This is a digital document from the collections of the Wyoming Water Resources Data System (WRDS) Library.

For additional information about this document and the document conversion process, please contact WRDS at wrds@uwyo.edu and include the phrase “Digital Documents” in your subject heading.

To view other documents please visit the WRDS Library online at: http://library.wrds.uwyo.edu

Mailing Address:
Water Resources Data System
University of Wyoming, Dept 3943
1000 E University Avenue
Laramie, WY 82071

Physical Address:
Wyoming Hall, Room 249
University of Wyoming
Laramie, WY 82071

Phone: (307) 766-6651
Fax: (307) 766-3785

Funding for WRDS and the creation of this electronic document was provided by the Wyoming Water Development Commission (http://wwdc.state.wy.us)
Bridger Valley Water Supply
Level II Study

Submitted To:

Wyoming Water Development Commission

and the

Pioneer Water and Sewer District

Executive Summary
Executive Summary
TABLE OF CONTENTS
BRIDGER VALLEY WATER SUPPLY
EXECUTIVE SUMMARY

SUMMARY

1.1 Project History
1.2 Existing System Description
1.3 Project Study Area
1.4 Municipal Water Needs
1.5 Present Supply Capacity
   1.5.1 Bridger Valley Treatment Plant Capacity
   1.5.2 Lyman Springs
1.6 Bridger Valley Joint Powers Water Rights
1.7 Regional Master Planning
1.8 Pioneer Water System Feasibility
1.9 Preliminary Recommended Project
1.10 Project Economic Data
   1.10.1 Preliminary Recommended Project Budgets
   1.10.2 Probable Project Financing
   1.10.3 Projected User Rate Impact
1.11 Where Do We Go From Here?

FIGURES

1.1 Location Map
1.2 Bridger Valley Water Supply-Schematic Overview of Existing System
1.3 Bridger Valley Water Supply-Service Area
1.4 Preliminary Layout of Proposed Pioneer Water System

TABLES

1.1 Bridger Valley Water Supply - Present and Projected System Demands
1.2 Bridger Valley Water Supply - Existing Water Rights Summary
1.3 Preliminary Project Budget - Transmission, Storage, and Supply WWDC Eligible Costs
1.4 Preliminary Project Budget - Distribution Improvements Non-WWDC Eligible Costs
1.5 Preliminary Project Funding
1.1 PROJECT HISTORY

Bridger Valley is located in Uinta County in the southwest corner of Wyoming, as shown in Figure 1.1. Communities within Bridger Valley include Lyman, Mountain View, Fort Bridger and Urie. Presently these communities obtain their domestic water supply through a pipe network system operated by the Bridger Valley Joint Powers Water Board. Raw water is diverted from the Smiths Fork River and piped approximately 1 1/4 miles to a water treatment plant and storage facility. The treated water is then gravity fed to the respective communities and residents within Bridger Valley.

The present population of the Bridger Valley area is estimated to be approximately 6825 persons based on the most recent (1990) census and the measured growth in water service connections over the past 5 years. Well over half of those residents receive their domestic water supply from the Bridger Valley Joint Powers Board water supply system. The existing system serves the communities of Lyman and Mountain View along with three other water districts (Fort Bridger, Blacks Fork, and Lower Bench) and 176 rural retail customers. There are, however, numerous homes and businesses in the valley that are not served. These individuals rely primarily on shallow groundwater wells and/or haul water for their domestic supply. The water quality and capacity of these wells varies dramatically throughout the valley with a significant percentage being characterized by water users as "poor".

In 1990, a citizens group from the rural area immediately southeast of Lyman began exploring options for dealing with their water supply problems. Preliminary investigations led to the conclusion that connection to Joint Powers Board water system was probably the most feasible means of providing clean and reliable domestic water to their area.

Wyoming Water Development Commission conducted a Level I study to determine the need and overall feasibility of providing municipal water to rural Bridger Valley residents. During the Level I study process, it became clear that the Joint Powers Water Board had no taxing authority to offer as collateral against the indebtedness associated with rural water system expansion. In addition, the Board indicated that they did not wish to place existing users financially "at risk" by accepting the responsibility for project loans.

The rural Bridger Valley residents subsequently formed the Pioneer Water and Sewer District to accept financial responsibility and to provide direction relative to rural water service.

1.2 EXISTING SYSTEM DESCRIPTION

A schematic overview of the existing Bridger Valley water system is shown in Figure 1.2 hereafter.

1.3 PROJECT STUDY AREA

Based on the conclusions of the Level I study, rural Bridger Valley residents formed the Pioneer Water and Sewer District. District boundaries were based directly on public input and one-on-one contact with area residents. It is felt that the district realistically represents those areas in need of (and interested in) a municipal water supply. The overall service area is shown on figure 1.3. The project study area includes most of Bridger Valley (south of I-80). The study focused primarily on the needs of the Pioneer Water and Sewer District.
LOCATION MAP

FIGURE: 1.1
BRIDGER VALLEY WATER SUPPLY
SCHEMATIC OVERVIEW OF EXISTING SYSTEM

FIGURE: 1.2
FIGURE: 1.3

KEY

<table>
<thead>
<tr>
<th>Areas Presently Served</th>
<th>Individuals Served</th>
<th>Individuals Not Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Diagram symbols]</td>
<td>[Diagram symbols]</td>
<td>[Diagram symbols]</td>
</tr>
</tbody>
</table>
1.4 MUNICIPAL WATER NEEDS

The extension of the present Bridger Valley water system into rural areas would clearly place additional demands on the current system's operation. Pioneer District water demands are estimated to be 130 connections based on one-on-one contact with area residents by district board members. This represents nearly everyone living within the district, which is consistent with the district formation criteria. Individuals expressing no desire to connect to the system were specifically excluded from the district because of the relatively large per-capita financial commitments involved.

Future system demands have been projected using a 1% annualized growth rate in the population. A 30-year growth was used in calculating future system demand for planning purposes.

Present and future projected demands on the Bridger Valley water system are shown in Table 1.1.

1.5 Present Supply Capacity

1.5.1 Bridger Valley Water Treatment Plant Capacity

Forsgren Associates evaluated the Bridger Valley Water Treatment plant as part of this study for its ability to serve the Pioneer District. It was felt that the condition, peak capacity, and the ability of the treatment plant to comply with current (and proposed) EPA regulations represented a significant feasibility issue.

Without modifications, the present treatment plant capacity is estimated to be approximately 1.2 mgd. This capacity is not sufficient to meet the needs of present users during high demand periods.

1.5.2 Lyman Spring

The Town of Lyman presently utilizes a secondary spring supply source. Three separate springs are located approximately 6 miles southwest of Lyman in the Milbourne area. Water is deliver from the springs to Lyman through an 8-inch asbestos cement pipeline. The combined spring capacity as measured at its destination point near Lyman delivers a year round average of approximately 208 gpm (.30 mgd). During the summer months of June, July and August, the springs average 265 gpm (.38 mgd).

The Lyman Springs have an excellent water quality history. In spite of that fact, however, the Lyman Springs appear to be, under the direct influence of surface water. This was verified through MPA sampling in April through June of 1994.

In October of 1994, the EPA formally notified the Town of Lyman that the Lyman Springs were "under high risk of being influenced by surface water because of high quantities of surface water biotindicators and algae species...consistently detected in MPA samples." The Town was further notified that the springs are subject to the Surface Water Treatment Rule (SWTR). Filtration treatment will be necessary for continued use of the Lyman Springs as a municipal source of supply.
TABLE 1.1
BRIDGER VALLEY WATER SUPPLY
PRESENT AND PROJECTED SYSTEM DEMANDS

<table>
<thead>
<tr>
<th></th>
<th>AVERAGE DAY</th>
<th>AVERAGE SUMMER DAY</th>
<th>PEAK DAY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MGD</td>
<td>Gal/Person/Day</td>
<td>MGD</td>
</tr>
<tr>
<td>Present Users (4785)</td>
<td>1.05</td>
<td>220</td>
<td>1.49</td>
</tr>
<tr>
<td>*Pioneer District Users (538)</td>
<td>0.12</td>
<td>220</td>
<td>.17</td>
</tr>
<tr>
<td>Total Immediate Needs (5323)</td>
<td>1.20</td>
<td>220</td>
<td>1.66</td>
</tr>
<tr>
<td>**Projected Future (7175)</td>
<td>1.58</td>
<td>220</td>
<td>2.24</td>
</tr>
</tbody>
</table>

* 1) Based on 130 connections, with 4.14 persons per household.
** 2) Assumes consistent per capita consumption, 1% annual growth, Pioneer District users connected to system.
3) Gallons per person per day based on weighted average of metered user connection for each community.
4) Estimated present Bridger Valley Water Treatment Plant capacity = 1.2 MGD
   Estimated present Lyman Spring capacity = 0.38 MGD
5) Numbers in parenthesis indicate population served.
The Lyman Springs presently provide a significant percentage of the Bridger Valley water supply (0.3 - 0.4 MGD during the summer months). The interruption of this supply would seriously impact the Bridger Valley water users. This is particularly true given the present limitations of Bridger Valley’s water treatment plant.

1.6 **BRIDGER VALLEY JOINT POWERS BOARD WATER RIGHTS**

The water rights status of the Bridger Valley Joint Powers Board is summarized in Table 1.2. In addition the Board’s water rights, the Town of Lyman presently supplements their legal supply with springs that deliver an average of approximately 208 gpm as discussed above. The long-term viability of that source is as a domestic supply is somewhat uncertain due to filtration requirements being imposed by EPA.

The Bridger Valley Joint Powers Board present water supply appears to be legally secure "on paper". The physically available water supply, however, is highly dependent upon the operational practices of the State Line Dam. Releases from the State Line Dam must account for reservoir inflows, irrigation needs, municipal needs, environmental factors, and the terms and conditions of storage contracts. In the past, releases from the reservoir have not always coincided with the needs of the Bridger Valley water users. This became an issue during the summer of 1994 when water supplies were short throughout the valley.

1.7 **REGIONAL MASTER PLANNING**

It is important, in our opinion, that any infrastructure construction associated with the Pioneer District is consistent with long-term regional planning for Bridger Valley. This study assumes that the Pioneer District water system will ultimately be connected to (and probably served by) the Joint Powers Board water system.

1.8 **PIONEER WATER SYSTEM FEASIBILITY**

The individual wells within the Pioneer District service area are generally very poor in quality. Many residents must haul or use bottled drinking water. The need and interest in a municipal water system is high. This study, however, revealed serious feasibility questions that must be resolved prior to proceeding with this project:

- **Bridger Valley Water Treatment Plant Capacity:** With recently imposed EPA regulations, the existing plant capacity is limited to approximately 1.2 MGD. Their ability to serve even existing users during the summer without rationing is questionable.

- **Alternative Supply Source Availability:** The only economically viable alternative source is the proposed "Mohawk" well. This well was never drilled or verified as a feasible supply due to land-owner and community opposition. No other economically feasible sources were discovered during the course of this investigation.

- **Marginal Project Economics:** The capital costs and user rate associated with this project appear to be at or above the resident’s ability and/or willingness to pay. In addition, the projected user rates are very sensitive to the number of users.
TABLE 1.2
BRIDGER VALLEY WATER SUPPLY
EXISTING WATER RIGHTS SUMMARY

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>AMOUNT</th>
<th>PRIORITY</th>
<th>SOURCE</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Rights:</td>
<td>1500 AC-FT</td>
<td>N/A</td>
<td>State Line Dam</td>
<td>Acquired by Lyman &amp; Mountain View. 800 Acre-Feet available to BVJPB June 1st - October 1st. Provides a firm source of supply of 2.17 MGD for June, 3.15 MGD for July and 2.17 MGD for August.</td>
</tr>
<tr>
<td>Misc. Direct Flow</td>
<td>2.32 CFS</td>
<td>Misc. 1891-1915</td>
<td>2.28 CFS Blacks Fork</td>
<td>Only senior rights with 1891 or earlier priority are generally available in late summer. BVJPB 1891 or earlier rights approach 0.9 CFS. (0.58 MGD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.04 CFS Smiths Fork</td>
<td></td>
</tr>
</tbody>
</table>

1.9 PRELIMINARY RECOMMENDED PROJECT

The preliminary recommended project is a non-fire protected water system. The district board has rejected the fire-protected alternative at this time due to the additional costs (and rate impact) involved. The preliminary recommended project is based on wholesale water service from the Bridger Valley Joint Powers Board. This system layout is shown in Figure 1.4.

1.10 PROJECT ECONOMIC DATA

1.10.1 Preliminary Recommended Project Budgets

For this project, therefore, the water system was examined as a whole and the respective budgets for WWDC eligible and non-WWDC eligible improvements separated accordingly. These budgets are summarized in Tables 1.3 and 1.4 respectively.

1.10.2 Probable Project Financing

A Preliminary project financing scenario is summarized in Table 1.5. Based on direct input from WWDC and on recent experience with similar projects, it is assumed that WWDC eligible project components would be funded with 67% grant and 33% loan. The loan is assumed to be at 4% interest over 30 years. The remainder of the project is proposed to be funded by Wyoming Farm Loan Board with 50% grant and 50% loan. The Farm Loan Board presently loans money at 7%-interest.

Federal funding programs (FmHA, HUD, etc.) are generally based on low to moderate income criteria. Income data collected as part of the 1990 census indicates that the Bridger Valley residents would not collectively qualify for low-income assistance.

1.10.3 Projected User Rate Impact

Projected user rates vary significantly depending on the actual number of rate payers. It is our understanding that the district has approximately 130 potential users of which approximately 70 have already signed. Projected user rates range from $71.38/conn./month to $105.76/conn./month for 130 and 70 users respectively.

1.11 WHERE DO WE GO FROM HERE?

Because of the present treatment plant limitations and economic feasibility issues, it is recommended that this project not be advanced for Level III funding and construction at this time.

It is recommended that the following activities be pursued in anticipation of water service becoming available from the Joint Powers Board in the future.

a) The Joint Powers Board has already begun the process of evaluating and correcting their treatment plant deficiencies. We fully concur with their efforts.

b) The Town of Lyman should pursue the necessary redevelopment and treatment of the Lyman Springs. These springs play a critical role in meeting the Valley's present water supply needs and represent a very valuable long-term source of supply.
PRELIMINARY LAYOUT OF PROPOSED PIONEER WATER SYSTEM
(NON-FIRE PROTECTED)

LEGEND

PIPILINE

PUMP STATION

TANK

EXISTING BRIDGER JPB SYSTEM

WWDC ELIGIBLE

NON-WWDC ELIGIBLE

TO

FORT BRIDGER

TO

LYMAN

TOWN OF

LYMAN

MILLBURN

E

2'-3'

2'-3'

PRV

LYMAN SPRINGS

TREATMENT PLANT

PUMP STATION

FILTER & PNEUMATIC TANK

CHARLOIS ACRES

FIGURE: 1.4

SCALE: 1"=2000

FORSCHN

ASSOCIATES / INC.
### TABLE 1.3

**Preliminary Project Budget**
**Transmission, Storage, and Supply**
**WWDC Eligible Costs**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Est. Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mainline Piping</td>
<td>$989,400</td>
</tr>
<tr>
<td>2</td>
<td>Storage Reservoir</td>
<td>$117,000</td>
</tr>
<tr>
<td>3</td>
<td>Misc. Items</td>
<td>$ 97,500</td>
</tr>
</tbody>
</table>

**Subtotal** $1,203,900

- Preparation of Plans and Specs: $96,300
- Permitting & Mitigation: $2,500
- Legal Fees: $500
- R.O.W. Acquisition: $6,000
- Joint Powers Board Connection Fee: $108,000

**Construction Cost (from above)** $1,203,900

**Construction Engineering (10%)** $120,400

**Subtotal** $1,324,300

**Contingency (15%)** $198,700

**Construction Total** $1,523,000  
$1,523,000

**PROJECT TOTAL** $1,736,300

* Non-fire protected system
TABLE 1.4

Preliminary Project Budget*
Distribution Improvements
Non-WWDC Eligible Costs

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Est. Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mainline Piping</td>
<td>$199,300</td>
</tr>
<tr>
<td>2</td>
<td>Services</td>
<td>$133,500</td>
</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td><strong>$332,800</strong></td>
</tr>
<tr>
<td></td>
<td>Preparation of Plans and Specs</td>
<td>$33,300</td>
</tr>
<tr>
<td></td>
<td>Permitting &amp; Mitigation</td>
<td>$ 0</td>
</tr>
<tr>
<td></td>
<td>Legal Fees</td>
<td>$ 2,500</td>
</tr>
<tr>
<td></td>
<td>R.O.W. Acquisition</td>
<td>$ 0</td>
</tr>
<tr>
<td></td>
<td>Construction Cost (from above)</td>
<td><strong>$332,800</strong></td>
</tr>
<tr>
<td></td>
<td>Construction Engineering (10%)</td>
<td><strong>$33,300</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td><strong>$366,100</strong></td>
</tr>
<tr>
<td></td>
<td>Contingency (15%)</td>
<td><strong>$54,900</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Construction Total</strong></td>
<td><strong>$421,000</strong></td>
</tr>
</tbody>
</table>

**PROJECT TOTAL** $456,800

* Non-fire protected system
c) It is recommended that the Pioneer District continue to secure use commitments in anticipation of connecting to the Joint Powers Board system. This process will reduce the risk to the district and accelerate planning and funding of their water system when adequate water supplies become available.

d) It is recommended that the District continue to work with the Joint Powers Board to insure future service to Pioneer residents at a fair and equitable rate.

e) At such time as water is available to the District, the cost estimates and financial information presented in this report should be updated to reflect the current bidding environment, inflation, actual number of committed users, current Joint Powers Board rate structure, current funding eligibility criteria, etc.

---

**TABLE 1.5**

**PRELIMINARY PROJECT FUNDING**

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWDC Grant (67%)</td>
<td>$1,163,320</td>
</tr>
<tr>
<td>*WWDC Loan (33%)</td>
<td>$ 572,980</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>$1,736,300</td>
</tr>
<tr>
<td>Wyoming Farm Loan Board Grant (50%)</td>
<td>$ 228,400</td>
</tr>
<tr>
<td><strong>Wyoming Farm Loan Board Loan (50%)</strong></td>
<td>$ 228,400</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>$ 456,800</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$2,193,100</td>
</tr>
</tbody>
</table>