RIVERTON REGIONAL
WATER MASTER PLAN
LEVEL I
EXECUTIVE SUMMARY
JUNE 1998

PREPARED BY:

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IN ASSOCIATION WITH:
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WESTER-WETSTEIN & ASSOCIATES, INC.
EXECUTIVE SUMMARY

RIVERTON REGIONAL WATER MASTER PLAN LEVEL I

For The

The Wyoming Water Development Commission
05SC0291035

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June 1998
CONCLUSIONS AND RECOMMENDATIONS

The Riverton Regional Water Supply Master Plan has two main objectives. First, to quantify potable water needs for the Riverton region through the year 2025, and second, plan for meeting those needs. In the course of this planning effort, the following conclusions and recommendations have been reached.

CONCLUSIONS

General

♦ The Riverton region is expected to experience steady growth through the year 2025 with population growth rates of approximately 1 percent per year.

♦ The Riverton central water system will experience growth from its present service population of 8,960 people, who now require a maximum of 4.3 million gallons per day (MGD) to a service population of 13,550 requiring 6.4 MGD.

♦ The Riverton central system is expected to be providing water to most of the region's 16 private systems by the year 2025.

♦ Capital reinvestment in the Riverton system is being under-funded by approximately $500,000 per year.

Water Supply

♦ Riverton has an ample surface water supply (river water) to meet all forecasted growth for the service area through the year 2025. Year-round use would require added equipment, however.

♦ In addition, Riverton’s well field also is capable of meeting the expected water needs of the service area over the coming 25 years.

♦ Riverton can obtain significant additional surface water rights through several sources if the community so wishes. Additional groundwater supplies are also available.

Water Treatment

♦ Riverton’s water treatment plant is in excellent operating condition. However, before long the treatment plant will not be able to meet the highest summer demands.

♦ The existing water treatment plant is well maintained and operated.
Growth projections indicate that the water demands for the year 2005 will exceed the capacity of the plant.

Pending regulations will impose more restrictive standards upon the operation of the treatment plant.

The capacity and performance of the treatment plant can be enhanced using other technology. The proposed improvement can be accomplished without major structural additions to the existing facility.

Transmission System

The transmission lines are capable of delivering sufficient water for fire fighting to all areas with the exception of the Highway Department shop on the west edge of the city and the Sale Barn on the south edge of the city.

The Country Club and West Riverview areas are served by a single transmission line, leaving this wide area of the city vulnerable to water outages.

It is feasible to extend service to all of the region’s 16 private water districts.

Storage System

The Riverton system has adequate gross storage capacity to meet forecasted needs through the year 2025, but the Central Wyoming College reservoir is undersized to meet all fire demands at the college.

Distribution System

With five pressure zones, the city’s system is complex for its size.

The city has some 15 miles of undersized distribution lines. This is 30% of all lines in the city.

Private Systems

There are some 1,300 people served by private systems in the Riverton regional planning area.

As EPA standards become increasingly stringent, it is expected that the majority of these districts will be approaching the city for water service.

RECOMMENDATIONS

General

Seek a Water Development Commission Level II study to develop preliminary designs, refined cost estimates, and funding planning for:

- Siting a new well for the upper pressure zone.
• Extending the transmission system to meet the recommendations in this report.
• Do advanced planning and process selection for the treatment plant.
• In-city irrigation ditch system rehabilitation and reconstruction.

Water Treatment

♦ Pursue process selection and preliminary planning and design for upgrading of the water treatment plant.

♦ It is recommended that the City of Riverton conduct the testing needed to select a specific process with the possible assistance of a WWDC Level II evaluation.

Water Transmission

♦ Replace the Main Street line from the Main Street tank to Federal and the Augusta Drive and East Logan Park transmission lines that are leak prone.

Water Distribution System

♦ Expedite the rate of replacement of undersized lines in the system.

♦ Put the pressure reducing station that is near the city shop on Riverview Drive into full and correct operation.

Private Systems

♦ Plan easement acquisition and eventual service delivery to all private systems within the planning area.

SERVICE PLANNING AREA AND WATER DEMANDS

Background of WWDC Involvement

Prior to this planning effort, the City of Riverton and the surrounding region had no long-term plan for addressing water needs. Several issues concerned local officials. The water treatment plant is operating near capacity. The city was unsure how many people it could reliably serve with the plant capacity and water rights it now has. The city is surrounded by scattered rural developments including 16 small private water systems. EPA’s drinking water standards are becoming increasingly more stringent and difficult to meet for both the city and those private water districts. The city is experiencing increasing requests for service outside the city. In response to these growing concerns, the City of Riverton requested that the Wyoming Water Development Commission (WWDC) conduct this study. In October 1996, that request was favorably reviewed and was funded by the 1997 Legislature as part of the Omnibus Water Bill.

Planning Area Boundary

The geographic limits of the planning area for the study was developed in cooperation with the Wyoming Water Development Commission, Fremont County, the City of Riverton, and the Wind River Reservation. The adopted Riverton Regional Water Master Plan boundary, shown in Figure 1, parallels the Urban Systems Planning boundary.
Local Economy

Fremont County's economy is comprised mainly of agriculture, government, and service industries. These industries provide a slow to moderate growth economy. The manufacturing and minerals industries share a minor role in the Fremont County economy at this time. There is no information indicating that any high growth industries will become a major part of the economy in this region during the 27-year planning horizon. Consequently, population is expected to grow only at a slow to moderate rate through the planning period.

Population Forecast and Water Demand

The State's growth forecast for both Fremont County and Riverton is 1 percent per year from 1997 through 2005.

### Forecast Service Area Water Demands at 1% Growth Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Service Population</th>
<th>Average Day (MG)</th>
<th>Maximum Day (MG)</th>
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</thead>
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<tr>
<td>1997</td>
<td>8,959</td>
<td>2.0</td>
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<tr>
<td>2000</td>
<td>9,456</td>
<td>2.1</td>
<td>4.5</td>
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<tr>
<td>2005</td>
<td>10,447</td>
<td>2.3</td>
<td>4.9</td>
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<tr>
<td>2010</td>
<td>11,495</td>
<td>2.6</td>
<td>5.4</td>
</tr>
<tr>
<td>2025</td>
<td>13,550</td>
<td>3.0</td>
<td>6.4 (9.9 cfs)</td>
</tr>
</tbody>
</table>

EXISTING POTABLE WATER INFRASTRUCTURE

Water Treatment Plant

The treatment plant is approximately 17 years old. It has a rated treatment capacity of 4.0 MGD. The plant is operated only in the summer and is the primary supply during the summer season. The maximum historical production is approximately 3.5 MGD during 20 hours of operation. The treatment plant is well maintained and monitoring tests show that the treated water is in compliance with all the current Safe Drinking Water Act (SDWA) regulations. It was a project priority to preserve the city's investment in the existing facility by investigating methods to improve the plant's performance and enable the facility to consistently comply with the safe drinking water standards of current and pending SDWA regulations. Recommendations for process improvements were based upon utilizing the existing process structures and modifying these facilities to improve the efficiency and production rates of the treatment plant.

The existing water treatment plant is a conventional filtration process. The performance of the facility is exceptional and there are not any known violations of any SDWA regulations during its operating history. While the performance of the existing facility has been exceptional, the peak water demands are approaching its full design capacity. It is our recommendation that the treatment capacity be expanded by improving the existing processes and requesting a variance from EPA to allow the treatment plant to be operated at a higher surface-loading rate. The alternative technologies that were investigated during this study included:

1) Solids Contact Absorption Clarifier;
2) Dissolved Air Floatation; and
3) Weighted Flocculation.
WATER STORAGE, TRANSMISSION, AND DISTRIBUTION

Fire Protection Demands

The water system was computer modeled. That model showed that it has adequate capacity to meet present fire flow demands with two minor exceptions.

The system was also modeled under the future load conditions expected by the year 2025. This is the end of the planning horizon. Under this scenario, the model was set up as though the system was serving the increased population in Riverton itself, plus 15 of the 16 private systems surrounding the city, a total of 13,550 people.

Storage System Evaluation

Riverton’s storage system has the capacity to serve a population of approximately 13,500 people. The Central Wyoming College (CWC) storage tank is significantly short of fire storage capacity for the college itself.

Transmission System

Riverton’s existing transmission system has three primary transmission mains that carry water from west to east. Water is carried in these transmission mains from the upper pressure zone to the lower pressure zone serving the core of the city.

Deficiencies were found in the Sunset, Main Street, and Augusta Drive transmission lines.

Distribution System

Nearly 15 miles (or 30%) of the city’s waterlines are undersized. These lines are 3-inch to 4-inches in diameter. This is an uncharacteristically high proportion of undersized lines in a distribution system.

Overall, the Riverton distribution system is in fair to good condition. Were it not for the large quantity of undersized lines in the system, the system would be judged in good to excellent condition.

The system also has significant problems with electrolysis corrosion of ductile iron pipe (DIP) causing water leaks. The city has an ongoing program of systematically replacing both the undersized lined and those links being attacked by electrolysis corrosion. Since 1980, the city has had a policy of installing only PVC water mains. This eliminates the electrolysis corrosion problem.

Inventory and Cursory Evaluation of Private Systems

The inventoried evaluation of private systems was limited to two concerns. The first concern was determining whether it was feasible to connect these individual private systems to the region’s central system. The second concern was determining what might be necessary to provide water delivery to these systems.
This data was collected for each system using a standardized questionnaire and interviewing the system caretaker. In addition, throughout the master planning process, the contact person for each of these private systems was mailed a personal notice of all public meetings. Their input was continuously sought throughout the planning process.

It was found that it is feasible to serve all of the surrounding private districts from Riverton’s central system.

WATER SUPPLY

Riverton has two potable water supplies available to it: surface water and groundwater. The city has a series of 12 wells that are currently being used for municipal supply. These wells in combination produce 12 percent of the summer demand and 50 percent of the annual demand.

The city holds surface rights totaling 13.21 cubic feet per second (CFS).

Retaining Irrigation Ditches in the City

Irrigation ditches serve portions of the City of Riverton. Approximately 409 residences are on this system according to city records. There is a savings of $12,000 per year in keeping the ditch system.

Groundwater

This groundwater investigation included a review of previous investigations and reports, assembly and compilation of water level and pumpage records, development of a three-dimensional groundwater model, and a review of water quality. The primary focus of this investigation was to evaluate the Wind River aquifer’s ability to meet long-term water supply needs for the City of Riverton. Secondary to this was the investigation of the potential for future wells to meet projected demands and maintain the present and pending water quality standards imposed by EPA.

Approximately one-half of the City of Riverton’s wells are, however, over 35 years old. One-third of the wells are more than 50 years old.

City Well Field

Most of the city’s wells are 8 to 10-inches in diameter with depths from 600 to 800 feet. The Airport wells are 1,400 and 1,823.5 feet deep to accommodate the positive difference in elevation between these wells and the wells in the immediate Riverton area.

Prior to the start-up of the water treatment plant in June 1981, the production from the well field showed a steady increase in production of approximately 12 million gallons (MG) per year over the period of 1958 to 1980. After the treatment plant was brought on line to supplement the well field during the peak demand periods of May through September, the annual well production dropped to an average of approximately 366 MG over the period from 1983-1996.
Economic Factors of Water Supply Alternatives

The water production costs of $0.97 per thousand gallons for wells and $0.71 per thousand gallons for water produced by the water treatment plant was arrived at using City of Riverton cost accounting data from the years 1993 through 1997. The calculated cost per thousand gallons, however, does not reflect the recommended replacement reserve account deposits.

PRELIMINARY FACILITY DESIGNS WHICH WERE ASSEMBLED

New Well

The city is short of water supply in the upper pressure zone. To remedy that shortage, it is recommended that a well be drilled in the vicinity of Cooper Road and the extension of College View Drive.

River Pump Station

If Riverton is to make year-round use of the water treatment plant, it will be necessary for the city to construct a pump station on the Wind River. This pump station will pump water to the plant during the months the LeClair Canal is not in operation. The two million dollar cost of this facility makes it unattractive in light of Riverton’s ability to meet winter water demands using the well field. In the author’s opinion, this facility will not be built before the year 2025.

Water Treatment Plant

Population growth within the service area and pending SDWA regulations will require that the treatment plant be improved in the near future. Three possible processes were investigated, as explained earlier. Each of the three processes could work well. The Level I investigation is not intended to carry out the detailed evaluation and testing that should be done to competently make a process choice. The selection of a specific process alternative will require additional study and should be the subject of a Level II project.

Downtown Main Street Line

The 6-inch and 8-inch transmission line on Main Street between the buried two million-gallon tank and Federal Boulevard is nearly the oldest line still in service in Riverton’s system. This 70-year-old unlined cast iron main is heavily choked with rust.

East Logan Park 10-inch Main

The 10-inch transmission main paralleling the northern boundary of the East Logan Park Addition is experiencing substantial electrolysis corrosion due to soil incompatibility with this ductile iron line.

Augusta Drive 12-inch Main

Electrolysis erosion due to corrosive soils in the lower Riverview area have weakened the Augusta Drive 12-inch ductile iron water main installed in the early 1980’s. This condition presently results in at least two breaks a year.
New Transmission Lines

Riverview Loop

It is recommended that the Riverview loop be constructed within the next five years because there is only a single line currently delivering water to the entire west Riverview/Country Club area.

Riverview 14-inch Extension

Extending the 14-inch transmission main 1,200 feet west on Riverview Road between Augusta Drive and Village Drive would connect two existing 14-inch mains and complete looping the Riverview Estates area.

Water Distribution System

The primary needs of the distribution system are:
- replacing undersized lines,
- installing a fire line at CWC, and
- replacing the electrolysis deteriorated lines in Riverview Terraces,
- planning eventual replacement of the asbestos cement lines.

COST ESTIMATES

The costs of the improvements for which preliminary designs were assembled are summarized below. Costs are all shown in year 2000 dollars.

<table>
<thead>
<tr>
<th>Project</th>
<th>Cost</th>
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<tr>
<td>New Well at Cooper Road</td>
<td>$425,000</td>
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<tr>
<td>River Pump Station</td>
<td>$2,094,000</td>
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<tr>
<td>Tie Private Water Districts into Riverton’s central system</td>
<td>$1,330,000</td>
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<td>Water Treatment Plant Process Modifications</td>
<td>$1,955,000</td>
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<td>Transmission System Upgrades, Year 1998 to 2005</td>
<td>$1,365,000</td>
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<tr>
<td>Transmission System Upgrades, Year 2005 to 2025</td>
<td>$2,663,000</td>
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<tr>
<td>Distribution System Upgrades, Year 1998 to 2025</td>
<td>$9,194,000</td>
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<td><strong>TOTAL</strong></td>
<td><strong>$19,026,000</strong></td>
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ECONOMIC ANALYSIS AND PROJECT FUNDING

A recommended financial plan and water user fee was formulated to support the Riverton regional water system needs through the planning horizon. That plan is summarized in Tables 8-1 and 8-2 in the report. Much of the needed funding will have to be generated locally. To do that, it is recommended that water rates be adjusted so that the monthly average residential bill
increases from the current $21.80 to $27.80 in 1998. By the year 2025, rates are expected to be in the $42.00 range.

PRIORITIZED MASTER PLAN

Year 1998 to 2010

It is recommended that the replacement lines be constructed in the first seven years of the master planning period.

Water Supply

The City of Riverton should file documents with the State Engineer’s Office to change to municipal use the water rights attached to lands developed over the previous five years.

Water Treatment

As previously discussed the city should go through process selection using a WWDC Level II Investigation implement any recommendations made in that report.

Water Transmission

At a population of 10,500, the transmission line from the two million-gallon treatment plant tank will begin to cause excessive pressure loss. When that population is reached a parallel line should be installed.

The loop from Vanessa Street to Riverview should be installed and the 14-inch main on west Riverview should be extended to tie the two 14-inch mains together. The Augusta Drive and East Logan Park lines should be replaced.

When Broadway Avenue is extended north to Webbwood Road, the 10-inch transmission line must also be extended.

Water Distribution

The undersized line replacement program should be expedited.

Year 2010 to Year 2025

Water Transmission

During this time, it is expected that the Stagner Lane, Mountain View, Glennie Lane, and Riverview loop will be required. It is also expected that the lines to serve several of the private systems will be necessary. The timing of all of these lines is dependent on events that cannot be accurately forecast at this time.

Water Distribution

The city should finalize its replacement of undersized lines.
## Possible Funding Sources

<table>
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<tr>
<th>Description</th>
<th>WWDC 60%</th>
<th>WLIB 50%</th>
<th>Private District Loans</th>
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<th>Total Costs</th>
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<td><strong>Water Supply</strong></td>
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<td>Increase WTP Capacity To 6MGD</td>
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<td>1998-2005 Planning Period</td>
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<td>2005-2010 Planning Period</td>
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<td>Total Private Water Districts Costs</td>
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<td>$541,368</td>
<td>$10,671,745</td>
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**Notes:**

All project costs are in the year 2000 dollars.