

## **Mitchell East Central Drainage System Study**

### **Executive Summary**

The East Central Drainage System has a drainage basin of approximately one square mile. The drainage system consists of concrete curb and gutter, storm sewer and ditches. The study utilized a model to analyze the existing drainage system's capacity to collect and carry a five-year storm event with a total precipitation of 3.06 inches and a peak rain intensity of 4.70 inches per hour. The 100-year storm event was analyzed with a total precipitation of 5.65 inches and a peak intensity of 8.67 inches per hour.

The storm water piping south of the interstate was found to be adequately sized for the five-year storm event. However, the majority of the remaining piping within the system was found to be is surcharged or under capacity.

The storm water model indicated storm water ponding greater than one-half foot in three locations. These locations are the intersections of Hackberry and Kimball (Klock Werks), Juniper and Langdon and Main and Elm. The worst of those intersections is the Hackberry and Kimball intersection where the model indicated 2.38 feet of ponding during the five-year storm event. The Hackberry and Kimball intersection is the lowest area within the drainage basin. The lack of capacity in the storm water system to carry the storm water away from this intersection is compounded by the area being low which actually resulted in the model indicating storm water flowing out of the system and increasing the storm water ponding in the intersection of Hackberry and Kimball (Klock Werks).

The vast majority of the streets within the East Central Drainage System were evaluated to determine the depth of flow within the street for the five- and 100-year storm events. The modeling indicated that the flooding which occurs is confined within the right-of-way during both the five-year and 100-year events. As such, no other areas were identified as being a concern at this time.

The storm water piping in the east portion of the drainage system has a high point at the intersection of Juniper and Langdon which results in storm water flowing in two directions. The storm water modeling indicates that the East Mainline provides relief to Mainline 3 during surcharged conditions. However, it should be noted that it is not recommended to convey additional storm water to the East Mainline due to the possibility of adverse effects on Burr Street.

The East Central Drainage System was also analyzed with the development as described in the Tax Incremental District Number 22. The TIF 22 document describes proposed improvements which include new streets, storm sewer and underground utilities. If no storm sewer improvements were made within the TIF District, the flooded depth at the Hackberry and Kimball intersection would increase from 2.38 feet to 2.67 feet. Phase 1 of the TIF proposes installing inlets at the intersection of Lawler and Hackberry and connecting these to Mainline 4 on Main Street. The storm water model indicates that installing these improvements will adversely affect the Hackberry and Kimball intersection by providing the surcharged storm water

pipe a relief point and allowing flow out of the inlets at the Lawler and Hackberry intersection and flow to the Hackberry and Kimball intersection, thus increasing the flooded depth at the Hackberry and Kimball intersection. As a result, completing storm sewer improvements as detailed in TIF 22 Phase 1 are not recommended. Phases 3 and 4 which connect to Phase 1 are also not recommended.

Multiple alternatives were developed to alleviate the issues identified above. Various detention pond layouts were considered and found to be ineffective options. The alternative found to provide the greatest benefit was installing new larger piping from the Kimball and Hackberry intersection to Dry Run Creek. This alternative lowers the storm water ponding at the Kimball and Hackberry intersection from 2.38 feet to 0.6 feet for the five-year storm event.

The costs associated with the work to complete the improvements within the TIF District are \$2,087,530 and \$2,998,470 outside of the TIF District to complete the improvements to Dry Run Creek for a total cost of \$5,086,000. In addition to storm sewer improvements the costs within the TIF boundaries include new sanitary sewer and water main where needed and new asphalt streets with curb and gutter. Localized storm water detention of all developing parcels within the drainage basin would still be required according to City Ordinance. The costs outside of the TIF boundaries include increasing the size of an existing storm sewer, replacing outdated clay sanitary sewer mains, replacing outdated iron pipe water main and reconstructing the existing streets along the storm sewer route. The water main on Rowley Street has been experiencing poor quality issues and has been scheduled to be replaced in the near future.

<b>Total Costs for Improvements Located Within the TIF Area</b>					
	Total	Water	Sewer	Storm Sewer	Street
Total Estimated Cost	\$2,087,530	\$115,000	\$209,800	\$682,800	\$1,079,930
<b>Total Costs for Improvements Located Outside the TIF Area</b>					
	Total	Water	Sewer	Storm Sewer	Street
Total Estimated Cost	\$2,998,470	\$175,000	\$298,700	\$1,623,400	\$901,370
<b>Total Estimated Project Cost</b>	<b>\$5,086,000</b>	<b>\$290,000</b>	<b>\$508,500</b>	<b>\$2,306,200</b>	<b>\$1,981,300</b>