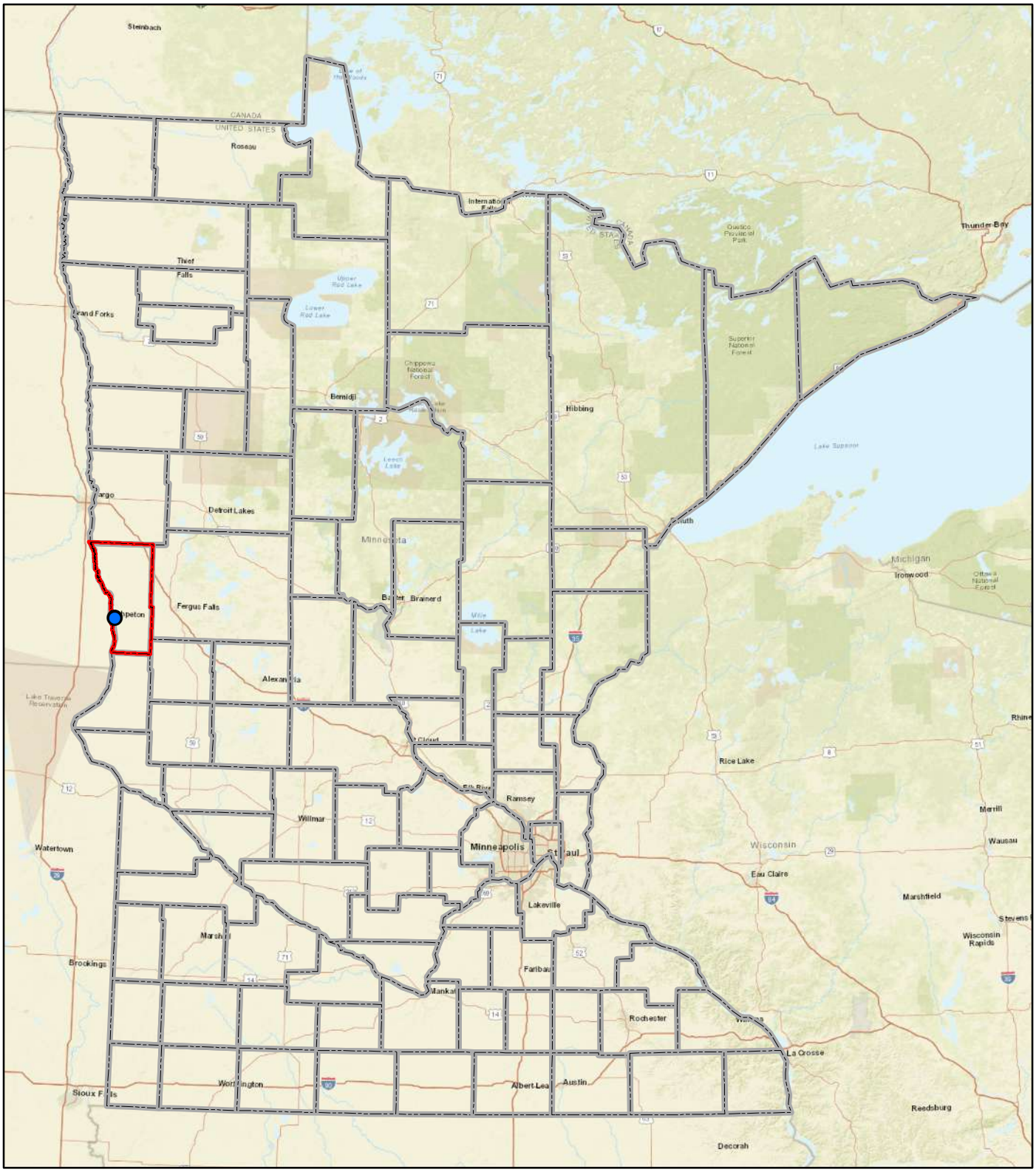

Legend

- Project Location
- Wilkin County
- County Boundary

N
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S

1:3,456,623 — 1 inch equals 288,052 feet

Approximate Scale in Feet

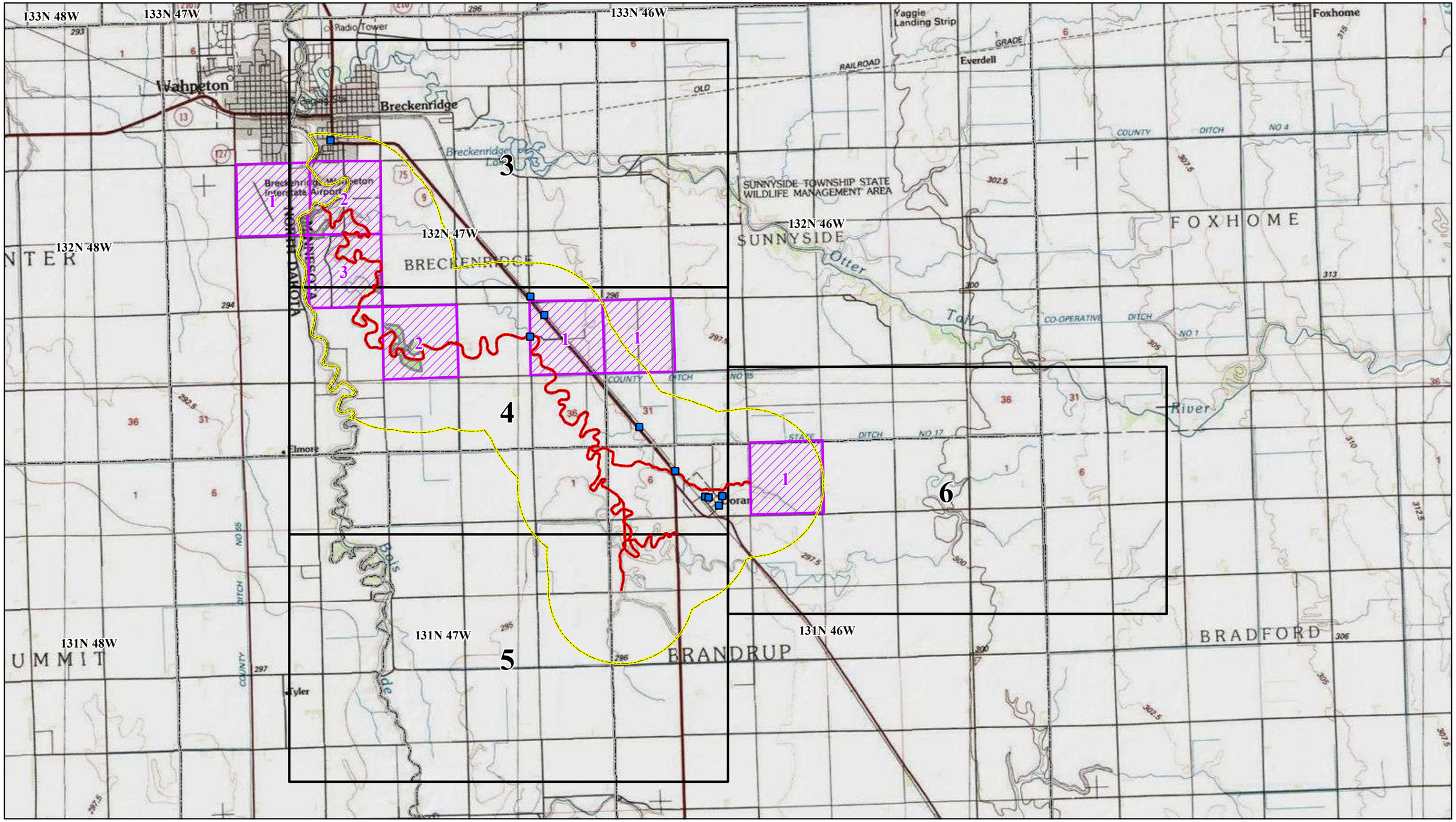
0 — 460,000 — 920,000

POLITICAL MAP

Doran Creek Development
Wilkin County, Minnesota

Note: Imagery courtesy of ESRI

Figure 1. Political map showing project location.



Legend

- Historic Structures
- Doran Creek Centerline
- 1-Mile Study Area (MN)
- Mapbook Page
- Number of Archaeological Sites/Section
- Previous Survey
- Township Boundary

N
W E
S

TOPOGRAPHIC MAP (Overview)

Doran Creek Development
Wilkin County, Minnesota

7,000 0 7,000
Feet

1:79,192 1 inch equals 6,599 feet

Note: Imagery courtesy of ESRI

Figure 2. Topographic map with previous cultural resources surveys and previously recorded sites.

T. 132N R. 047W Sec 5
T. 132N R. 047W Sec 4
T. 132N R. 047W Sec 3
T. 132N R. 047W Sec 2
T. 132N R. 047W Sec 1
T. 132N R. 046W Sec 6
T. 132N R. 046W Sec 5
T. 132N R. 047W Sec 9
T. 132N R. 047W Sec 10
T. 132N R. 047W Sec 11
T. 132N R. 047W Sec 12
T. 132N R. 046W Sec 7
T. 132N R. 046W Sec 8
T. 132N R. 047W Sec 8
WL-BKC-017
WL-99-01
T. 132N R. 047W Sec 16
T. 132N R. 047W Sec 17
132N 47W
132N 46W
T. 132N R. 047W Sec 15
T. 132N R. 047W Sec 14
T. 132N R. 047W Sec 13
T. 132N R. 046W Sec 18
T. 132N R. 046W Sec 17
Holley et. al. 2022
T. 132N R. 047W Sec 22
T. 132N R. 047W Sec 23
T. 132N R. 047W Sec 24
T. 132N R. 046W Sec 19
T. 132N R. 046W Sec 20
T. 132N R. 047W Sec 20
T. 132N R. 047W Sec 21

Legend

- Historic Structures
- Doran Creek Centerline
- 1-Mile Study Area (MN)
- Number of Archaeological Sites/Section
- Previous Survey
- Township/Range/Section
- Township Boundary
- NHD Stream/River
- N HD Waterbody

TOPOGRAPHIC MAP (Detailed)

Doran Creek Development
Wilkin County, Minnesota

2,000 0 2,000
Feet

1:24,000 1 inch equals 2,000 feet

Note: Imagery courtesy of ESRI

Figure 3. Topographic map with previous cultural resources surveys and previously recorded sites.

T. 132N R. 047W Sec 21
T. 132N R. 047W Sec 22
T. 132N R. 047W Sec 23
T. 132N R. 047W Sec 24
T. 132N R. 046W Sec 19
T. 132N R. 046W Sec 20
T. 132N R. 047W Sec 27
T. 132N R. 047W Sec 26
T. 132N R. 047W Sec 25
T. 132N R. 046W Sec 30
T. 132N R. 046W Sec 29
T. 132N R. 047W Sec 28
T. 132N R. 047W Sec 29
T. 132N R. 047W Sec 33
T. 132N R. 047W Sec 34
T. 132N R. 047W Sec 35
T. 132N R. 047W Sec 36
T. 132N R. 046W Sec 31
T. 132N R. 046W Sec 32
T. 132N R. 047W Sec 32
T. 131N R. 047W Sec 5
T. 131N R. 047W Sec 4
T. 131N R. 047W Sec 3
T. 131N R. 047W Sec 2
T. 131N R. 047W Sec 1
T. 131N R. 046W Sec 6
T. 131N R. 047W Sec 9
T. 131N R. 047W Sec 10
T. 131N R. 047W Sec 11
T. 131N R. 047W Sec 12
T. 131N R. 046W Sec 7
T. 131N R. 046W Sec 8
T. 131N R. 046W Sec 5

Holley et. al. 2022

WL-BKT-001
WL-ROD-001
WL-BKT-003
WL-ROD-001
XX-ROD-020
WL-DRC-001
WL-DRC-004
WL-DRC-002

1
2
3

132N 47W
132N 46W
131N 47W
131N 46W

Bois de Sioux River
RICHLAND CO
RIVER
NORTH DAKOTA
MINNESOTA
COUNTY DITCH NO 35
Townhall

Legend

- Historic Structures
- Doran Creek Centerline
- 1-Mile Study Area (MN)
- Number of Archaeological Sites/Section
- Previous Survey
- Township/Range/Section
- Township Boundary
- NHD Stream/River
- N HD Waterbody

N W E S

TOPOGRAPHIC MAP (Detailed)

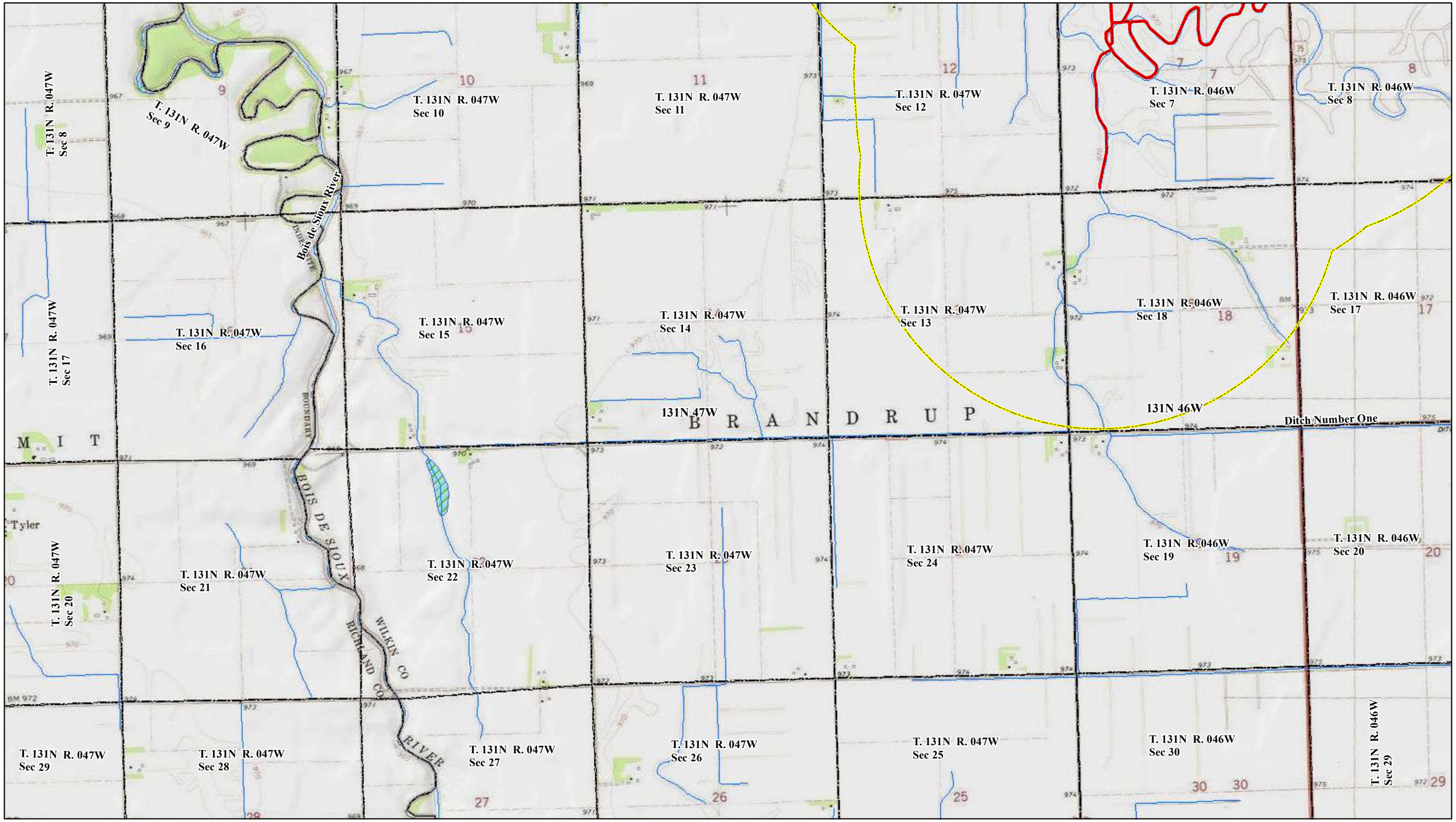
Doran Creek Development
Wilkin County, Minnesota

2,000 0 2,000
Feet

1:24,000 1 inch equals 2,000 feet

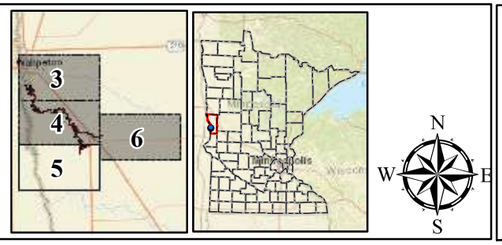
Note: Imagery courtesy of ESRI

Figure 4. Topographic map with previous cultural resources surveys and previously recorded sites.



Legend

- Historic Structures
- Doran Creek Centerline
- 1-Mile Study Area (MN)
- Number of Archaeological Sites/Section
- Previous Survey
- Township/Range/Section
- Township Boundary
- NHD Stream/River
- N HD Waterbody



TOPOGRAPHIC MAP (Detailed)

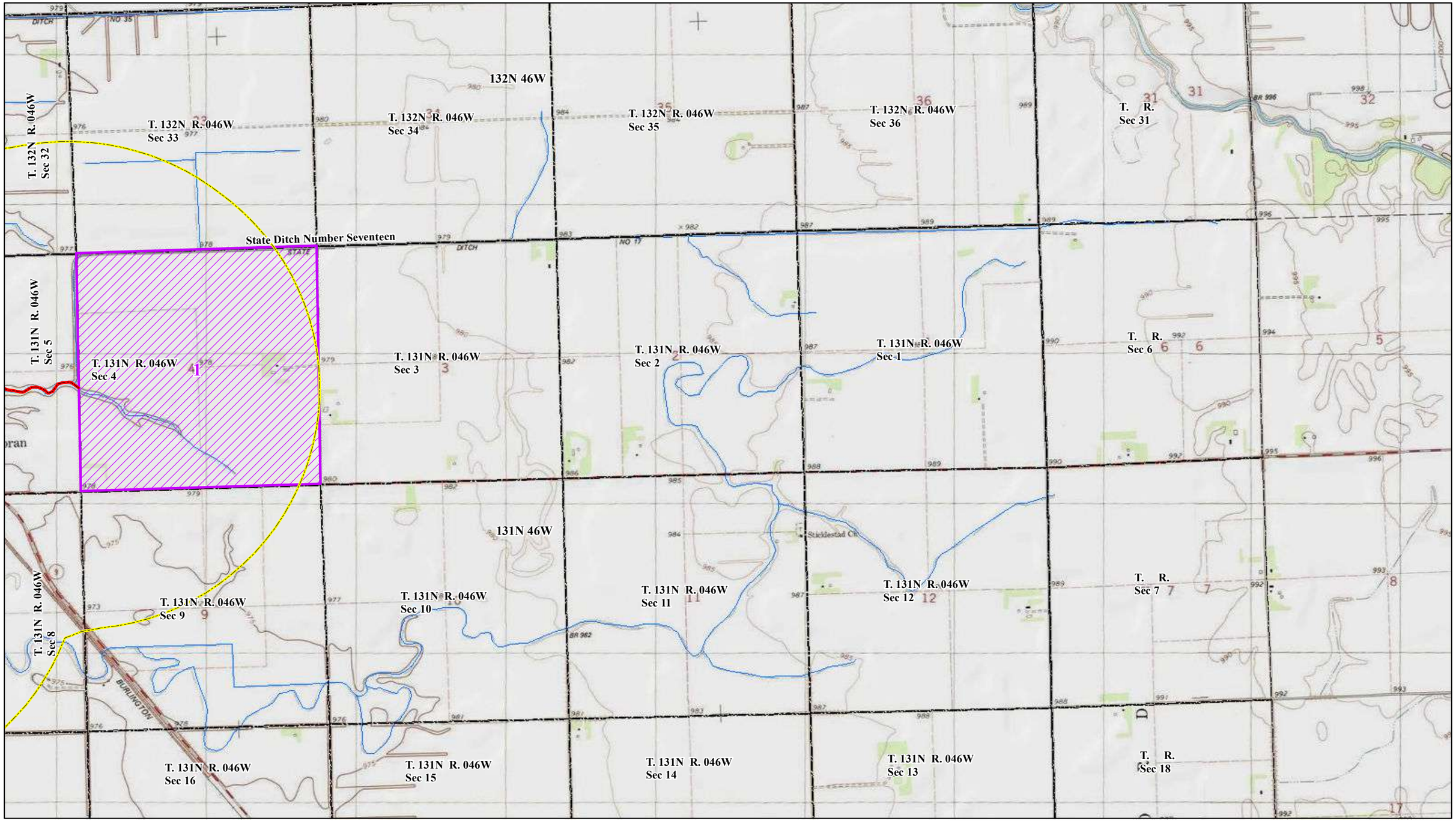
Doran Creek Development
Wilkin County, Minnesota

2,000 0 2,000
Feet

1:24,000 1 inch equals 2,000 feet

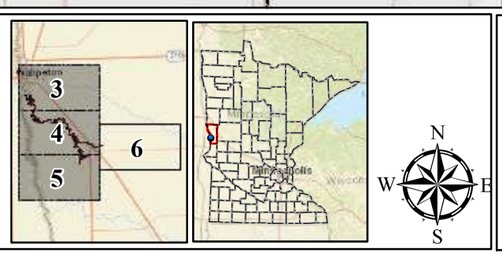
Note: Imagery courtesy of ESRI

Figure 5. Topographic map with previous cultural resources surveys and previously recorded sites.



Legend

- Historic Structures
- Doran Creek Centerline
- 1-Mile Study Area (MN)
- Number of Archaeological Sites/Section
- Previous Survey
- Township/Range/Section
- Township Boundary
- NHD Stream/River
- N HD Waterbody



TOPOGRAPHIC MAP (Detailed)

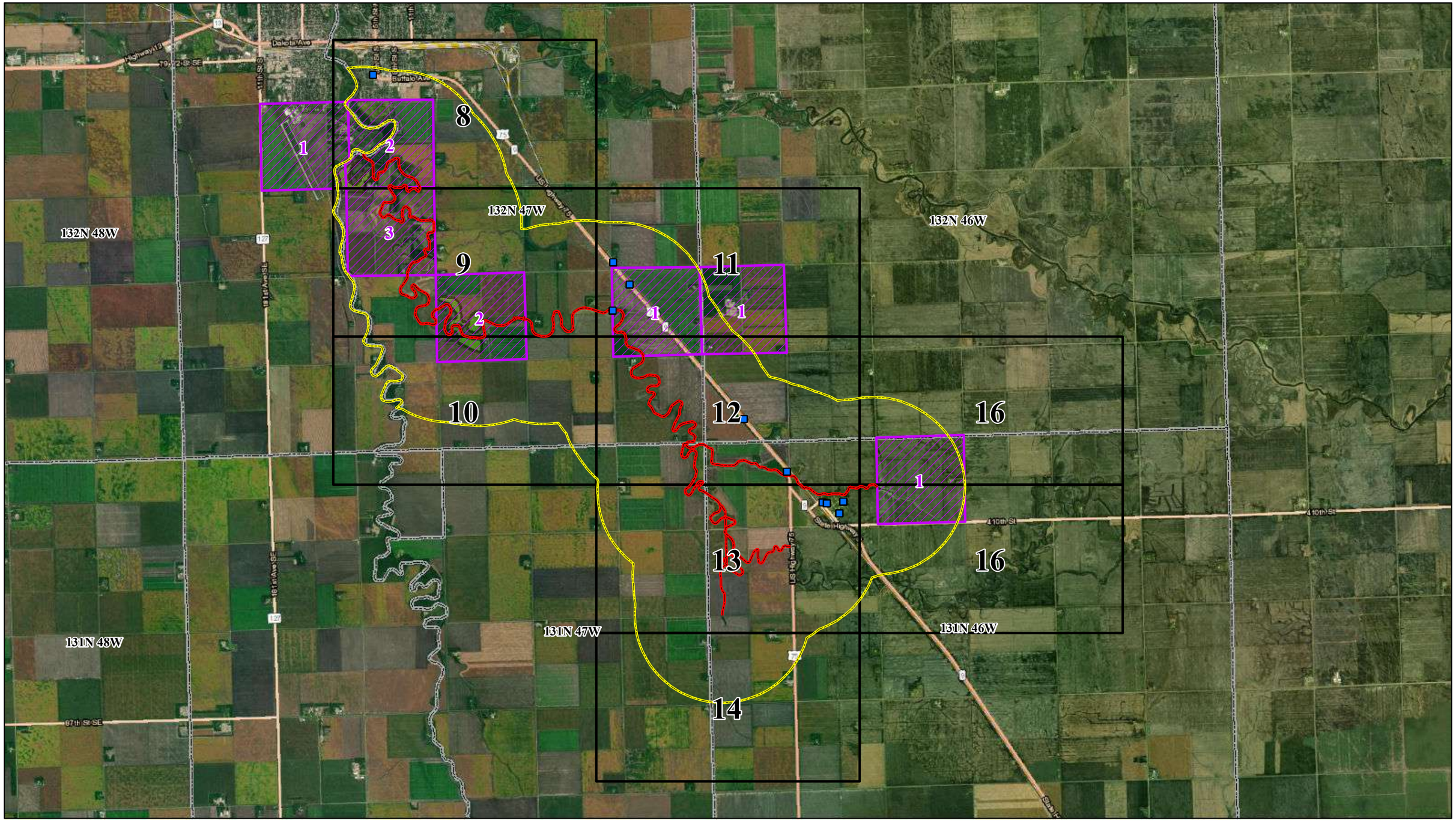
Doran Creek Development
Wilkin County, Minnesota

2,000 0 2,000
Feet

1:24,000 1 inch equals 2,000 feet

Note: Imagery courtesy of ESRI

Figure 6. Topographic map with previous cultural resources surveys and previously recorded sites.



Legend

- Historic Structures
- Doran Creek Centerline
- 1-Mile Study Area (MN)
- Mapbook Pages
- Number of Archaeological Sites/Section
- Previous Survey
- Township Boundary
- World Transportation

N
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AERIAL MAP (Overview)

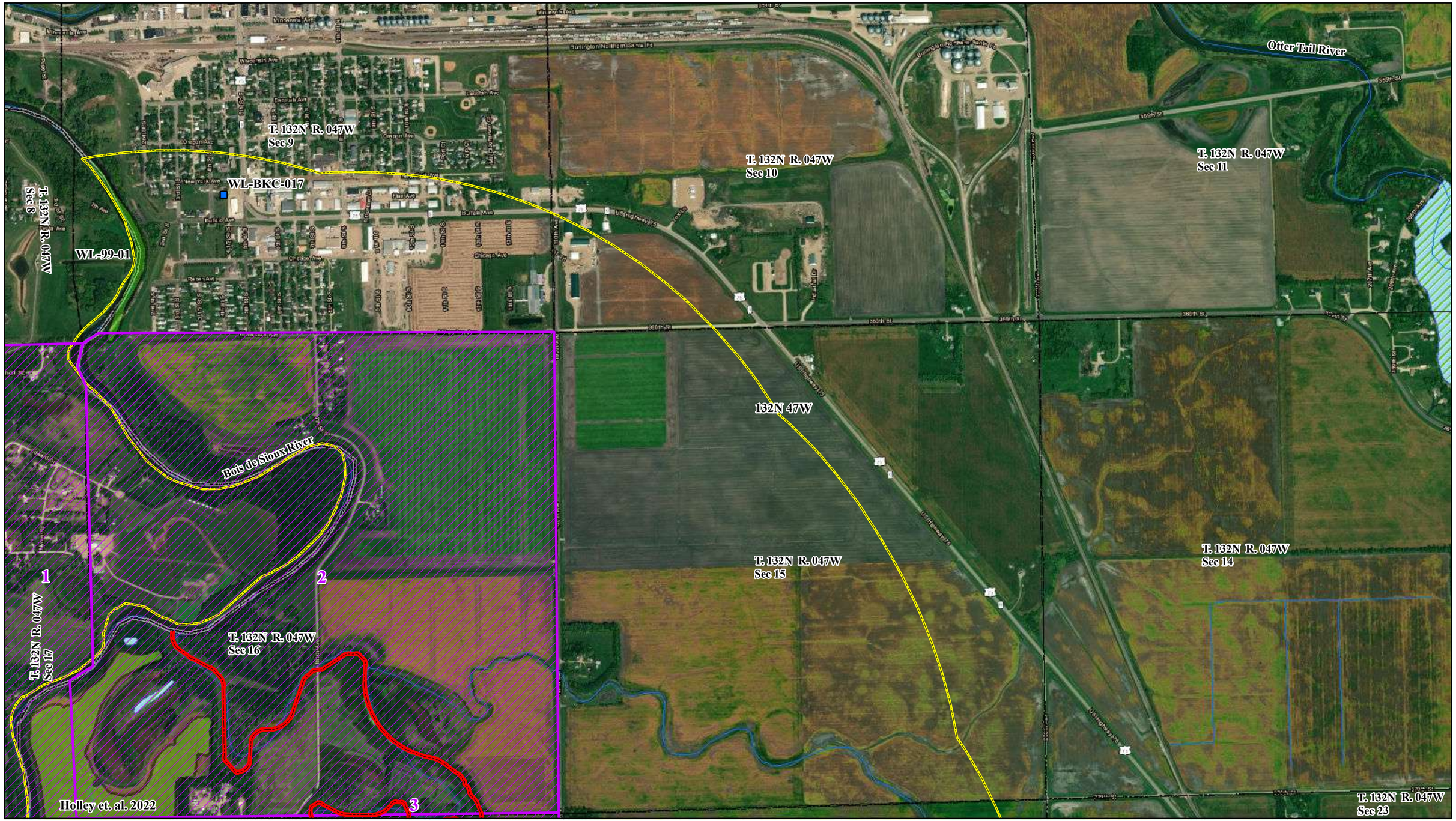
Doran Creek Development
Wilkin County, Minnesota

6,000 0 6,000
Feet

1:65,993 1 inch equals 5,499 feet

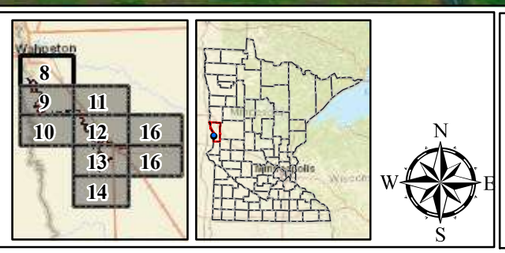
Note: Imagery courtesy of ESRI

Figure 7. Aerial map with previous cultural resources surveys and previously recorded sites.



Legend

- Historic Structures
- Doran Creek Centerline
- Number of Archaeological Sites/Section
- 1-Mile Study Area (MN)
- Previous Survey
- Township Boundary
- Township/Range/Section
- NHD Stream/River
- N HD Waterbody



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AERIAL MAP (Detailed)

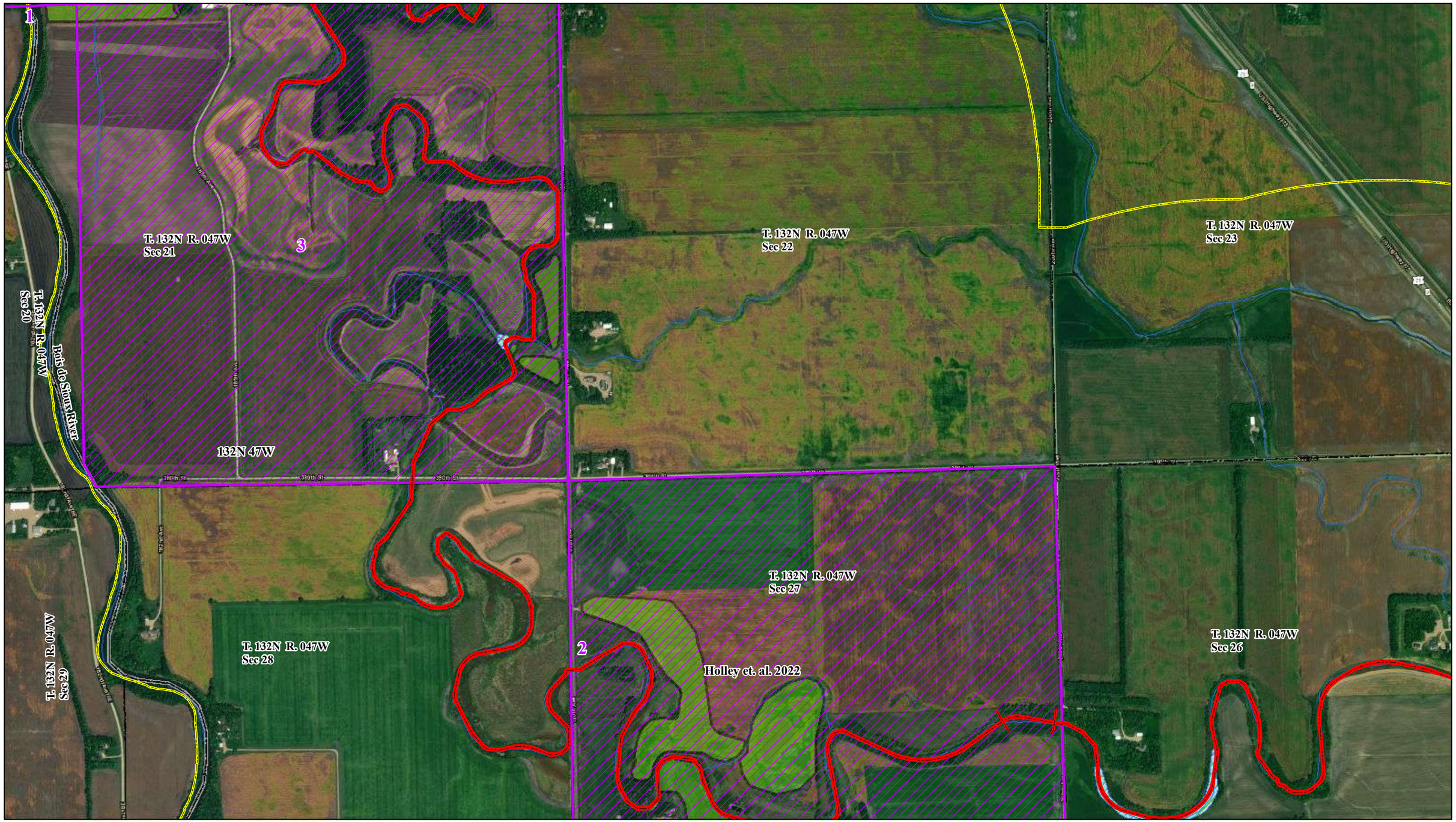
Doran Creek Development
Wilkin County, Minnesota

1,000 0 1,000
Feet

1:12,000 1 inch equals 1,000 feet

Note: Imagery courtesy of ESRI

Figure 8. Aerial map with previous cultural resources surveys and previously recorded sites.



Legend

- Historic Structures
- Doran Creek Centerline
- Number of Archaeological Sites/Section
- 1-Mile Study Area (MN)
- Previous Survey
- Township Boundary
- Township/Range/Section
- NHD Stream/River
- N HD Waterbody

N W E S

AERIAL MAP
(Detailed)
Doran Creek Development
Wilkin County, Minnesota

1,000 0 1,000
Feet

1:12,000 1 inch equals 1,000 feet

Note: Imagery courtesy of ESRI

Figure 9. Aerial map with previous cultural resources surveys and previously recorded sites.

T. 132N R. 047W Sec 29

T. 132N R. 047W Sec 28

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2

T. 132N R. 047W Sec 27

T. 132N R. 047W Sec 26

Bois de Sioux River

T. 132N R. 047W Sec 32

T. 132N R. 047W Sec 33

132N 47W

T. 132N R. 047W Sec 34

T. 132N R. 047W Sec 35

T. 131N R. 047W Sec 5

T. 131N R. 047W Sec 4

131N 47W

T. 131N R. 047W Sec 3

T. 131N R. 047W Sec 2

Legend

- Historic Structures
- Doran Creek Centerline
- Number of Archaeological Sites/Section
- 1-Mile Study Area (MN)
- Previous Survey
- Township Boundary
- Township/Range/Section
- NHD Stream/River
- N HD Waterbody

N W E S

AERIAL MAP (Detailed)

Doran Creek Development
Wilkin County, Minnesota

1,000 0 1,000
Feet

1:12,000 1 inch equals 1,000 feet

Note: Imagery courtesy of ESRI

Figure 10. Aerial map with previous cultural resources surveys and previously recorded sites.

T. 132N R. 047W
Sec 23

T. 132N R. 047W
Sec 24

T. 132N R. 046W
Sec 19

T. 132N R. 046W
Sec 20

WL-BKT-001

132N 47W

132N 46W

T. 132N R. 047W
Sec 26

WL-ROD-001

T. 132N R. 047W
Sec 25

1

WL-BKT-003

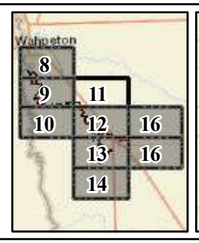
T. 132N R. 046W
Sec 30

1

T. 132N R. 046W
Sec 29

Legend

- Historic Structures
- Doran Creek Centerline
- Number of Archaeological Sites/Section
- 1-Mile Study Area (MN)
- Previous Survey
- Township Boundary
- Township/Range/Section
- NHD Stream/River
- N HD Waterbody



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AERIAL MAP (Detailed)

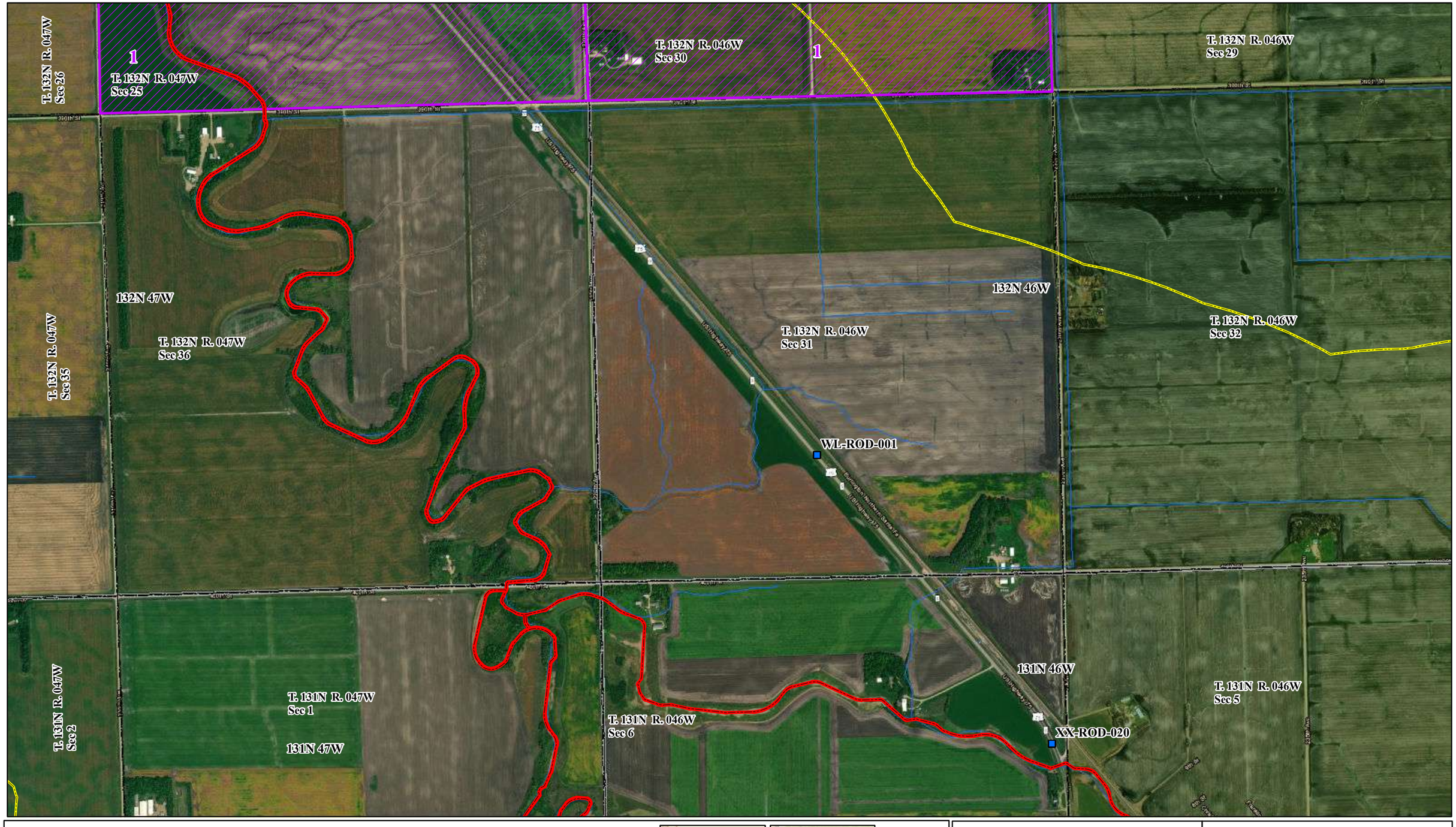
Doran Creek Development
Wilkin County, Minnesota

1,000 0 1,000
Feet

1:12,000 1 inch equals 1,000 feet

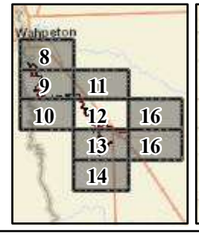
Note: Imagery courtesy of ESRI

Figure 11. Aerial map with previous cultural resources surveys and previously recorded sites.



Legend

- Historic Structures
- Doran Creek Centerline
- Number of Archaeological Sites/Section
- 1-Mile Study Area (MN)
- Previous Survey
- Township Boundary
- Township/Range/Section
- NHD Stream/River
- N HD Waterbody



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AERIAL MAP (Detailed)

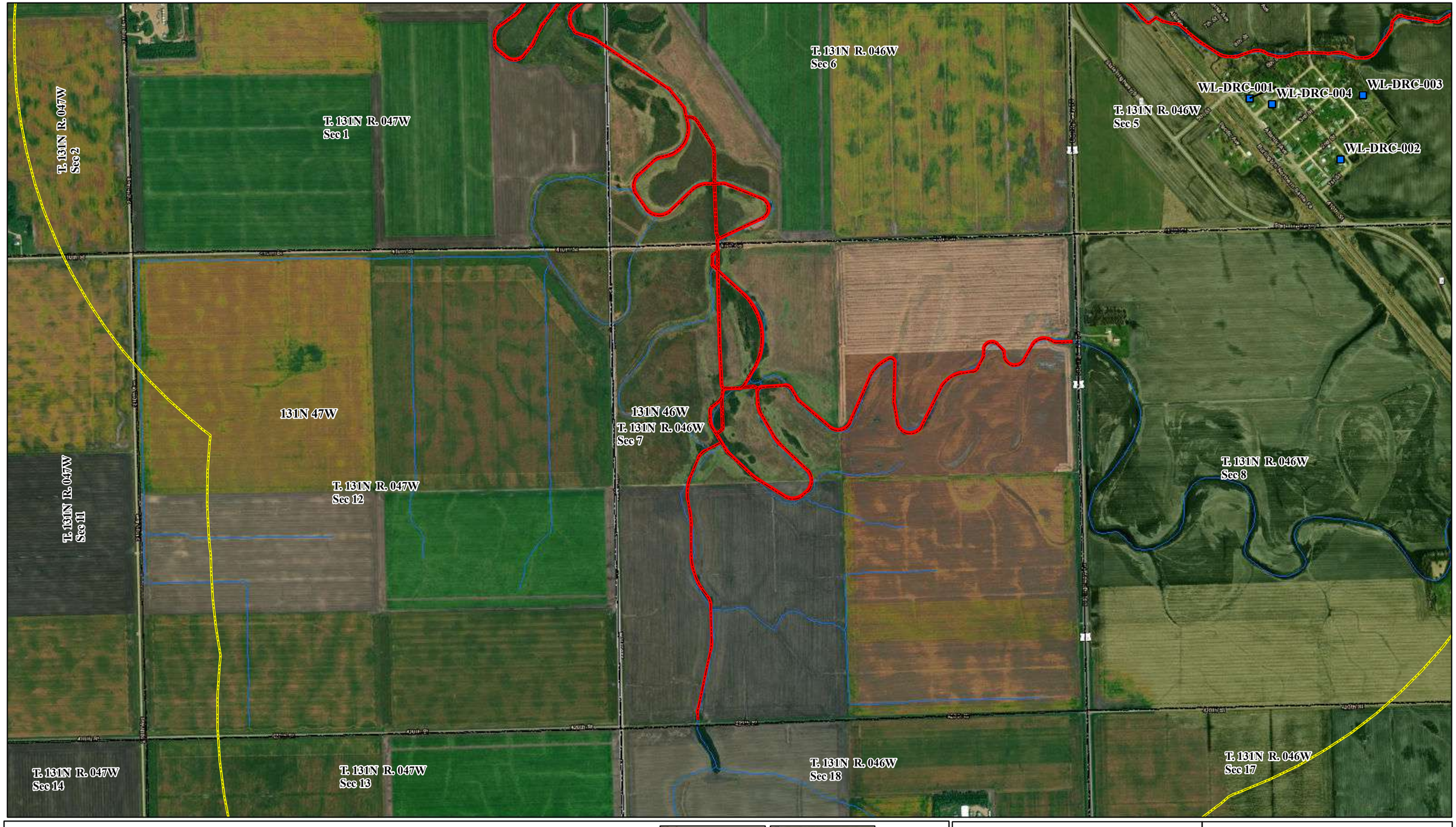
Doran Creek Development
Wilkin County, Minnesota

1,000 0 1,000
Feet

1:12,000 1 inch equals 1,000 feet

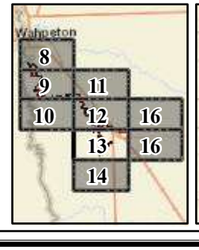
Note: Imagery courtesy of ESRI

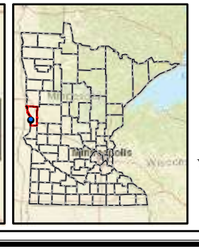
Figure 12. Aerial map with previous cultural resources surveys and previously recorded sites.



Legend

- Historic Structures
- Doran Creek Centerline
- Number of Archaeological Sites/Section
- 1-Mile Study Area (MN)
- Previous Survey
- Township Boundary
- Township/Range/Section
- NHD Stream/River
- N HD Waterbody





N W E S

AERIAL MAP (Detailed)

Doran Creek Development
Wilkin County, Minnesota

1,000 0 1,000
Feet

1:12,000 1 inch equals 1,000 feet

Note: Imagery courtesy of ESRI

Figure 13. Aerial map with previous cultural resources surveys and previously recorded sites.

Legend

- Historic Structures
- Doran Creek Centerline
- Number of Archaeological Sites/Section
- 1-Mile Study Area (MN)
- Previous Survey
- Township Boundary
- Township/Range/Section
- NHD Stream/River
- N HD Waterbody

N
W E
S

AERIAL MAP
(Detailed)
Doran Creek Development
Wilkin County, Minnesota

1,000 0 1,000
Feet

1:12,000 1 inch equals 1,000 feet

Note: Imagery courtesy of ESRI

Figure 14. Aerial map with previous cultural resources surveys and previously recorded sites.

T. 132N R. 046W
Sec 28

T. 132N R. 046W
Sec 27

T. 132N R. 046W
Sec 26

132N 46W

T. 132N R. 046W
Sec 33

T. 132N R. 046W
Sec 34

T. 132N R. 046W
Sec 35

T. 132N R. 046W
Sec 32

State Ditch Number Seventeen

1

T. 131N R. 046W
Sec 4

131N 46W

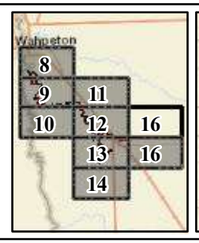
T. 131N R. 046W
Sec 3

T. 131N R. 046W
Sec 2

T. 131N R. 046W
Sec 5

Legend

- Historic Structures
- Doran Creek Centerline
- Number of Archaeological Sites/Section
- 1-Mile Study Area (MN)
- Previous Survey
- Township Boundary
- Township/Range/Section
- NHD Stream/River
- N HD Waterbody



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AERIAL MAP
(Detailed)

Doran Creek Development
Wilkin County, Minnesota

1,000 0 1,000
Feet

1:12,000 1 inch equals 1,000 feet

Note: Imagery courtesy of ESRI

Figure 15. Aerial map with previous cultural resources surveys and previously recorded sites.

T. 131N R. 046W
Sec 5

T. 131N R. 046W
Sec 4

1

T. 131N R. 046W
Sec 3

T. 131N R. 046W
Sec 2

T. 131N R. 046W
Sec 8

T. 131N R. 046W
Sec 9

131N 46W

T. 131N R. 046W
Sec 10

T. 131N R. 046W
Sec 11

T. 131N R. 046W
Sec 17

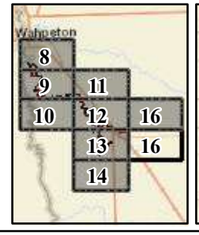
T. 131N R. 046W
Sec 16

T. 131N R. 046W
Sec 15

T. 131N R. 046W
Sec 14

Legend

- Historic Structures
- Doran Creek Centerline
- Number of Archaeological Sites/Section
- 1-Mile Study Area (MN)
- Previous Survey
- Township Boundary
- Township/Range/Section
- NHD Stream/River
- N HD Waterbody



N
W E
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AERIAL MAP
(Detailed)

Doran Creek Development
Wilkin County, Minnesota

1,000 0 1,000
Feet

1:12,000 1 inch equals 1,000 feet

Note: Imagery courtesy of ESRI

Figure 16. Aerial map with previous cultural resources surveys and previously recorded sites.

133N 48W

133N 47W

133N 46W

132N 48W

132N 47W

132N 46W

131N 48W

131N 47W

131N 46W

18

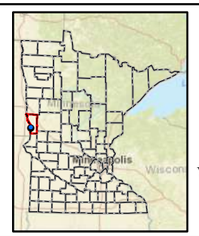
19

20

21

Legend

- Doran Creek Centerline
- 1-Mile Study Area (MN)
- Mapbook Page
- Township Boundary



N

W E

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HISTORICAL BLM GLO PLAT MAP (Overview)

Doran Creek Development
Wilkin County, Minnesota

7,000 0 7,000

Feet

1:79,192 1 inch equals 6,599 feet

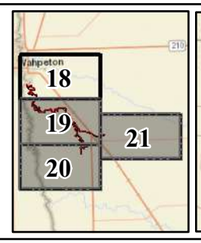
Note: Imagery courtesy of ESRI

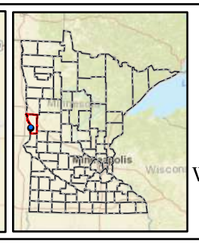
Figure 17. Project location on the BLM GLO Plat map.

T. 132N R. 047W Sec 5
T. 132N R. 047W Sec 4
T. 132N R. 047W Sec 3
T. 132N R. 047W Sec 2
T. 132N R. 047W Sec 1
T. 132N R. 046W Sec 6
T. 132N R. 046W Sec 5
T. 132N R. 047W Sec 8
T. 132N R. 047W Sec 9
T. 132N R. 047W Sec 10
T. 132N R. 047W Sec 11
T. 132N R. 047W Sec 12
T. 132N R. 046W Sec 7
T. 132N R. 046W Sec 8
132N 47W
132N 46W
T. 132N R. 047W Sec 17
T. 132N R. 047W Sec 15
T. 132N R. 047W Sec 14
T. 132N R. 047W Sec 13
T. 132N R. 046W Sec 18
T. 132N R. 046W Sec 17
T. 132N R. 047W Sec 16
T. 132N R. 047W Sec 21
T. 132N R. 047W Sec 22
T. 132N R. 047W Sec 23
T. 132N R. 047W Sec 24
T. 132N R. 046W Sec 19
T. 132N R. 046W Sec 20
T. 132N R. 047W Sec 20

Legend

- Doran Creek Centerline
- 1-Mile Study Area (MN)
- Township Boundary
- Township/Range/Section





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HISTORICAL BLM GLO PLAT MAP (Detailed)

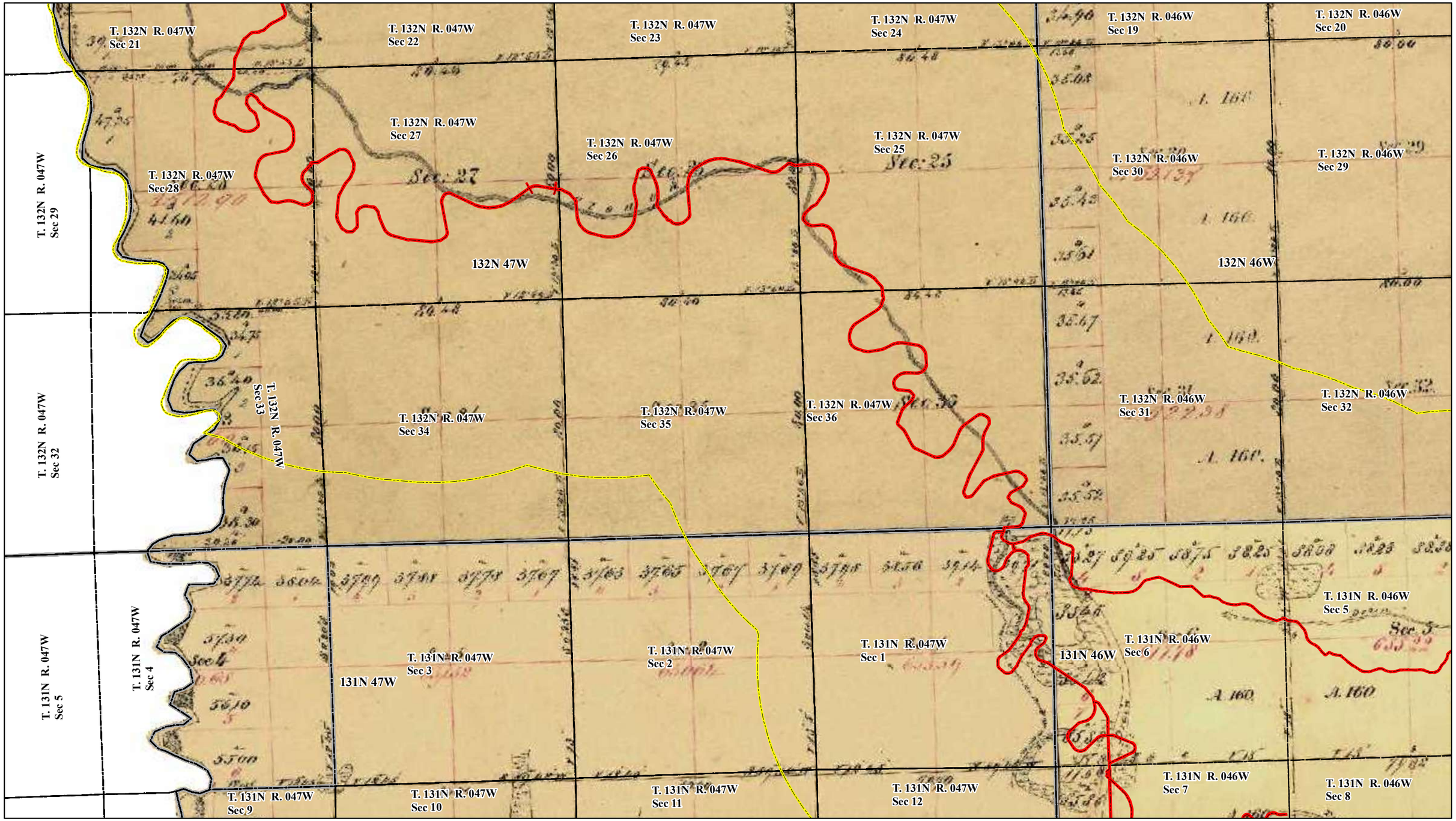
Doran Creek Development
Wilkin County, Minnesota

2,000 0 2,000
Feet

1:24,000 1 inch equals 2,000 feet

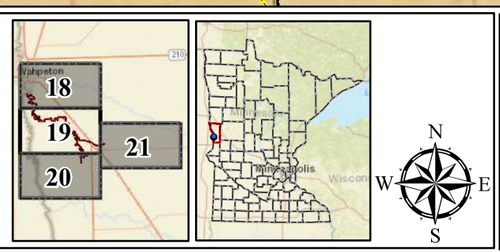
Note: Imagery courtesy of ESRI

Figure 18. Project location on the BLM GLO Plat map.



Legend

- Doran Creek Centerline
- 1-Mile Study Area (MN)
- Township Boundary
- Township/Range/Section



HISTORICAL BLM GLO PLAT MAP (Detailed)

Doran Creek Development
Wilkin County, Minnesota

2,000 0 2,000
Feet

1:24,000 1 inch equals 2,000 feet

Note: Imagery courtesy of ESRI

Figure 19. Project location on the BLM GLO Plat map.

T. 131N R. 047W Sec 8

T. 131N R. 047W Sec 9

T. 131N R. 047W Sec 10

T. 131N R. 047W Sec 11

T. 131N R. 047W Sec 12

T. 131N R. 046W Sec 7

T. 131N R. 046W Sec 8

T. 131N R. 047W Sec 16

T. 131N R. 047W Sec 15

T. 131N R. 047W Sec 14

T. 131N R. 047W Sec 13

T. 131N R. 046W Sec 18

T. 131N R. 046W Sec 17

131N 47W

131N 46W

T. 131N R. 047W Sec 20

T. 131N R. 047W Sec 21

T. 131N R. 047W Sec 22

T. 131N R. 047W Sec 23

T. 131N R. 047W Sec 24

T. 131N R. 046W Sec 19

T. 131N R. 046W Sec 20

T. 131N R. 047W Sec 29

T. 131N R. 047W Sec 28

T. 131N R. 047W Sec 27

T. 131N R. 047W Sec 26

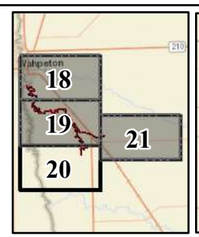
T. 131N R. 047W Sec 25

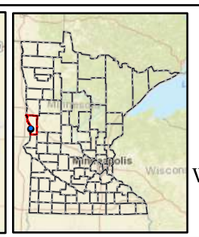
T. 131N R. 046W Sec 30

T. 131N R. 046W Sec 29

Legend

- Doran Creek Centerline
- 1-Mile Study Area (MN)
- Township Boundary
- Township/Range/Section





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HISTORICAL BLM GLO PLAT MAP (Detailed)

Doran Creek Development
Wilkin County, Minnesota

2,000 0 2,000
Feet

1:24,000 1 inch equals 2,000 feet

Note: Imagery courtesy of ESRI

Figure 20. Project location on the BLM GLO Plat map.

132N 46W

T. 132N R. 046W Sec 33

T. 132N R. 046W Sec 34

T. 132N R. 046W Sec 35

T. 132N R. 046W Sec 36

T. R. Sec 31

T. 132N R. 046W Sec 32

T. 131N R. 046W Sec 5

T. 131N R. 046W Sec 4

T. 131N R. 046W Sec 3

T. 131N R. 046W Sec 2

T. 131N R. 046W Sec 1

T. R. Sec 6

131N 46W

T. 131N R. 046W Sec 9

T. 131N R. 046W Sec 10

T. 131N R. 046W Sec 11

T. 131N R. 046W Sec 12

T. R. Sec 7

T. 131N R. 046W Sec 8

T. 131N R. 046W Sec 16

T. 131N R. 046W Sec 15

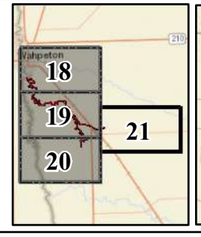
T. 131N R. 046W Sec 14

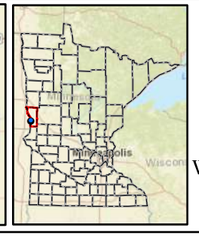
T. 131N R. 046W Sec 13

T. R. Sec 18

Legend

- Doran Creek Centerline
- 1-Mile Study Area (MN)
- Township Boundary
- Township/Range/Section





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HISTORICAL BLM GLO PLAT MAP (Detailed)

Doran Creek Development
Wilkin County, Minnesota

2,000 0 2,000
Feet

1:24,000 1 inch equals 2,000 feet

Note: Imagery courtesy of ESRI

Figure 21. Project location on the BLM GLO Plat map.