Executive Summary

HDR has completed a study of the Elk Vale Road Pump Station to identify improvement options needed for the City to maintain the capacity of the wastewater collection facilities in this drainage basin and accommodate both the current and future development plans.

The study evaluated three major areas of analyses: 1) current and future wastewater flows, 2) lift station and force main system, and 3) capacity of downstream gravity sewer system.

The Elk Vale basin is defined by using a combination of ridgelines that break gravity basin on the west and south with the Pennington County line as a north border and the city limits on the as an east border. Peak flows in the basin were developed using the City design standards and incorporating information from development plans and future land use maps as approved by City Engineering and Growth Management staff. The projected near term growth that has been identified in Phases 1 and 2 results in a peak sanitary sewer flow that would exceed the current Elk Vale's pumping capacity by over four times. Calculations for peak sanitary flows for Phases 3 thru 6 (Full Development or Build-out) show a significant increase in the basin and identify up to 18,600 gpm for Full Development.

The lift station and force main system was evaluated for five separate improvement options to meet the future flows projected in Section 1. The options ranged from minimal pump improvements to a new treatment facility. The existing station pumping capacity is 450 gpm. With minimal upgrades to the pumps the capacity could be increased to 700 gpm, but that does not meet the peak flows projected for the near term development. In order to meet the projected flows beyond near term for Phase 2 thru 6, the existing pumps/motors, electrical switchgear, force main piping, and wet well would need to be replaced or upgraded and the existing building would need an addition. The construction cost estimate for the recommended option for upgrades to meet the projected flows up to Phase 3 is $3,110,000. These pump station and forcemain improvements would also result in a facility that would be sized adequately to meet additional flows up to the full development condition.

The Elk Vale forcemain enters the gravity sewer system on Elk Vale road south of Interstate 90. The analysis of the downstream 12" gravity sewer line indicated that upsizing will be required only when lift station improvements are made and increased flows are experienced from the pump station and other lateral sewers in the area. The projected flow information from this study was provided to the City for use in another current project that is upgrading that gravity sewer system to provide the needed capacity.

Jody W. Page, PE, Project Manager