ITEM REPORT
UTILITIES COMMISSION

Agenda Date: 12/4/2024
Agenda Section: Business Item

Department Origination: Public Works

Agenda Item: Accept Water System Planning and Hydraulic Model Report

Approval Required: Simple Majority Vote

BACKGROUND

SEH was hired to update and calibrate the City's water system model and develop updated water demand projections for the next 20-year planning period. In addition, other contracted tasks included water main abandonment and replacement analysis for the proposed TH 210/371 interchange project and update of the City's overall water distribution system planning map. The purpose of this effort was to develop planning tools so that well informed decisions can be made with regard to water system planning and improvements.

Water Use Projections: Recent challenges with regard to water demand exceeding available supply have emphasized the need for reliable water use projections. Work was completed to analyze historical water use trends and then update water demand projections with current demographic and growth trends. This effort utilize multiple approaches to help define future system needs. These updated water use projections are the foundation for nearly all water system planning decisions, and provides for an understand as two when existing system capacities may be exceeded. In turn, the City can be proactive to address potential water system capacity shortages before they become an issue.

Water System Model Update & Calibration: The first step was to update the model to reflect current system conditions, and is producing results that reflect the actual water system operations, so that the model can be used to identify potential issues. The hydraulic model was last revised in 2009-2010. The update integrates current data to reflect the city's expanded water system and verify its accuracy through field testing. The updated model provides a reliable tool for future system planning and operational analysis, ensuring the system can accommodate current and future water demands.

TH 371/210 Interchange Water Main Impacts: One of the first uses of the updated model was to evaluate the necessary water main rerouting changes for pipe that will be impacted by the pending Hwy 371/210 interchange project. The model was used to evaluate various alternatives for relocating the water main. The conclusion of the evaluation determined that a large portion of the conflicting main could be removed from service with minimal hydraulic impacts, provided the prescribed water main looping occurs along the proposed alignment when Fairview Road N. is connected to Excelsior Rd. This evaluation provided valuable insight in that much of the impacted main does not need to be re-routed and re-installed, saving utility costs. In summary, the evaluation proved that 2,700 LF of decommissioned water main could be replaced in function by the installation of the 600 LF of water main proposed with the Fairview Road N. extension. This is a net savings of 2,100 feet of pipe with an estimated cost of $450,000 that does not need to be expended.

Ultimate Water System Planning Map: The updated water demand projections coupled with the updated water system model allowed for the "future" water system to be evaluated so that future system components can be "right sized". The City's existing ultimate water system map was updated to reflect current water system changes and also the future system was simulated with "ultimate demand" projections to validate the proposed

infrastructure identified on the planning map. This updated map services as guiding document for making future water main sizing decision.

Other Water System Evaluations: In addition to evaluation the TH 371/210 interchange water main, an overall water system evaluation was conducted with numerous water model simulations. These simulations allow for system pressure and fire flow to be evaluated across the entire system. One area of interest is the West side of the City where industrial growth is a potential. Currently the available fire flow in this area is limited. The model was used to evaluate potential improvements including a new elevated water storage tank and/or a trunk water main (previously defined in the ultimate water system planning map. The analysis concluded that the proposed looped trunk main would have a positive impact on available fire flow, meeting flow goals for the area. While this area is still the preferred location for the next elevated storage tank, the installation of the trunk main loop will bolster fire protection capabilities in the near term.

Future Water Model Use: The value of the updated model will continue to be realized when key water system decisions need to be made. This is a dynamic tool that can continue to be consulted for a wide array of purposes such as: Right sizing of water main, fire flow evaluations, future development water needs planning, operations optimization, water quality evaluations, risk planning and pressure analysis.

A copy of the Water system model update and planning report is included for reference.

FINANCIAL IMPLICATIONS

There are no financial implications associated with accepting the report. The report identifies improvements which will have financial implications in the future.

STAFF RECOMMENDATIONS

Staff recommends accepting the Water System Planning and Hydraulic Model Report.

COUNCIL ACTION REQUESTED

MOTION to accept Water System Planning and Hydraulic Model Report.