Executive Summary

RIVERTON WATER SUPPLY PROJECT

LEVEL II
Phase II

Wyoming Water Development Commission

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JUNE 2000
RIVERTON WATER SUPPLY PROJECT

LEVEL II STUDY

PHASE II
EXECUTIVE SUMMARY

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JUNE 2000
PROJECT NO. 99-093-1
EXECUTIVE SUMMARY

I. INTRODUCTION

1.1 General

The City of Riverton is located in west central Wyoming, Fremont County. The 1990 census recorded a population of 9,202, and it is presently estimated at 10,044. Riverton is served by U.S. Highway 26 and State Highway 789, lies on the north bank of the Wind River adjacent to the confluence with the Little Wind River, and is surrounded by the Wind River Indian Reservation.

The climate is semi-arid with 7.74 inches of average annual precipitation with nearly half occurring as spring showers in April, May, and June. Typically, Riverton receives 30 inches of snowfall per year. Average high temperatures of 89°F occur in July while average lows of -1°F occur in January.

Fremont County’s economy consists primarily of agriculture, government, and service industries. Gas and oil production has increased in recent years and also plays an important role in the area’s economy. Mineral extraction/refinement and manufacturing are a smaller sector. The growth in the Riverton area has been slow to moderate and is forecast to continue at about the same rate. According to the Level I Study, the largest growth in jobs will occur in the services, government, and retail trade industries, respectively.

1.2 Water Supply

The City of Riverton produces potable water from both groundwater and surface water sources. Groundwater is supplied from twelve wells that are developed in the Wind River Formation. Typically, the wells contribute 1,060 ac-ft of water per year to satisfy consumer demands. The wells are relied upon for the total City supply from about mid-October to May. The City also diverts surface water from the Big Wind River via the LeClair Canal to their 4.0 MGD water treatment plant. The status of Riverton’s water rights were compiled in the Level I Study and are briefly summarized herein:
Surface Water Rights
Municipal  Seasonal (May 15-Oct 15) Adjudicated  1.11 cfs
Agricultural Seasonal (May 15-Oct 15) 2.10 cfs
             Converted to Municipal Use .74 cfs±

Municipal  Unadjudicated 10.00 cfs
Subtotal  11.85 cfs

Agricultural privately held within City limits 15.84 cfs
             Converted to Municipal Use 5.54 cfs
Subtotal 5.54 cfs

Groundwater Rights
Municipal  Adjudicated 8.46 cfs
Municipal  Unadjudicated .89 cfs
Subtotal 9.35 cfs

Total Water Rights 26.74 cfs
(17.28 MGD)

The surface water used at the water treatment plant is covered by permits with 1906 Priority (3.21 cfs) and a 1976 Priority of 10.00 cfs. If the 1906 rights were converted from irrigation to municipal use, as illustrated above, then the City would have 1.85 cfs of very senior rights available to the treatment plant which would further insure a more reliable supply. Additionally, the City maintains a raw water distribution system for yard and garden irrigation.

1.3 Purpose

The purpose of the Level II Study is three-fold:

- Determine the feasibility of improving the water treatment plant.

- Site and design a new well to serve the City’s upper pressure zone.

- Evaluate the viability of and recommend improvements for the raw water irrigation supply system.
1.4 Acknowledgments

Through the course of this Level II Study, information and assistance has been received from a number of individuals. In particular, we would like to recognize the time and effort provided us from Bill Urbigkit, the Director of Public Works and his staff; Vern Heisler, City Engineer, and Ron Saban, Head Operator at the water treatment plant.

1.5 Authorization

Nelson Engineering was retained by WWDC to complete the scope of work associated with this Study through Consultant Contract No. 055C0291428. The contract was signed June 8, 1999, and work began shortly thereafter.

II. POTABLE WATER SUPPLY SYSTEM

2.1 Potable Water Use

Water use in Riverton has been estimated to the year 2025 based on projected population. Existing and projected use are illustrated in Table 1.

Table 1 - Existing and Projected Water Use - Year 2025

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Day Demand</td>
<td>205 gpcd</td>
<td>205 gpcd</td>
</tr>
<tr>
<td></td>
<td>1.9 mgd</td>
<td>2.9 mgd</td>
</tr>
<tr>
<td>Average Summer Day Demand (May 16 - Sep 15)</td>
<td>376 gpcd</td>
<td>376 gpcd</td>
</tr>
<tr>
<td></td>
<td>3.6 mgd</td>
<td>5.3 mgd</td>
</tr>
<tr>
<td>Average Winter Day Demand (Sep 16 - May 15)</td>
<td>117 gpcd</td>
<td>117 gpcd</td>
</tr>
<tr>
<td></td>
<td>1.1 mgd</td>
<td>1.7 mgd</td>
</tr>
<tr>
<td>Maximum Day Demand</td>
<td>453 gpcd</td>
<td>453 gpcd</td>
</tr>
<tr>
<td></td>
<td>4.3 mgd</td>
<td>6.4 mgd</td>
</tr>
</tbody>
</table>
2.2 Future Operation

The Level II, Phase I report investigated three operating scenarios. After further evaluation in this study, the following was selected for future system operation. When the LeClair Canal is not in service, all demands will be met by the wells. When the LeClair Canal is in service, the wells will provide a base supply of a 1.4 MGD and all demands beyond 1.4 MGD will be supplied by the water treatment plant, up to a maximum plant production of 5.0 MGD. This scheme will require 25 percent increase in the rated plant capacity and is similar to that recommendation in the Level I Report. This operating scenario will require upgrades to the treatment process units ahead of the filters in order to meet the increased demands, as well as future regulations.

2.3 Proposed Municipal Well

Three well sites reviewed in the Level I Study were further considered and more closely scrutinized in this Level II Study. Comparison of various selection criteria for the three sites is illustrated in Table 2.

It is recommended the City pursue implementing a well at the Raintree Road Site. Opinion of Probable Project Cost is $424,586.

2.4 Proposed Water Treatment Plant Upgrades and Expansion

The study has concluded that the existing water treatment plant not only needs to be upgraded, but also needs to be expanded to 5.0 MGD capacity. A variety of pretreatment processes were evaluated during Phase I. Phase II work compared the feasibility of "sand-ballasted clarification" with "microfiltration". The former proved to be less costly than the latter in construction expense, consequently, it is the recommended system. Construction was separated into two phases. Project Costs were estimated as follow:

Phase I (Upgrades and Rehabilitation) $1,146,000
Phase II (Expansion) $2,870,000

Opinion of Probable Total Project Cost $4,016,000
Table 2 - Comparison of Three Potential Well Sites

<table>
<thead>
<tr>
<th>Comparison Criteria</th>
<th>Cooper Road Site (Site 1)</th>
<th>Section 20 Site (Site 2)</th>
<th>Raintree Road Site (Site 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of Target</td>
<td>1,150 feet</td>
<td>1,380 feet</td>
<td>1,100 feet</td>
</tr>
<tr>
<td>Interference</td>
<td>75.25 feet drawdown</td>
<td>69.65 feet drawdown</td>
<td>66.17 feet drawdown</td>
</tr>
<tr>
<td>Proximity to Infrastructure</td>
<td>1,650 feet</td>
<td>6,650 feet new housing</td>
<td>1,000 feet potential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>development</td>
<td>connection to subdivisions/</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>system flexibility</td>
</tr>
<tr>
<td>Land Ownership</td>
<td>Private</td>
<td>City of Riverton</td>
<td>City of Riverton</td>
</tr>
<tr>
<td>Electrical Service Provider</td>
<td>Pacific Power</td>
<td>Pacific Power</td>
<td>High Plains Power</td>
</tr>
<tr>
<td>Wellhead Protection</td>
<td>Agricultural and Residential Land Use</td>
<td>Old dump, Fremont County firefighters, and Weed &amp; Pest located nearby</td>
<td>Residential Land Use</td>
</tr>
</tbody>
</table>

III. RAW WATER SUPPLY SYSTEM

3.1 Summary of Alternative Analysis

Three alternatives were evaluated and presented during the Phase I portion of this study, relative to the future of Raw Water Supply System. They were:

1. Maintain the status quo by operating the existing system, but not expanding or making any capital improvements.

2. Upgrade and expand the system.

3. Abandon the system.

In order for the system to operate as an "Enterprise Facility" under Alternative 1, substantial user fee increases would be necessary. By comparison, the operating budget for the 1999 season was approximately twice the revenue the system generated.

Upgrading the existing system under Alternative 2, to provide a higher level of service while mitigating operation and maintenance cost, requires significant capital investment on the City's part. Based on the field investigation, a Draft Rehabilitation Plan was developed in Phase I for each of the five individual systems. The detailed plan is contained in the final report.
Estimated project costs for upgrading the system as illustrated in the rehabilitation plan is $1,406,900.

Costs associated with abandoning the system would be minimal and, for the most part would be absorbed into future street improvement projects.

IV. FUNDING AND ECONOMICS

Funding scenarios for the well, water treatment plant improvements, and raw water distribution system are illustrated in Table 3; estimated repayment is shown.

Table 4 presents the increase in annual expense to implement the potable water system improvements, based on life cycle costing of the expanded facility. The City adopted a $6.00/EDU base rate increase in 1999 and has been generating a sinking fund to construct improvements. Using a phased construction approach and considering their reserves, the City believes the improvements can be made with less construction loan than depicted, resulting in no user fee increase.

Table 3 - Estimated Annual Debt Retirement

<table>
<thead>
<tr>
<th>Project</th>
<th>GRANT (50%)</th>
<th>LOAN 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WWDC</td>
<td>SLIB</td>
</tr>
<tr>
<td>1. Municipal Well</td>
<td>$212,293</td>
<td></td>
</tr>
<tr>
<td>Annual Repayment</td>
<td></td>
<td>$15,621</td>
</tr>
<tr>
<td>2. Water Treatment Plant:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase I</td>
<td>$573,000</td>
<td></td>
</tr>
<tr>
<td>Phase II</td>
<td>$1,435,000</td>
<td></td>
</tr>
<tr>
<td>Annual Repayment</td>
<td></td>
<td>$147,752</td>
</tr>
<tr>
<td>Project Subtotal</td>
<td>$2,220,293</td>
<td></td>
</tr>
<tr>
<td>Annual Repayment</td>
<td></td>
<td>$163,373</td>
</tr>
<tr>
<td>3. Raw Water Distribution</td>
<td>$703,450</td>
<td></td>
</tr>
<tr>
<td>System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Repayment</td>
<td></td>
<td>$58,119</td>
</tr>
</tbody>
</table>

Total Annual Repayment w/out Raw Water System = $163,373

Total Annual Repayment w/ Raw Water System = $221,492
Table 4 - Estimated Annual Cost Increase - Potable Water Supply System

<table>
<thead>
<tr>
<th>Category</th>
<th>Depreciation</th>
<th>Maintenance, Repair and Supplies</th>
<th>Labor</th>
<th>Estimated Electrical Cost</th>
<th>Testing &amp; Training</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Construction Cost</td>
<td>Economic Life</td>
<td>Salvage</td>
<td>Annual Cost</td>
<td></td>
</tr>
<tr>
<td>Municipal Well</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Mechanical</td>
<td>$21,400</td>
<td>20 years</td>
<td>$4,280</td>
<td>$865</td>
<td>* $5466 *</td>
</tr>
<tr>
<td>2. Electrical</td>
<td>$33,450</td>
<td>20 years</td>
<td>$6,690</td>
<td>$1,338</td>
<td></td>
</tr>
<tr>
<td>3. Piping</td>
<td>$29,300</td>
<td>50 years</td>
<td>$0</td>
<td>$586</td>
<td></td>
</tr>
<tr>
<td>4. Building</td>
<td>$38,000</td>
<td>30 years</td>
<td>$7,600</td>
<td>$1,013</td>
<td></td>
</tr>
<tr>
<td>5. Well</td>
<td>$160,335</td>
<td>30 years</td>
<td>$0</td>
<td>$5,344</td>
<td></td>
</tr>
<tr>
<td>6. Site Work</td>
<td>$35,200</td>
<td>50 years</td>
<td>$3,520</td>
<td>$634</td>
<td></td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td></td>
<td>$9,780</td>
<td>$3,925</td>
<td>$5,466</td>
</tr>
<tr>
<td>WTP Upgrades (5)</td>
<td>$2,966,156</td>
<td>20 years</td>
<td>$1,483,078</td>
<td>$74,154</td>
<td>**$61,000 Total Cost</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td></td>
<td>$93,714</td>
<td>$0</td>
<td>$0</td>
</tr>
</tbody>
</table>

*Pro rated from 1999-2000 Budgeted Amount

** From Table 6.2.3. In this report

Well OM&R = $25,602
Debt Retirement = $15,620
WTP OM&R = $135,154
Debt Retirement = $147,753
Estimated Cost Increase
Annual OM&R = $324,129

V. PUBLIC PARTICIPATION

The final report was presented to the City of Riverton at a council meeting on June 22, 2000. Proposed improvements to the Water Treatment Plant and location of Raintree Well were well received.

An estimated 150-200 people attended and universally opposed terminating use of the Raw Water System. Many voiced support for expanding the system’s use.

At the meeting, the City agreed to and began scheduling neighborhood meetings to discuss the fate of each system with the users.

Information presented in the report can be used by the City in developing a solution for operation of the Raw Water System.

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VI. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

A number of conclusions can be made as a result of work completed during this Level II Study. The more significant conclusions are as follows:

6.1.1 Potable Water System

1. Finished water quality from the water treatment plant meets existing and future requirements for inorganic and organic contaminants.

2. Ballasted Flocculation is the best alternative technology for pretreatment implementation.

3. Upgrades and retrofit to subsystems at the WTP are needed.

4. In order to spread improvement costs over a period of several budgeting cycles, the City is desirous of phasing the improvements and expansion to the potable water system.

5. Of three well sites evaluated, the Raintree Road Site is the preferred site.

6. A well of approximately 250 gpm yield can be expected at the Raintree Road site, with minimum drawdown of the three sites evaluated.

7. As shown in Phase I, annual costs for operating the WTP year-round exceed costs for other options.

6.1.2 Raw Water Distribution System

1. The distribution system is under-utilized by the approximately 800 adjoining lot owners.

2. The system is presently used by about 400 lot owners, but only 200 are paying for use.

3. Present operating costs are over twice the amount of revenue generated through user fees. The system is presently subsidized about $25,000 per year.

4. Properly maintaining the existing system requires increasing user fees from $101/year to $225/year.
5. Operation of the system is administratively difficult because:
   • Lack of access and easement
   • Contrived nature of systems components
   • Inadequate revenue for proper operations
   • Resulting problems from running open ditches through urban areas such as trash, siltation, flooding, etc.

6. Lot owners would utilize the system more if the situation and sediment loading problems could be improved.

7. Existence of the system has caused settlement of several City streets.

8. Expanding the system does not appear to be economically justifiable.

9. There is widespread support for continued use of the system among residents.

6.2 Recommendations

Recommendations as a result of this Level II Study are as follows:

6.2.1 Potable Water System

1. Accept the findings of this study and pursue water supply improvements as delineated herein.

2. Request Level III Funding from WWDC to implement the municipal well and connecting water transmission pipeline at the Raintree Road Site.

3. Begin negotiations with High Plains Power for more favorable electric rates for the Raintree Road Well.

4. Increase the rated capacity of the WTP to 5 MGD by incorporating ballasted sand flocculation for pretreatment and upgrading the filters as suggested in this report.

5. Review proposed phasing of the WTP improvements and submit application to SLIB and DWSRF for funding of Phase I improvements.
6. When the WTP is capable of increased capacity, utilize it to provide all supplies required during the summer months in excess of 1.4 MGD. This revision in operation will prolong water levels in the underlying Wind River Formation.

6.2.2 Raw Water Distribution System

1. Commence a series of public meetings with system users to determine what their desires are with regard to continued operation of the existing system.

2. The system is comprised of differing sections; meetings should be organized by the individual sections due to specific needs and capabilities of each area.

3. Based on specific response from users of each section, formulate a plan for either terminating the use of the particular section or turning over responsibility of operations and maintenance to the users.

4. Utilize information generated in this study and presented in this report for discussion purposes with system users.

5. Once individual solutions have been formulated for each system, re-estimate project costs.