

PRELIMINARY ENGINEERING REPORT
NEW WATER SOURCE ALTERNATIVES

RURAL WAER PROJECTS
LITTLE BLUE NATURAL RESOURCES DISTRICT
DAVENPORT, NEBRASKA

PURPOSE

The purpose of this report is to attempt to identify and quantify the facilities required to substitute a new water supply for the entire rural water project from new wells developed by the District or from the Village of Alexandria.

The level of detail for this study is limited due to the lack of specific sites, routes, and other items that could significantly affect the overall project costs as they are identified. The intent is to identify the facilities and steps involved between the two potential alternatives for further considerations and discussions and to obtain a potential overall project cost for financial considerations.

CURRENT SITUATION

The LBNRD Rural Water Project (District) has purchased its water supply solely from the City of Fairbury since its inception in 1978. In 1998, the District added approximately 150 additional customers which required additional water resources and thus an amendment to the water purchase contract. Over the past 4 years, the City of Fairbury has increased the water rates to the District by nearly 235% with another 25% raise slated for next year. This will result in a cost per thousand gallons of \$4.177 with a maximum purchase flow rate of 250 gallons per minute.

Numerous negotiations have been attempted to convince the City of Fairbury that the District has the impression these increases are being unfairly and non-proportionally being assessed to the District, all to no avail. Therefore, the District is exploring alternatives for replacing this current water source with one that might be more advantageous to the patrons of the District.

ALTERNATIVES CONSIDERED

Alternative No.1 – Well field investigations, new wells, elevated water storage tank, booster pumping station, electrical, controls, piping, and related items.

Alternative No.2 – Purchase water from the Village of Alexandria, elevated water storage tank, booster pumping station, electrical, controls, piping, and related items.

The individual items and their estimated costs are listed on Exhibit A along with the allocation of items and costs for each of the alternatives. Exhibit B shows the general locations of these improvements. The following assumptions are listed to explain the rationale to explain more detail that led to these assumptions:

1. It was assumed that a suitable well field could be located and purchased within the area around Alexandria that would support at least two wells with a capacity of 350 gpm each.
2. The average annual water use for the rural system is approximately 150,000 gallons per day. Peak day water use would likely fall between 1.5 and 2.0 times the average. Since all of the water from either alternative needs to be re-pumped to be utilized, we recommend that elevated water storage be provided at least equal to average day use. The capacity of the Alexandria tank is 50,000 gallons which is adequate for their average use of 15 – 30,000 gallons per day but doesn't leave any significant storage for the rural system.
3. It was assumed that a pumping rate of 350 gallons per minute would be sufficient for the present needs of the rural water system as well as provide some room for growth. The ground elevation at Alexandria is approximately 1415 while the ground elevation at Gilead is 1540 which explains the need for a 10" water main and the booster pumping station.
4. It was assumed that the internal improvements to the existing distribution system would include a new 10" water main between the Gilead elevated water storage tank and the 6" main and 8" main connect west of Fairbury. In addition, the valves at the existing booster pumping station west of Fairbury need to be turned to allow reverse pumping to the rural system located north from Fairbury. A new 6" water main will also need to be constructed to connect these two systems.
5. This report is based upon the assumptions that appear reasonable at this level of detail. It is not intended that any of these recommended facilities be constructed without further engineering analysis.

RECOMMENDATIONS

1. We recommend the District initiate discussions within the members of the rural water project to determine the ranking of the alternatives to actively pursue:
 - a. Develop two new wells in the Alexandria area
 - b. Continue discussions with the Village of Alexandria
 - c. Continue to explore the well field potential south of Fairbury
 - d. Continue to discuss the potential of negotiating with the City of Fairbury

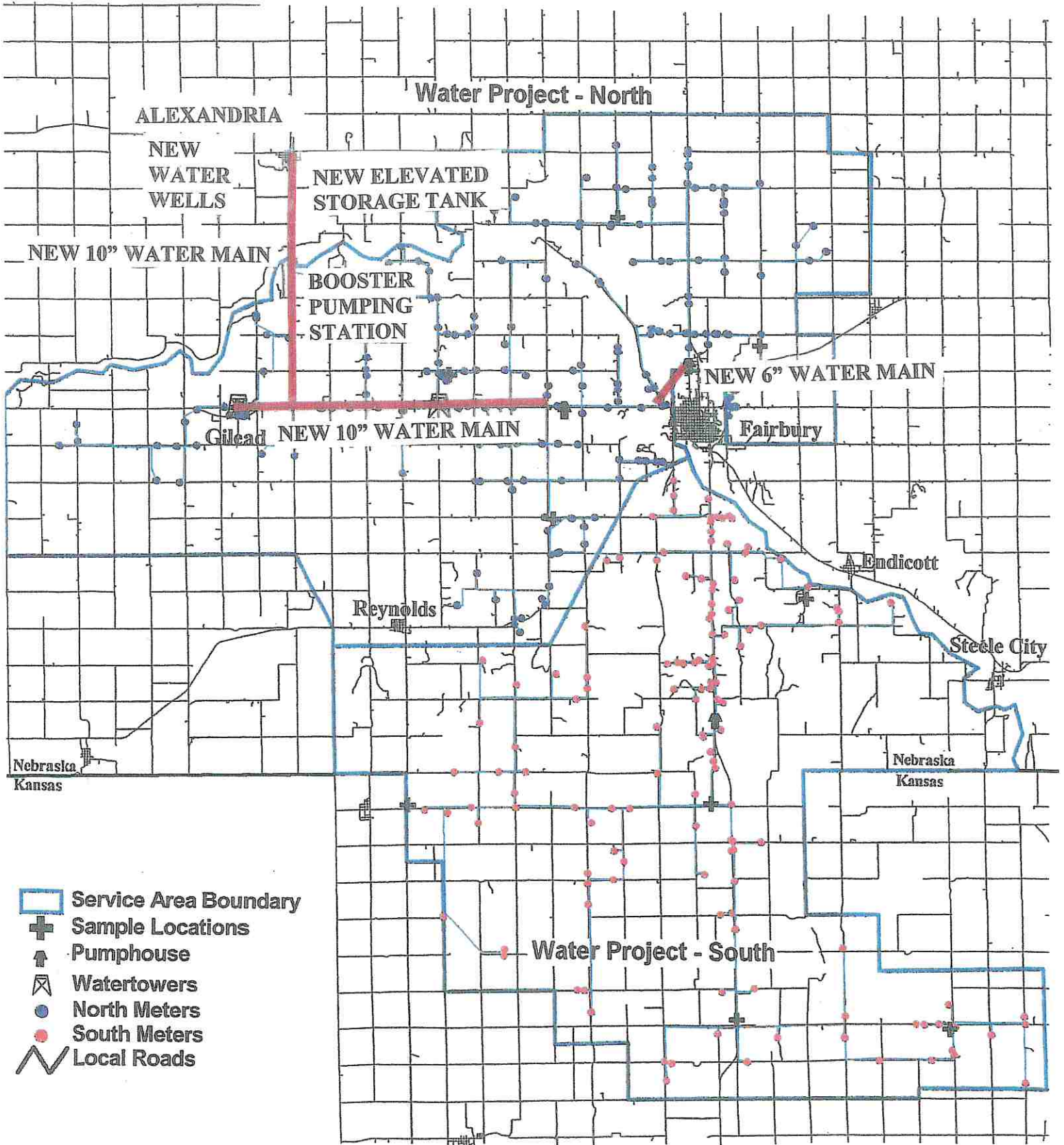
It is important to set a priority for these options in order for any progress to be made and should there be a lack of consensus on the goal, there will either be no progress or potentially a lot of wasted efforts, costs, and precious time.

2. Initiate discussions with USDA Rural Development to explore financing potential

Submitted this 8th Day of July, 2019
McIntyre Consulting

Ted J McIntyre, PE

Little Blue Natural Resources District Rural Water Districts



NOTE: LOCATIONS OF FACILITIES ARE NOT CONFIRMED AND ARE SHOWN ONLY FOR ILLUSTRATION.

EXHIBIT B

PRELIMINARY ESTIMATE OF COSTS
 ALTERNATIVE NO.1 - New Water Wells
 ALTERNATIVE NO.2 - Purchase Water

Cost Assessments for:
 ALTERNATIVE ALTERNATIVE
NO.1 NO.2

WELL FIELD INVESTIGATIONS

| | | | |
|--------------------------------------|-----------------|----------|-----|
| Paper survey of potential sites | \$5,000 | | |
| Survey potential availabilities | \$2,000 | | |
| purchase agreement | \$5,000 | | |
| Test drilling program | <u>\$30,000</u> | | |
| Subtotal Initial Site Investigations | \$42,000 | \$42,000 | \$0 |

WELL FIELD CONSTRUCTION

| | | | |
|-----------------------------|------------------|-----------|------------|
| Purchase Land | \$50,000 | | |
| Well Construction | \$250,000 | | Likely to |
| Electrical | \$15,000 | | be a part |
| Controls | \$25,000 | | of the |
| Well Field Piping | \$75,000 | | connection |
| Testing | \$10,000 | | fee in the |
| Engineering / Inspection | \$100,000 | | contract |
| Generator - Standby Power | <u>\$50,000</u> | | |
| Subtotal Construction Costs | \$575,000 | \$575,000 | ??? |

ELEVATED WATER STORAGE

| | | | |
|-----------------------------------|------------------|-----------|-----------|
| 200,000 Gallon - 130' High | \$750,000 | | |
| Land, testing, sitework, Engr/Ins | <u>\$100,000</u> | | |
| Subtotal Construction Costs | \$850,000 | \$850,000 | \$850,000 |

WATER TRANSMISSION MAIN

| | | | |
|----------------------------------|--------------------|-------------|-------------|
| 37,100 LF 10" Water Main | \$450,000 | | |
| Valves, road crossings, etc | \$45,000 | | |
| River Crossings, RR Crossing | \$120,000 | | |
| 44,000 LF 10" Water Main | \$525,000 | | |
| 6,000 LF 6" Water Main | \$50,000 | | |
| Engineering / Inspection | \$100,000 | | |
| Contingencies | <u>\$130,000</u> | | |
| Subtotal Water Main Construction | \$1,420,000 | \$1,420,000 | \$1,420,000 |

| | | | |
|-------------------------------|--------------------|-------------|-------------|
| ESTIMATED PROJECT COST | \$2,887,000 | \$2,887,000 | \$2,270,000 |
|-------------------------------|--------------------|-------------|-------------|

EXHIBIT A