

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 wrd@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>)

WYOMING WATER DEVELOPMENT COMMISSION

**BIG VALLEY AND CROSSED
ARROWS IMPROVEMENT DISTRICT
WATER SUPPLY LEVEL II STUDY**

05SC0292678

EXECUTIVE SUMMARY

FEBRUARY 2006

Prepared By:

Engineering
offices of

JAMES GORES AND ASSOCIATES
RIVERTON, WYOMING

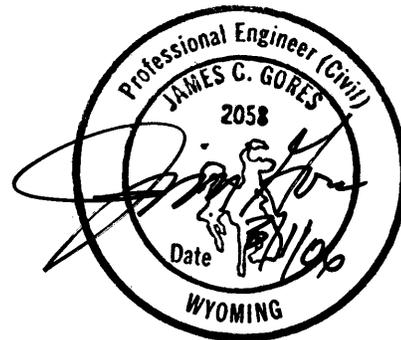
BIG VALLEY AND CROSSED ARROWS IMPROVEMENT DISTRICT
WATER SUPPLY LEVEL II STUDY
EXECUTIVE SUMMARY

For The:

Wyoming Water Development Commission
05SC0292678

Prepared By:

James Gores and Associates, P.C.
450 South Federal Blvd., Suite C
Riverton, WY 82501
Telephone: 307-856-2444
Fax: 307-856-0171
Email: mail@jamesgoresandassociates.com



February 2006

BIG VALLEY AND CROSSED ARROWS IMPROVEMENT DISTRICT
WATER SUPPLY LEVEL II STUDY
EXECUTIVE SUMMARY

I. AUTHORIZATION AND PURPOSE

The Level II Report for the Big Valley/Crossed Arrows Improvement District has been completed in accordance with a contract between the Wyoming Water Development Commission (WWDC) and James Gores and Associates, P.C. of Riverton, Wyoming dated June 9, 2005. The purpose of this project was to evaluate the current water supply and distribution system. Secondly, it was to determine a feasible and affordable water source for the Big Valley/Crossed Arrows Improvement District. This study evaluated a water source that could sustain both the existing and potential users within the current Big Valley/Crossed Arrows Improvement District boundaries, and also a large area of users surrounding the district. This study also considered the water supply needs of the River Grove area immediately across the river from the Town of Meeteetse.

Preliminary conceptual designs were then prepared and cost estimates developed for all of the alternative systems. These systems were analyzed to support the anticipated growth in the study area through the year 2025.

The tasks included in the Scope of Work are as follows:

Task 1	Scoping Meeting, Project Meetings
Task 2	Identification of Service Areas, Demand Projections
Task 3	Evaluation of Current Water Supply, System Components, Water Quality
Task 4	Conceptual Designs and Preliminary Cost Estimates
Task 5	Permits, Easements, Rights of Way, Land Use Planning, Water Use Agreements
Task 6	Selection of Preferred Alternatives
Task 7	Geotechnical Analysis
Task 8	Hydraulic Analysis and System Operation
Task 9	Economic Analysis and Project Financing
Task 10	Environmental Report
Task 11	Draft, Final, and Executive Summary Reports

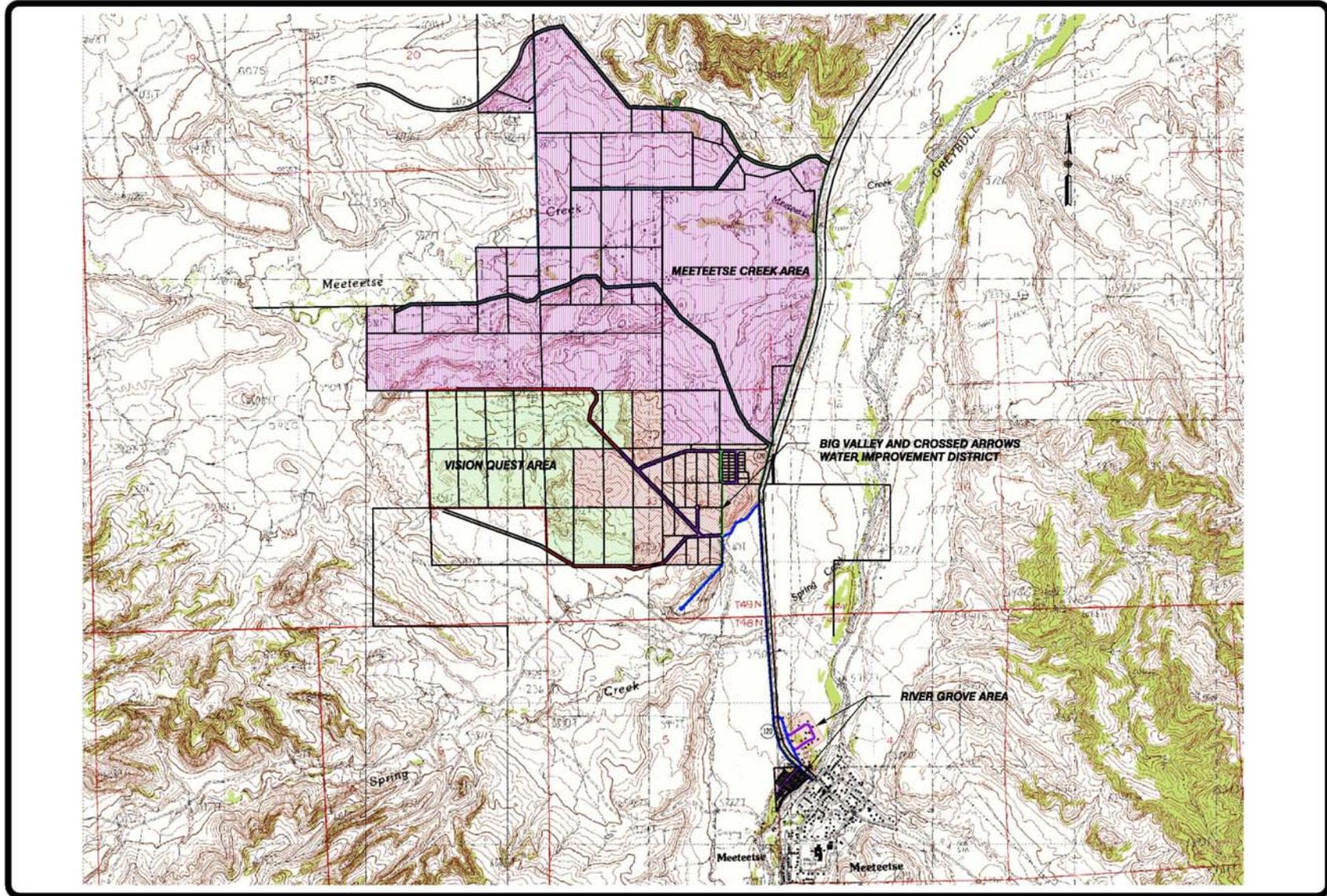
II. STUDY AREA

The Big Valley/Crossed Arrows Improvement District is located approximately 2 miles north of the Town of Meeteetse in the foothills of the Carter Mountains in Park County, Wyoming. Additional areas surrounding the district that were considered in the study include the Vision Quest Area, River Grove Area, and Black Diamond and Meeteetse Creek Areas. These study areas can be seen on Exhibit II-1, Big Valley and Crossed Arrows Improvement District Water Supply Level II Study Conceptual Level Study Area.

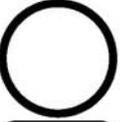
The district currently consists of 55 properties, with 24 properties in the Big Valley Subdivision, 26 in the Crossed Arrows Subdivision, and 5 in the Vision Quest Subdivision. The district was the primary area studied, as they were the project sponsor. The remainder of Vision Quest, which consists of 14 properties, was also studied because it is contiguous to the district. A third area studied included the Black Diamond and Meeteetse Creek Area, which extends north to Meeteetse Creek Road. This area contains 24 lots, but currently only consists of eight residences. The final area studied included the River Grove area directly

north of the Greybull River, between the Town of Meeteetse and the Big Valley/Crossed Arrows Improvement District. This area consists of approximately 40 lots, with approximately 12 residences.

Exhibit II-1 Big Valley and Crossed Arrows Improvement District Water Supply Level II Study Conceptual Level Study Area



NO.	DESCRIPTION	DATE



Engineering
 Company of
JAMES GORES AND ASSOCIATES, P.C.
 RIVERTON, WYOMING 82501

Drawn By: J.L.
 Date: 05/11/05
 Check By: J.L.
 Date: 05/11/05
 Title: CONCEPTUAL LEVEL STUDY AREA

FIGURE II-1
BIG VALLEY AND CROSSED ARROWS
IMPROVEMENT DISTRICT
WATER SUPPLY LEVEL II STUDY
CONCEPTUAL LEVEL STUDY AREA

PROJECT NUMBER
 05-06-00-05
 SHEET NUMBER
1 of 1

For this project, a 20-year planning horizon through the year 2025 was used to forecast population growth in the Meeteetse area. This forecast will cover approximately half of the expected life of the water system improvements.

The State of Wyoming is the only source for population data for the Meeteetse area. Neither Park County nor the Town of Meeteetse compiles population data or forecasts. The State of Wyoming's current population data extends through the 2000 census and includes forecasts through the year 2020. James Gores and Associates extended those forecasts to 2025 to cover the planning horizon for this project. The Wyoming Department of Administration and Information (A & I) forecasts that Meeteetse's population will grow at 0.63 percent to 2010 and 0.38 percent to the year 2020. By contrast, it forecasts that Park County's population will grow at 0.76 percent to 2010 and 0.37 percent to the 2020. It is not expected that the rate of growth will vary significantly in the future, so the rate for the year 2020 was used to determine the population forecasts for the year 2025, which were then rounded.

The historical census and forecast population of the Town of Meeteetse and Park County are shown below.

Table II-1 - Historical and Projected Population Data

Census Year	Town of Meeteetse Population	Percent Change in Town Population (Per Year)	Park County Population	Percent Change in County Population (Per Year)
1910	207	---	4,909	---
1920	300	4.49 %	7,298	4.87 %
1930	296	-0.13 %	8,207	1.25 %
1940	373	2.60 %	10,976	3.37 %
1950	404	0.83 %	15,182	3.83 %
1960	514	2.72 %	16,874	1.11 %
1970	459	-1.07 %	17,752	0.52 %
1980	512	1.15 %	21,639	2.19 %
1990	368	-2.81 %	23,178	0.71 %
2000	351	-0.46 %	25,786	1.13 %
2010*	373	0.63 %	27,747	0.76 %
2020*	387	0.38 %	28,760	0.37 %
2025**	394	0.36 %	29,300	0.38 %

* Projection by Wyoming Department of Administration and Information, Division of Economic Analysis

** Projection by James Gores and Associates based on historical trend

The projected growth for both Park County and the Town of Meeteetse is very similar with a range of 0.36 to 0.38 percent. It is expected that the rural areas north of town will also grow at this rate. The addition of water service to the area may cause a slight increase in growth, but should not be significant during the 20-year planning period. Additionally, a majority of any growth will occur within the rural subdivisions themselves, and not add to the user base used in this study.

III. INVESTIGATION, FIELD WORK, AND MEETINGS

The investigation and field work was conducted from June 2005 to November 2005. The investigation included researching population and income data, analyzing the existing system for the Town of

Meeteetse and the Big Valley/Crossed Arrows Improvement District, field reconnaissance, and completing a soils investigation through Inberg-Miller Engineers of Riverton, Wyoming.

Meetings conducted during the course of work included:

1. A Scoping Meeting held in the Meeteetse Town Hall on June 21, 2005 with members of the Big Valley/Crossed Arrows Improvement District, the residents of the remaining study area, and Town of Meeteetse and WWDC personnel.
2. A Project Meeting held in the Meeteetse Town Hall on July 21, 2005 with members of the Big Valley/Crossed Arrows Improvement District, the residents of the remaining study area, and Town of Meeteetse personnel.
3. A Project Meeting held in the Meeteetse Town Hall on September 22, 2005 with members of the Big Valley/Crossed Arrows Improvement District, the residents of the remaining study area, and Town of Meeteetse personnel.
4. A Final Conclusion Meeting held in the Meeteetse Town Hall on October 26, 2005 with members of the Big Valley/Crossed Arrows Improvement District and Town of Meeteetse personnel.

IV. CONCLUSIONS

A variety of alternatives were analyzed for the entire region north of the Town of Meeteetse from the Greybull River to Meeteetse Creek Road. The Big Valley, Crossed Arrows, Meeteetse Creek, Black Diamond, River Grove, and Vision Quest Estates subdivisions, as well as a small group of residences and businesses across the Greybull River from the town, were included in the initial portion of the study. The alternatives included treating the district's current water supply and upgrading the distribution and storage system, using the town's water supply to provide fire protection to a variety of combinations of areas north of the Town of Meeteetse, and using the town's water supply to provide only domestic service to each of these combinations of areas.

The district elected to proceed with a system that uses the Town of Meeteetse as its water source and provides limited fire flow through two post type fire hydrants placed in the north and south portions of the Big Valley/Crossed Arrows Improvement District. These hydrants would also provide a flushing source for the operation of the system. The system also includes a water storage facility, new distribution network, new services to the property line, and meters both at the connection to town and for individual services. The preferred alternative improvements can be seen on Exhibit IV-1, Concept 1, Preferred Alternative.

The capital improvements would include the following:

- Installation of a meter and meter pit at the connection to the town system
- Installation of 10,000 linear feet of 8-inch transmission line, including valves and connections along the Highway 120 right-of-way
- Installation of 3,980 linear feet of 6-inch transmission line, including valves and connections through the Big Valley/Crossed Arrows Improvement District
- Installation of 8,280 linear feet of 4-inch transmission line, including valves and connections through the Big Valley/Crossed Arrows Improvement District
- Installation of water services to each property line, connection to the existing services, and installation of a meter on each service
- Installation of a 30,000 to 50,000 gallon (estimated) water storage tank and all appurtenances

The project is considered to have minimal impacts on the environment and wildlife. The proposed transmission line does cross the Greybull River and Spring Creek, requiring care to minimize or eliminate contamination, erosion, and degradation to these surface waters. Most of the land that the proposed work would disturb has previously been disturbed through agricultural and development activities and, therefore, will have little impact on the natural environment.

It was determined that:

- The Town of Meeteetse has ample surface water supply from the Sunshine Reservoir to meet the demands of the selected alternative.
- The Town of Meeteetse water treatment plant is in excellent condition and has ample capacity to meet the demands of the selected alternative.
- The funding plan provides an affordable system that is paid for by the Big Valley/Crossed Arrows Improvement District users.
- The district's current system is not sufficient to meet the long term needs and desires of the district. It also produces low quality water that is not drinkable due to dissolved salts and minerals.
- The proposed system would establish a regional system north of the Town of Meeteetse that could enhance the area, increase growth, and provide quality water to additional users in the future.

V. COSTS AND FUNDING

The opinion of probable project cost is escalated to the year 2007 and includes engineering services, construction, permitting, fees, easement acquisition, and contingencies for a total project cost of \$1,227,377. The project is proposed to be funded through a combination of grants and loans provided by the Wyoming Water Development Commission (WWDC) and the Rural Utility Service (RUS) Program. Under the conceptual funding plan, WWDC would provide grant money to pay for the construction of the transmission line, storage facility, and master meter. RUS would provide grant funds and a low rate loan of 4.5 percent for 25 years for the remainder of the unpaid portion of the project. The preliminary funding plan is structured so approximately 69 percent of the project costs are paid in grant money, with the remainder paid by the loan. This loan would be repaid through either property assessments or water charges. A breakdown of the funding sources is shown in Table V-1.

Table V-1 Summary of Proposed Financing With 50 Percent WWDC Grant

	WWDC Grant 67% of Eligible Items	RUS Grant 20% of Sponsor Cost	RUS Loan (Remaining Cost)	Total
Construction Cost (Est.)	\$ 479,881	\$ 63,772	\$ 255,087	\$ 798,740
Contingency	\$ 79,180	\$ 10,522	\$ 42,090	\$ 131,792
Const. Engineering Fee (Est.)	\$ 47,988	\$ 6,377	\$ 25,509	\$ 79,874
Non-Construction Cost (Est.)	\$ 68,917	\$ 6,789	\$ 27,155	\$ 102,861
Total Estimated Cost (2005)	\$ 675,966	\$87,460	\$ 349,841	\$1,113,267
Total Estimated Cost (2007)	\$ 745,253	\$96,425	\$ 385,700	\$1,227,378

VI. ESTIMATED WATER USER RATES

The Big Valley/Crossed Arrows Improvement District's current water rate is a flat fee of \$35.00 per month. This does not include the cost of purchasing drinking water.

The preferred alternative would provide a metered system with water supplied by the Town of Meeteetse. The town would charge the district a bulk water rate based on the gallons used by all the users served by the district outside the town's system. This water rate would be based on an agreement negotiated between the town and district to establish an equitable cost structure for each entity. The district would, in turn, charge each of the users on its system according to usage.

The water user agreement is still being negotiated between the Big Valley/Crossed Arrows Improvement District and the Town of Meeteetse. The town has expressed a reluctance to assume the operation and maintenance of the district's system. They have proposed providing bulk water at the edge of their current system that the district could purchase for their member's use. The estimated water user rates were calculated using a range of values for the cost of purchasing bulk water. This range was established by estimating the town's cost to provide water using their accounting and usage data and by the initial negotiation position offered to the district by the town. This cost ranged from \$2.30 to \$7.82 per 1,000 gallons of water.

The user cost per property with an active tap for the proposed alternative is shown below.

Table VI-1 - Estimated Cost Per Property With Active Tap

Loan	Low Est. (\$2.30 / 1000 Gal.)		High Est. (\$7.82 / 1000 Gal.)	
Project Cost	\$	1,227,377	\$	1,227,377
WWDC Grant (67%)	\$	745,253	\$	745,253
RUS Grant Applied to Sponsor Cost (20%)	\$	96,425	\$	96,425
RUS Loan Amount Applied to Sponsor Cost	\$	385,700	\$	385,700
Interest Rate		4.5	Percent	4.5
Period		25	Years	25
District Debt Service Per Month	\$	2,168	\$	2,168
User Debt Service Per Property	\$	39	\$	39
O & M				
District O & M Costs Per Month	\$	2,063	\$	2,063
User O & M Costs Per Month	\$	38	\$	38
Water Charges				
Number of Properties		55	Properties	55
Estimated Water Usage (Gallons per Month)		455,400	Gallons	455,400
Water Cost per Month (District)	\$	1,047	\$	3,561
Average Water Cost per Month per Property	\$	19	\$	65
Administrative Costs				
District Administrative Costs Per Month	\$	275	\$	275
User Administrative Costs Per Month	\$	5	\$	5
Total Estimated User Cost Per Property	\$	101	\$	147

The typical monthly user fee per subscriber is expected to be between \$101 and \$147 per month, assuming water consumption of 8,280 gallons per month per water service.

WWDC currently has a proposal before the legislature to provide 67 percent grant for this project to cover eligible items under the WWDC program. This funding could significantly affect the Big Valley/Crossed Arrows Improvement District portion of the project cost and reduce the amount the district requests from RUS. With a higher grant percentage offered by WWDC, the cost per property with an active tap would drop approximately \$15 with a 67 percent grant. The new estimated user fee per property owner with an active tap would be between \$101 and \$147 per month with a 67 percent grant. The higher grant percentages would increase the affordability of the project significantly.