Multi-Purpose Drainage Management Report

County Ditch No. 28

Brown County, Minnesota

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ISG Project No.: 25-23281

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INTRODUCTION

Upon request, ISG completed a review of Brown County Ditch No. 28 (CD 28). The scope included an examination of the CD 28 watershed utilizing drone aerial imagery and GIS mapping. The information was utilized to identify practices or activities that will reduce downstream peak flows and flooding, reduce erosion and sedimentation, protect drainage system efficiency, reduce drainage system maintenance, improve water quality, and improve aquatic and terrestrial habitat. In addition, the report includes rough estimates of the current drainage system capacities and an estimation of cost to repair current infrastructure as well as cost to obtain sufficient drainage capacities for modern drainage under an improvement.

ISG utilized Agricultural Conservation Planning Framework (ACPF) datasets to investigate and prioritize BMPs throughout the watershed. Storage based cost effective BMPs were identified and ranked utilizing ACPF datasets and additional desktop review.

It should be noted that some general assumptions were made during this analysis. ISG received the original watershed map, profiles, and cut sheets under the current record for the drainage system. Additional information may or may not modify our findings, but large change in scope is not anticipated from this report. If landowners have tile maps or any other information that can aid in future work, please feel free to share this information. A future survey will be necessary to verify these assumptions if repairs or impoundments are ordered to the system.

WATERSHED

Location

Brown County Ditch No. 28 (CD 28) is located in Sections 17, 19, 20, 21, 22, 26, 27, 28, 34, 35 of Mulligan Township. The CD 28 watershed is part of the Little Cottonwood sub watersheds (HUC12) and the Cottonwood-Middle Minnesota watershed (HUC8). CD 28 drainage infrastructure is comprised of the Mainline open ditch approximately 40,780-feet and three (3) tile systems totaling approximately 2,403 -feet of subsurface drainage tiles. Tile branches surrounding the agricultural land flow into the Mainline open ditch, which runs from south to north and discharges into the Little Cottonwood River in SE ¼ of section 17 of Mulligan Township. CD 28 consists of two open ditches: Branch 2, which begins at Section 21, and Branch 2A, which diverges from Branch 2 at Section 28 and continues through to Section 34.

Watershed Description

The CD 28 ditch drains approximately 4,053 acres of land within the watershed. The watershed is characterized by mostly flat agricultural land with an elevation difference of approximately 101-feet. The watershed follows the natural drainage patterns and defines the area where water drains within this district. In the southern part of the district, the watershed runs close to Wood Lake.

Figure 1: CD 28 Mainline open ditch near the outlet to Little Cottonwood River

Natural Resources, Wetlands, and Water Quality

There are no known areas identified as moderate or high value for areas of biological significance by the Minnesota Biologic Survey (MBS) for biodiversity significance within the CD 28 watershed. Although the ditch is not officially listed as impaired, drone footage reveals that much of its water is affected by eutrophication, with visible algae present in several sections.

A review of the National Wetland Inventory (NWI) shows there is a forested wetland located in Section 20 and a freshwater emergent wetland at Section 17; in both wetland locations there are no rare communities identified. Within the watershed, areas of RIM easements and Wildlife Management Areas (WMAs) have been designated to protect riparian zones and wetlands. A map of the NWI is displayed on the Wetland and Natural Resources Map in Appendix A.

CD 28 has a primary outlet in the Little Cottonwood River, which meanders through Section 17 of Mulligan Township.

Figure 2: Little Cottonwood River outlet to CD 28 – Section 17 of Mulligan Township

Nature of the Outlet

The outlet for CD 28 is in the Little Cottonwood River located in the N ½ of the SE ¼ of Section 17 of Mulligan Township of Brown County. The outlet within CD 28 is in good condition, with buffers and stable banks as seen on the drone footage. At this location, the Little Cottonwood River is characterized by a very flat gradient, low banks, and a highly meandering channel. The river is listed as impaired for nitrates, turbidity and E. coli contamination. There is an adequate grass buffer along the outlet channel. The outlet junction of CD 28 and Little Cottonwood River is shown in Figure 3 below.

Figure 3: Terminus of the CD 28 Mainline open ditch in Section 17 of Mulligan Township

HISTORY

According to the materials supplied by Brown County, CD 28 was established around 1920 with a drainage area of 3,650 acres. During this time, the system consisted of approximately 41,236 feet of open ditch, including the Mainline and Branch "A" (now known as Branch 2), and approximately 72,650 feet of tile including laterals of the Mainline and Branch "A", Branch "B", Branch "C" (now known as Branch 1), Branch "D", and their numerous sublaterals. It is noted that the original construction of the open ditch (then called a plough ditch) was intended to only be adequate to drain surficial flow within the watershed and not provide a proper outlet for subsurface drainage.

The 1952 Preliminary Engineering Report (PER) and 1953 Final Engineering Report (FER) describe major improvements that were carried out on CD 28, altering the drainage area to 3,355 acres; The Mainline and Branch 2 open ditch systems were deepened and widened to provide adequate outlets for the connecting tile systems; The main ditch outlet was extended to the Little Cottonwood River; Branch 2 was shortened from the NE corner of Section 34 to the SE corner of Section 27; Branch 2A was established as an open ditch running south along the east side of Section 28 from Branch 2 and east along the north side of Section 34 ending in the NE corner of the Section; Branch 2A-1 was established as a tile line running across Co Hwy 8, providing drainage to the SW corner of Section 27; A culvert through the grade of County Trunk Highway 67 along the East side of Section 34 was removed and the grade on this highway was raised through the low area, and a tile line was added from the Main ditch to the SW ¼ of Section 20.

By 1976, various changes took place within the CD 28 watershed. This included an extension of Branch 1 into the west half of Section 20, establishment of a private system in the NW corner of Section 22 draining out of the watershed to the east, loss of watershed area to the County and State within the north half of Section 33, and the establishment of an independent tile system and natural overland flow path in the northern half of Section 34 draining into the CD 28 system. At this time, it was also recommended that Branch 2, Branch 2A, and the Main open ditch in the southern half of Section 21 and the SW corner of Section 24 be cleaned out due to sediment build up.

Several ditch clean outs including removal of sediments from ditch bottoms, tile and wash out repairs and replacement of tile outlets have been carried out on different sections of the ditch system between 1977-2008. In 2011, a side drain washout on Branch 2A was carried out through tile repair and backfilling. Records indicate that in 2012, beaver dams were removed at the outlet to the Little Cottonwood River, and at NW ¼ of section 34, side drains were repaired, the channel was cleaned, and erosion control blankets were installed and seeded. Several petitions for repairs and improvements on CD 28 were applied but further investigation is needed to confirm if these repairs/changes occurred.

The Wood Lake watershed, which is independent of CD 28, often breaches the watershed divide during floods and high water events in the NE ¼ of Section 33 and in the NW ¼ of Section 34 the overflow eventually enters the open ditch of Branch 2A of the ditch. At the same time during periods of high water, the Mulligan Slough watershed reverses its normal southeast flow, instead flowing northwest and entering the upper end of the open ditch of Branch 2 in Section 27.

EXISTING CONDITIONS ANALYSIS

A drone flight inventory was completed on July 18th, 2025. The drone flight captured video of the conditions of the open ditch identifying areas in need of repair and other locations where Multi-purpose Drainage Management (MDM) Best Management Practices (BMPs) are recommended to enhance water quality and reduce erosion. Full drone report is located in Appendix C.

Vegetation Cover

The ditch is surrounded by perennial grass. This grass grows along the ditch banks and side slopes, developing dense root systems that help stabilize the banks and minimize erosion. In some sections, the grass has grown down to the bottom of the ditch. Figure 4 shows examples of perennial grass growing within the open ditch and the 16.5-foot buffer zone.

Figure 4: Vegetation cover along Branch 2A to outwards outlet T-15 open ditch – Section 28 of Mulligan Township

Bank Erosion and Sloughing

Sloughing has been observed at multiple locations along the ditch. This occurs when the ditch bank shears and collapses into the channel, often due to factors such as overland flow overtopping the bank, lack of buffer vegetation, steep side slopes, and the meandering alignment of the ditch. Sloughing deposits sediment into the CD 28 open ditch, restricting flow and increasing the need for maintenance. In some areas, severe sloughing has led to natural bench formation. Constructing benches at 3 to 5 times the width of the inner channel in these areas may help minimize further erosion. Bank erosion is also evident along various sections of the ditch, resulting in localized bank collapse and reduced water flow. Potential gully erosion has been noted in some locations, which could lead to additional bank failure. The following photos provide examples of sloughing and bank erosion.

Figure 5: Gulley erosion on Branch 2A outlet near T-5 (SE ¼ of Sec. 28) of Mulligan Township

Figure 6: Bank erosion on CD 28 Mainline open ditch downstream between T-208 and CO Hwy 8 (SW ¼ of Sec. 21) of Mulligan Township

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Figure 7: Bank sloughing on Mainline open ditch between CO Hwy 8 and T-212 (NW ¼ of Sec. 27) of Mulligan Township

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Figure 8: Bank erosion on Branch 2 upstream approaching CO Hwy 8 (NE ¼ of Sec. 27) of Mulligan Township

Figure 9: Sloughing on CD 28 Mainline open ditch approaching T-212 (NE ¼ of Sec. 28) of Mulligan Township

Figure 10: Sloughing on Branch 2 at 120th street towards Co Hwy 8 (NW ¼ of Sec. 28) of Mulligan Township

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Figure 11: Erosion and sloughing on the Mainline open ditch from CR 20 T-208 (NE ¼ of Sec. 20) of Mulligan Township

Figure 12: Bank erosion on the Mainline open ditch from CR 20 to T-208 (SW ¼ of Sec. 20) of Mulligan Township

Open Ditch Cleaning

There are areas within CD 28 where open ditch cleaning may be necessary. Cleaning of open ditch on a watershed of this size is recommended to take place every 15 to 20 years. Deposited sediment provides an opportunity for vegetation growth at the bottom of the channel. The effects of vegetation in the ditch vary depending on the variety present. Sediment, grasses, and cattails in the ditch bottom can impede water flow leading to localized flooding during storm events. Sediment deposits along with vegetation growth can cause the ditch to meander potentially eroding side slopes. This report assumes that open ditch cleaning is needed on a majority of the open ditch based on the drone video. A future survey will be necessary to determine the legal grade and accumulated sediment depths. The survey and legal grade analysis will determine the exact areas recommended for open ditch cleaning. Figure 13 and 14 shows some areas that require vegetation and cleaning for sediment removal respectively.

Figure 13: Vegetation overgrowth in the bottom of the channel on the Mainline open ditch CD 28 downstream of T-212 of Mulligan Township

Figure 14: Impeded water flow at culvert on Branch 2 outlet to 120th Street

Buffers

The Minnesota Buffer Law requires 50-foot buffer zones along lakes, rivers, and streams, and a 16.5-foot (1-rod) buffer along public ditches. The CD 28 open ditch system must comply with this law by maintaining a 16.5-foot buffer along the entire length of the open ditch. The buffer strips help reduce sediment entering the ditch and minimize sloughing off the side slopes. Based on a review of drone footage, most sections of the CD 28 open ditch appear to be in compliance with the Minnesota Buffer Law.

A summary of the buffer widths is compiled in the Buffer Map in Appendix A. Average widths were determined from aerial review and drone video. On-site verification is needed to verify buffer widths as well as determine shot stretches of buffers that may be larger or smaller than the indicated width on map.

Figure 15: Buffer strip on the Mainline open ditch from Co Hwy 8 to T-212 in compliance with the Minnesota buffer law

Culvert Crossings

There are 25 culvert crossings present on CD 28 open ditch, 10 on the Mainline, 14 on Branch 2, and 1 on Branch 2A. The size, slope, and condition of the culverts was determined based off drone video and county records. The size, slope, and condition of each crossing will need to be verified in the future proceedings.

Based on drone imagery, the culvert structures appear to be in fair condition; however, the surrounding areas require maintenance to preserve proper ditch hydraulics. This includes removing vegetation from the ditch bottom and installing riprap to prevent future erosion. The culverts also need sediment removal and stabilization of the ditch banks, as some sections show signs of erosion and reduced water flow. The final determination on whether they need to be replaced or not will be completed in the repair report after survey is obtained to determine the condition and capacity. Their capacity and elevation in relation to legal ditch grade will need to be determined in order to further justify repairs. The figures below show the culverts within the system.

Figure 16: Downstream end of the Mainline open ditch on CR 20 culvert crossing

Figure 17: Downstream end of Branch 2A outlet at T-15 culvert crossing

Figure 18: Downstream end CO Hwy 8 culvert crossing

Figure 19: Mainline open ditch from CR 20 at T-208 culvert crossing

Tile and Culvert Crossing Capacities

The information in this document has been prepared with the original Brown CD 28 alignment maps and profiles, historical aerials, and the drone videos. The watershed boundary was generated by LiDAR contours, Minnesota DNR watershed lines, aerial imagery and USGS Stream-Stats information. Culvert sizes and slopes were assumed based on a review of the available historical documents and drone videos. While the drainage calculations provide a general observation of the culverts' drainage capacities, survey and site visits will be required to determine current drainage capacities from the existing conditions of the culverts.

The capacity of agricultural drainage systems is expressed as a drainage coefficient, in inches per day (in/day), and is defined as the depth of water over the entire area of the upstream watershed that a can drain in a 24-hour period. For a system like CD 28, the recommended drainage coefficient is 1.0 inch per day for open ditches and culvert crossings with roadway designs further impacting culvert capacities.

Table 1 outlines the existing capacities of the culverts, respectively, within the systems. It should be noted that there were some assumptions made in the calculations. All information and data for Branch 1 and Branch 2-A-1 has been assumed based on the drone flights and the review of historical plans and profiles. ISG did not receive plans for Branch 4, therefore, the slope of the existing tile was assumed to follow Lidar topography and tile size was estimated based on sizing of the other branches. A future site visit and topographic survey will be necessary to verify the culverts and tiles size, slopes, and condition.

Based on the existing inventory (Table 1), some of the culverts do not meet the recommended drainage capacity. It can be assumed that the operating capacities of the existing culverts are less due to degradation of the CD 28 system over its years of use and noticeable impoundment of water upstream of culverts.

TABLE 1. CD 28 EXISTING TILE CAPACITIES

Area	ACSIC Size (in)	ACSIC Slope (%)	Drainage Area (Acres)	ACSIC Drainage Coefficient (in/day)
Branch 1	14	1.20%	355.3	0.40
Branch 1	14	0.10%	353.3	0.11
Branch 1	12	0.10%	135.6	0.20
Branch 2-A-1	10	2.00%	39.5	1.87
Branch 4	12	0.05%	271.0	0.07

TABLE 2. CD 28 EXISTING OPEN DITCH CULVERT CAPACITIES

Crossing # on Map	Branch	Roadway / Crossing	Existing Type	Existing Material	Existing Size (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
1	Mainline	Co Hwy 20	ROUND CULVERT	RCP	84	0.04%	2412	1.26
2	Mainline	Field Crossing	ROUND CULVERT	RCP	72	0.04%	2232	*0.91*
3	Mainline	Field Crossing	ROUND CULVERT	RCP	66	0.04%	1928	*0.83*
4	Mainline	Field Crossing	ROUND CULVERT	RCP	60	0.04%	1924	*0.65*
5	Mainline	T-206	ROUND CULVERT	RCP	72	0.04%	1451	1.39
6	Mainline	Field Crossing	ROUND CULVERT	RCP	54	0.04%	1112	*0.84*
7	Mainline	CO Hwy 8	ROUND CULVERT	RCP	60	0.04%	1098	1.13
8	Mainline	CO Hwy 8	ROUND CULVERT	RCP	60	0.04%	1096	1.13
9	Mainline	Field Crossing	ROUND CULVERT	RCP	48	0.04%	1090	*0.63*
10	Mainline	T-212	ROUND CULVERT	RCP	30	0.04%	506	*0.39*
11	Branch 2	T-15	ROUND CULVERT	RCP	72	0.05%	984	2.30
12	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	734	1.60
13	Branch 2	Irrigation Crossing	ROUND CULVERT	RCP	72	0.05%	734	3.08
14	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	733	1.60

15	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	733	1.60
16	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	733	1.60
17	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	732	1.60
18	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	587	2.00
18	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	587	2.00
20	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	586	2.00
21	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	586	2.01
22	Branch 2	Co Hwy 8	ROUND CULVERT	RCP	72	0.05%	301	7.50
23	Branch 2	Field Crossing	ROUND CULVERT	RCP	66	0.05%	116	15.39
24	Branch 2	Field Crossing	ROUND CULVERT	RCP	60	0.05%	115	12.07
25	Branch 2-A	CO Hwy 8 / T-5	ROUND CULVERT	RCP	60	0.10%	124	15.83

DRAINAGE PROJECT OPTIONS

Repair

Standard open ditch repairs include open ditch cleaning, tile outlet repairs, side bank repairs, culvert replacement (if deemed necessary), alternative side inlets, and re-seeding of ditch banks. Repairs to tiles may also take place replacing tile branches or portions of tiles that may be in disrepair. Typically, tile branches are replaced adjacent to the existing lines at an offset of 30 to 40-feet. Under MN Statute 103.E, the Drainage Authority can repair the legal drainage system back to the As Constructed or Subsequently Improved Condition (ACSIC) while following all local, state, and federal drainage and wetland laws. Repair sizes and costs were included for all branches of tile and open ditch. A repair may consist of select branches as further determined by landowners and the Drainage Authority.

Improvement

This report includes an analysis and an estimation of cost to repair current infrastructure as well as cost to obtain sufficient drainage capacities for modern drainage. Any increases in capacity to the current public drainage system will fall under improvement and is subject to follow the MN Statue 103E for improvement proceedings including but not limited to environmental, land use, and multipurpose water management criteria. Sizes and cost estimates are included to obtain drainage coefficients of at least 1.0 inch per day for culverts (Table 2). Through analysis of the existing conditions of the system, it was determined that culvert crossing #1, #2, #5, #7, #8, and #9 have insufficient capacity and are recommended to be increased in an improvement project. An analysis of the adequacy of the outlet will be required when reviewing any improvement project and additional storage may be required.

TABLE 3. CD 28 IMPROVEMENT TILE CAPACITIES

Area	ACSIC Size (in)	Proposed Size (in)	ACSIC Slope (%)	Proposed Slope (%)	Drainage Area (Acres)	ACSIC Drainage Coefficient (in/day)	Proposed Drainage Coefficient (in/day)
Branch 1	14	24	1.20%	0.11%	355.3	0.40	0.50
Branch 1	14	24	0.10%	0.11%	353.3	0.11	0.51
Branch 1	12	15	0.10%	0.19%	135.6	0.20	0.50
Branch 2-A-1	10	10	2.00%	2.00%	39.5	1.87	1.87
Branch 4	12	30	0.05%	0.05%	271.0	0.07	0.81

TABLE 4. CD 28 IMPROVEMENT CULVERT CAPACITIES

Crossing # on Map	Ditch Description	Roadway / Crossing	Proposed Type	Proposed Material	Proposed Size (in)	Proposed Slope (%)	Drainage Area (Acres)	Proposed Drainage Coefficient (in/day)
1	Mainline	Co Hwy 20	ROUND CULVERT	RCP	84	0.04%	2412	1.26
2	Mainline	Field Crossing	ROUND CULVERT	RCP	84	0.04%	2232	1.37
3	Mainline	Field Crossing	ROUND CULVERT	RCP	72	0.04%	1928	1.05
4	Mainline	Field Crossing	ROUND CULVERT	RCP	72	0.04%	1924	1.05
5	Mainline	T-206	ROUND CULVERT	RCP	72	0.04%	1451	1.39
6	Mainline	Field Crossing	ROUND CULVERT	RCP	60	0.04%	1112	1.12
7	Mainline	CO Hwy 8	ROUND CULVERT	RCP	60	0.04%	1098	1.13
8	Mainline	CO Hwy 8	ROUND CULVERT	RCP	60	0.04%	1096	1.13
9	Mainline	Field Crossing	ROUND CULVERT	RCP	60	0.04%	1090	1.14
10	Mainline	T-212	ROUND CULVERT	RCP	48	0.04%	506	1.36
11	Branch 2	T-15	ROUND CULVERT	RCP	72	0.05%	984	2.30
12	Branch 2	Irrigation Crossing	ROUND CULVERT	RCP	72	0.05%	734	3.08
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18	Branch 2	Irrigation Crossing	ROUND CULVERT	RCP	72	0.05%	587	3.85
20	Branch 2	Irrigation Crossing	ROUND CULVERT	RCP	72	0.05%	586	3.85
21	Branch 2	Irrigation Crossing	ROUND CULVERT	RCP	72	0.05%	586	3.86
22	Branch 2	Co Hwy 8	ROUND CULVERT	RCP	72	0.05%	301	7.50
23	Branch 2	Field Crossing	ROUND CULVERT	RCP	72	0.05%	116	19.41
24	Branch 2	Field Crossing	ROUND CULVERT	RCP	60	0.05%	115	12.07
25	Branch 2-A	CO Hwy 8 / T-5	ROUND CULVERT	RCP	60	0.10%	124	15.83

COST ESTIMATES

Cost estimates were generated for both repair and improvement options and are based on the drone inventory and assumptions from ISG's experience in past construction projects. Closer repair quantities will be generated if repair or improvement proceedings move forward, and those costs will be updated in the future. Itemized costs are based on bid prices from recent construction projects of similar nature.

Other Costs

Road Authority costs apply to tile and ditch crossings along roadways. In turn, costs for repairs to these crossings are transferred to the respective road authority (i.e. County, Township, etc.). The Drainage Authority should review these costs with the respective road authorities and determine proper assessments for culvert maintenance.

Per MN Statute 103E.351, if the Drainage Authority determines that the benefits of a drainage system do not reflect the present-day drainage area or value; viewers may be appointed to appropriately update the systems drainage benefits. This process is called redetermination of benefits and will likely be required for CD 28 if the benefited land is outdated or benefitted costs does not reflect today's value of the dollar. Buffer acquisition may be needed if the CD 28 system has not been redetermined since its establishment. After the system is redetermined, 1-rod buffer strips are generally acquired by the drainage system for access and maintenance to the system.

The costs below outline the cost to repair to the As Constructed or Subsequently Improved Capacities as well as the cost to improve the system to the recommended drainage coefficients for modern farming practices. A full itemized breakdown of the construction cost estimates including estimated temporary damages, administrative, engineering, and unforeseen contingencies are included in Appendix B.

TABLE 5. REPAIR AND IMPROVEMENT COST ESTIMATE

Area	Separable Maintenance / Repair	Improvement Cost	Net Cost
Mainline	$ 787,306	$ 812,921	$ 25,615
Branch 1	$ 115,868	$ 149,468	$ 33,600
Branch 2	$ 277,914	$ 286,629	$ 8,715
Branch 2-A	$ 136,110	$ 140,551	$ 4,441
Branch 4	$ 33,846	$ 61,138	$ 27,291
Mainline Crossing #1 - CO Hwy 20	$ 100,775	$ 101,559	$ 784
Mainline - Crossing #2	$ 292,474	$ 320,284	$ 27,810
Mainline - Crossing #3	$ 174,227	$ 185,501	$ 11,275
Mainline - Crossing #4	$ 54,423	$ 65,849	$ 11,426
Mainline Crossing #5 - T-206	$ 195,062	$ 196,580	$ 1,518
Mainline - Crossing #6	$ 44,262	$ 50,741	$ 6,479
Mainline Crossing #7 - CO Hwy 8	$ 156,983	$ 158,204	$ 1,221
Mainline - Crossing #8	$ 38,677	$ 50,741	$ 12,064
Mainline - Crossing #9	$ 50,350	$ 50,741	$ 391
Mainline Crossing #10 - T-212	$ 42,043	$ 70,984	$ 28,941
Branch 2 Crossing #11 - T-15	$ 179,585	$ 180,982	$ 1,397
Branch 2 - Crossing #12	$ 26,345	$ 34,636	$ 8,291
Branch 2 - Crossing #13	$ 38,670	$ 55,444	$ 16,774
Branch 2 - Crossing #14	$ 23,376	$ 32,890	$ 9,514
Branch 2 - Crossing #15	$ 23,376	$ 29,442	$ 6,065
Branch 2 - Crossing #16	$ 23,376	$ 29,442	$ 6,065
Branch 2 - Crossing #17	$ 23,376	$ 29,442	$ 6,065
Branch 2 - Crossing #18	$ 23,376	$ 29,442	$ 6,065
Branch 2 - Crossing #19	$ 26,345	$ 34,636	$ 8,291
Branch 2 - Crossing #20	$ 26,345	$ 34,636	$ 8,291
Branch 2 - Crossing #21	$ 26,345	$ 34,636	$ 8,291
Branch 2 Crossing #22 - CO Hwy 8	$ 107,432	$ 108,268	$ 836
Branch 2 - Crossing #23	$ 60,398	$ 65,849	$ 5,451
Branch 2 - Crossing #24	$ 54,423	$ 54,846	$ 423
Branch 2-A Crossing #25 - Co Hwy 8 / T-5	$ 131,829	$ 145,904	$ 14,075
Road Crossing Costs	$ -	$ 41,771	$ 41,771
Subtotal	**$ 3,294,923**	**$ 3,644,160**	**$ 349,236**
Road Authority Repair Costs	$ 922,457	$ 922,457	$ -
Total Project Costs	**$ 4,217,380**	**$ 4,566,617**	**$ 349,236**
		Subtotal Separable Maintenance Costs	$ 3,294,923
		Net Costs	$ 349,236
		Total Project Costs for Landowners	**$ 3,644,160**

TABLE 6. REPAIR OPTION #2 COST ESTIMATE

Area	Repair Cost
Mainline	$ 787,306
Branch 1	$ 115,868
Branch 2	$ 277,914
Branch 2-A	$ 136,110
Branch 2-A-1	$ 9,458
Branch 4	$ 31,152
Mainline - Crossing #2	$ 292,474
Mainline - Crossing #3	$ 174,227
Mainline - Crossing #4	$ 54,423
Mainline - Crossing #6	$ 44,262
Mainline - Crossing #9	$ 50,350
Mainline Crossing #10 - T-212	$ 42,043
Total Project Costs	**$ 2,015,588**

MULTI-PUPOSE DRAINAGE MANAGEMENT METHODS

Existing Data, Desktop Analysis and Site Investigation

Prior to this report, Agricultural Conservation Planning Framework (ACPF) was completed for the watershed. Both GIS tools are used to site and prioritize BMPs within the watershed. The data sets previously developed were the starting point for identifying practical and feasible practices to prioritize for implementation. Additional desktop analysis was completed to refine the number of practices based on the site conditions. Additional practices were added that may be outside the scope of siting through the GIS tools but would be feasible based upon on-site conditions such as topography, field boundaries, and aerial review. It is important to note that this study was completed through desktop analysis and on-site investigation is needed to verify project feasibility.

Water Quality Modeling

Nutrient and sediment reductions were estimated utilizing Hydrological Simulation Program – FORTRAN (HSPF) Scenario Application Manager (SAM). For each practice the treated acres were determined and correlated with the loading based on the land use. Practice reductions were used for each practice based on research and literature review. Each pollution reduction was determined independently of each other therefore, if multiple practices are implemented, the expected reductions for the practice may be different based on the change in loading.

BMP Cost Estimates

Estimated cost for each BMP includes materials, construction, and installation of the practice. Costs were determined using an average cost on a per linear foot or per acre basis. These costs take into consideration easements (where applicable), mobilization, technical assistance/engineering design, and contingency. The BMP cost estimates included in this analysis are not detailed cost estimates and on-site investigation with specific design criteria.

TABLE 7. BMP COST ANALYSIS

Wetlands			Grass Waterways		
Item	**Cost**	**Unit**	**Item**	**Cost**	**Unit**
Berms	$5.00	LF	Grass Waterway	$6.00	LF
Seeding	$3,500.00	AC	Technical Assistance (10%)	$0.60	LF
Outlet Structure	$25,000.00	EA	Administration (5%)	$0.30	LF
Riprap	$85.00	CY	Contingency (10%)	$0.60	LF
Land Acquisition	$14,000.00	AC	Total per LF		$7.50
Temporary Damages	$650.00	AC	Mobilization	$2,000.00	EA
Other (20%)					
Technical Assistance (20%)					
Administration (10%)					
Mobilization (5%)					
WASCOBs			**ASIs**		
Item	**Cost**	**Unit**	**Item**	**Cost**	**Unit**
Land Acquisition	$14,000.00	AC	ASI	$3500.00	EA
WASCOB Berm	$12.00	LF	Technical Assistance (10%)	$350.00	EA
Technical Assistance (10%)	$1.20	LF	Administration (5%)	175.00	EA
Administration (5%)	$0.60	LF	Subtotal		$4,025.00
10% Contingency	$1.38	LF	10 % Contingency	$402.50	EA
Total per LF		$15.18	Mobilization	$2,000	EA
Mobilization	$2,000.00	EA	Total per ASI		$6,427.50
Outlet structure	$2,500	EA			

BEST MANAGEMENT PRACTICES

Impoundment + Storage Practices

Constructed Treatment Wetland

Constructed treatment wetlands are generally located in low-lying areas that would otherwise be saturated during rain events. Constructed wetlands use embankments such as berms or overflow weirs to hold agricultural drainage water to be treated. Constructed wetland benefits are similar to wetland restorations in that they include reduced peak flow rates, sedimentation, nutrient reductions, wildlife enhancement, and overall improved water quality. There are many programs available for constructed treatment wetlands and include wetland banking, RIM-WRP, CREP, and through various NRCS programs.

Figure 20: A constructed wetland designed to store water and provide nutrient reduction (ISG L. Washington project)

Storage Ponds/Floodplain Storage

A storage pond or floodplain storage is an excavated area or existing low-lying basin designed to hold water, trap sediment, and reduce peak flowrates. Many variations of storage pond and floodplain storage can be engineered to allow water to enter and exit in a controlled manner to produce these benefits. For example, a surge storage pond can be excavated to treat subsurface drainage water to temporarily store water and help reduce peak flowrates. Storage can also be designed within an existing low-lying basin in which water is controlled to only enter during large rain event for additional flood storage.

Figure 21: A constructed flood plain storage designed to reduce peak flowrates (ISG Wright project)

Water and Sediment Control Basins (WASCOBs)

Water and sediment control basins (WASCOBs) are an earth embankment placed perpendicular to the water flow direction on a moderate to steep hillside of an agricultural area. The primary goal of a WASCOB is to improve the ability to farm steep sloped areas of farmland by reducing gully erosion. They are placed in areas that experience gully erosion and steep side slopes or can be placed adjacent to ditch banks that experience gully erosion. They are designed to temporarily pool water on the hillside behind the embankment, thus reducing peak surface flow, reduce erosion, and provide an area for sedimentation.

Alternative Side Inlets

Alternative side inlet structures replace open surface intakes that are level with the existing ground and convey water through the ditch bank. They are also placed along open ditches where gully erosion is occurring through the ditch bank. The goal of an alternative side inlet is to prevent erosion through the ditch bank and keep sediment and debris from entering the open channel. An alternative side inlet contains a drop structure behind the ditch bank with a later pipe entering the open channel. Various intakes can be placed on the drop structure and include Hickenbottom, trash grate, perforated risers, or rock inlets. Alternative side inlets are recommended for areas with existing surface inlets, where gully erosion occurs through the ditch bank, or where large surface flow enters the ditch. Similarly to WASCOBs, ASIs are designed to temporarily store water behind the spoil banks providing temporary storage, reducing erosion, and allowing for sedimentation.

Figure 22: An alternative side inlet preventing ditch bank erosion

Two Stage Drainage Ditches

Two-stage drainage ditches offer an alternative to conventional drainage systems. They are specifically engineered to replicate the stable hydrologic and geomorphic conditions commonly found in natural low-order streams. A low-flow channel is designed to reflect the characteristics of a natural channel in the surrounding region with a comparable drainage area. Two-stage channels incorporate narrow benches on either side of the low-flow channel, functioning as floodplains during high flow conditions. The benches help reduce the fluvial energy generated during high flow events.

Figure 23: A two-stage *drainage ditch with a storage pond (ISG Martin County Project)*

Soil Health Practices

Soil health practices include cover crops, reduced tillage, no-till, perennial cover and other practices that promote healthy soils. Areas with high runoff risk are priority areas to target implementation of soil health practices. Runoff risk is determined as the potential for overland flow to carry sediment and nutrients to downstream waters. A runoff risk was completed for the CD 28 watershed which identified areas currently in agricultural production and identified field boundaries as very high, high, moderate, or low runoff risk.

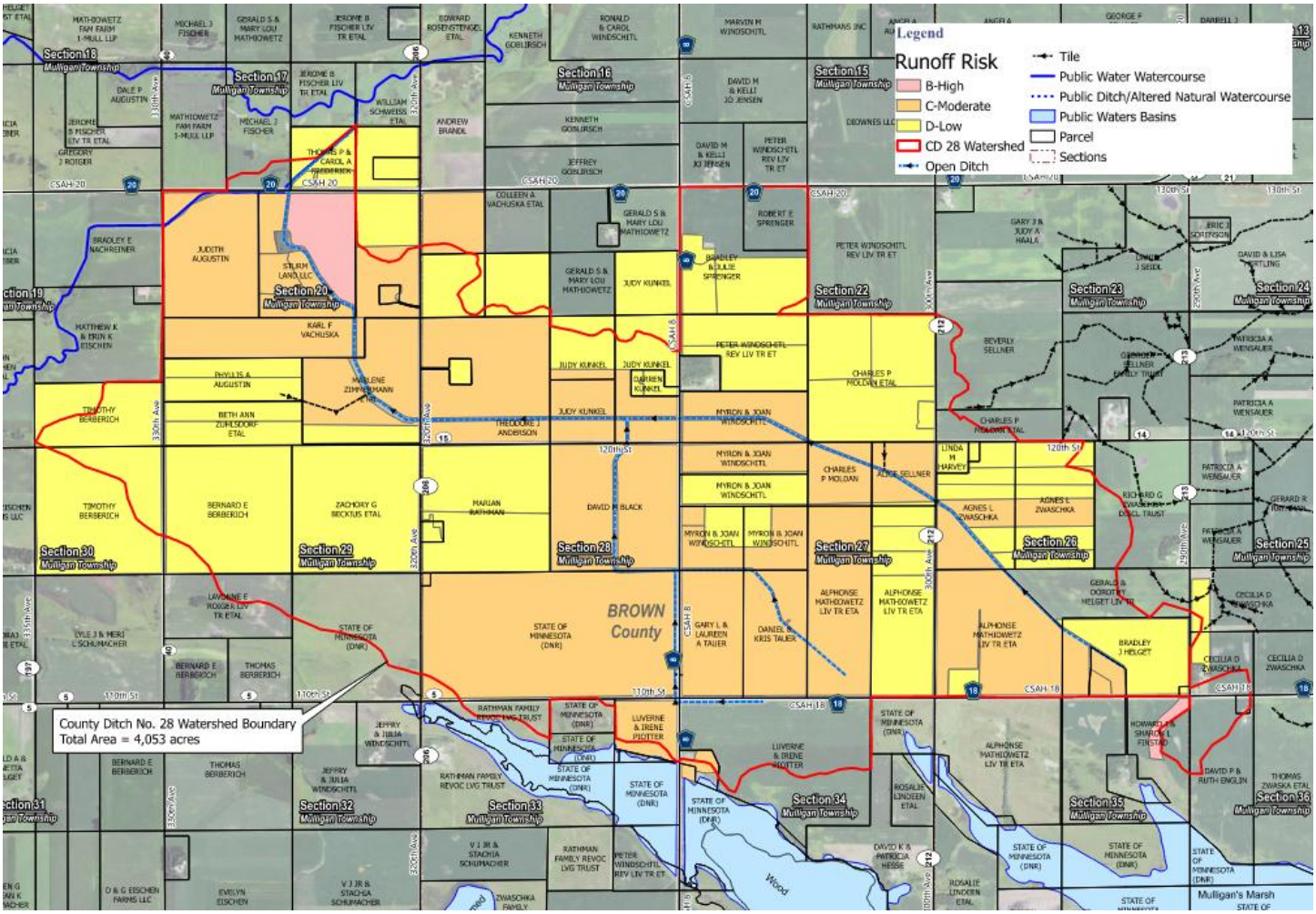


Figure 24: Runoff risk for CD 28 watershed

Control Measure Conservation Practices

Grassed Waterways

Grassed waterways are installed to reduce the risk of concentrated flow (gully) erosion. This practice is effective in preventing gully erosion as the growing grasses can reduce mean velocity of runoff, which discourages soil detachment. Grass vegetation also provides a physical barrier to prevent gully formation and the fibrous root systems of grasses lead to increased soil strength, which can limit detachment of soil particles. Grassed waterways are typically placed in steep sloped areas with concentrated flows subject to erosion.

Woodchip Bioreactor

The use of a woodchip bioreactor is method of removing nitrate from a subsurface drainage water. Carbon from the woodchip is used by bacteria to break down nitrates through the process of denitrification. Construction of a woodchip bioreactor includes excavating a trench in line with the drainage tile system, filling the trench with woodchips, and installing water control structures to manage water levels in the trench. Woodchip bioreactors typically reduce nitrate loading by 30-60 percent and can reduce up to 90 percent under base flow conditions.

PRIORITIZATION

The focus of the study was to prioritize practices for sediment reductions with the greatest ability reduce sediment for the lowest cost. Additional benefits from the practices include reductions in total phosphorus (TP) and total nitrogen (TN) with both included in table below. A map of all BMP locations are included in Appendix A.

TABLE 8. PRIORITIZED BMPS

Unique ID	BMP Number	Provides Storage?	TSS Reductions (T/yr)	TN Reductions (lb/yr)	TP Reductions (lb/yr)	Estimated Total Cost	TSS Cost Effectiveness ($/lb/yr)	TN Cost Effectiveness ($/lb/yr)	TP Effectiveness ($/lb/yr)	Rank
WASCOB7	106	Yes	9.82	812.71	38.33	$8,325.99	$0.42	$10.24	$217.23	1
WASCOB12	111	Yes	9.29	768.84	36.26	$8,325.99	$0.45	$10.83	$229.63	2
WASCOB14	113	Yes	5.40	446.85	21.07	$8,325.99	$0.77	$18.63	$395.09	3
WASCOB2	101	Yes	4.96	410.57	19.36	$8,325.99	$0.84	$20.28	$430.00	4
WASCOB9	108	Yes	3.75	310.04	14.62	$8,325.99	$1.11	$26.85	$569.43	5
WASCOB15	114	Yes	2.80	232.00	10.94	$8,325.99	$1.48	$35.89	$760.97	6
WASCOB3	102	Yes	2.30	190.52	8.99	$8,325.99	$1.81	$43.70	$926.64	7
StoragePond1	1	Yes	144.59	9105.64	342.57	$615,281.19	$2.13	$67.57	$67.57	8
StoragePond29	29	Yes	133.60	8413.67	316.54	$571,069.23	$2.14	$67.87	$67.87	9
StoragePond23	23	Yes	113.86	7170.35	269.76	$491,630.53	$2.16	$68.56	$68.56	10
StoragePond34	34	Yes	102.50	6454.80	242.84	$445,912.35	$2.18	$69.08	$69.08	11
StoragePond10	10	Yes	44.73	2816.64	105.97	$213,461.67	$2.39	$75.79	$75.79	12
StoragePond24	24	Yes	43.01	2708.89	101.91	$206,577.20	$2.40	$76.26	$76.26	13
StoragePond33	33	Yes	39.14	2465.01	92.74	$190,995.48	$2.44	$77.48	$77.48	14
StoragePond25	25	Yes	38.52	2425.87	91.27	$188,494.61	$2.45	$77.70	$77.70	15
StoragePond27	27	Yes	36.76	2314.89	87.09	$181,403.92	$2.47	$78.36	$78.36	16
TwoStageDitch1	129	Yes	35.56	2239.20	84.24	$176,568.00	$2.48	$78.85	$2,095.94	17
StoragePond22	22	Yes	32.71	2060.24	77.51	$165,133.84	$2.52	$80.15	$80.15	18
StoragePond17	17	Yes	28.48	1793.56	67.48	$148,094.61	$2.60	$82.57	$82.57	19
StoragePond26	26	Yes	27.14	1708.90	64.29	$142,685.57	$2.63	$83.50	$83.50	20
StoragePond20	20	Yes	26.57	1673.19	62.95	$140,404.34	$2.64	$83.91	$83.91	21
StoragePond3	3	Yes	26.01	1637.79	61.62	$138,142.21	$2.66	$84.35	$84.35	22
StoragePond5	5	Yes	25.60	1612.42	60.66	$136,521.65	$2.67	$84.67	$84.67	23
StoragePond9	9	Yes	23.96	1508.81	56.76	$129,901.19	$2.71	$86.10	$86.10	24
StoragePond35	35	Yes	21.92	1380.15	51.92	$121,681.12	$2.78	$88.17	$88.17	25
StoragePond8	8	Yes	21.52	1355.43	50.99	$120,101.56	$2.79	$88.61	$88.61	26
StoragePond30	30	Yes	21.32	1342.79	50.52	$119,294.36	$2.80	$88.84	$88.84	27
StoragePond32	32	Yes	21.03	1324.11	49.82	$118,100.75	$2.81	$89.19	$89.19	28
StoragePond28	28	Yes	20.84	1312.72	49.39	$117,372.83	$2.82	$89.41	$89.41	29
StoragePond19	19	Yes	19.82	1248.33	46.96	$113,258.68	$2.86	$90.73	$90.73	30
StoragePond2	2	Yes	19.71	1241.50	46.71	$112,822.18	$2.86	$90.88	$90.88	31
StoragePond36	36	Yes	19.61	1235.05	46.46	$112,410.24	$2.87	$91.02	$91.02	32
StoragePond11	11	Yes	19.48	1226.91	46.16	$111,890.06	$2.87	$91.20	$91.20	33
StoragePond16	16	Yes	19.38	1220.58	45.92	$111,486.01	$2.88	$91.34	$91.34	34
StoragePond14	14	Yes	18.27	1150.52	43.28	$107,009.56	$2.93	$93.01	$93.01	35

WASCOB1	100	Yes	1.41	116.98	5.52	$8,325.99	$2.94	$71.17	$1,509.13	36
StoragePond4	4	Yes	17.94	1129.93	42.51	$105,694.05	$2.95	$93.54	$93.54	37
StoragePond7	7	Yes	17.16	1080.85	40.66	$102,558.00	$2.99	$94.89	$94.89	38
StoragePond13	13	Yes	16.33	1028.27	38.69	$99,198.57	$3.04	$96.47	$96.47	39
StoragePond18	18	Yes	14.82	933.09	35.10	$93,117.62	$3.14	$99.79	$99.79	40
StoragePond15	15	Yes	14.42	907.83	34.15	$91,503.25	$3.17	$100.79	$100.79	41
StoragePond12	12	Yes	14.09	887.35	33.38	$90,195.16	$3.20	$101.65	$101.65	42
StoragePond6	6	Yes	11.00	692.87	26.07	$77,769.28	$3.53	$112.24	$112.24	43
StoragePond31	31	Yes	8.55	538.14	20.25	$67,883.00	$3.97	$126.14	$126.14	44
WASCOB5	104	Yes	0.91	75.22	3.55	$8,325.99	$4.58	$110.68	$2,346.91	45
StoragePond21	21	Yes	5.67	357.37	13.45	$56,333.45	$4.96	$157.63	$157.63	46
WASCOB6	105	Yes	0.81	67.21	3.17	$8,325.99	$5.13	$123.88	$2,626.77	47
WASCOB8	107	Yes	0.81	66.79	3.15	$8,325.99	$5.16	$124.66	$2,643.36	48
WASCOB4	103	Yes	0.70	57.65	2.72	$8,325.99	$5.98	$144.43	$3,062.43	49
WASCOB11	110	Yes	0.63	51.88	2.45	$8,325.99	$6.64	$160.47	$3,402.70	50
WASCOB10	109	Yes	0.47	38.81	1.83	$8,325.99	$8.88	$214.55	$4,549.27	51
WASCOB13	112	Yes	0.24	19.54	0.92	$8,325.99	$17.63	$426.01	$9,033.08	52
GrassedWaterway32	63	No	55.49	3960.08	182.90	$8,740.62	$0.08	$2.21	$47.79	53
ASI5	119	No	30.18	2436.61	110.86	$8,034.38	$0.13	$3.30	$72.48	54
ASI2	116	No	26.36	2128.51	96.84	$8,034.38	$0.15	$3.77	$82.97	55
ASI3	117	No	23.01	1857.99	84.53	$8,034.38	$0.17	$4.32	$95.05	56
GrassedWaterway22	53	No	13.41	957.31	44.21	$6,148.97	$0.23	$6.42	$139.07	57
ASI4	118	No	17.43	1407.03	64.01	$8,034.38	$0.23	$5.71	$125.51	58
ASI6	120	No	16.79	1355.31	61.66	$8,034.38	$0.24	$5.93	$130.30	59
ASI1	115	No	16.48	1330.82	60.55	$8,034.38	$0.24	$6.04	$132.70	60
ASI11	125	No	14.59	1178.28	53.61	$8,034.38	$0.28	$6.82	$149.87	61
ASI7	121	No	14.58	1176.98	53.55	$8,034.38	$0.28	$6.83	$150.04	62
GrassedWaterway46	76	No	12.83	915.67	42.29	$7,911.93	$0.31	$8.64	$187.08	63
ASI10	124	No	12.30	993.37	45.19	$8,034.38	$0.33	$8.09	$177.77	64
GrassedWaterway55	83	No	7.35	524.77	24.24	$5,810.62	$0.40	$11.07	$239.74	65
ASI9	123	No	8.23	664.42	30.23	$8,034.38	$0.49	$12.09	$265.79	66
GrassedWaterway43	73	No	7.26	518.44	23.94	$7,909.93	$0.54	$15.26	$330.35	67
ASI8	122	No	6.98	563.32	25.63	$8,034.38	$0.58	$14.26	$313.49	68
ASI12	126	No	6.45	520.38	23.68	$8,034.38	$0.62	$15.44	$339.36	69
GrassedWaterway12	47	No	4.08	290.96	13.44	$6,753.66	$0.83	$23.21	$502.57	70
GrassedWaterway11	46	No	3.87	276.48	12.77	$7,641.65	$0.99	$27.64	$598.44	71
GrassedWaterway62	89	No	2.38	169.64	7.84	$5,465.83	$1.15	$32.22	$697.61	72
GrassedWaterway27	58	No	4.22	301.37	13.92	$11,168.03	$1.32	$37.06	$802.35	73
GrassedWaterway60	87	No	3.85	274.55	12.68	$10,397.31	$1.35	$37.87	$819.95	74
GrassedWaterway57	84	No	3.70	263.80	12.18	$10,839.06	$1.47	$41.09	$889.63	75
GrassedWaterway54	82	No	2.67	190.69	8.81	$7,884.10	$1.48	$41.34	$895.18	76
GrassedWaterway51	81	No	1.99	142.03	6.56	$6,014.04	$1.51	$42.34	$916.81	77
GrassedWaterway40	70	No	1.81	129.13	5.96	$5,589.79	$1.54	$43.29	$937.28	78
GrassedWaterway31	62	No	1.76	125.96	5.82	$6,299.72	$1.78	$50.01	$1,082.89	79

GrassedWaterway34	65	No	1.43	101.74	4.70	$6,200.47	$2.17	$60.94	$1,319.54	80
GrassedWaterway21	52	No	1.55	110.57	5.11	$7,093.36	$2.29	$64.15	$1,389.04	81
ASI13	127	No	1.46	118.11	5.37	$8,034.38	$2.75	$68.02	$1,495.18	82
GrassedWaterway58	85	No	3.53	251.58	11.62	$20,524.98	$2.91	$81.58	$1,766.45	83
GrassedWaterway25	56	No	1.60	114.08	5.27	$10,510.43	$3.29	$92.13	$1,994.89	84
GrassedWaterway13	48	No	1.66	118.60	5.48	$11,091.30	$3.34	$93.52	$2,024.79	85
GrassedWaterway74	98	No	1.16	82.73	3.82	$8,050.54	$3.47	$97.31	$2,107.01	86
GrassedWaterway50	80	No	0.93	66.54	3.07	$6,627.65	$3.55	$99.60	$2,156.46	87
GrassedWaterway29	60	No	1.89	135.24	6.25	$13,524.68	$3.57	$100.01	$2,165.30	88
GrassedWaterway23	54	No	1.26	89.63	4.14	$9,608.42	$3.83	$107.20	$2,321.06	89
GrassedWaterway49	79	No	0.68	48.32	2.23	$5,726.25	$4.23	$118.50	$2,565.67	90
GrassedWaterway66	92	No	0.83	59.30	2.74	$7,530.80	$4.53	$126.99	$2,749.59	91
GrassedWaterway61	88	No	0.59	42.21	1.95	$5,529.62	$4.67	$130.99	$2,836.25	92
GrassedWaterway42	72	No	0.58	41.53	1.92	$6,165.59	$5.30	$148.45	$3,214.16	93
GrassedWaterway41	71	No	0.55	39.04	1.80	$5,979.29	$5.46	$153.14	$3,315.81	94
GrassedWaterway70	95	No	0.68	48.44	2.24	$7,561.18	$5.57	$156.10	$3,379.91	95
GrassedWaterway2	38	No	0.64	45.38	2.10	$7,242.88	$5.70	$159.60	$3,455.62	96
GrassedWaterway26	57	No	1.14	81.03	3.74	$15,923.91	$7.01	$196.52	$4,254.96	97
GrassedWaterway72	97	No	0.40	28.75	1.33	$6,069.80	$7.53	$211.16	$4,571.93	98
GrassedWaterway69	94	No	0.44	31.57	1.46	$6,867.96	$7.76	$217.51	$4,709.58	99
GrassedWaterway17	50	No	0.46	33.16	1.53	$7,498.12	$8.07	$226.13	$4,896.03	100
GrassedWaterway65	91	No	0.57	40.52	1.87	$10,227.61	$9.01	$252.44	$5,465.75	101
GrassedWaterway30	61	No	0.37	26.48	1.22	$7,131.19	$9.61	$269.28	$5,830.49	102
GrassedWaterway20	51	No	1.08	77.07	3.56	$20,838.04	$9.65	$270.38	$5,854.22	103
GrassedWaterway59	86	No	0.88	63.04	2.91	$17,417.10	$9.86	$276.30	$5,982.46	104
GrassedWaterway63	90	No	1.13	80.69	3.73	$22,553.00	$9.97	$279.50	$6,051.65	105
GrassedWaterway7	42	No	0.26	18.45	0.85	$5,358.29	$10.36	$290.47	$6,289.23	106
GrassedWaterway1	37	No	0.48	33.95	1.57	$10,083.37	$10.60	$297.00	$6,430.48	107
GrassedWaterway67	93	No	0.26	18.56	0.86	$5,636.92	$10.84	$303.71	$6,575.92	108
GrassedWaterway44	74	No	0.29	20.82	0.96	$6,616.95	$11.34	$317.76	$6,880.17	109
GrassedWaterway36	67	No	0.62	44.48	2.05	$15,009.37	$12.04	$337.47	$7,306.82	110
GrassedWaterway4	39	No	0.31	22.29	1.03	$8,208.27	$13.14	$368.17	$7,971.58	111
GrassedWaterway33	64	No	0.40	28.63	1.32	$10,802.80	$13.46	$377.29	$8,169.11	112
GrassedWaterway5	40	No	0.34	24.11	1.11	$9,119.17	$13.50	$378.30	$8,190.96	113
GrassedWaterway15	49	No	0.22	15.62	0.72	$5,978.85	$13.66	$382.83	$8,288.91	114
GrassedWaterway10	45	No	0.63	44.82	2.07	$17,708.09	$14.10	$395.13	$8,555.30	115
GrassedWaterway39	69	No	0.21	15.28	0.71	$6,876.69	$16.06	$450.10	$9,745.51	116
GrassedWaterway8	43	No	0.48	33.95	1.57	$17,014.12	$17.88	$501.13	$10,850.43	117
GrassedWaterway9	44	No	0.23	16.52	0.76	$8,362.57	$18.06	$506.12	$10,958.36	118
GrassedWaterway28	59	No	0.14	10.30	0.48	$5,585.01	$19.35	$542.31	$11,741.99	119
GrassedWaterway47	77	No	0.19	13.35	0.62	$7,320.98	$19.56	$548.22	$11,869.88	120
GrassedWaterway35	66	No	0.12	8.60	0.40	$5,570.54	$23.11	$647.66	$14,023.05	121
GrassedWaterway48	78	No	0.15	10.64	0.49	$7,813.74	$26.21	$734.51	$15,903.39	122
GrassedWaterway37	68	No	0.12	8.37	0.39	$6,673.46	$28.43	$796.86	$17,253.55	123

GrassedWaterway24	55	No	0.20	13.92	0.64	$11,167.59	$28.63	$802.27	$17,370.54	124
GrassedWaterway6	41	No	0.11	7.92	0.37	$7,875.61	$35.47	$994.15	$21,525.11	125
GrassedWaterway45	75	No	0.18	12.90	0.60	$13,322.68	$36.85	$1,032.65	$22,358.65	126
GrassedWaterway71	96	No	0.13	9.28	0.43	$11,065.99	$42.55	$1,192.45	$25,818.76	127
Bioreactor1	99	No	-	175.05	-	$41,250.00	-	$235.65	-	128
PlugCulvert1	128	No	-	-	-	$1,665.50	-	-	-	129

FUNDING

There are several outside funding sources available to assist in financing practices that help to improve water quality and natural resources in the watershed. All of the water quality measures proposed with this project are applicable for some source of outside funding. Below outlines options for pursuing funding to improve water quality, reduce erosion and sedimentation, reduce downstream flooding, and protect and enhance aquatic and terrestrial habitat. These grants can be applied for if there is support from the Drainage Authority, Soil and Water Conservation District, and/or interest from individual landowners. While this list outlines many options available for this region, it is not all inclusive and other funding sources may be options for pursuing cost-share for implementation.

TABLE 9. GRANT PROGRAMS

Grant / Program	Grant / Program Goals*
BWSR CWF Watershed Based Implementation Fund (WBIF)	Approved workplan developed to support goals outline in the Cottonwood-Middle Watershed Management Plan
BWSR Clean Water Fund (CWF) Multi-purpose drainage management (MDM)	Target critical pollution source areas to reduce erosion and sedimentation, reduce peak flows and flooding, and improve water quality while protecting drainage system efficiency and reducing drainage system maintenance on 103E drainage systems
BWSR CWF Project and Practices	On-the-ground projects and practices that will protect or restore water quality in lakes, rivers or streams, or will protect groundwater or drinking water
BWSR Water Quantity and Storage Program	Establish storage practices in the Minnesota River basin and Lower Mississippi River basin to control water rates and/or volumes to protect infrastructure, improve water quality and related public benefits, and mitigate climate change impacts.
BWSR Outdoor Heritage Fund	Provides permanent protection on private lands through conservation easements
BWSR CWF Soil Health Grants	Provides funding for farmers to adopt cover crops or other soil health practices that benefit public water supplies
DNR CPL grant program	Provides funds for conservation projects that restore, enhance, or protect forests, wetlands, prairies, and habitat for fish, game, and wildlife in Minnesota.
MDA Ag BMP Loan Program	Low interest loans to farmers, rural landowners, and agricultural supply business to encourage BMPs that prevent or reduce runoff from feedlots, farm fields, and other pollution problems identified by the county in local water plan.
NRCS Environmental Quality Incentives Program (EQUIP)	Address natural resources concerns and deliver environmental benefits such as improved water, air quality, conserved ground and surface water, increased soil health and reduced soil erosion and sedimentation, improved or create wildlife habitat and mitigation against drought and increasing weather volatility.

*Grant / program goals outlined above are a summary. Please reference the grant request for submission for the grant/program goals as well as eligible practices along with other program requirements or guidelines.

SUMMARY OF FINDINGS, CONCLUSIONS + RECOMMENDATIONS

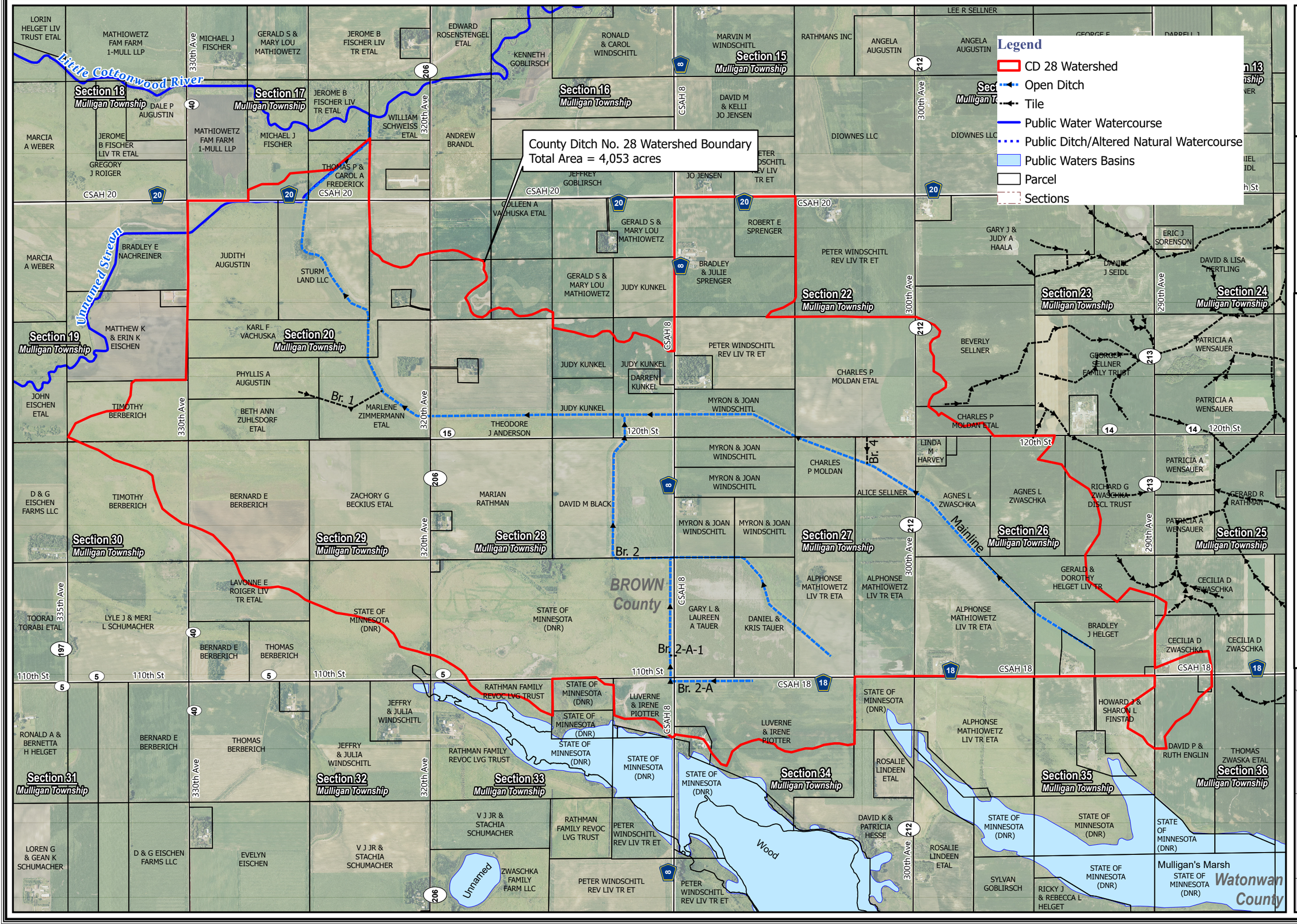
The CD 28 watershed has been assessed, conservation practice locations have been identified, and locations were determined for repair. Conservation practices that have been identified will help to meet the Little Cottonwood River water quality goals by reducing sediment to its outlet. Additional benefits include reductions in phosphorus, nitrogen, and water quantity and rate to downstream waters. Pollution reductions

were calculated, and cost were estimated for construction and implementation of practices. The practices were then prioritized with practices that had the lowest cost with the greatest ability for sediment capture. The practice prioritization will help to engage local staff and landowners on targeting practices that will have the most impact on the watershed and to downstream waters at the lowest cost. Funding opportunities can be sought after for all the practices outlined through this study.

An assessment of the ditch was completed, and areas were identified that are in need of repair including bank sloughing, bank erosion, erosion at culverts, vegetation overgrowth in the ditch bottom, and sediment accumulation in the open ditch. Cost associated with repairs are included in the report. In addition, consideration was given for capacity of current system and what may be needed to increase capacity to meet capacities for modern drainage needs. Five of the culvert crossings are undersized for today's standards. An improvement may be considered to increase the capacity the culverts. Alternative side inlets (ASIs) would be useful in controlling erosion, improving sediment settling and water quality. A cost-effective alternative to an improvement would be the inclusion of storage such as storage ponds to increase capacity within the system.

Next steps in the process would be to meet with landowners to review the report and its findings to receive feedback on the direction moving forward. If there is a desire to move forward with repairs or conservation practices. From that point, a repair report can be ordered which will involve surveying, preliminary design and construction plans, cost estimates, and potential permitting. Conservation practices could be explored independently or in junction with drainage system project.

Appendix A: Maps



ISG

Existing Watershed

County Ditch No. 28

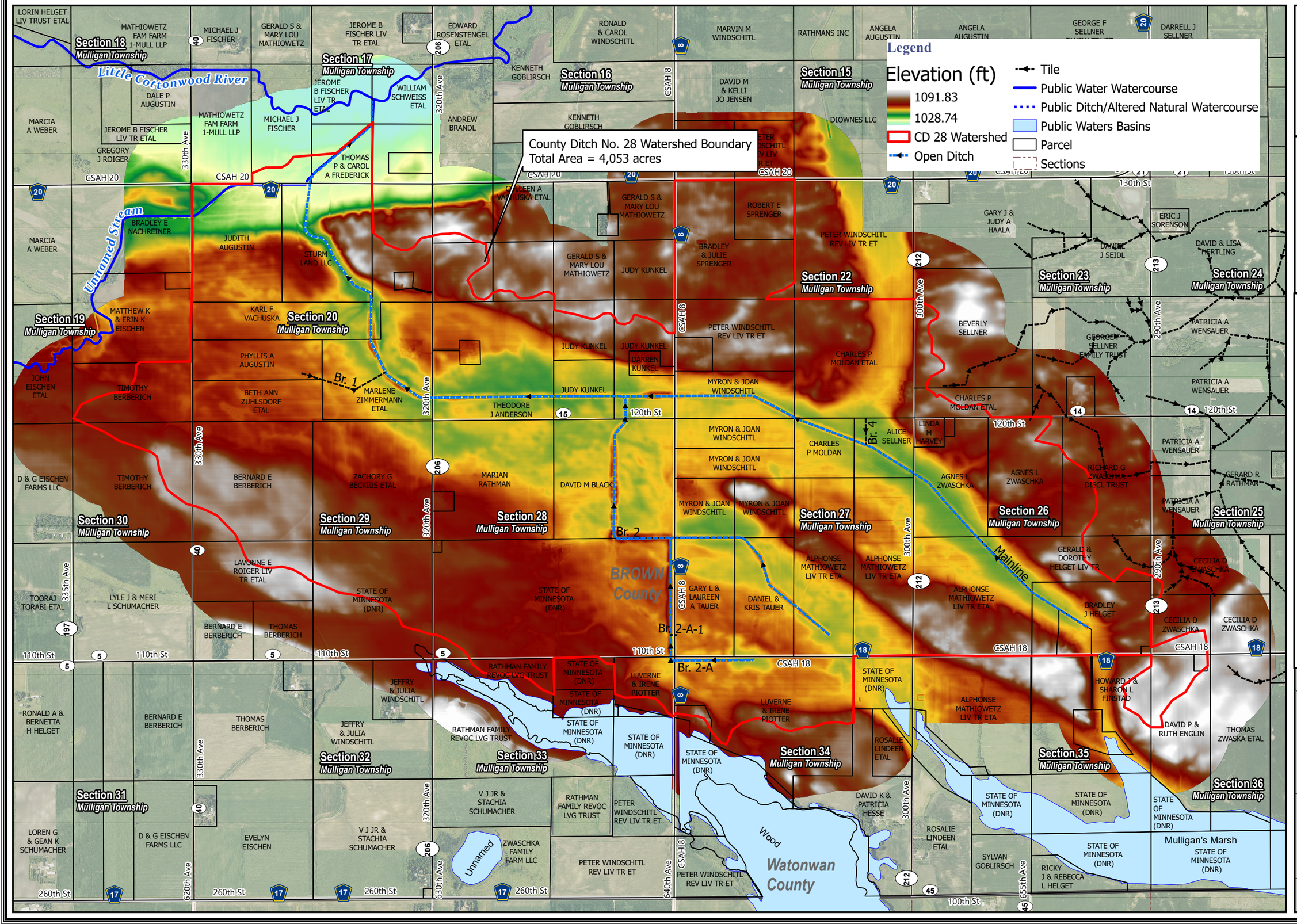
Brown County, Minnesota

Tuesday, August 12, 2025

PN: 19-23281

Source:

Orthophotograph (MnGeo WMS, 2019)
Tile/Ditch (Brown County, 2018)
Parcels (Brown County, 2020)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



ISG

Topography
County Ditch No. 28
Brown County, Minnesota
Wednesday, August 13, 2025

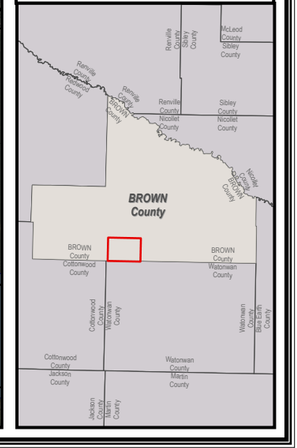
PN: 19-23281

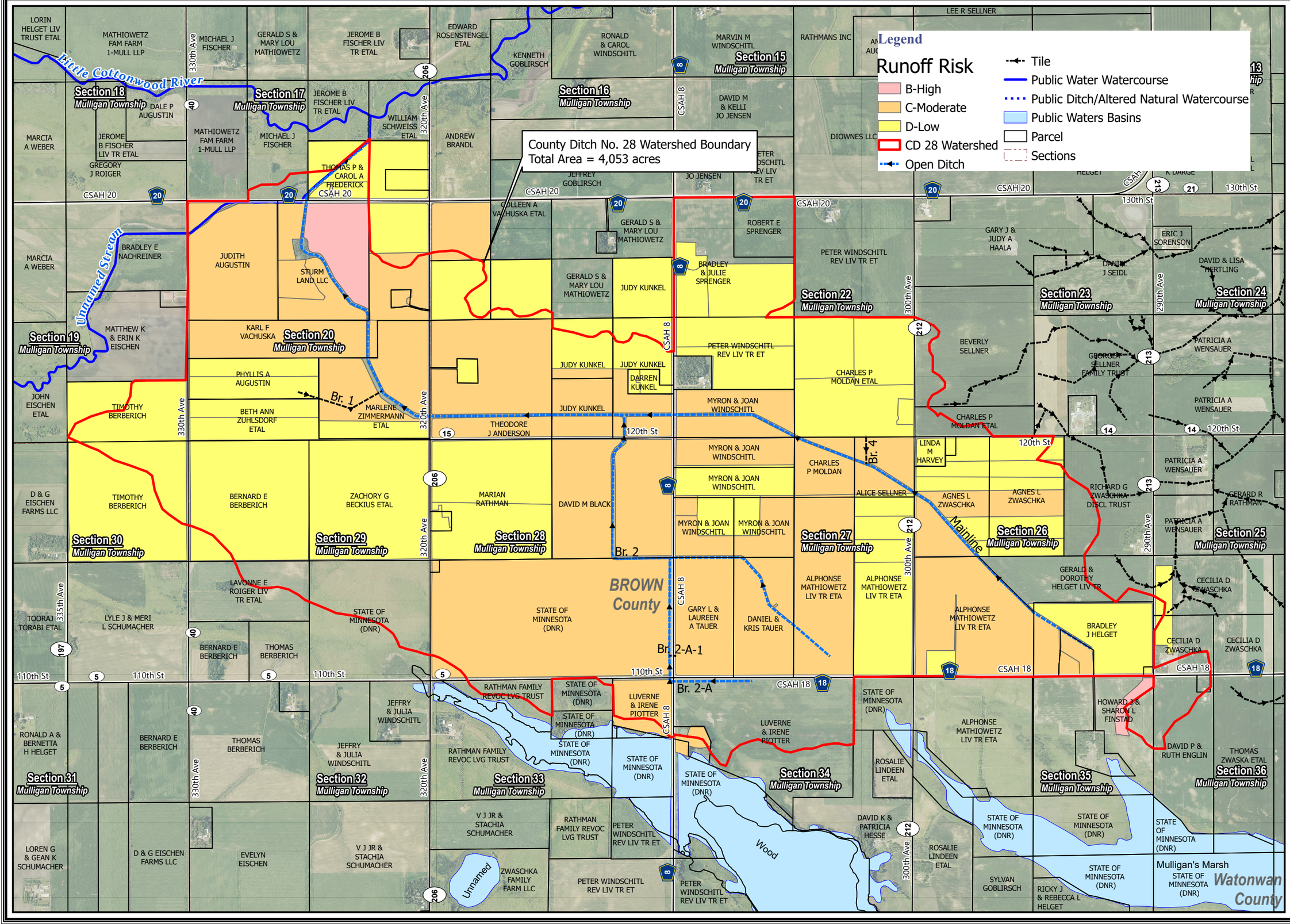
Source:

Orthophotograph (MnGeo WMS, 2019)
Tile/Ditch (Brown County, 2018)
Parcels (Brown County, 2020)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

N

0 475 950 1,900 Feet





ISG

Runoff Risk

County Ditch No. 28

Brown County, Minnesota

Tuesday, August 12, 2025

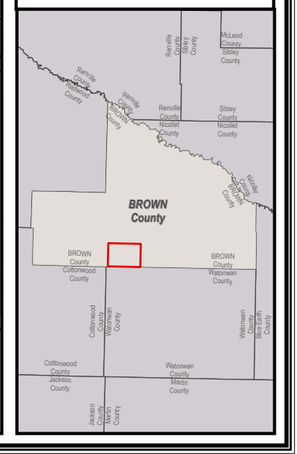
PN: 19-23281

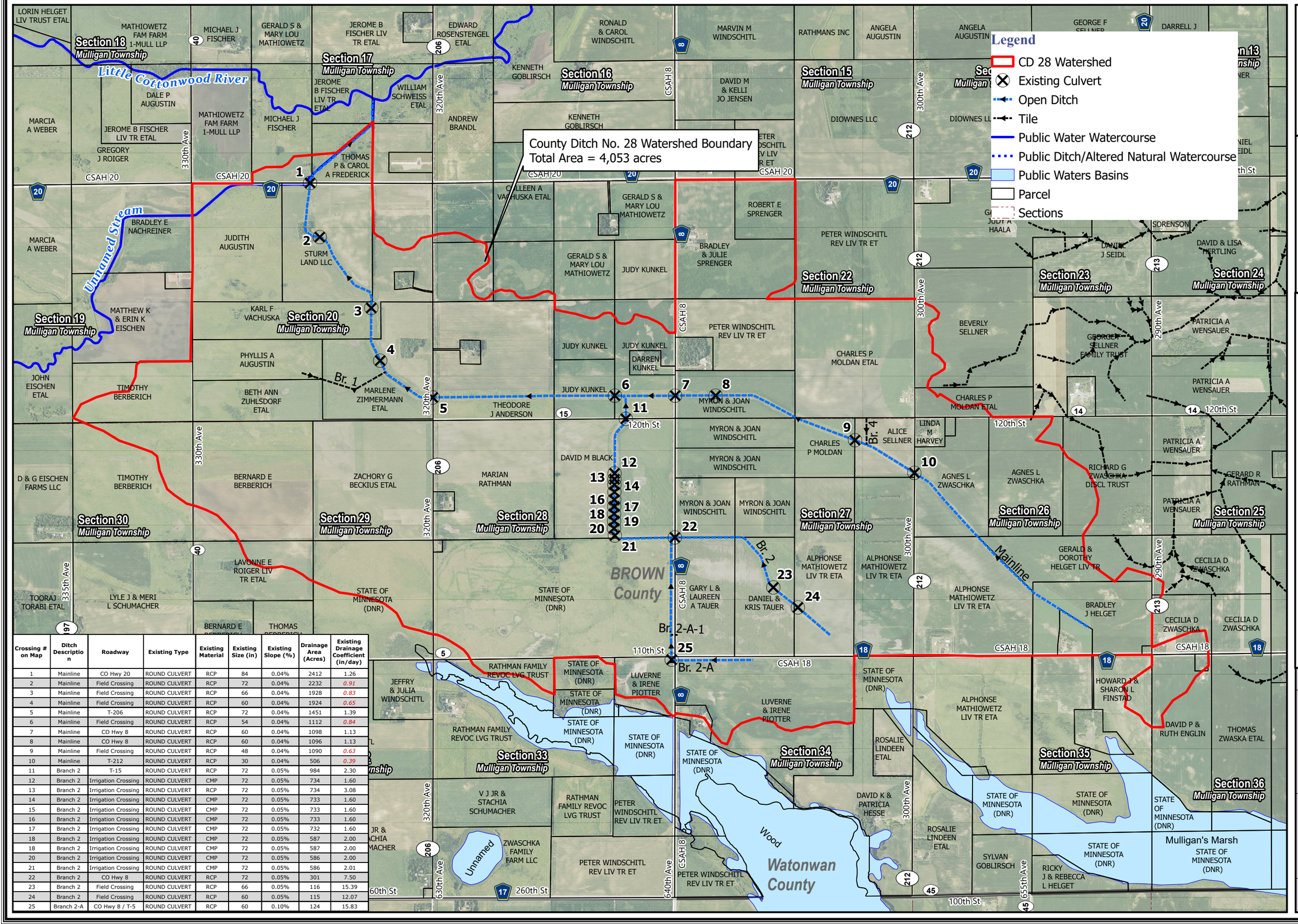
Source:

Orthophotograph (MnGeo WMS, 2019)
Tile/Ditch (Brown County, 2018)
Parcels (Brown County, 2020)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

N

0 475 950 1,900 Feet





Crossing # on Map	Ditch Description	Roadway	Existing Type	Existing Material	Existing Size (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
1	Mainline	CO Hwy 20	ROUND CULVERT	RCP	84	0.04%	2412	1.26
2	Mainline	Field Crossing	ROUND CULVERT	RCP	72	0.04%	2232	*0.91*
3	Mainline	Field Crossing	ROUND CULVERT	RCP	66	0.04%	1928	*0.83*
4	Mainline	Field Crossing	ROUND CULVERT	RCP	60	0.04%	1924	*0.65*
5	Mainline	T-206	ROUND CULVERT	RCP	72	0.04%	1451	1.39
6	Mainline	Field Crossing	ROUND CULVERT	RCP	54	0.04%	1112	*0.84*
7	Mainline	CO Hwy 8	ROUND CULVERT	RCP	60	0.04%	1098	1.13
8	Mainline	CO Hwy 8	ROUND CULVERT	RCP	60	0.04%	1096	1.13
9	Mainline	Field Crossing	ROUND CULVERT	RCP	48	0.04%	1090	*0.63*
10	Mainline	T-212	ROUND CULVERT	RCP	30	0.04%	506	*0.39*
11	Branch 2	T-15	ROUND CULVERT	RCP	72	0.05%	984	2.30
12	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	734	1.60
13	Branch 2	Irrigation Crossing	ROUND CULVERT	RCP	72	0.05%	734	3.08
14	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	733	1.60
15	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	733	1.60
16	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	733	1.60
17	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	732	1.60
18	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	587	2.00
18	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	587	2.00
20	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	586	2.00
21	Branch 2	Irrigation Crossing	ROUND CULVERT	CMP	72	0.05%	586	2.01
22	Branch 2	CO Hwy 8	ROUND CULVERT	RCP	72	0.05%	301	7.50
23	Branch 2	Field Crossing	ROUND CULVERT	RCP	66	0.05%	116	15.39
24	Branch 2	Field Crossing	ROUND CULVERT	RCP	60	0.05%	115	12.07
25	Branch 2-A	CO Hwy 8 / T-5	ROUND CULVERT	RCP	60	0.10%	124	15.83

Existing Culvert

County Ditch No. 28

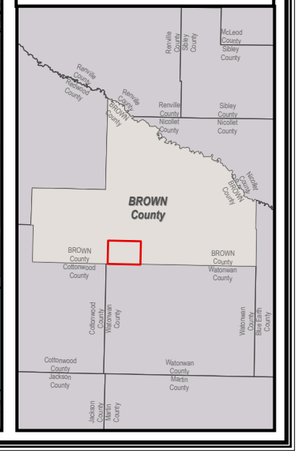
Brown County, Minnesota

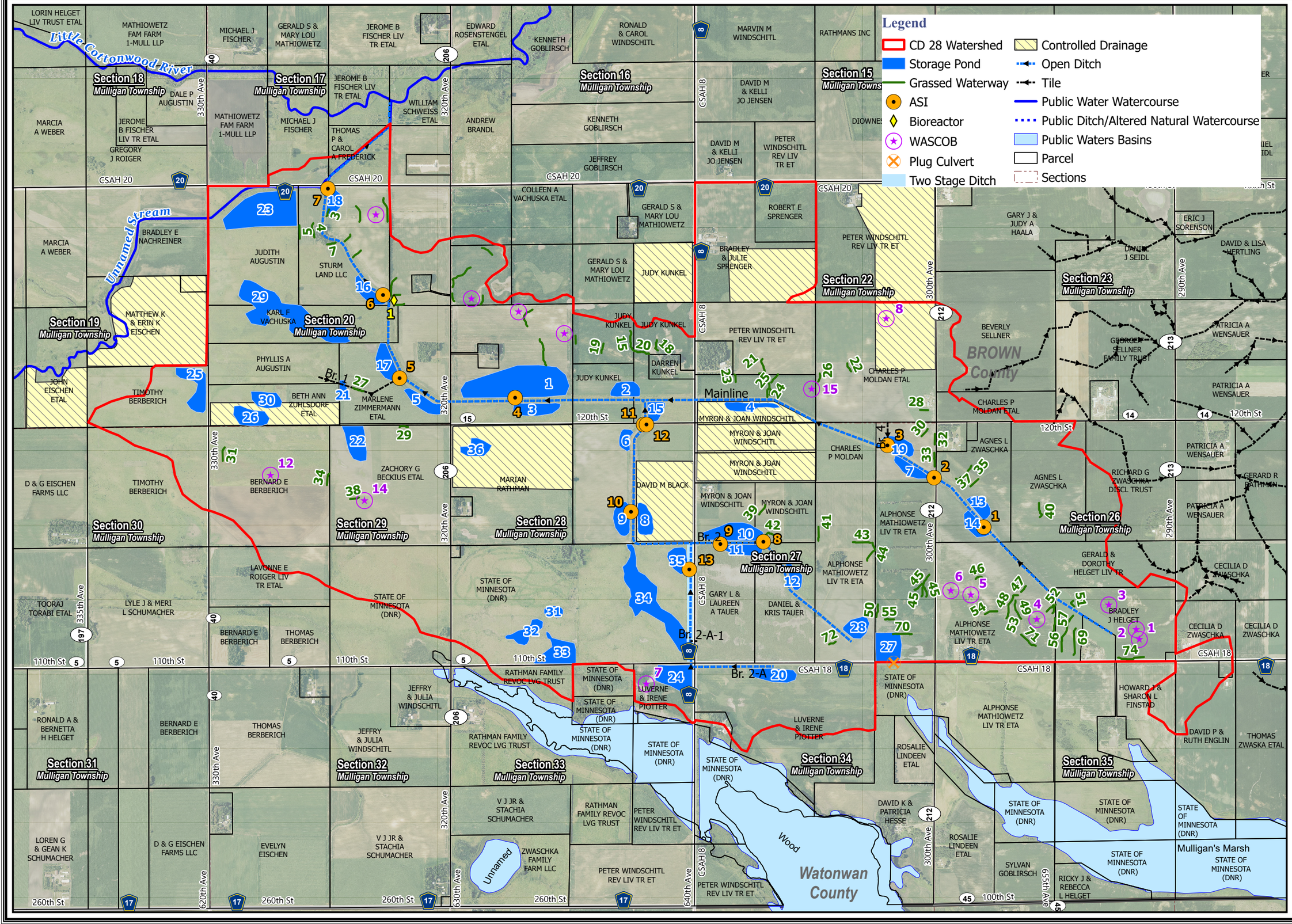
Thursday, August 14, 2025

PN: 19-23281

Source:

Orthophotograph (MnGeo WMS, 2019)
Tile/Ditch (Brown County, 2018)
Parcels (Brown County, 2020)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)





MDM Map

County Ditch No. 28

Brown County, Minnesota

Wednesday, August 13, 2025

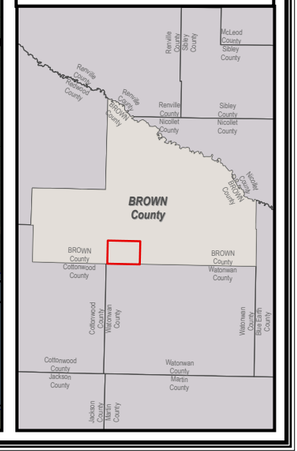
PN: 19-23281

Source:

Orthophotograph (MnGeo WMS, 2019)
Tile/Ditch (Brown County, 2018)
Parcels (Brown County, 2020)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

N

0 475 950 1,900 Feet



MDM Map Central

County Ditch No. 28

Brown County,
Minnesota
Wednesday, August 13, 2025

ISG

Legend

- CD 28 Watershed
- Storage Pond
- Grassed Waterway
- ASI
- Bioreactor
- WASCOB
- Plug Culvert
- Two Stage Ditch
- Controlled Drainage
- Open Ditch
- Tile
- Public Water Watercourse
- Public Ditch/Altered Natural Watercourse
- Public Waters Basins

N W E S

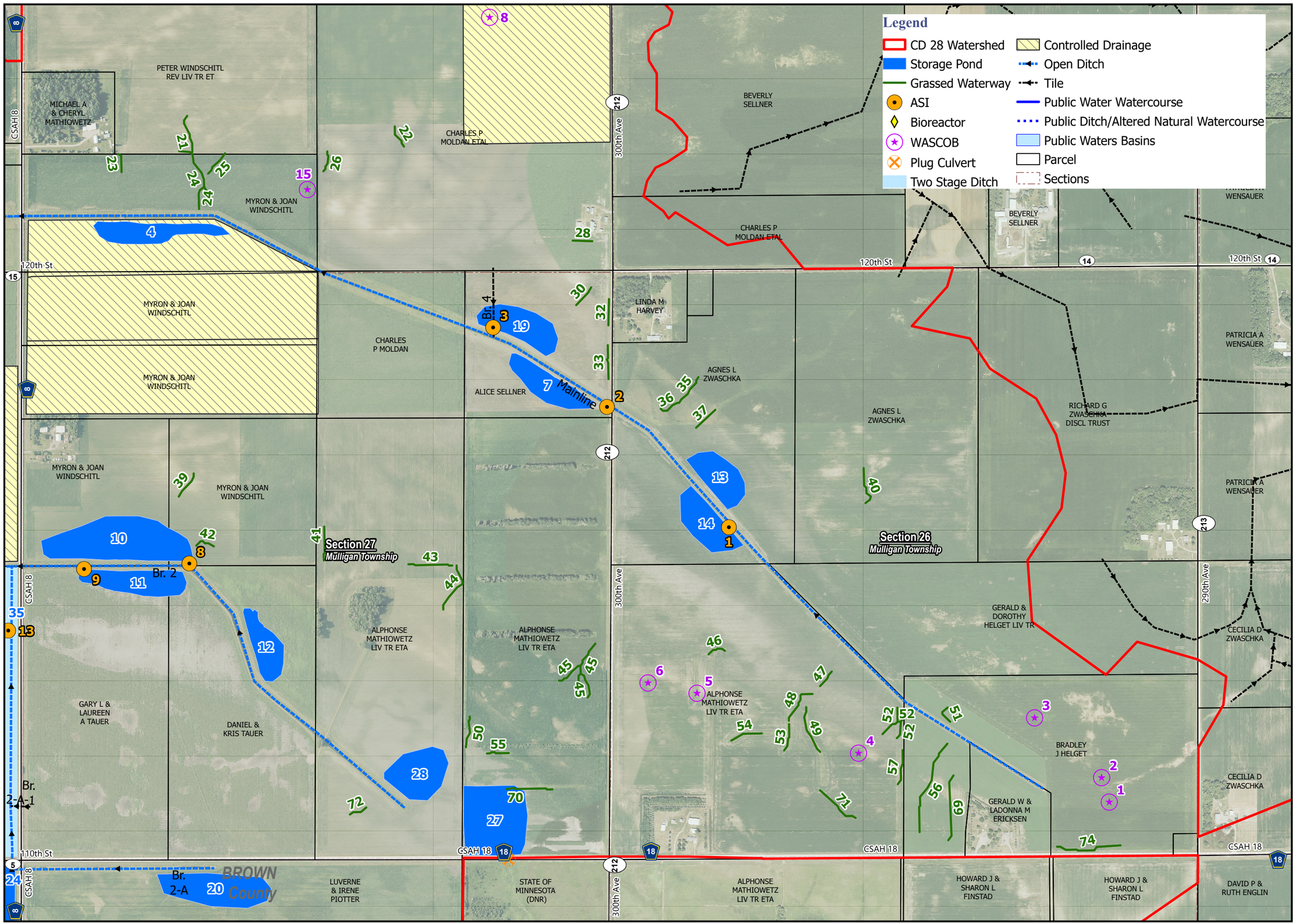
0 205 410 820 Feet

1:10,000

PN: 19-23281

Source:

Orthophotograph (MnGeo WMS, 2019)
Tile/Ditch (Brown County, 2018)
Parcels (Brown County, 2020)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



MDM Map East

County Ditch No. 28

Brown County, Minnesota

Wednesday, August 13, 2025

PN: 19-23281

Source:

Orthophotograph (MnGeo WMS, 2019)
Tile/Ditch (Brown County, 2018)
Parcels (Brown County, 2020)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

N

0 195 390 780 Feet

County Ditch No. 28 Watershed Boundary
Total Area = 4,053 acres

DALE P AUGUSTIN
JEROME B FISCHER LIV TR ETAL
MARCIA A WEBER
GREGORY J ROIGER
MATHIOWETZ FAM FARM 1-MULL LLP
MICHAEL J FISCHER
THOMAS P & CAROL A FREDERICK
WILLIAM SCHWEISS ETAL
GARY L & LAUREEN TAUER ETAL
CHRISTENSEN FARMS MIDWEST LLC
ANDREW BRANDL
KENNETH GOBLIRSCH
JEFFREY GOBLIRSCH
JAMES A ANDERSON
COLLEEN A VACHUSKA ETAL
BRADLEY E NACHREINER
JUDITH AUGUSTIN
STURM LAND LLC
PETER & COLLEEN VACHUSKA
MARLENE ZIMMERMANN ETAL
THEODORE J ANDERSON
EISCHEN & SONS FEEDLOTS LLC
MATTHEW K & ERIN K EISCHEN
KARL F VACHUSKA
JUDY KUNKEL
JOHN EISCHEN ETAL
PHYLLIS A AUGUSTIN
JAMES A ANDERSON ETAL
TIMOTHY BERBERICH
BETH ANN ZUHLSDORF ETAL
BERNARD E BERBERICH
ZACHORY G BECKIUS ETAL
MARIAN RATHMAN
DAVID M BLACK
BRADLEY E NACHREINER

Section 19
Mulligan Township

Section 20
Mulligan Township

Section 21
Mulligan Township

BROWN County

CSAH 20
330th Ave
320th Ave
206
15
120th St

Legend

- CD 28 Watershed
- Storage Pond
- Grassed Waterway
- WASCOB
- ASI
- Bioreactor
- Controlled Drainage
- Open Ditch
- Tile
- Public Water Watercourse
- Public Ditch/Altered Natural Watercourse
- Public Waters Basins
- Parcel
- Sections

ISG

MDM Map West
County Ditch No. 28
Brown County, Minnesota
Monday, August 4, 2025

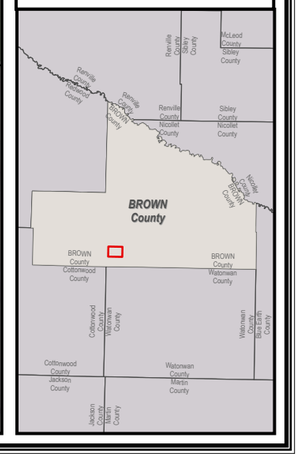
PN: 19-23281

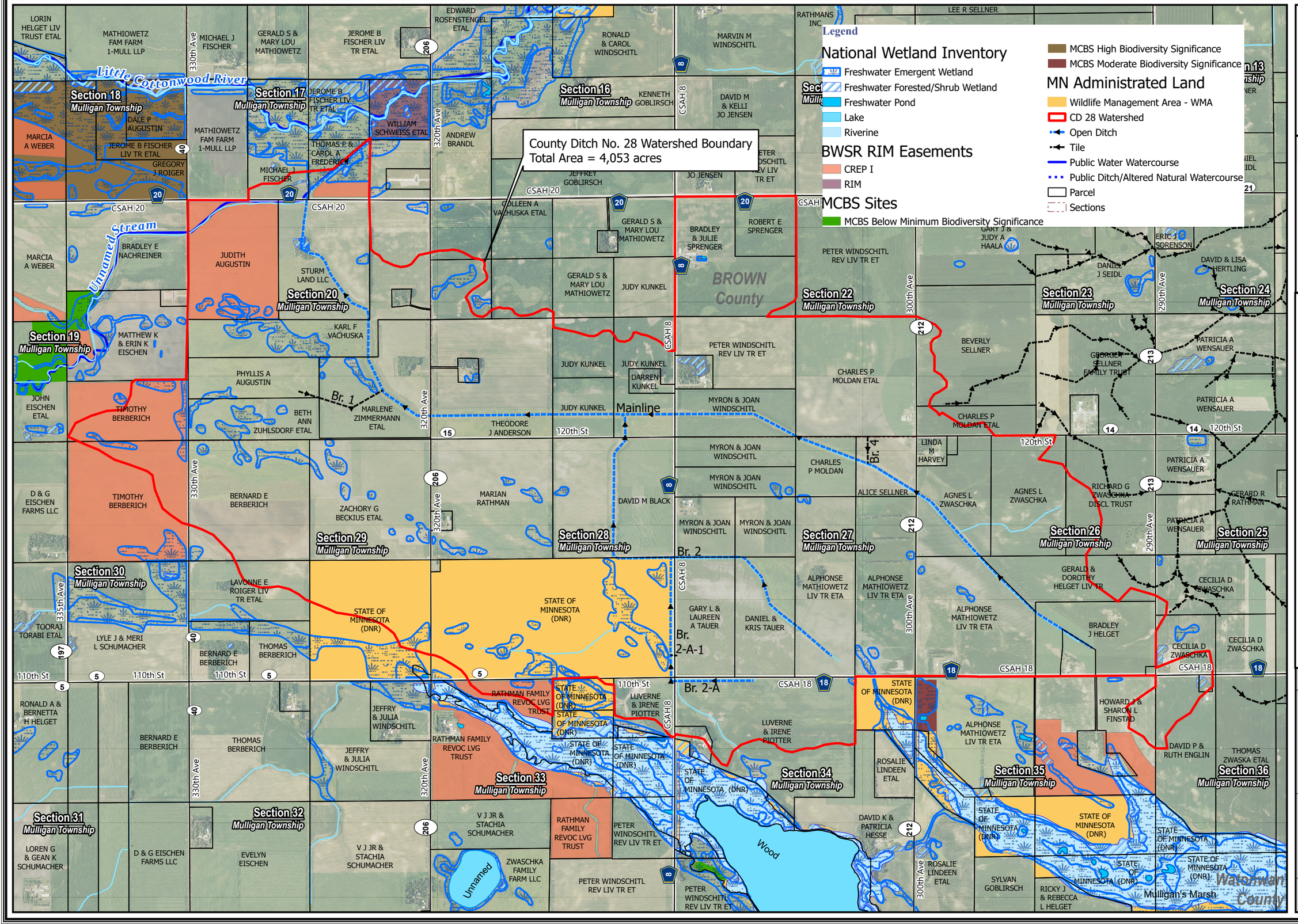
Source:

Orthophotograph (MnGeo WMS, 2019)
Tile/Ditch (Brown County, 2018)
Parcels (Brown County, 2020)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

N

0 205 410 820 Feet





ISG

NWI and BWSR Easements

County Ditch No. 28

Brown County, Minnesota

Tuesday, August 12, 2025

PN: 19-23281

Source:

Orthophotograph (MnGeo WMS, 2019)
Tile/Ditch (Brown County, 2018)
Parcels (Brown County, 2020)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

N

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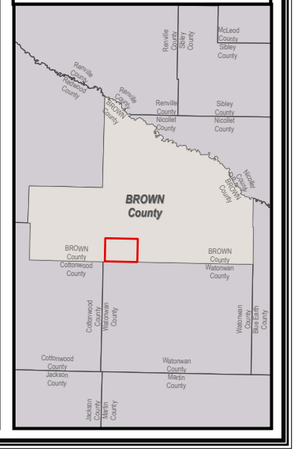
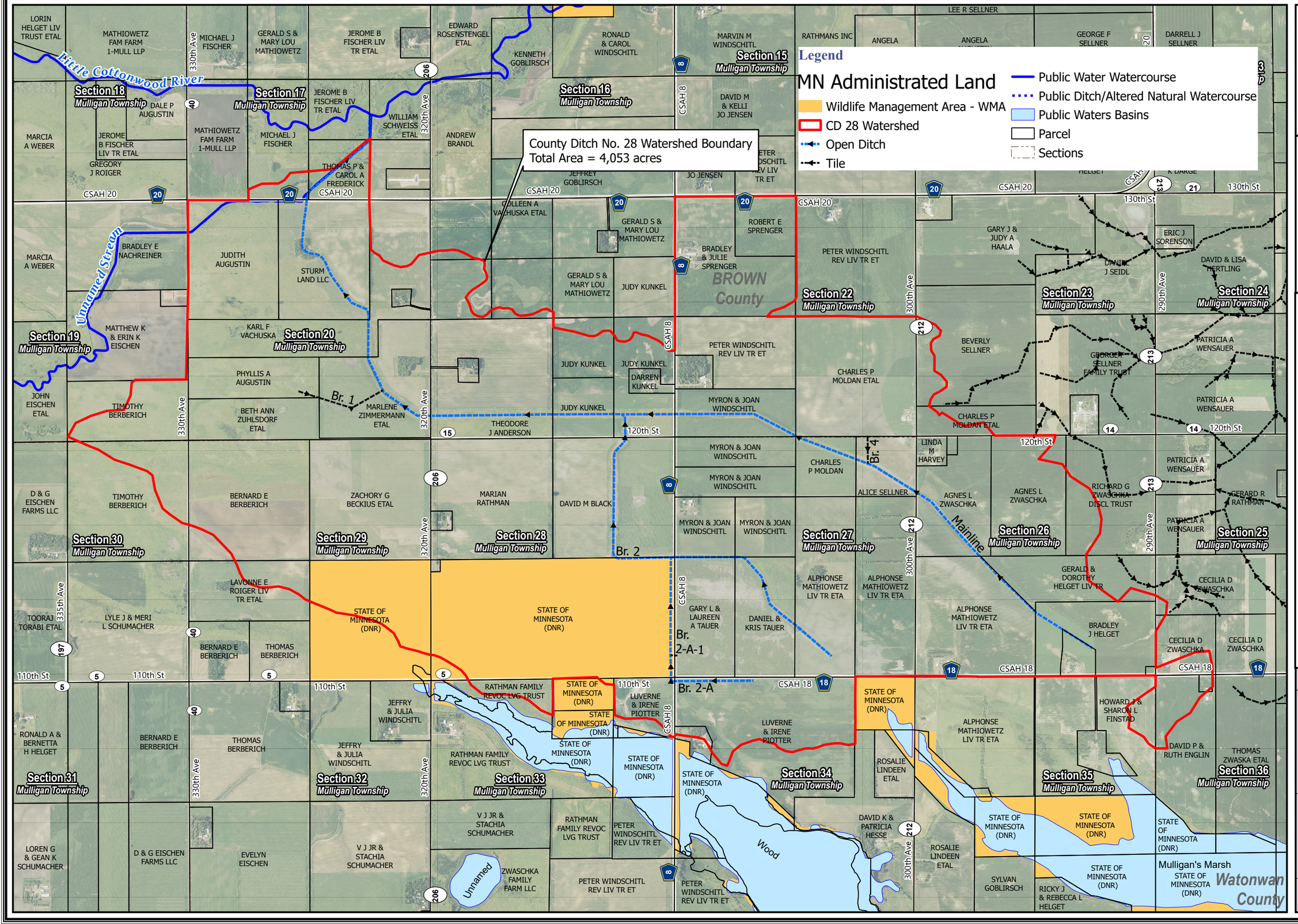




Public Waters and Lands

County Ditch No. 28

Brown County, Minnesota

Tuesday, August 12, 2025

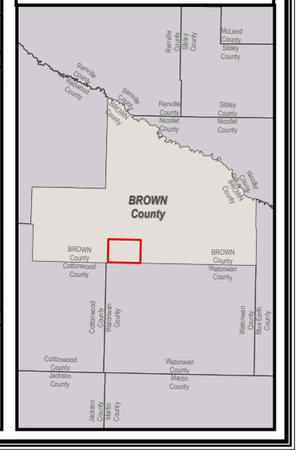
PN: 19-23281

Source:

Orthophotograph (MnGeo WMS, 2019)
Tile/Ditch (Brown County, 2018)
Parcels (Brown County, 2020)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

N

0 475 950 1,900 Feet



Appendix B: Cost Estimate

BROWN COUNTY
COUNTY DITCH No. 28

ISG

PROPOSED IMPROVEMENT COST SUMMARY

Area	Separable Maintenance / Repair Cost	Improvement Cost	Net Cost
Mainline	$ 787,306	$ 812,921	$ 25,615
Branch 1	$ 115,868	$ 149,468	$ 33,600
Branch 2	$ 277,914	$ 286,629	$ 8,715
Branch 2-A	$ 136,110	$ 140,551	$ 4,441
Branch 4	$ 33,846	$ 61,138	$ 27,291
Mainline Crossing #1 - CO Hwy 20	$ 100,775	$ 101,559	$ 784
Mainline - Crossing #2	$ 292,474	$ 320,284	$ 27,810
Mainline - Crossing #3	$ 174,227	$ 185,501	$ 11,275
Mainline - Crossing #4	$ 54,423	$ 65,849	$ 11,426
Mainline Crossing #5 - T-206	$ 195,062	$ 196,580	$ 1,518
Mainline - Crossing #6	$ 44,262	$ 50,741	$ 6,479
Mainline Crossing #7 - CO Hwy 8	$ 156,983	$ 158,204	$ 1,221
Mainline - Crossing #8	$ 38,677	$ 50,741	$ 12,064
Mainline - Crossing #9	$ 50,350	$ 50,741	$ 391
Mainline Crossing #10 - T-212	$ 42,043	$ 70,984	$ 28,941
Branch 2 Crossing #11 - T-15	$ 179,585	$ 180,982	$ 1,397
Branch 2 - Crossing #12	$ 26,345	$ 34,636	$ 8,291
Branch 2 - Crossing #13	$ 38,670	$ 55,444	$ 16,774
Branch 2 - Crossing #14	$ 23,376	$ 32,890	$ 9,514
Branch 2 - Crossing #15	$ 23,376	$ 29,442	$ 6,065
Branch 2 - Crossing #16	$ 23,376	$ 29,442	$ 6,065
Branch 2 - Crossing #17	$ 23,376	$ 29,442	$ 6,065
Branch 2 - Crossing #18	$ 23,376	$ 29,442	$ 6,065
Branch 2 - Crossing #19	$ 26,345	$ 34,636	$ 8,291
Branch 2 - Crossing #20	$ 26,345	$ 34,636	$ 8,291
Branch 2 - Crossing #21	$ 26,345	$ 34,636	$ 8,291
Branch 2 Crossing #22 - CO Hwy 8	$ 107,432	$ 108,268	$ 836
Branch 2 - Crossing #23	$ 60,398	$ 65,849	$ 5,451
Branch 2 - Crossing #24	$ 54,423	$ 54,846	$ 423
Branch 2-A Crossing #25 - Co Hwy 8 / T-	$ 131,829	$ 145,904	$ 14,075
Road Crossing Costs	$ -	$ 41,771	$ 41,771
Subtotal	**$ 3,294,923**	**$ 3,644,160**	**$ 349,236**
Road Authority Repair Costs	$ 922,457	$ 922,457	$ -
Total Project Costs	**$ 4,217,380**	**$ 4,566,617**	**$ 349,236**
		Subtotal Separable Maintenance Costs	$ 3,294,923
		Net Costs	$ 349,236
		Total Project Costs for Landowners	**$ 3,644,160**
		Net Benefit	**$ (349,236)**

BROWN COUNTY
COUNTY DITCH No. 28

SEPARABLE MAINTENANCE (REPAIR)

Mainline

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 25,470.00	$ 25,470
102	INSTALL 18-INCH ASI RISER ASSEMBLY W/TRASH GRATE	EA	7	$ 1,585.85	$ 11,101
103	INSTALL 18-INCH ASI OUTLET ASSEMBLY	EA	7	$ 1,683.51	$ 11,785
104	DITCH CLEANING (12' WIDE DITCH BOTTOM)	LF	3193	$ 6.40	$ 20,435
105	DITCH CLEANING (6' WIDE DITCH BOTTOM)	LF	11358	$ 3.60	$ 40,889
106	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	10949	$ 3.00	$ 32,847
107	DITCH SIDESLOPE REPAIR	LF	2550	$ 7.78	$ 19,839
108	ARMOR TILE OUTET (RIPRAP & GEOTEXTILE FABRIC)	EA	128	$ 920.23	$ 117,789
109	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	19.32	$ 2,072.57	$ 40,042
110	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 8 MULCH)	AC	11.71	$ 16,032.95	$ 187,746
111	MOWING	AC	38.64	$ 184.04	$ 7,111
112	WEED SPRAYING	AC	50.35	$ 317.14	$ 15,968
				SUBTOTAL CONSTRUCTION COST	**$ 531,022**
				10% UNFORSEEN	$ 53,102
				TOTAL CONSTRUCTION COST	**$ 584,124**
TEMPORARY DAMAGES		AC	19.32	$ 650.00	$ 12,557
				COUNTY ADMINISTRATION COSTS	$ 29,207
				TOPOGRAPHIC SURVEY	$ 24,148
				REPORTS, PLANS AND SPECIFICATIONS	$ 58,413
				CONSTRUCTION STAKING & ADMINISTRATION	$ 78,857
				TOTAL MAINLINE REPAIR COST	**$ 787,306**

Branch 1

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 3,670.00	$ 3,670
102	TILE INVESTIGATION	HR	5	$ 209.03	$ 1,045
103	15-INCH AGRICULTURAL TILE	LF	1600	$ 26.14	$ 41,824
104	12-INCH AGRICULTURAL TILE	LF	500	$ 22.41	$ 11,205
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	9	$ 1,031.25	$ 9,281
106	15-INCH CROSS-CONNECT W/40 LF OF SPECIFIED PIPE	EA	1	$ 1,948.21	$ 1,948
107	GRANULAR PIPE FOUNDATION	CY	53	$ 40.92	$ 2,169
108	INSTALL DROP INTAKE (18-INCH)	EA	3	$ 1,293.01	$ 3,879
109	CAP DROP INTAKE (18-INCH)	EA	1	$ 625.71	$ 626
110	INSTALL BAR GUARD ASSEMBLY (18-INCH DROP INTAKES)	EA	2	$ 382.12	$ 764
				SUBTOTAL CONSTRUCTION COST	**$ 76,411**
				10% UNFORSEEN	$ 7,641
				TOTAL CONSTRUCTION COST	**$ 84,053**
TEMPORARY DAMAGES		AC	4.82	$ 650.00	$ 3,134
				COUNTY ADMINISTRATION COSTS	$ 4,203
				TOPOGRAPHIC SURVEY	$ 2,625
				REPORTS, PLANS AND SPECIFICATIONS	$ 8,406
				CONSTRUCTION STAKING & ADMINISTRATION	$ 11,348
				TOTAL BRANCH 1 REPAIR COST	**$ 115,868**

BROWN COUNTY
COUNTY DITCH No. 28

SEPARABLE MAINTENANCE (REPAIR)

Branch 2

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 9,000.00	$ 9,000
102	INSTALL 18-INCH ASI RISER ASSEMBLY W/TRASH GRATE	EA	5	$ 1,585.85	$ 7,929
103	INSTALL 18-INCH ASI OUTLET ASSEMBLY	EA	5	$ 1,683.51	$ 8,418
104	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	8900	$ 3.00	$ 26,700
105	DITCH SIDESLOPE REPAIR	LF	890	$ 7.78	$ 6,924
106	ARMOR TILE OUTET (RIPRAP & GEOTEXTILE FABRIC)	EA	44.5	$ 920.23	$ 40,950
107	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	6.75	$ 2,072.57	$ 13,990
108	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 8 MULCH)	AC	4.09	$ 16,032.95	$ 65,575
109	MOWING	AC	13.5	$ 184.04	$ 2,485
110	WEED SPRAYING	AC	17.59	$ 317.14	$ 5,578
				SUBTOTAL CONSTRUCTION COST	**$ 187,549**
				10% UNFORSEEN	$ 18,755
				TOTAL CONSTRUCTION COST	**$ 206,304**
TEMPORARY DAMAGES		AC	6.74	$ 650.00	$ 4,383
				COUNTY ADMINISTRATION COSTS	$ 10,316
				TOPOGRAPHIC SURVEY	$ 8,429
				REPORTS, PLANS AND SPECIFICATIONS	$ 20,631
				CONSTRUCTION STAKING & ADMINISTRATION	$ 27,852
				TOTAL BRANCH 2 REPAIR COST	**$ 277,914**

Branch 2-A

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 4,400.00	$ 4,400
102	INSTALL 18-INCH ASI RISER ASSEMBLY W/TRASH GRATE	EA	1	$ 1,585.85	$ 1,586
103	INSTALL 18-INCH ASI OUTLET ASSEMBLY	EA	1	$ 1,683.51	$ 1,684
104	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	4600	$ 3.00	$ 13,800
105	DITCH SIDESLOPE REPAIR	LF	460	$ 7.78	$ 3,579
106	ARMOR TILE OUTET (RIPRAP & GEOTEXTILE FABRIC)	EA	23	$ 920.23	$ 21,165
107	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	3.49	$ 2,072.57	$ 7,233
108	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 8 MULCH)	AC	2.12	$ 16,032.95	$ 33,990
109	MOWING	AC	6.98	$ 184.04	$ 1,285
110	WEED SPRAYING	AC	9.1	$ 317.14	$ 2,886
				SUBTOTAL CONSTRUCTION COST	**$ 91,607**
				10% UNFORSEEN	$ 9,161
				TOTAL CONSTRUCTION COST	**$ 100,768**
TEMPORARY DAMAGES		AC	3.48	$ 650.00	$ 2,265
				COUNTY ADMINISTRATION COSTS	$ 5,039
				TOPOGRAPHIC SURVEY	$ 4,357
				REPORTS, PLANS AND SPECIFICATIONS	$ 10,077
				CONSTRUCTION STAKING & ADMINISTRATION	$ 13,604
				TOTAL BRANCH 2-A REPAIR COST	**$ 136,110**

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SEPARABLE MAINTENANCE (REPAIR)

Branch 4

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,080.00	$ 1,080
102	TILE INVESTIGATION	HR	2	$ 209.03	$ 418
103	12-INCH AGRICULTURAL TILE	LF	600	$ 22.41	$ 13,446
104	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	3	$ 1,031.25	$ 3,094
105	12-INCH CROSS-CONNECT W/40 LF OF SPECIFIED PIPE	EA	1	$ 1,826.13	$ 1,826
106	GRANULAR PIPE FOUNDATION	CY	14	$ 40.92	$ 573
107	INSTALL DROP INTAKE (18-INCH)	EA	1	$ 1,293.01	$ 1,293
				SUBTOTAL CONSTRUCTION COST	**$ 22,356**
				10% UNFORSEEN	$ 2,236
				TOTAL CONSTRUCTION COST	**$ 24,591**
TEMPORARY DAMAGES		AC	1.38	$ 650.00	$ 895
TELEVISING (POST CONSTRUCTION)		LF	600	$ 1.00	$ 600
				COUNTY ADMINISTRATION COSTS	$ 1,230
				TOPOGRAPHIC SURVEY	$ 750
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,460
				CONSTRUCTION STAKING & ADMINISTRATION	$ 3,320
				TOTAL BRANCH 4 REPAIR COST	**$ 33,846**

BROWN COUNTY
COUNTY DITCH No. 28

SEPARABLE MAINTENANCE (REPAIR)

Mainline Crossing #1 - CO Hwy 20

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 3,420.00	$ 3,420
102	84-INCH CLASS III RCP PIPE	LF	55	$ 750.00	$ 41,250
103	84-INCH RCP APRON	EA	2	$ 7,251.33	$ 14,503
104	OPEN CUT & RESTORE PAVED ROADWAY (MATCH EXISTING SECTION)	EA	1	$ 3,500.00	$ 3,500
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	75	$ 92.46	$ 6,935
106	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 71,293**
				10% UNFORSEEN	$ 7,129
				TOTAL CONSTRUCTION COST	**$ 78,422**
				COUNTY ADMINISTRATION COSTS (Legal, Staff, Bonding, Advertisement)	$ 3,922
				REPORTS, PLANS AND SPECIFICATIONS	$ 7,843
				CONSTRUCTION STAKING & ADMINISTRATION	$ 10,588
				TOTAL MAINLINE CROSSING #1 - CO HWY 20 REPAIR COST	**$ 100,775**

Mainline - Crossing #2

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 9,930.00	$ 9,930
102	72-INCH CLASS III RCP PIPE	LF	270	$ 695.36	$ 187,747
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 206,914**
				10% UNFORSEEN	$ 20,691
				TOTAL CONSTRUCTION COST	**$ 227,605**
				COUNTY ADMINISTRATION COSTS (Legal, Staff, Bonding, Advertisement)	$ 11,381
				REPORTS, PLANS AND SPECIFICATIONS	$ 22,761
				CONSTRUCTION STAKING & ADMINISTRATION	$ 30,727
				TOTAL MAINLINE - CROSSING #2 REPAIR COST	**$ 292,474**

Mainline - Crossing #3

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 5,920.00	$ 5,920
102	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
103	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
104	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
105	66-INCH CLASS III RCP PIPE	LF	165	$ 628.82	$ 103,755
				SUBTOTAL CONSTRUCTION COST	**$ 123,258**
				10% UNFORSEEN	$ 12,326
				TOTAL CONSTRUCTION COST	**$ 135,584**
				COUNTY ADMINISTRATION COSTS	$ 6,780
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 13,559
				CONSTRUCTION STAKING & ADMINISTRATION	$ 18,304
				TOTAL MAINLINE - CROSSING #3 REPAIR COST	**$ 174,227**

BROWN COUNTY
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SEPARABLE MAINTENANCE (REPAIR)

Mainline - Crossing #4

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,850.00	$ 1,850
102	60-INCH CLASS III RCP PIPE	LF	50	$ 548.28	$ 27,414
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 38,501**
				10% UNFORSEEN	$ 3,850
				TOTAL CONSTRUCTION COST	**$ 42,351**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 2,118
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 4,236
				CONSTRUCTION STAKING & ADMINISTRATION	$ 5,718
				TOTAL MAINLINE - CROSSING #4 REPAIR COST	**$ 54,423**

Mainline Crossing #5 - T-206

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 6,620.00	$ 6,620
102	72-INCH CLASS III RCP PIPE	LF	160	$ 695.36	$ 111,258
103	72-INCH RCP APRON	EA	2	$ 5,195.98	$ 10,392
104	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	$ 3,420.75	$ 3,421
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
106	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 137,999**
				10% UNFORSEEN	$ 13,800
				TOTAL CONSTRUCTION COST	**$ 151,799**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 7,590
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 15,180
				CONSTRUCTION STAKING & ADMINISTRATION	$ 20,493
				TOTAL MAINLINE CROSSING #5 - T-206 REPAIR COST	**$ 195,062**

Mainline - Crossing #6

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,510.00	$ 1,510
102	54-INCH CLASS III RCP PIPE	LF	45	$ 457.03	$ 20,566
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 31,313**
				10% UNFORSEEN	$ 3,131
				TOTAL CONSTRUCTION COST	**$ 34,444**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 1,723
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 3,445
				CONSTRUCTION STAKING & ADMINISTRATION	$ 4,650
				TOTAL MAINLINE - CROSSING #6 REPAIR COST	**$ 44,262**

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SEPARABLE MAINTENANCE (REPAIR)

Mainline Crossing #7 - CO Hwy 8

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 5,330.00	$ 5,330
102	60-INCH CLASS III RCP PIPE	LF	160	$ 548.28	$ 87,725
103	60-INCH RCP APRON	EA	2	$ 4,097.01	$ 8,194
104	OPEN CUT & RESTORE PAVED ROADWAY	EA	1	$ 3,500.00	$ 3,500
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
106	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 111,058**
				10% UNFORSEEN	$ 11,106
				TOTAL CONSTRUCTION COST	**$ 122,164**
	TEMPORARY DAMAGES	AC	0.00	$ 650.00	$ -
	TELEVISING (POST CONSTRUCTION)	LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 6,109
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 12,217
				CONSTRUCTION STAKING & ADMINISTRATION	$ 16,493
				TOTAL MAINLINE CROSSING #7 - CO HWY 8 REPAIR COST	**$ 156,983**

Mainline - Crossing #8

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,320.00	$ 1,320
102	48-INCH CLASS III RCP PIPE	LF	45	$ 414.55	$ 18,655
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	30	$ 92.46	$ 2,774
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 27,362**
				10% UNFORSEEN	$ 2,736
				TOTAL CONSTRUCTION COST	**$ 30,098**
	TEMPORARY DAMAGES	AC	0.00	$ 650.00	$ -
	TELEVISING (POST CONSTRUCTION)	LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 1,505
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 3,010
				CONSTRUCTION STAKING & ADMINISTRATION	$ 4,064
				TOTAL MAINLINE - CROSSING #8 REPAIR COST	**$ 38,677**

Mainline - Crossing #9

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,710.00	$ 1,710
102	60-INCH CLASS III RCP PIPE	LF	45	$ 548.28	$ 24,673
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 35,619**
				10% UNFORSEEN	$ 3,562
				TOTAL CONSTRUCTION COST	**$ 39,181**
	TEMPORARY DAMAGES	AC	0.00	$ 650.00	$ -
	TELEVISING (POST CONSTRUCTION)	LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 1,960
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 3,919
				CONSTRUCTION STAKING & ADMINISTRATION	$ 5,290
				TOTAL MAINLINE - CROSSING #9 REPAIR COST	**$ 50,350**

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SEPARABLE MAINTENANCE (REPAIR)

Mainline Crossing #10 - T-212

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,430.00	$ 1,430
102	30-INCH CLASS III RCP PIPE	LF	80	$ 212.90	$ 17,032
103	30-INCH RCP APRON	EA	2	$ 1,700.73	$ 3,401
104	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	$ 3,420.75	$ 3,421
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	30	$ 92.46	$ 2,774
106	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 29,744**
				10% UNFORSEEN	$ 2,974
				TOTAL CONSTRUCTION COST	**$ 32,718**
	TEMPORARY DAMAGES	AC	0.00	$ 650.00	$ -
	TELEVISING (POST CONSTRUCTION)	LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 1,636
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 3,272
				CONSTRUCTION STAKING & ADMINISTRATION	$ 4,417
				TOTAL MAINLINE CROSSING #10 - T-212 REPAIR COST	**$ 42,043**

Branch 2 Crossing #11 - T-15

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 6,100.00	$ 6,100
102	72-INCH CLASS III RCP PIPE	LF	145	$ 695.36	$ 100,827
103	72-INCH RCP APRON	EA	2	$ 5,195.98	$ 10,392
104	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	$ 3,420.75	$ 3,421
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
106	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 127,049**
				10% UNFORSEEN	$ 12,705
				TOTAL CONSTRUCTION COST	**$ 139,754**
	TEMPORARY DAMAGES	AC	0.00	$ 650.00	$ -
	TELEVISING (POST CONSTRUCTION)	LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 6,988
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 13,976
				CONSTRUCTION STAKING & ADMINISTRATION	$ 18,867
				TOTAL BRANCH 2 CROSSING #11 - T-15 REPAIR COST	**$ 179,585**

Branch 2 - Crossing #12

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
103	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
104	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
105	72-INCH CMP PIPE	LF	20	$ 420.00	$ 8,400
				SUBTOTAL CONSTRUCTION COST	**$ 18,637**
				10% UNFORSEEN	$ 1,864
				TOTAL CONSTRUCTION COST	**$ 20,500**
	TEMPORARY DAMAGES	AC	0.00	$ 650.00	$ -
	TELEVISING (POST CONSTRUCTION)	LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 1,026
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,051
				CONSTRUCTION STAKING & ADMINISTRATION	$ 2,768
				TOTAL BRANCH 2 - CROSSING #12 REPAIR COST	**$ 26,345**

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SEPARABLE MAINTENANCE (REPAIR)

Branch 2 - Crossing #13

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,320.00	$ 1,320
102	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
103	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
104	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
105	72-INCH CMP PIPE	LF	40	$ 420.00	$ 16,800
				SUBTOTAL CONSTRUCTION COST	**$ 27,357**
				10% UNFORSEEN	$ 2,736
				TOTAL CONSTRUCTION COST	**$ 30,092**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 1,505
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 3,010
				CONSTRUCTION STAKING & ADMINISTRATION	$ 4,063
				TOTAL BRANCH 2 - CROSSING #13 REPAIR COST	**$ 38,670**

Branch 2 - Crossing #14

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
103	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
104	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
105	72-INCH CMP PIPE	LF	15	$ 420.00	$ 6,300
				SUBTOTAL CONSTRUCTION COST	**$ 16,537**
				10% UNFORSEEN	$ 1,654
				TOTAL CONSTRUCTION COST	**$ 18,190**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 910
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 1,820
				CONSTRUCTION STAKING & ADMINISTRATION	$ 2,456
				TOTAL BRANCH 2 - CROSSING #14 REPAIR COST	**$ 23,376**

Branch 2 - Crossing #15

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
103	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
104	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
105	72-INCH CMP PIPE	LF	15	$ 420.00	$ 6,300
				SUBTOTAL CONSTRUCTION COST	**$ 16,537**
				10% UNFORSEEN	$ 1,654
				TOTAL CONSTRUCTION COST	**$ 18,190**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 910
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 1,820
				CONSTRUCTION STAKING & ADMINISTRATION	$ 2,456
				TOTAL BRANCH 2 - CROSSING #15 REPAIR COST	**$ 23,376**

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SEPARABLE MAINTENANCE (REPAIR)

Branch 2 - Crossing #16

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
103	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
104	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
105	72-INCH CMP PIPE	LF	15	$ 420.00	$ 6,300
				SUBTOTAL CONSTRUCTION COST	**$ 16,537**
				10% UNFORSEEN	$ 1,654
				TOTAL CONSTRUCTION COST	**$ 18,190**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 910
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 1,820
				CONSTRUCTION STAKING & ADMINISTRATION	$ 2,456
				TOTAL BRANCH 2 - CROSSING #16 REPAIR COST	**$ 23,376**

Branch 2 - Crossing #17

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
103	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
104	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
105	72-INCH CMP PIPE	LF	15	$ 420.00	$ 6,300
				SUBTOTAL CONSTRUCTION COST	**$ 16,537**
				10% UNFORSEEN	$ 1,654
				TOTAL CONSTRUCTION COST	**$ 18,190**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 910
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 1,820
				CONSTRUCTION STAKING & ADMINISTRATION	$ 2,456
				TOTAL BRANCH 2 - CROSSING #17 REPAIR COST	**$ 23,376**

Branch 2 - Crossing #18

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
103	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
104	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
105	72-INCH CMP PIPE	LF	15	$ 420.00	$ 6,300
				SUBTOTAL CONSTRUCTION COST	**$ 16,537**
				10% UNFORSEEN	$ 1,654
				TOTAL CONSTRUCTION COST	**$ 18,190**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 910
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 1,820
				CONSTRUCTION STAKING & ADMINISTRATION	$ 2,456
				TOTAL BRANCH 2 - CROSSING #18 REPAIR COST	**$ 23,376**

BROWN COUNTY
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SEPARABLE MAINTENANCE (REPAIR)

Branch 2 - Crossing #19

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
103	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
104	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
105	72-INCH CMP PIPE	LF	20	$ 420.00	$ 8,400
				SUBTOTAL CONSTRUCTION COST	**$ 18,637**
				10% UNFORSEEN	$ 1,864
				TOTAL CONSTRUCTION COST	**$ 20,500**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 1,026
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,051
				CONSTRUCTION STAKING & ADMINISTRATION	$ 2,768
				TOTAL BRANCH 2 - CROSSING #19 REPAIR COST	**$ 26,345**

Branch 2 - Crossing #20

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
103	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
104	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
105	72-INCH CMP PIPE	LF	20	$ 420.00	$ 8,400
				SUBTOTAL CONSTRUCTION COST	**$ 18,637**
				10% UNFORSEEN	$ 1,864
				TOTAL CONSTRUCTION COST	**$ 20,500**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 1,026
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,051
				CONSTRUCTION STAKING & ADMINISTRATION	$ 2,768
				TOTAL BRANCH 2 - CROSSING #20 REPAIR COST	**$ 26,345**

Branch 2 - Crossing #21

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
103	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
104	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
105	72-INCH CMP PIPE	LF	20	$ 420.00	$ 8,400
				SUBTOTAL CONSTRUCTION COST	**$ 18,637**
				10% UNFORSEEN	$ 1,864
				TOTAL CONSTRUCTION COST	**$ 20,500**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 1,026
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,051
				CONSTRUCTION STAKING & ADMINISTRATION	$ 2,768
				TOTAL BRANCH 2 - CROSSING #21 REPAIR COST	**$ 26,345**

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SEPARABLE MAINTENANCE (REPAIR)

Branch 2 Crossing #22 - CO Hwy 8

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 3,650.00	$ 3,650
102	72-INCH CLASS III RCP PIPE	LF	75	$ 695.36	$ 52,152
103	72-INCH RCP APRON	EA	2	$ 5,195.98	$ 10,392
104	OPEN CUT & RESTORE PAVED ROADWAY (MATCH EXISTING SECTION)	EA	1	$ 3,500.00	$ 3,500
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
106	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 76,003**
				10% UNFORSEEN	$ 7,600
				TOTAL CONSTRUCTION COST	**$ 83,603**
	TEMPORARY DAMAGES	AC	0.00	$ 650.00	$ -
	TELEVISING (POST CONSTRUCTION)	LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 4,181
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 8,361
				CONSTRUCTION STAKING & ADMINISTRATION	$ 11,287
				TOTAL BRANCH 2 CROSSING #22 - CO HWY 8 REPAIR COST	**$ 107,432**

Branch 2 - Crossing #23

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 2,050.00	$ 2,050
102	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
103	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
104	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
105	66-INCH CLASS III RCP PIPE	LF	50	$ 628.82	$ 31,441
				SUBTOTAL CONSTRUCTION COST	**$ 42,728**
				10% UNFORSEEN	$ 4,273
				TOTAL CONSTRUCTION COST	**$ 47,000**
	TEMPORARY DAMAGES	AC	0.00	$ 650.00	$ -
	TELEVISING (POST CONSTRUCTION)	LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 2,351
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 4,701
				CONSTRUCTION STAKING & ADMINISTRATION	$ 6,346
				TOTAL BRANCH 2 - CROSSING #23 REPAIR COST	**$ 60,398**

Branch 2 - Crossing #24

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,850.00	$ 1,850
102	60-INCH CLASS III RCP PIPE	LF	50	$ 548.28	$ 27,414
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 38,501**
				10% UNFORSEEN	$ 3,850
				TOTAL CONSTRUCTION COST	**$ 42,351**
	TEMPORARY DAMAGES	AC	0.00	$ 650.00	$ -
	TELEVISING (POST CONSTRUCTION)	LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 2,118
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 4,236
				CONSTRUCTION STAKING & ADMINISTRATION	$ 5,718
				TOTAL BRANCH 2 - CROSSING #24 REPAIR COST	**$ 54,423**

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SEPARABLE MAINTENANCE (REPAIR)

Branch 2-A Crossing #25 - Co Hwy 8 / T-5

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 4,480.00	$ 4,480
102	60-INCH CLASS III RCP PIPE	LF	145	$ 548.28	$ 79,501
103	60-INCH RCP APRON	EA	1	$ 4,097.01	$ 4,097
104	OPEN CUT & RESTORE PAVED ROADWAY (MATCH EXISTING SECTION)	EA	1	$ 3,500.00	$ 3,500
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 93,264**
				10% UNFORSEEN	$ 9,326
				TOTAL CONSTRUCTION COST	**$ 102,590**
	TEMPORARY DAMAGES	AC	0.00	$ 650.00	$ -
	TELEVISING (POST CONSTRUCTION)	LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 5,130
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 10,259
				CONSTRUCTION STAKING & ADMINISTRATION	$ 13,850
				TOTAL BRANCH 2-A CROSSING #25 - CO HWY 8 / T-5 REPAIR COST	**$ 131,829**

BROWN COUNTY
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ISG

SEPARABLE MAINTENANCE (REPAIR)

TOTAL REPAIR COST		
Mainline	$	787,306
Branch 1	$	115,868
Branch 2	$	277,914
Branch 2-A	$	136,110
Branch 4	$	33,846
Mainline Crossing #1 - CO Hwy 20	$	100,775
Mainline - Crossing #2	$	292,474
Mainline - Crossing #3	$	174,227
Mainline - Crossing #4	$	54,423
Mainline Crossing #5 - T-206	$	195,062
Mainline - Crossing #6	$	44,262
Mainline Crossing #7 - CO Hwy 8	$	156,983
Mainline - Crossing #8	$	38,677
Mainline - Crossing #9	$	50,350
Mainline Crossing #10 - T-212	$	42,043
Branch 2 Crossing #11 - T-15	$	179,585
Branch 2 - Crossing #12	$	26,345
Branch 2 - Crossing #13	$	38,670
Branch 2 - Crossing #14	$	23,376
Branch 2 - Crossing #15	$	23,376
Branch 2 - Crossing #16	$	23,376
Branch 2 - Crossing #17	$	23,376
Branch 2 - Crossing #18	$	23,376
Branch 2 - Crossing #19	$	26,345
Branch 2 - Crossing #20	$	26,345
Branch 2 - Crossing #21	$	26,345
Branch 2 Crossing #22 - CO Hwy 8	$	107,432
Branch 2 - Crossing #23	$	60,398
Branch 2 - Crossing #24	$	54,423
Branch 2-A Crossing #25 - Co Hwy 8 / T-5	$	131,829

COMPLETE REPAIR COST	$	3,294,923

BROWN COUNTY
COUNTY DITCH No. 28

ISG

SEPARABLE MAINTENANCE (REPAIR OPTION #2)

Mainline

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 25,470.00	$ 25,470
102	INSTALL 18-INCH ASI RISER ASSEMBLY W/TRASH GRATE	EA	7	$ 1,585.85	$ 11,101
103	INSTALL 18-INCH ASI OUTLET ASSEMBLY	EA	7	$ 1,683.51	$ 11,785
104	DITCH CLEANING (12' WIDE DITCH BOTTOM)	LF	3193	$ 6.40	$ 20,435
105	DITCH CLEANING (6' WIDE DITCH BOTTOM)	LF	11358	$ 3.60	$ 40,889
106	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	10949	$ 3.00	$ 32,847
107	DITCH SIDESLOPE REPAIR	LF	2550	$ 7.78	$ 19,839
108	ARMOR TILE OUTET (RIPRAP & GEOTEXTILE FABRIC)	EA	128	$ 920.23	$ 117,789
109	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	19.32	$ 2,072.57	$ 40,042
110	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 8 MULCH)	AC	11.71	$ 16,032.95	$ 187,746
111	MOWING	AC	38.64	$ 184.04	$ 7,111
112	WEED SPRAYING	AC	50.35	$ 317.14	$ 15,968
				SUBTOTAL CONSTRUCTION COST	**$ 531,022**
				10% UNFORSEEN	$ 53,102
				TOTAL CONSTRUCTION COST	**$ 584,124**
TEMPORARY DAMAGES		AC	19.32	$ 650.00	$ 12,557
				COUNTY ADMINISTRATION COSTS	$ 29,207
				TOPOGRAPHIC SURVEY	$ 24,148
				REPORTS, PLANS AND SPECIFICATIONS	$ 58,413
				CONSTRUCTION STAKING & ADMINISTRATION	$ 78,857
				TOTAL MAINLINE REPAIR COST	**$ 787,306**

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SEPARABLE MAINTENANCE (REPAIR OPTION #2)

Branch 1

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 3,670.00	$ 3,670
102	TILE INVESTIGATION	HR	5	$ 209.03	$ 1,045
103	15-INCH AGRICULTURAL TILE	LF	1600	$ 26.14	$ 41,824
104	12-INCH AGRICULTURAL TILE	LF	500	$ 22.41	$ 11,205
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	9	$ 1,031.25	$ 9,281
106	15-INCH CROSS-CONNECT W/40 LF OF SPECIFIED PIPE	EA	1	$ 1,948.21	$ 1,948
107	GRANULAR PIPE FOUNDATION	CY	53	$ 40.92	$ 2,169
108	INSTALL DROP INTAKE (18-INCH)	EA	3	$ 1,293.01	$ 3,879
109	CAP DROP INTAKE (18-INCH)	EA	1	$ 625.71	$ 626
110	INSTALL BAR GUARD ASSEMBLY (18-INCH DROP INTAKES)	EA	2	$ 382.12	$ 764
				SUBTOTAL CONSTRUCTION COST	**$ 76,411**
				10% UNFORSEEN	$ 7,641
				TOTAL CONSTRUCTION COST	**$ 84,053**
TEMPORARY DAMAGES		AC	4.82	$ 650.00	$ 3,134
				COUNTY ADMINISTRATION COSTS	$ 4,203
				TOPOGRAPHIC SURVEY	$ 2,625
				REPORTS, PLANS AND SPECIFICATIONS	$ 8,406
				CONSTRUCTION STAKING & ADMINISTRATION	$ 11,348
				TOTAL BRANCH 1 REPAIR COST	**$ 115,868**

Branch 2

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 9,000.00	$ 9,000
102	INSTALL 18-INCH ASI RISER ASSEMBLY W/TRASH GRATE	EA	5	$ 1,585.85	$ 7,929
103	INSTALL 18-INCH ASI OUTLET ASSEMBLY	EA	5	$ 1,683.51	$ 8,418
104	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	8900	$ 3.00	$ 26,700
105	DITCH SIDESLOPE REPAIR	LF	890	$ 7.78	$ 6,924
106	ARMOR TILE OUTET (RIPRAP & GEOTEXTILE FABRIC)	EA	44.5	$ 920.23	$ 40,950
107	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	6.75	$ 2,072.57	$ 13,990
108	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 8 MULCH)	AC	4.09	$ 16,032.95	$ 65,575
109	MOWING	AC	13.5	$ 184.04	$ 2,485
110	WEED SPRAYING	AC	17.59	$ 317.14	$ 5,578
				SUBTOTAL CONSTRUCTION COST	**$ 187,549**
				10% UNFORSEEN	$ 18,755
				TOTAL CONSTRUCTION COST	**$ 206,304**
TEMPORARY DAMAGES		AC	6.74	$ 650.00	$ 4,383
				COUNTY ADMINISTRATION COSTS	$ 10,316
				TOPOGRAPHIC SURVEY	$ 8,429
				REPORTS, PLANS AND SPECIFICATIONS	$ 20,631
				CONSTRUCTION STAKING & ADMINISTRATION	$ 27,852
				TOTAL BRANCH 2 REPAIR COST	**$ 277,914**

BROWN COUNTY
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SEPARABLE MAINTENANCE (REPAIR OPTION #2)

Branch 2-A

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 4,400.00	$ 4,400
102	INSTALL 18-INCH ASI RISER ASSEMBLY W/TRASH GRATE	EA	1	$ 1,585.85	$ 1,586
103	INSTALL 18-INCH ASI OUTLET ASSEMBLY	EA	1	$ 1,683.51	$ 1,684
104	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	4600	$ 3.00	$ 13,800
105	DITCH SIDESLOPE REPAIR	LF	460	$ 7.78	$ 3,579
106	ARMOR TILE OUTET (RIPRAP & GEOTEXTILE FABRIC)	EA	23	$ 920.23	$ 21,165
107	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	3.49	$ 2,072.57	$ 7,233
108	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 8 MULCH)	AC	2.12	$ 16,032.95	$ 33,990
109	MOWING	AC	6.98	$ 184.04	$ 1,285
110	WEED SPRAYING	AC	9.1	$ 317.14	$ 2,886
				SUBTOTAL CONSTRUCTION COST	**$ 91,607**
				10% UNFORSEEN	$ 9,161
				TOTAL CONSTRUCTION COST	**$ 100,768**
TEMPORARY DAMAGES		AC	3.48	$ 650.00	$ 2,265
				COUNTY ADMINISTRATION COSTS	$ 5,039
				TOPOGRAPHIC SURVEY	$ 4,357
				REPORTS, PLANS AND SPECIFICATIONS	$ 10,077
				CONSTRUCTION STAKING & ADMINISTRATION	$ 13,604
				TOTAL BRANCH 2-A REPAIR COST	**$ 136,110**

Branch 2-A-1

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	TILE INVESTIGATION	HR	1	$ 209.03	$ 209
103	10-INCH AGRICULTURAL TILE	LF	100	$ 21.84	$ 2,184
104	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	1	$ 1,031.25	$ 1,031
105	GRANULAR PIPE FOUNDATION	CY	2	$ 40.92	$ 82
106	INSTALL DROP INTAKE (18-INCH)	EA	1	$ 1,293.01	$ 1,293
107	CAP DROP INTAKE (18-INCH)	EA	1	$ 625.71	$ 626
				SUBTOTAL CONSTRUCTION COST	**$ 6,425**
				10% UNFORSEEN	$ 642
				TOTAL CONSTRUCTION COST	**$ 7,067**
TEMPORARY DAMAGES		AC	0.23	$ 650.00	$ 149
TELEVISING (POST CONSTRUCTION)		LF	100	$ 1.00	$ 100
				COUNTY ADMINISTRATION COSTS	$ 354
				TOPOGRAPHIC SURVEY	$ 125
				REPORTS, PLANS AND SPECIFICATIONS	$ 707
				CONSTRUCTION STAKING & ADMINISTRATION	$ 955
				TOTAL BRANCH 2-A-1 REPAIR COST	**$ 9,458**

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SEPARABLE MAINTENANCE (REPAIR OPTION #2)

Branch 4

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	TILE INVESTIGATION	HR	2	$ 209.03	$ 418
103	12-INCH AGRICULTURAL TILE	LF	600	$ 22.41	$ 13,446
104	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	3	$ 1,031.25	$ 3,094
105	GRANULAR PIPE FOUNDATION	CY	14	$ 40.92	$ 573
106	INSTALL DROP INTAKE (18-INCH)	EA	1	$ 1,293.01	$ 1,293
107	CAP DROP INTAKE (18-INCH)	EA	1	$ 625.71	$ 626
				SUBTOTAL CONSTRUCTION COST	**$ 20,450**
				10% UNFORSEEN	$ 2,045
				TOTAL CONSTRUCTION COST	**$ 22,494**
	TEMPORARY DAMAGES	AC	1.38	$ 650.00	$ 895
	TELEVISING (POST CONSTRUCTION)	LF	600	$ 1.00	$ 600
				COUNTY ADMINISTRATION COSTS	$ 1,125
				TOPOGRAPHIC SURVEY	$ 750
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,250
				CONSTRUCTION STAKING & ADMINISTRATION	$ 3,037
				TOTAL BRANCH 4 REPAIR COST	**$ 31,152**

BROWN COUNTY
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SEPARABLE MAINTENANCE (REPAIR OPTION #2)

Mainline - Crossing #2

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 9,930.00	$ 9,930
102	72-INCH CLASS III RCP PIPE	LF	270	$ 695.36	$ 187,747
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 206,914**
				10% UNFORSEEN	$ 20,691
				TOTAL CONSTRUCTION COST	**$ 227,605**
				COUNTY ADMINISTRATION COSTS (Legal, Staff, Bonding, Advertisement)	$ 11,381
				REPORTS, PLANS AND SPECIFICATIONS	$ 22,761
				CONSTRUCTION STAKING & ADMINISTRATION	$ 30,727
				TOTAL MAINLINE - CROSSING #2 REPAIR COST	**$ 292,474**

Mainline - Crossing #3

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 5,920.00	$ 5,920
102	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
103	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
104	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
105	66-INCH CLASS III RCP PIPE	LF	165	$ 628.82	$ 103,755
				SUBTOTAL CONSTRUCTION COST	**$ 123,258**
				10% UNFORSEEN	$ 12,326
				TOTAL CONSTRUCTION COST	**$ 135,584**
				COUNTY ADMINISTRATION COSTS	$ 6,780
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 13,559
				CONSTRUCTION STAKING & ADMINISTRATION	$ 18,304
				TOTAL MAINLINE - CROSSING #3 REPAIR COST	**$ 174,227**

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SEPARABLE MAINTENANCE (REPAIR OPTION #2)

Mainline - Crossing #4

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,850.00	$ 1,850
102	60-INCH CLASS III RCP PIPE	LF	50	$ 548.28	$ 27,414
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 38,501**
				10% UNFORSEEN	$ 3,850
				TOTAL CONSTRUCTION COST	**$ 42,351**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 2,118
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 4,236
				CONSTRUCTION STAKING & ADMINISTRATION	$ 5,718
				TOTAL MAINLINE - CROSSING #4 REPAIR COST	**$ 54,423**

Mainline - Crossing #6

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,510.00	$ 1,510
102	54-INCH CLASS III RCP PIPE	LF	45	$ 457.03	$ 20,566
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 31,313**
				10% UNFORSEEN	$ 3,131
				TOTAL CONSTRUCTION COST	**$ 34,444**
TEMPORARY DAMAGES		AC	0.00	$ 650.00	$ -
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 1,723
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 3,445
				CONSTRUCTION STAKING & ADMINISTRATION	$ 4,650
				TOTAL MAINLINE - CROSSING #6 REPAIR COST	**$ 44,262**

BROWN COUNTY
COUNTY DITCH No. 28

ISG

SEPARABLE MAINTENANCE (REPAIR OPTION #2)

Mainline - Crossing #9

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,710.00	$ 1,710
102	60-INCH CLASS III RCP PIPE	LF	45	$ 548.28	$ 24,673
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 35,619**
				10% UNFORSEEN	$ 3,562
				TOTAL CONSTRUCTION COST	**$ 39,181**
	TEMPORARY DAMAGES	AC	0.00	$ 650.00	$ -
	TELEVISING (POST CONSTRUCTION)	LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 1,960
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 3,919
				CONSTRUCTION STAKING & ADMINISTRATION	$ 5,290
				TOTAL MAINLINE - CROSSING #9 REPAIR COST	**$ 50,350**

Mainline Crossing #10 - T-212

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,430.00	$ 1,430
102	30-INCH CLASS III RCP PIPE	LF	80	$ 212.90	$ 17,032
103	30-INCH RCP APRON	EA	2	$ 1,700.73	$ 3,401
104	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	$ 3,420.75	$ 3,421
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	30	$ 92.46	$ 2,774
106	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 29,744**
				10% UNFORSEEN	$ 2,974
				TOTAL CONSTRUCTION COST	**$ 32,718**
	TEMPORARY DAMAGES	AC	0.00	$ 650.00	$ -
	TELEVISING (POST CONSTRUCTION)	LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 1,636
				TOPOGRAPHIC SURVEY	$ -
				REPORTS, PLANS AND SPECIFICATIONS	$ 3,272
				CONSTRUCTION STAKING & ADMINISTRATION	$ 4,417
				TOTAL MAINLINE CROSSING #10 - T-212 REPAIR COST	**$ 42,043**

BROWN COUNTY
COUNTY DITCH No. 28

SEPARABLE MAINTENANCE (REPAIR OPTION #2)

TOTAL REPAIR OPTION #2 COST

Mainline	$	787,306
Branch 1	$	115,868
Branch 2	$	277,914
Branch 2-A	$	136,110
Branch 2-A-1	$	9,458
Branch 4	$	31,152
Mainline - Crossing #2	$	292,474
Mainline - Crossing #3	$	174,227
Mainline - Crossing #4	$	54,423
Mainline - Crossing #6	$	44,262
Mainline - Crossing #9	$	50,350
Mainline Crossing #10 - T-212	$	42,043

COMPLETE REPAIR COST	$	2,015,588

BROWN COUNTY
COUNTY DITCH No. 28

PROPOSED IMPROVEMENT

Mainline

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 26,140.00	$ 26,140
102	INSTALL 24-INCH ASI RISER ASSEMBLY W/TRASH GRATE	EA	7	$ 1,585.85	$ 11,101
103	INSTALL 24-INCH ASI OUTLET ASSEMBLY	EA	7	$ 1,683.51	$ 11,785
104	DITCH DEEPENING (12' WIDE DITCH BOTTOM)	LF	3193	$ 7.40	$ 23,628
105	DITCH DEEPENING (6' WIDE DITCH BOTTOM)	LF	11358	$ 4.00	$ 45,432
106	DITCH DEEPENING (4' WIDE DITCH BOTTOM)	LF	10949	$ 3.50	$ 38,322
107	DITCH SIDESLOPE REPAIR	LF	2550	$ 7.78	$ 19,839
108	ARMOR TILE OUTET (RIPRAP & GEOTEXTILE FABRIC)	EA	128	$ 920.23	$ 117,789
109	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	19.32	$ 2,072.57	$ 40,042
110	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 8 MULCH)	AC	11.71	$ 16,032.95	$ 187,746
111	MOWING	AC	38.64	$ 184.04	$ 7,111
112	WEED SPRAYING	AC	50.35	$ 317.14	$ 15,968
				SUBTOTAL CONSTRUCTION COST	**$ 544,903**
				10% UNFORSEEN	$ 54,490
				TOTAL CONSTRUCTION COST	**$ 599,393**
TEMPORARY DAMAGES		AC	19.32	$ 650.00	$ 12,557
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 29,970
				TOPOGRAPHIC SURVEY	$ 24,148
				REPORTS, PLANS AND SPECIFICATIONS	$ 65,934
				CONSTRUCTION STAKING & ADMINISTRATION	$ 80,919
				TOTAL MAINLINE IMPROVEMENT COST	**$ 812,921**

Branch 1

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 4,730.00	$ 4,730
102	TILE INVESTIGATION	HR	5	$ 209.03	$ 1,045
103	24-INCH AGRICULTURAL TILE	LF	1600	$ 37.88	$ 60,608
104	15-INCH AGRICULTURAL TILE	LF	500	$ 26.14	$ 13,070
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	9	$ 1,031.25	$ 9,281
106	15-INCH CROSS-CONNECT W/40 LF OF SPECIFIED PIPE	EA	1	$ 1,948.21	$ 1,948
107	GRANULAR PIPE FOUNDATION	CY	64	$ 40.92	$ 2,619
108	INSTALL DROP INTAKE (18-INCH)	EA	3	$ 1,293.01	$ 3,879
109	CAP DROP INTAKE (18-INCH)	EA	1	$ 625.71	$ 626
110	INSTALL BAR GUARD ASSEMBLY (18-INCH DROP INTAKES)	EA	2	$ 382.12	$ 764
				SUBTOTAL CONSTRUCTION COST	**$ 98,571**
				10% UNFORSEEN	$ 9,857
				TOTAL CONSTRUCTION COST	**$ 108,428**
TEMPORARY DAMAGES		AC	6.66	$ 650.00	$ 4,327
TELEVISING (POST CONSTRUCTION)		LF	2100	$ 1.00	$ 2,100
				COUNTY ADMINISTRATION COSTS	$ 5,422
				TOPOGRAPHIC SURVEY	$ 2,625
				REPORTS, PLANS AND SPECIFICATIONS	$ 11,928
				CONSTRUCTION STAKING & ADMINISTRATION	$ 14,638
				TOTAL BRANCH 1 IMPROVEMENT COST	**$ 149,468**

BROWN COUNTY
COUNTY DITCH No. 28

PROPOSED IMPROVEMENT

Branch 2

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 9,220.00	$ 9,220
102	INSTALL 18-INCH ASI RISER ASSEMBLY W/TRASH GRATE	EA	5	$ 1,585.85	$ 7,929
103	INSTALL 18-INCH ASI OUTLET ASSEMBLY	EA	5	$ 1,683.51	$ 8,418
104	DITCH DEEPENING (4' WIDE DITCH BOTTOM)	LF	8900	$ 3.50	$ 31,150
105	DITCH SIDESLOPE REPAIR	LF	890	$ 7.78	$ 6,924
106	ARMOR TILE OUTET (RIPRAP & GEOTEXTILE FABRIC)	EA	44.5	$ 920.23	$ 40,950
107	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	6.75	$ 2,072.57	$ 13,990
108	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 8 MULCH)	AC	4.09	$ 16,032.95	$ 65,575
109	MOWING	AC	13.5	$ 184.04	$ 2,485
110	WEED SPRAYING	AC	17.59	$ 317.14	$ 5,578
				SUBTOTAL CONSTRUCTION COST	**$ 192,219**
				10% UNFORSEEN	$ 19,222
				TOTAL CONSTRUCTION COST	**$ 211,441**
TEMPORARY DAMAGES		AC	6.74	$ 650.00	$ 4,383
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 10,573
				TOPOGRAPHIC SURVEY	$ 8,429
				REPORTS, PLANS AND SPECIFICATIONS	$ 23,259
				CONSTRUCTION STAKING & ADMINISTRATION	$ 28,545
				TOTAL BRANCH 2 IMPROVEMENT COST	**$ 286,629**

Branch 2A

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 4,510.00	$ 4,510
102	INSTALL 18-INCH ASI RISER ASSEMBLY W/TRASH GRATE	EA	1	$ 1,585.85	$ 1,586
103	INSTALL 18-INCH ASI OUTLET ASSEMBLY	EA	1	$ 1,683.51	$ 1,684
104	DITCH DEEPENING (4' WIDE DITCH BOTTOM)	LF	4600	$ 3.50	$ 16,100
105	DITCH SIDESLOPE REPAIR	LF	460	$ 7.78	$ 3,579
106	ARMOR TILE OUTET (RIPRAP & GEOTEXTILE FABRIC)	EA	23	$ 920.23	$ 21,165
107	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	3.49	$ 2,072.57	$ 7,233
				SUBTOTAL CONSTRUCTION COST	**$ 94,017**
				10% UNFORSEEN	$ 9,402
				TOTAL CONSTRUCTION COST	**$ 103,419**
TEMPORARY DAMAGES		AC	3.48	$ 650.00	$ 2,265
TELEVISING (POST CONSTRUCTION)		LF	0	$ 1.00	$ -
				COUNTY ADMINISTRATION COSTS	$ 5,171
				TOPOGRAPHIC SURVEY	$ 4,357
				REPORTS, PLANS AND SPECIFICATIONS	$ 11,377
				CONSTRUCTION STAKING & ADMINISTRATION	$ 13,962
				TOTAL BRANCH 2A IMPROVEMENT COST	**$ 140,551**

BROWN COUNTY
COUNTY DITCH No. 28

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PROPOSED IMPROVEMENT

Branch 4

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,970.00	$ 1,970
102	TILE INVESTIGATION	HR	2	$ 209.03	$ 418
103	30-INCH AGRICULTURAL TILE	LF	600	$ 51.50	$ 30,900
104	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	3	$ 1,031.25	$ 3,094
105	12-INCH CROSS-CONNECT W/40 LF OF SPECIFIED PIPE	EA	1	$ 1,826.13	$ 1,826
106	GRANULAR PIPE FOUNDATION	CY	22	$ 40.92	$ 900
107	INSTALL DROP INTAKE (18-INCH)	EA	1	$ 1,293.01	$ 1,293
				SUBTOTAL CONSTRUCTION COST	**$ 41,027**
				10% UNFORSEEN	$ 4,103
				TOTAL CONSTRUCTION COST	**$ 45,130**
TEMPORARY DAMAGES		AC	2.07	$ 650.00	$ 1,343
TELEVISING (POST CONSTRUCTION)		LF	600	$ 1.00	$ 600
				COUNTY ADMINISTRATION COSTS	$ 2,257
				TOPOGRAPHIC SURVEY	$ 750
				REPORTS, PLANS AND SPECIFICATIONS	$ 4,965
				CONSTRUCTION STAKING & ADMINISTRATION	$ 6,093
				TOTAL BRANCH 4 IMPROVEMENT COST	**$ 61,138**

Mainline Crossing #1 - CO Hwy 20

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 3,420.00	$ 3,420
102	84-INCH CLASS III RCP PIPE	LF	55	$ 750.00	$ 41,250
103	84-INCH RCP APRON	EA	2	$ 7,251.33	$ 14,503
104	OPEN CUT & RESTORE PAVED ROADWAY (MATCH EXISTING SECTION)	EA	1	$ 3,500.00	$ 3,500
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	75	$ 92.46	$ 6,935
106	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 71,293**
				10% UNFORSEEN	$ 7,129
				TOTAL CONSTRUCTION COST	**$ 78,422**
				COUNTY ADMINISTRATION COSTS (Legal, Staff, Bonding, Advertisement)	$ 3,922
				REPORTS, PLANS AND SPECIFICATIONS	$ 8,627
				CONSTRUCTION STAKING & ADMINISTRATION	$ 10,588
				TOTAL MAINLINE CROSSING #1 - CO HWY 20 IMPROVEMENT COST	**$ 101,559**

BROWN COUNTY
COUNTY DITCH No. 28

ISG

PROPOSED IMPROVEMENT

Mainline - Crossing #2

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 10,790.00	$ 10,790
102	84-INCH CLASS III RCP PIPE	LF	270	$ 750.00	$ 202,500
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	75	$ 92.46	$ 6,935
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 224,838**
				10% UNFORSEEN	$ 22,484
				TOTAL CONSTRUCTION COST	**$ 247,322**
				COUNTY ADMINISTRATION COSTS (Legal, Staff, Bonding, Advertisement)	$ 12,367
				REPORTS, PLANS AND SPECIFICATIONS	$ 27,206
				CONSTRUCTION STAKING & ADMINISTRATION	$ 33,389
				TOTAL MAINLINE - CROSSING #2 IMPROVEMENT COST	**$ 320,284**

Mainline - Crossing #3

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 6,250.00	$ 6,250
102	72-INCH CLASS III RCP PIPE	LF	165	$ 695.36	$ 114,734
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 130,221**
				10% UNFORSEEN	$ 13,022
				TOTAL CONSTRUCTION COST	**$ 143,243**
				COUNTY ADMINISTRATION COSTS	$ 7,163
				REPORTS, PLANS AND SPECIFICATIONS	$ 15,757
				CONSTRUCTION STAKING & ADMINISTRATION	$ 19,338
				TOTAL MAINLINE - CROSSING #3 IMPROVEMENT COST	**$ 185,501**

Mainline - Crossing #4

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 2,220.00	$ 2,220
102	72-INCH CLASS III RCP PIPE	LF	50	$ 695.36	$ 34,768
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 46,225**
				10% UNFORSEEN	$ 4,622
				TOTAL CONSTRUCTION COST	**$ 50,847**
				COUNTY ADMINISTRATION COSTS	$ 2,543
				REPORTS, PLANS AND SPECIFICATIONS	$ 5,594
				CONSTRUCTION STAKING & ADMINISTRATION	$ 6,865
				TOTAL MAINLINE - CROSSING #4 IMPROVEMENT COST	**$ 65,849**

BROWN COUNTY
COUNTY DITCH No. 28

PROPOSED IMPROVEMENT

Mainline Crossing #5 - T-206

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 6,620.00	$ 6,620
102	72-INCH CLASS III RCP PIPE	LF	160	$ 695.36	$ 111,258
103	72-INCH RCP APRON	EA	2	$ 5,195.98	$ 10,392
104	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	$ 3,420.75	$ 3,421
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
106	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 137,999**
				10% UNFORSEEN	$ 13,800
				TOTAL CONSTRUCTION COST	**$ 151,799**
				COUNTY ADMINISTRATION COSTS	$ 7,590
				REPORTS, PLANS AND SPECIFICATIONS	$ 16,698
				CONSTRUCTION STAKING & ADMINISTRATION	$ 20,493
				TOTAL MAINLINE CROSSING #5 - T-206 IMPROVEMENT COST	**$ 196,580**

Mainline - Crossing #6

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,710.00	$ 1,710
102	60-INCH CLASS III RCP PIPE	LF	45	$ 548.28	$ 24,673
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 35,619**
				10% UNFORSEEN	$ 3,562
				TOTAL CONSTRUCTION COST	**$ 39,181**
				COUNTY ADMINISTRATION COSTS	$ 1,960
				REPORTS, PLANS AND SPECIFICATIONS	$ 4,310
				CONSTRUCTION STAKING & ADMINISTRATION	$ 5,290
				TOTAL MAINLINE - CROSSING #6 IMPROVEMENT COST	**$ 50,741**

BROWN COUNTY
COUNTY DITCH No. 28

PROPOSED IMPROVEMENT

Mainline Crossing #7 - Co Hwy 8

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 5,330.00	$ 5,330
102	60-INCH CLASS III RCP PIPE	LF	160	$ 548.28	$ 87,725
103	60-INCH RCP APRON	EA	2	$ 4,097.01	$ 8,194
104	OPEN CUT & RESTORE PAVED ROADWAY	EA	1	$ 3,500.00	$ 3,500
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
				SUBTOTAL CONSTRUCTION COST	**$ 111,058**
				10% UNFORSEEN	$ 11,106
				TOTAL CONSTRUCTION COST	**$ 122,164**
				COUNTY ADMINISTRATION COSTS	$ 6,109
				REPORTS, PLANS AND SPECIFICATIONS	$ 13,438
				CONSTRUCTION STAKING & ADMINISTRATION	$ 16,493
				TOTAL MAINLINE CROSSING #7 - CO HWY 8 IMPROVEMENT COST	**$ 158,204**

Mainline - Crossing #8

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,710.00	$ 1,710
102	60-INCH CLASS III RCP PIPE	LF	45	$ 548.28	$ 24,673
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 35,619**
				10% UNFORSEEN	$ 3,562
				TOTAL CONSTRUCTION COST	**$ 39,181**
				COUNTY ADMINISTRATION COSTS	$ 1,960
				REPORTS, PLANS AND SPECIFICATIONS	$ 4,310
				CONSTRUCTION STAKING & ADMINISTRATION	$ 5,290
				TOTAL MAINLINE - CROSSING #8 IMPROVEMENT COST	**$ 50,741**

Mainline - Crossing #9

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,710.00	$ 1,710
102	60-INCH CLASS III RCP PIPE	LF	45	$ 548.28	$ 24,673
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 35,619**
				10% UNFORSEEN	$ 3,562
				TOTAL CONSTRUCTION COST	**$ 39,181**
				COUNTY ADMINISTRATION COSTS	$ 1,960
				REPORTS, PLANS AND SPECIFICATIONS	$ 4,310
				CONSTRUCTION STAKING & ADMINISTRATION	$ 5,290
				TOTAL MAINLINE - CROSSING #9 IMPROVEMENT COST	**$ 50,741**

BROWN COUNTY
COUNTY DITCH No. 28

PROPOSED IMPROVEMENT

Mainline Crossing #10 - T-212

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 2,390.00	$ 2,390
102	48-INCH CLASS III RCP PIPE	LF	80	$ 414.55	$ 33,164
103	48-INCH RCP APRON	EA	2	$ 3,197.93	$ 6,396
104	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	$ 3,420.75	$ 3,421
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	30	$ 92.46	$ 2,774
106	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 49,830**
				10% UNFORSEEN	$ 4,983
				TOTAL CONSTRUCTION COST	**$ 54,813**
				COUNTY ADMINISTRATION COSTS	$ 2,741
				REPORTS, PLANS AND SPECIFICATIONS	$ 6,030
				CONSTRUCTION STAKING & ADMINISTRATION	$ 7,400
				TOTAL MAINLINE CROSSING #10 - T-212 IMPROVEMENT COST	**$ 70,984**

Branch 2 Crossing #11 - T-15

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 6,100.00	$ 6,100
102	72-INCH CLASS III RCP PIPE	LF	145	$ 695.36	$ 100,827
103	72-INCH RCP APRON	EA	2	$ 5,195.98	$ 10,392
104	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	$ 3,420.75	$ 3,421
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
106	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 127,049**
				10% UNFORSEEN	$ 12,705
				TOTAL CONSTRUCTION COST	**$ 139,754**
				COUNTY ADMINISTRATION COSTS	$ 6,988
				REPORTS, PLANS AND SPECIFICATIONS	$ 15,373
				CONSTRUCTION STAKING & ADMINISTRATION	$ 18,867
				TOTAL BRANCH 2 CROSSING #11 - T-15 IMPROVEMENT COST	**$ 180,982**

Branch 2 - Crossing #12

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,170.00	$ 1,170
102	72-INCH CLASS III RCP PIPE	LF	20	$ 695.36	$ 13,907
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 24,314**
				10% UNFORSEEN	$ 2,431
				TOTAL CONSTRUCTION COST	**$ 26,745**
				COUNTY ADMINISTRATION COSTS	$ 1,338
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,942
				CONSTRUCTION STAKING & ADMINISTRATION	$ 3,611
				TOTAL BRANCH 2 - CROSSING #12 IMPROVEMENT COST	**$ 34,636**

BROWN COUNTY
COUNTY DITCH No. 28

PROPOSED IMPROVEMENT

Branch 2 - Crossing #13

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,870.00	$ 1,870
102	72-INCH CLASS III RCP PIPE	LF	40	$ 695.36	$ 27,814
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 38,921**
				10% UNFORSEEN	$ 3,892
				TOTAL CONSTRUCTION COST	**$ 42,813**
				COUNTY ADMINISTRATION COSTS	$ 2,141
				REPORTS, PLANS AND SPECIFICATIONS	$ 4,710
				CONSTRUCTION STAKING & ADMINISTRATION	$ 5,780
				TOTAL BRANCH 2 - CROSSING #13 IMPROVEMENT COST	**$ 55,444**

Branch 2 - Crossing #14

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,110.00	$ 1,110
102	72-INCH CLASS III RCP PIPE	LF	15	$ 695.36	$ 10,430
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	75	$ 92.46	$ 6,935
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 23,089**
				10% UNFORSEEN	$ 2,309
				TOTAL CONSTRUCTION COST	**$ 25,397**
				COUNTY ADMINISTRATION COSTS	$ 1,270
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,794
				CONSTRUCTION STAKING & ADMINISTRATION	$ 3,429
				TOTAL BRANCH 2 - CROSSING #14 IMPROVEMENT COST	**$ 32,890**

Branch 2 - Crossing #15

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	72-INCH CLASS III RCP PIPE	LF	15	$ 695.36	$ 10,430
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 20,667**
				10% UNFORSEEN	$ 2,067
				TOTAL CONSTRUCTION COST	**$ 22,734**
				COUNTY ADMINISTRATION COSTS	$ 1,137
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,501
				CONSTRUCTION STAKING & ADMINISTRATION	$ 3,070
				TOTAL BRANCH 2 - CROSSING #15 IMPROVEMENT COST	**$ 29,442**

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PROPOSED IMPROVEMENT

Branch 2 - Crossing #16

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	72-INCH CLASS III RCP PIPE	LF	15	$ 695.36	$ 10,430
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 20,667**
				10% UNFORSEEN	$ 2,067
				TOTAL CONSTRUCTION COST	**$ 22,734**
				COUNTY ADMINISTRATION COSTS	$ 1,137
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,501
				CONSTRUCTION STAKING & ADMINISTRATION	$ 3,070
				TOTAL BRANCH 2 - CROSSING #16 IMPROVEMENT COST	**$ 29,442**

Branch 2 - Crossing #17

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	72-INCH CLASS III RCP PIPE	LF	15	$ 695.36	$ 10,430
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 20,667**
				10% UNFORSEEN	$ 2,067
				TOTAL CONSTRUCTION COST	**$ 22,734**
				COUNTY ADMINISTRATION COSTS	$ 1,137
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,501
				CONSTRUCTION STAKING & ADMINISTRATION	$ 3,070
				TOTAL BRANCH 2 - CROSSING #17 IMPROVEMENT COST	**$ 29,442**

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PROPOSED IMPROVEMENT

Branch 2 - Crossing #18

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,000.00	$ 1,000
102	72-INCH CLASS III RCP PIPE	LF	15	$ 695.36	$ 10,430
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 20,667**
				10% UNFORSEEN	$ 2,067
				TOTAL CONSTRUCTION COST	**$ 22,734**
				COUNTY ADMINISTRATION COSTS	$ 1,137
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,501
				CONSTRUCTION STAKING & ADMINISTRATION	$ 3,070
				TOTAL BRANCH 2 - CROSSING #18 IMPROVEMENT COST	**$ 29,442**

Branch 2 - Crossing #19

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,170.00	$ 1,170
102	72-INCH CLASS III RCP PIPE	LF	20	$ 695.36	$ 13,907
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 24,314**
				10% UNFORSEEN	$ 2,431
				TOTAL CONSTRUCTION COST	**$ 26,745**
				COUNTY ADMINISTRATION COSTS	$ 1,338
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,942
				CONSTRUCTION STAKING & ADMINISTRATION	$ 3,611
				TOTAL BRANCH 2 - CROSSING #19 IMPROVEMENT COST	**$ 34,636**

Branch 2 - Crossing #20

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,170.00	$ 1,170
102	72-INCH CLASS III RCP PIPE	LF	20	$ 695.36	$ 13,907
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 24,314**
				10% UNFORSEEN	$ 2,431
				TOTAL CONSTRUCTION COST	**$ 26,745**
				COUNTY ADMINISTRATION COSTS	$ 1,338
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,942
				CONSTRUCTION STAKING & ADMINISTRATION	$ 3,611
				TOTAL BRANCH 2 - CROSSING #20 IMPROVEMENT COST	**$ 34,636**

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PROPOSED IMPROVEMENT

Branch 2 - Crossing #21

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,170.00	$ 1,170
102	72-INCH CLASS III RCP PIPE	LF	20	$ 695.36	$ 13,907
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 24,314**
				10% UNFORSEEN	$ 2,431
				TOTAL CONSTRUCTION COST	**$ 26,745**
				COUNTY ADMINISTRATION COSTS	$ 1,338
				REPORTS, PLANS AND SPECIFICATIONS	$ 2,942
				CONSTRUCTION STAKING & ADMINISTRATION	$ 3,611
				TOTAL BRANCH 2 - CROSSING #21 IMPROVEMENT COST	**$ 34,636**

Branch 2 Crossing #22 - CO Hwy 8

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 3,650.00	$ 3,650
102	72-INCH CLASS III RCP PIPE	LF	75	$ 695.36	$ 52,152
103	72-INCH RCP APRON	EA	2	$ 5,195.98	$ 10,392
104	OPEN CUT & RESTORE PAVED ROADWAY (MATCH EXISTING SECTION)	EA	1	$ 3,500.00	$ 3,500
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
106	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 76,003**
				10% UNFORSEEN	$ 7,600
				TOTAL CONSTRUCTION COST	**$ 83,603**
				COUNTY ADMINISTRATION COSTS	$ 4,181
				REPORTS, PLANS AND SPECIFICATIONS	$ 9,197
				CONSTRUCTION STAKING & ADMINISTRATION	$ 11,287
				TOTAL BRANCH 2 CROSSING #22 - CO HWY 8 IMPROVEMENT COST	**$ 108,268**

Branch 2 - Crossing #23

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 2,220.00	$ 2,220
102	72-INCH CLASS III RCP PIPE	LF	50	$ 695.36	$ 34,768
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 46,225**
				10% UNFORSEEN	$ 4,622
				TOTAL CONSTRUCTION COST	**$ 50,847**
				COUNTY ADMINISTRATION COSTS	$ 2,543
				REPORTS, PLANS AND SPECIFICATIONS	$ 5,594
				CONSTRUCTION STAKING & ADMINISTRATION	$ 6,865
				TOTAL BRANCH 2 - CROSSING #23 IMPROVEMENT COST	**$ 65,849**

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PROPOSED IMPROVEMENT

Branch 2 - Crossing #24

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,850.00	$ 1,850
102	60-INCH CLASS III RCP PIPE	LF	50	$ 548.28	$ 27,414
103	OPEN CUT & RESTORE FIELD CROSSING	EA	1	$ 2,927.73	$ 2,928
104	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
105	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 38,501**
				10% UNFORSEEN	$ 3,850
				TOTAL CONSTRUCTION COST	**$ 42,351**
				COUNTY ADMINISTRATION COSTS	$ 2,118
				REPORTS, PLANS AND SPECIFICATIONS	$ 4,659
				CONSTRUCTION STAKING & ADMINISTRATION	$ 5,718
				TOTAL BRANCH 2 - CROSSING #24 IMPROVEMENT COST	**$ 54,846**

Branch 2-A Crossing #25 - Co Hwy 8 / T-5

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 4,920.00	$ 4,920
102	60-INCH CLASS III RCP PIPE	LF	145	$ 548.28	$ 79,501
103	60-INCH RCP APRON	EA	2	$ 4,097.01	$ 8,194
104	OPEN CUT & RESTORE PAVED ROADWAY (MATCH EXISTING SECTION)	EA	1	$ 3,500.00	$ 3,500
105	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	$ 92.46	$ 4,623
106	REMOVE CULVERT	EA	1	$ 1,685.90	$ 1,686
				SUBTOTAL CONSTRUCTION COST	**$ 102,424**
				10% UNFORSEEN	$ 10,242
				TOTAL CONSTRUCTION COST	**$ 112,666**
				COUNTY ADMINISTRATION COSTS	$ 5,634
				REPORTS, PLANS AND SPECIFICATIONS	$ 12,394
				CONSTRUCTION STAKING & ADMINISTRATION	$ 15,210
				TOTAL BRANCH 2-A CROSSING #25 - CO HWY 8 / T-5 IMPROVEMENT COST	**$ 145,904**

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PROPOSED IMPROVEMENT

TOTAL IMPROVEMENT COST		
Mainline	$	812,921
Branch 1	$	149,468
Branch 2	$	286,629
Branch 2A	$	140,551
Branch 4	$	61,138
Mainline Crossing #1 - CO Hwy 20	$	101,559
Mainline - Crossing #2	$	320,284
Mainline - Crossing #3	$	185,501
Mainline - Crossing #4	$	65,849
Mainline Crossing #5 - T-206	$	196,580
Mainline - Crossing #6	$	50,741
Mainline Crossing #7 - Co Hwy 8	$	158,204
Mainline - Crossing #8	$	50,741
Mainline - Crossing #9	$	50,741
Mainline Crossing #10 - T-212	$	70,984
Branch 2 Crossing #11 - T-15	$	180,982
Branch 2 - Crossing #12	$	34,636
Branch 2 - Crossing #13	$	55,444
Branch 2 - Crossing #14	$	32,890
Branch 2 - Crossing #15	$	29,442
Branch 2 - Crossing #16	$	29,442
Branch 2 - Crossing #17	$	29,442
Branch 2 - Crossing #18	$	29,442
Branch 2 - Crossing #19	$	34,636
Branch 2 - Crossing #20	$	34,636
Branch 2 - Crossing #21	$	34,636
Branch 2 Crossing #22 - CO Hwy 8	$	108,268
Branch 2 - Crossing #23	$	65,849
Branch 2 - Crossing #24	$	54,846
Branch 2-A Crossing #25 - Co Hwy 8 / T-5	$	145,904

COMPLETE IMPROVEMENT COST	$	3,602,389

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ROAD CROSSINGS

MAINLINE CROSSING #10 REPAIR COST - T-212

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,500.00	$ 1,500
102	30-INCH CLASS III RCP PIPE	LF	80	$ 212.90	$ 17,032
103	30-INCH RCP APRON	EA	2	$ 1,700.73	$ 3,401
104	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	$ 3,420.75	$ 3,421
				SUBTOTAL CONSTRUCTION COST	**$ 29,814**
				10% UNFORSEEN	$ 2,981
				TOTAL CONSTRUCTION COST	**$ 32,795**
				COUNTY ADMINISTRATION COSTS	$ 1,700
				REPORTS, PLANS AND SPECIFICATIONS	$ 3,700
				CONSTRUCTION STAKING & ADMINISTRATION	$ 4,500
				ESTIMATED MAINLINE CROSSING #10 REPAIR COST - T-212	**$ 42,695**

MAINLINE CROSSING #10 IMPROVEMENT COST - T-212

Item No.	Item	Unit	Quantity	Unit Price	Amount
201	MOBILIZATION	LS	1	$ 2,400.00	$ 2,400
202	48-INCH CLASS III RCP PIPE	LF	80	$ 414.55	$ 33,164
203	48-INCH RCP APRON	EA	2	$ 3,197.93	$ 6,396
204	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	$ 3,420.75	$ 3,421
				SUBTOTAL CONSTRUCTION COST	**$ 49,840**
				10% UNFORSEEN	$ 4,984
				TOTAL CONSTRUCTION COST	**$ 54,824**
				COUNTY ADMINISTRATION COSTS	$ 2,800
				REPORTS, PLANS AND SPECIFICATIONS	$ 6,100
				CONSTRUCTION STAKING & ADMINISTRATION	$ 7,500
				ESTIMATED MAINLINE CROSSING #10 IMPROVEMENT COST - T-212	**$ 71,224**

MAINLINE CROSSING #7 REPAIR COST WITH ROAD - CO HWY 8

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 5,400.00	$ 5,400
102	60-INCH CLASS III RCP PIPE	LF	160	$ 548.28	$ 87,725
103	60-INCH RCP APRON	EA	2	$ 4,097.01	$ 8,194
104	CUT & RESTORE PAVED ROADWAY(MATCH EXISTING SECT	EA	1	$ 3,500.00	$ 3,500
				SUBTOTAL CONSTRUCTION COST	**$ 111,128**
				10% UNFORSEEN	$ 11,113
				TOTAL CONSTRUCTION COST	**$ 122,240**
				COUNTY ADMINISTRATION COSTS	$ 6,200
				REPORTS, PLANS AND SPECIFICATIONS	$ 13,500
				CONSTRUCTION STAKING & ADMINISTRATION	$ 16,600
				ESTIMATED MAINLINE CROSSING #7 REPAIR COST WITH ROAD - CO HWY 8	**$ 158,540**

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ROAD CROSSINGS

MAINLINE CROSSING #7 IMPROVEMENT COST - CO HWY 8

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	$ 5,400.00	$ 5,400
302	60-INCH CLASS III RCP PIPE	LF	160	$ 548.28	$ 87,725
303	60-INCH RCP APRON	EA	2	$ 4,097.01	$ 8,194
304	CUT & RESTORE PAVED ROADWAY(MATCH EXISTING SECT	EA	1	$ 3,500.00	$ 3,500
				SUBTOTAL CONSTRUCTION COST	**$ 111,128**
				10% UNFORSEEN	$ 11,113
				TOTAL CONSTRUCTION COST	**$ 122,240**
				COUNTY ADMINISTRATION COSTS	$ 6,200
				REPORTS, PLANS AND SPECIFICATIONS	$ 13,500
				CONSTRUCTION STAKING & ADMINISTRATION	$ 16,600
				ESTIMATED MAINLINE CROSSING #7 IMPROVEMENT COST - CO HWY 8	**$ 158,540**

MAINLINE CROSSING #5 REPAIR COST WITH ROAD - T-206

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 6,700.00	$ 6,700
102	72-INCH CLASS III RCP PIPE	LF	160	$ 695.36	$ 111,258
103	72-INCH RCP APRON	EA	2	$ 5,195.98	$ 10,392
104	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	$ 3,420.75	$ 3,421
				SUBTOTAL CONSTRUCTION COST	**$ 138,079**
				10% UNFORSEEN	$ 13,808
				TOTAL CONSTRUCTION COST	**$ 151,887**
				COUNTY ADMINISTRATION COSTS	$ 7,600
				REPORTS, PLANS AND SPECIFICATIONS	$ 16,800
				CONSTRUCTION STAKING & ADMINISTRATION	$ 20,600
				ESTIMATED MAINLINE CROSSING #5 REPAIR COST WITH ROAD - T-206	**$ 196,887**

MAINLINE CROSSING #5 IMPROVEMENT COST - T-206

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	$ 6,700.00	$ 6,700
302	72-INCH CLASS III RCP PIPE	LF	160	$ 695.36	$ 111,258
303	72-INCH RCP APRON	EA	2	$ 5,195.98	$ 10,392
304	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	$ 3,420.75	$ 3,421
				SUBTOTAL CONSTRUCTION COST	**$ 138,079**
				10% UNFORSEEN	$ 13,808
				TOTAL CONSTRUCTION COST	**$ 151,887**
				COUNTY ADMINISTRATION COSTS	$ 7,600
				REPORTS, PLANS AND SPECIFICATIONS	$ 16,800
				CONSTRUCTION STAKING & ADMINISTRATION	$ 20,600
				ESTIMATED MAINLINE CROSSING #5 IMPROVEMENT COST - T-206	**$ 196,887**

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ROAD CROSSINGS

MAINLINE CROSSING #1 REPAIR COST WITH ROAD - CO HWY 20

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 3,500.00	$ 3,500
102	84-INCH CLASS III RCP PIPE	LF	55	$ 750.00	$ 41,250
103	84-INCH RCP APRON	EA	2	$ 7,251.33	$ 14,503
104	CUT & RESTORE PAVED ROADWAY(MATCH EXISTING SECT	EA	1	$ 3,500.00	$ 3,500
				SUBTOTAL CONSTRUCTION COST	**$ 71,373**
				10% UNFORSEEN	$ 7,137
				TOTAL CONSTRUCTION COST	**$ 78,510**
				COUNTY ADMINISTRATION COSTS	$ 4,000
				REPORTS, PLANS AND SPECIFICATIONS	$ 8,700
				CONSTRUCTION STAKING & ADMINISTRATION	$ 10,600
				ESTIMATED MAINLINE CROSSING #1 REPAIR COST WITH ROAD - CO HWY 20	**$ 101,810**

MAINLINE CROSSING #1 IMPROVEMENT COST - CO HWY 20

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	$ 3,500.00	$ 3,500
302	84-INCH CLASS III RCP PIPE	LF	55	$ 750.00	$ 41,250
303	84-INCH RCP APRON	EA	2	$ 7,251.33	$ 14,503
304	CUT & RESTORE PAVED ROADWAY(MATCH EXISTING SECT	EA	1	$ 3,500.00	$ 3,500
				SUBTOTAL CONSTRUCTION COST	**$ 71,373**
				10% UNFORSEEN	$ 7,137
				TOTAL CONSTRUCTION COST	**$ 78,510**
				COUNTY ADMINISTRATION COSTS	$ 4,000
				REPORTS, PLANS AND SPECIFICATIONS	$ 8,700
				CONSTRUCTION STAKING & ADMINISTRATION	$ 10,600
				ESTIMATED MAINLINE CROSSING #1 IMPROVEMENT COST - CO HWY 20	**$ 101,810**

BRANCH 2 CROSSING #22 REPAIR COST WITH ROAD - CO HWY 8

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 3,700.00	$ 3,700
102	72-INCH CLASS III RCP PIPE	LF	75	$ 695.36	$ 52,152
103	72-INCH RCP APRON	EA	2	$ 5,195.98	$ 10,392
104	CUT & RESTORE PAVED ROADWAY(MATCH EXISTING SECT	EA	1	$ 3,500.00	$ 3,500
				SUBTOTAL CONSTRUCTION COST	**$ 76,053**
				10% UNFORSEEN	$ 7,605
				TOTAL CONSTRUCTION COST	**$ 83,658**
				COUNTY ADMINISTRATION COSTS	$ 4,200
				REPORTS, PLANS AND SPECIFICATIONS	$ 9,300
				CONSTRUCTION STAKING & ADMINISTRATION	$ 11,300
				ESTIMATED BRANCH 2 CROSSING #22 REPAIR COST WITH ROAD - CO HWY 8	**$ 108,458**

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ROAD CROSSINGS

BRANCH 2 CROSSING #22 IMPROVEMENT COST - CO HWY 8

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	$ 3,700.00	$ 3,700
302	72-INCH CLASS III RCP PIPE	LF	75	$ 695.36	$ 52,152
303	72-INCH RCP APRON	EA	2	$ 5,195.98	$ 10,392
304	CUT & RESTORE PAVED ROADWAY(MATCH EXISTING SECT	EA	1	$ 3,500.00	$ 3,500
				SUBTOTAL CONSTRUCTION COST	**$ 76,053**
				10% UNFORSEEN	$ 7,605
				TOTAL CONSTRUCTION COST	**$ 83,658**
				COUNTY ADMINISTRATION COSTS	$ 4,200
				REPORTS, PLANS AND SPECIFICATIONS	$ 9,300
				CONSTRUCTION STAKING & ADMINISTRATION	$ 11,300
				ESTIMATED BRANCH 2 CROSSING #22 IMPROVEMENT COST - CO HWY 8	**$ 108,458**

BRANCH 2 CROSSING #11 REPAIR COST WITH ROAD - T-15

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 6,100.00	$ 6,100
102	72-INCH CLASS III RCP PIPE	LF	145	$ 695.36	$ 100,827
103	72-INCH RCP APRON	EA	2	$ 5,195.98	$ 10,392
104	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	$ 3,420.75	$ 3,421
				SUBTOTAL CONSTRUCTION COST	**$ 127,049**
				10% UNFORSEEN	$ 12,705
				TOTAL CONSTRUCTION COST	**$ 139,754**
				COUNTY ADMINISTRATION COSTS	$ 7,000
				REPORTS, PLANS AND SPECIFICATIONS	$ 15,400
				CONSTRUCTION STAKING & ADMINISTRATION	$ 18,900
				ESTIMATED BRANCH 2 CROSSING #11 REPAIR COST WITH ROAD - T-15	**$ 181,054**

BRANCH 2 CROSSING #11 IMPROVEMENT COST - T-15

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	$ 6,100.00	$ 6,100
302	72-INCH CLASS III RCP PIPE	LF	145	$ 695.36	$ 100,827
303	72-INCH RCP APRON	EA	2	$ 5,195.98	$ 10,392
304	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	$ 3,420.75	$ 3,421
				SUBTOTAL CONSTRUCTION COST	**$ 127,049**
				10% UNFORSEEN	$ 12,705
				TOTAL CONSTRUCTION COST	**$ 139,754**
				COUNTY ADMINISTRATION COSTS	$ 7,000
				REPORTS, PLANS AND SPECIFICATIONS	$ 15,400
				CONSTRUCTION STAKING & ADMINISTRATION	$ 18,900
				ESTIMATED BRANCH 2 CROSSING #11 IMPROVEMENT COST - T-15	**$ 181,054**

BROWN COUNTY
COUNTY DITCH No. 28

ISG

ROAD CROSSINGS

BRANCH 2-A CROSSING #25 REPAIR COST WITH ROAD - CO HWY 8 / T-5

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 4,500.00	$ 4,500
102	60-INCH CLASS III RCP PIPE	LF	145	$ 548.28	$ 79,501
103	60-INCH RCP APRON	EA	1	$ 4,097.01	$ 4,097
104	CUT & RESTORE PAVED ROADWAY(MATCH EXISTING SECT	EA	1	$ 3,500.00	$ 3,500
				SUBTOTAL CONSTRUCTION COST	**$ 93,284**
				10% UNFORSEEN	$ 9,328
				TOTAL CONSTRUCTION COST	**$ 102,612**
				COUNTY ADMINISTRATION COSTS	$ 5,200
				REPORTS, PLANS AND SPECIFICATIONS	$ 11,300
				CONSTRUCTION STAKING & ADMINISTRATION	$ 13,900
				ESTIMATED BRANCH 2-A CROSSING #25 REPAIR COST WITH ROAD - CO HWY 8 / T-5	**$ 133,012**

BRANCH 2-A CROSSING #25 IMPROVEMENT COST - CO HWY 8 / T-5

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	$ 5,000.00	$ 5,000
302	60-INCH CLASS III RCP PIPE	LF	145	$ 548.28	$ 79,501
303	60-INCH RCP APRON	EA	2	$ 4,097.01	$ 8,194
304	CUT & RESTORE PAVED ROADWAY(MATCH EXISTING SECT	EA	1	$ 3,500.00	$ 3,500
				SUBTOTAL CONSTRUCTION COST	**$ 102,504**
				10% UNFORSEEN	$ 10,250
				TOTAL CONSTRUCTION COST	**$ 112,754**
				COUNTY ADMINISTRATION COSTS	$ 5,700
				REPORTS, PLANS AND SPECIFICATIONS	$ 12,500
				CONSTRUCTION STAKING & ADMINISTRATION	$ 15,300
				ESTIMATED BRANCH 2-A CROSSING #25 IMPROVEMENT COST - CO HWY 8 / T-5	**$ 146,254**

BRANCH 2-A-1 REPAIR COST WITH ROAD - CO HWY 8

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	$ 1,500.00	$ 1,500
102	BORE 10-INCH TILE	LF	100	$ 200.50	$ 20,050
103	SAND OR CLSM FILL PIPE UNDER ROAD (10-INCH)	LF	100	$ 10.10	$ 1,010
104	FURNISH & INSTALL WATER QUALITY INLET	EA	2	$ 1,094.87	$ 2,190
				SUBTOTAL CONSTRUCTION COST	**$ 29,816**
				10% UNFORSEEN	$ 2,982
				TOTAL CONSTRUCTION COST	**$ 32,798**
				COUNTY ADMINISTRATION COSTS	$ 1,700
				REPORTS, PLANS AND SPECIFICATIONS	$ 3,700
				CONSTRUCTION STAKING & ADMINISTRATION	$ 4,500
				ESTIMATED BRANCH 2-A-1 REPAIR COST WITH ROAD - CO HWY 8	**$ 42,698**

BRANCH 2-A-1 IMPROVEMENT COST - CO HWY 8

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	$ 1,500.00	$ 1,500
302	BORE 10-INCH TILE	LF	100	$ 200.50	$ 20,050
303	SAND OR CLSM FILL PIPE UNDER ROAD (10-INCH)	LF	100	$ 10.10	$ 1,010
304	FURNISH & INSTALL WATER QUALITY INLET	EA	2	$ 1,094.87	$ 2,190
				SUBTOTAL CONSTRUCTION COST	**$ 29,816**

BROWN COUNTY
COUNTY DITCH No. 28

ISG

ROAD CROSSINGS

10% UNFORSEEN	$	2,982
TOTAL CONSTRUCTION COST	**$**	**32,798**
COUNTY ADMINISTRATION COSTS	$	1,700
REPORTS, PLANS AND SPECIFICATIONS	$	3,700
CONSTRUCTION STAKING & ADMINISTRATION	$	4,500
ESTIMATED BRANCH 2-A-1 IMPROVEMENT COST - CO HWY 8	**$**	**42,698**

BROWN COUNTY

COUNTY DITCH No. 28

ISG

ROAD CROSSING SUMMARY

Crossing	Road Authority	Road Authority Cost (Repair Cost With Road)	Improvement Cost	Project Cost for Road Crossings (Difference of Improvement Cost and Road Authority Cost)
Mainline				
T-212	MULLIGAN TOWNSHIP	$ 42,695	$ 71,224	$ 28,529
CO Hwy 8	BROWN COUNTY	$ 158,540	$ 158,540	$ -
T-206	MULLIGAN TOWNSHIP	$ 196,887	$ 196,887	$ -
CO Hwy 20	BROWN COUNTY	$ 101,810	$ 101,810	$ -
Branch 2				
CO Hwy 8	BROWN COUNTY	$ 108,458	$ 108,458	$ -
T-15	MULLIGAN TOWNSHIP	$ 181,054	$ 181,054	$ -
Branch 2-A				
CO Hwy 8 / T-5	BROWN COUNTY / MULLIGAN COUNTY	$ 133,012	$ 146,254	$ 13,242
Branch 2-A-1				
CO Hwy 8	BROWN COUNTY	$ 42,698	$ 42,698	$ -

TOTAL	**$ 922,457**	**$ 964,228**	**$ 41,771**

BROWN COUNTY ROAD AUTHORITY TOTAL	**$ 411,507**	**$ 411,507**	**$ -**
MULLIGAN TOWNSHIP ROAD AUTHORITY TOTAL	**$ 420,636**	**$ 449,165**	**$ 28,529**
BROWN COUNTY / MULLIGAN COUNTY ROAD AUTHORITY TOTAL	**$ 133,012**	**$ 146,254**	**$ 13,242**

Appendix C: Drone Report

County Ditch No. 28 Watershed – Brown County

DRONE REPORT

Project Name: CD 28 Multi-Purpose Drainage Management Report –Brown County
ISG Project Number: 25-23281
Date of Drone Flight: July 17th, 2025

Picture 1: CD 28 terminus at Little Cottonwood River in Section 17 of Mulligan Township

Picture 2: CD 28 round curvets (84” RCP) at CR 20 in Section 20 towards Little Cottonwood River

Picture 3: Vegetation cover along Branch 2A to outwards Outlet T-5 open ditch – Section 28 of Mulligan Township

Picture 4: Gulley erosion on Branch 2A outlet near T-5 at Section 28 of Mulligan Township

County Ditch No. 28 Watershed – Brown County

DRONE REPORT

Project Name: CD 28 Multi-Purpose Drainage Management Report – Brown County
ISG Project Number: 25-23281
Date of Drone Flight: July 17th, 2025

Picture 5: Sloughing on Branch 2 at 120th street towards Co Hwy 8 section 28 of Mulligan Township

Picture 6: Erosion and sloughing on Main Open Dich from CR 20 T-208 section 20 of Mulligan Township

Picture 7: Bank erosion on culvert on mainline open ditch from CR 20 to T-208 at section 20 of Mulligan Township

Picture 8: Bank erosion on culvert on mainline open ditch from T-208 to Co Hwy 8 at section 21 of Mulligan Township

County Ditch No. 28 Watershed – Brown County

DRONE REPORT

Project Name: CD 28 Multi-Purpose Drainage Management Report – Brown County
ISG Project Number: 25-23281
Date of Drone Flight: July 17th, 2025

Picture 9: Eutrophicated standing waters along the main open ditch at Co Hwy 8 to T-212 at section 27 of Mulligan Township

Picture 10: Eutrophicated standing waters with dense vegetation at the ditch bottom along the mainline T-212 to the End at section 26 of Mulligan Township

Picture 11: Vegetation overgrowth in the bottom of the channel on Main open ditch CD 28 downstream of T-212 at section 26 of Mulligan Township

Picture 12: Sloughing on Branch 2 at 120th street towards Co Hwy 8 at section 28 of Mulligan Township

County Ditch No. 28 Watershed – Brown County

DRONE REPORT

Project Name: CD 28 Multi-Purpose Drainage Management Report – Brown County
ISG Project Number: 25-23281
Date of Drone Flight: July 17th, 2025

Picture 13: Multiple culverts and areas of standing water within the ditch along Branch 2 at 120th street towards Co Hwy 8 at section 28 of Mulligan Township

Picture 14 Eroded ditch bank with surface runoff drainage along Branch 2 at 120th street towards Co Hwy 8 at section 28 of Mulligan Township

Picture 15: Tile outlet to CD 28 at Branch 2 at 120th street towards Co Hwy 8 at section 27 of Mulligan Township

Picture 16: Curvet on the outlet to CD 28 at Branch 2A at section 27 of Mulligan Township