

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>)

**EXECUTIVE SUMMARY
FOR
WRIGHT MASTER PLAN
LEVEL I STUDY**

SUBMITTED TO:
WYOMING WATER DEVELOPMENT COMMISSION
AND
WRIGHT WATER AND SEWER DISTRICT

December 2009

Prepared by:

STETSON ENGINEERING, INC.
P.O. BOX 457
601 METZ DRIVE
GILLETTE, WYOMING 82717
(307) 682-8936

In Association with:

Wester Wetstein & Associates
605 Plaza Court
Laramie, WY 82073

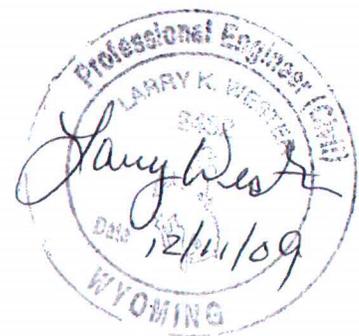


Table of Contents

Introduction	2
Water Demand.....	4
Water Storage.....	5
Water Production.....	5
Water Line Distribution.....	5
Maintenance and Operation	5
Recommendations	5
Cost Estimate Summary	7
Funding Options	7

List of Figures

Figure 1	Wright Water & Sewer District Project Area Map
Figure 2	Wright Water & Sewer District Existing Water Systems
Figure 3	Populations Estimates for Town of Wright and the WWSD

List of Tables

Table 1	Summary of Data Reported for 2000-2008
Table 2	Design Demand
Table 3	Cost Estimate Summary
Table 4	Proposed Rate Structure

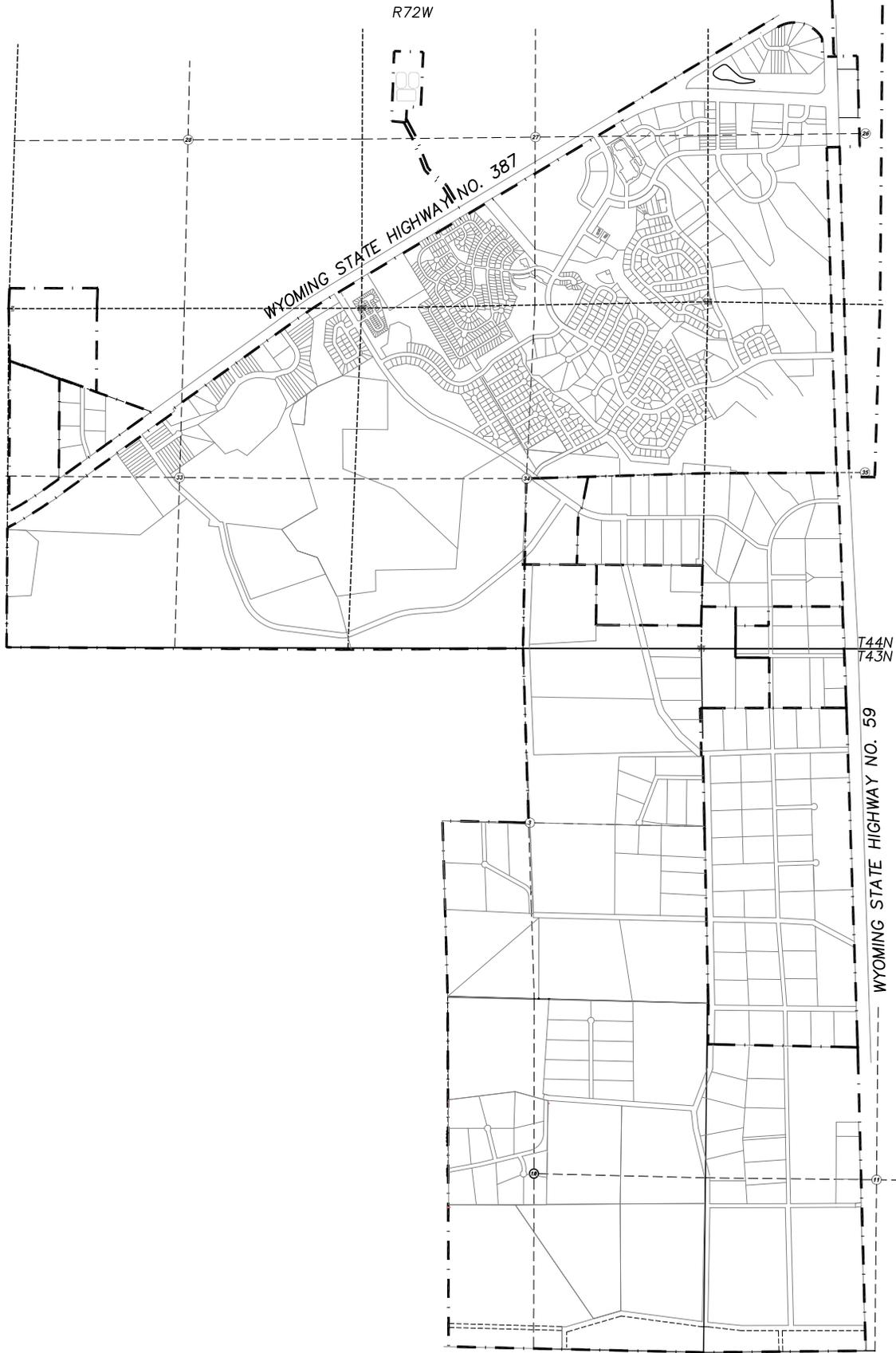
Introduction

The Wright Water and Sewer District, which was formed in 1977, is a regional water system that supplies water for the Town of Wright and the surrounding area. (See Figure 1) The WWSD water system consists of five Fort Union Wells, two storage tanks and supply and distribution lines. (See Figure 2) The WWSD is very pro active and has continually added to and updated their water system.

The Wright Water and Sewer District is located in Campbell County 30 miles south of Gillette and 70 miles north of Douglas. The WWSD is the largest water district in Campbell County.

The Wright Water and Sewer District served a population of 2,650 in 2009. The WWSD has experienced rapid growth in the past few years due to the energy development in the area. A new power plant is being built in the area along with a new business that will contract to the current mines to suppress coal car dust. The population of the WWSD is expected to reach 4,500 by 2030. (See Figure 3) As a result it has become necessary to develop a master plan to guide the expansion of the District.

WRIGHT WATER & SEWER DISTRICT, WYOMING



X:\2008\08-040-WRIGHT-MASTER-PLAN\MAP-WWSD LOCATION.Dwg, LOCATION MAP, 11/19/2009, 2:33:35 PM

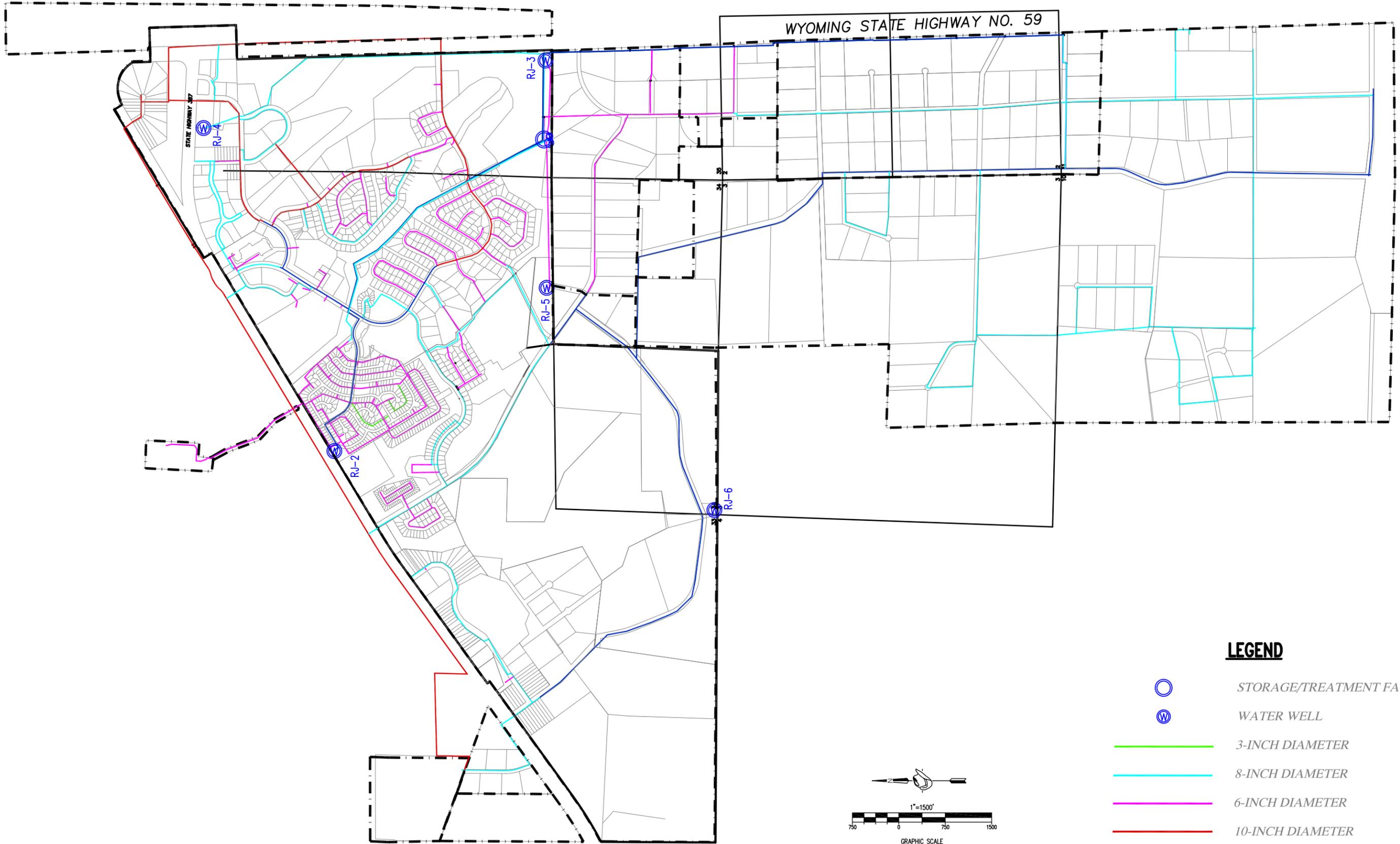


P.O. BOX 457
601 METZ DRIVE
GILLETTE, WY 82717
(307) 682-8936

FIGURE 1

WRIGHT WATER & SEWER DISTRICT, WYOMING
PROJECT AREA MAP

X:\2008\08-040-WRIGHT-MASTER-PLAN\WP-WWSD-WATER.dwg, EX-EXISTING WATER, 11/19/2009 2:27:09 PM



LEGEND

-  STORAGE/TREATMENT FACILITY
-  WATER WELL
-  3-INCH DIAMETER
-  8-INCH DIAMETER
-  6-INCH DIAMETER
-  10-INCH DIAMETER
-  12-INCH DIAMETER

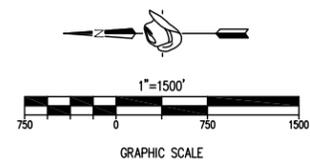


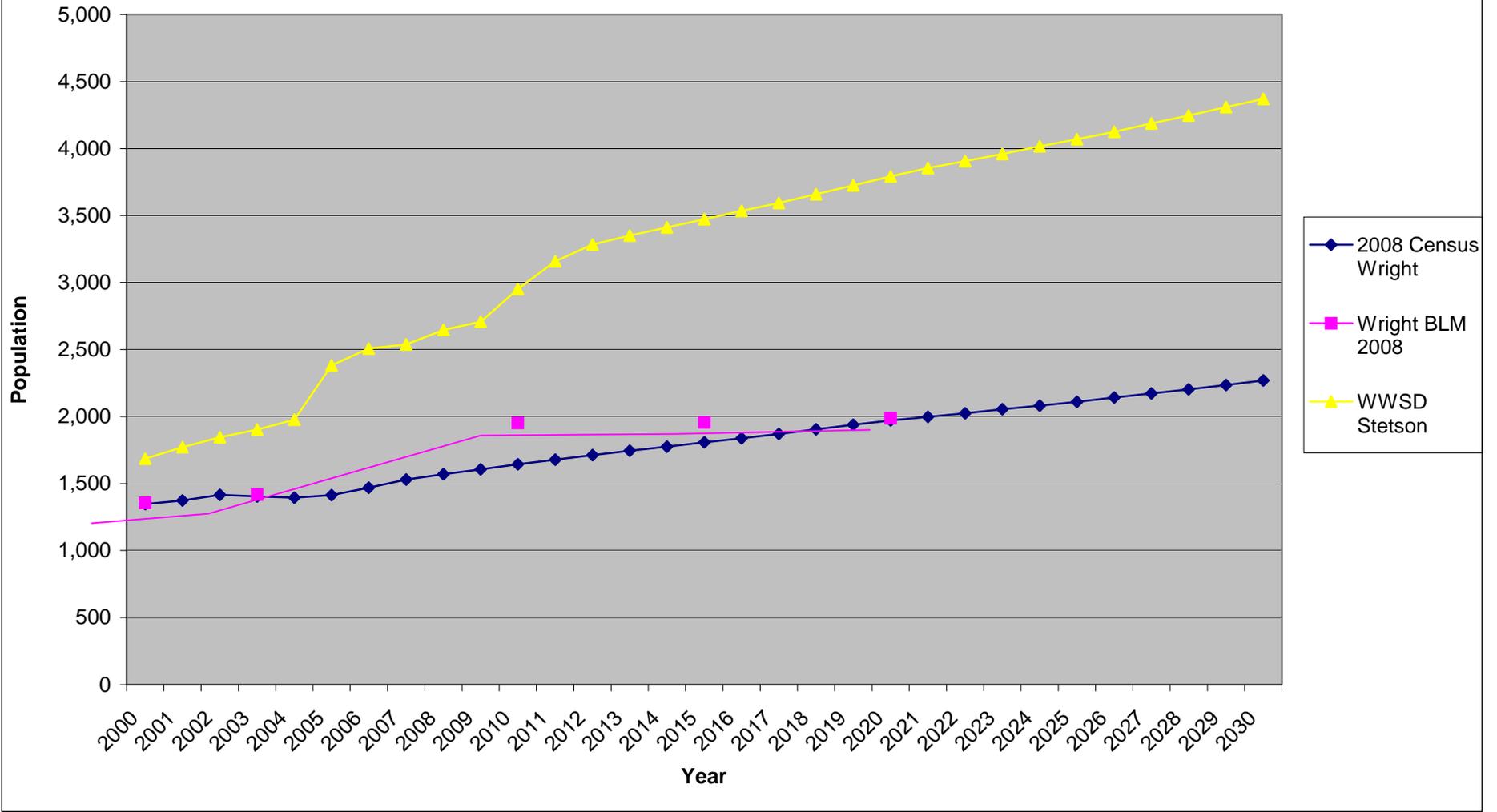
FIGURE 2



P.O. BOX 457
601 METZ DRIVE
GILLETTE, WY 82717
(307) 682-8936

EXISTING WATER SYSTEMS
WRIGHT WATER & SEWER DISTRICT

Figure 3
Population Estimates for Town of Wright and the
Water and Sewer District 2000 through 2030



Water Demand

The WWSD water records from 2000-2008 were analyzed to determine the maximum and average daily demands. Average day demand was calculated by taking the monthly average of recorded water usage within the water district. The average water consumption was 11,677,532 gallons per month. The average per capita use is 180 gallons per person per day. For planning purposes an average daily demand of 200 gallons per person per day was used.

The peak day demand was found by searching WWSD records for the single highest demand within a single day. Since water usage was highest in months of May through September, these records were analyzed to determine the peak usage. A peak usage of 1,377,800 gallons or 747 gpcd was recorded in July 2002. For the purposes of planning a maximum day demand of 750 gpcd was used. This peak day demand is higher than other communities in the area. Wright has always had the opportunity to sell bulk water. From 2002-2005 the coal bed methane production was booming and the WWSD was selling water to coal bed methane contractors. The sale of bulk water explains the abnormally high peak in water demand for the summer months of 2000-2003. Since 2005 coal bed methane production has slowly tapered off, resulting in more typical daily use peaks. Please see Table 1 and Table 2.

Table 1
Summary of Data Reported for
2000-2008

	Gallons per month	Gallons per Day	Gallons per Person per Day
Maximum	32,835,700	1,059,216	574
Minimum	3,988,300	128,655	66
Average	11,677,532	376,695	180

Table 2
Design Demand

	Gallons per person per day
Maximum	750
Average	200

Water Storage

The WWSD has two storage tanks comprising one storage and chlorination facility in the Town of Wright. The current tanks are 1.0 million gallons and 0.5 million gallons. The five Fort Union wells supply raw water to the two tanks where the water is disinfected with gas chlorination. Currently the two tanks together supply 25% of the maximum daily demand plus fire protection.

Water Production

The current production capacity of the WWSD five wells is 2,167,200 gpd. The maximum demand for 2009 is 2,031,000 gpd. With the projected rate of population growth the demand would exceed production by 2011. In 2011 the water demand would necessitate the development of RJ-7 with an estimated production of 300 gpm. The next additional well should not be needed until 2015 unless other factors such as industrial development occur.

Water Line Distribution

The WWSD distribution system consists of 12-inch, 10-inch, 8-inch, and 6-inch, lines. All distribution lines are PVC except for one 12-inch line, which is asbestos cement. The oldest lines are approximately 35 years old. Over the years the only leaks detected were located at the valves. From analyzing the WWSD water records they have always had less than 5% water loss. Because of such a low percentage of water loss it is not necessary to perform leak detection.

Maintenance and Operation

An expanding water system creates more maintenance and daily operation tasks. One tool to manage the WWSD assets is a Geographic Information System (GIS) for the water system. Information essential to the WWSD to provide the consumer base with proper maintenance, faster service, and accurate billing was compiled into a central Geographic Information System using a combination of ARCVIEW and CartêGraph. All data was exported to a geodatabase format for ease of sharing and displaying information. This system will help in planning for expansion, assisting with operations and scheduling maintenance for the system.

Recommendations

The WWSD has made it a goal to keep their system updated and adequate to provide water to the increasing population. In order to achieve this the WWSD will need to plan on installing three additional wells and a storage tank within the next 10 years. With these additions the WWSD will be able to provide an adequate water supply and storage system until 2030.

Completing of RJ-7 in 2010, RJ-8 in 2015 and RJ-9 in 2025 will require proper planning by the WWSD. Currently the WWSD has decided on the best locations and has already purchased property for RJ-7 and RJ-8. A well permit from the

State Engineers Office for RJ-7 has already been issued. The location of RJ-7 was selected because it is located south of Wright and on the top of a hill. This elevated location will provide an excellent spot for an additional storage tank.

We recommend a storage facility be built along with the installation of RJ-7 in 2011. This additional storage facility (RJ-7 Storage Tank) with a size of 1.0 million gallons will greatly benefit the users of the WWSD. The benefits are:

- The water level of the aquifer in Wright is declining. A storage facility would allow a longer time for the aquifer to replenish after draw down from pumping has occurred.
- With the addition of the RJ-7 tank the fire flow for the entire community is increased. With a fire at the Wright Hotel the RJ-7 tank increases and maintains the surrounding minimum pressure to 20 psi, as required by WYDEQ.
- The RJ-7 Storage tank will be fully connected to the WWSD system so water from RJ-5, RJ-6 and RJ-7 can be used to fill the RJ-7 Storage Tank. This connection to the three newest wells will ensure the ability to maintain the appropriate level in the new tank. The RJ-7 Storage tank will also increase system reliability and redundancy and provide an additional water source when maintenance issues on the existing storage tanks occur.
- The area south of Wright has been subdivided and slated to attract numerous industrial facilities. These facilities are support vendors and contractors to the several coal mines in the area. Industrial facilities historically are high users of water. The RJ-7 Storage Tank will be necessary to supply any high demands so the existing tanks serving the majority of the population will not be depleted.
- The RJ-7 Storage tank will also extend the operating life of the existing and proposed wells. With the cost of the drilling and installing a water well greatly increasing in the past few years the benefit of extending their life cycle can be a great economic benefit to the WWSD.

We also recommend the WWSD start the permit application process with the State Engineers Office for the RJ-8 well. This will ensure the WWSD is ready for the installation of RJ-8 in 2015.

Cost Estimate Summary

The following estimates for the proposed improvements to the Wright Water and Sewer District are feasibility-level cost estimates reflecting 2009 construction prices with annual 5% inflation to the future construction date.

Table 3
Cost Estimate Summary

Project	Proposed Date	Total Est Cost (\$)
RJ-7 Well, Pumphouse, Tank & Transmission Line	2011	4,600,000.00
RJ-8 Well, Pumphouse & Transmission Line	2015	2,800,000.00
RJ-9 Well, Pumphouse & Transmission Line	2025	4,000,000.00
Rounded Total Costs		\$11,400,000.00

Funding Options

The Wright Water & Sewer District is currently applying for Wyoming Water Development Level III funding for the RJ-7 Well and Tank project. The Campbell County District Support Grant is also available to the WWSD on an annual basis. The WWSD will also look at funding options for grants and loans through the Wyoming Water Development Commission, State Land and Investment Board, Rural Development, and the Drinking Water State Revolving. The WWSD currently has a tiered water rate structure for their users. With loans and grants the WWSD still must increase their current rate structure in order to pay for the upcoming capital improvements. The following is the proposed increase:

Table 4
Proposed Rate Structure

Tap size	Min Monthly	Min Gallons	Additional per 1,000 gallons
3/4 "	\$24.00	9,000	3.00 per 1,000 up to 5,000 3.50 per 1,000 for 5,001 to 10,000 4.00 per 1,000 for over 10,000
1"	\$32.00	12,000	
1 1/2"	\$71.00	27,000	
2"	\$105.00	40,500	
3"	\$258.00	99,000	
4"	\$425.00	162,000	
6"	\$1,000.00	382,000	