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FORT LARAMIE
WATER SUPPLY REHABILITATION
LEVEL II STUDY

PREPARED FOR:

WYOMING WATER DEVELOPMENT COMMISSION
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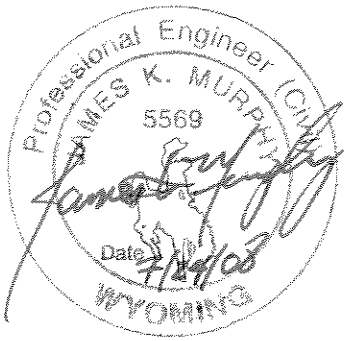
JULY 2008

• ENGINEER'S AND GEOLOGIST'S CERTIFICATE •

WE HEREBY CERTIFY THAT WE HAVE PREPARED OR DIRECTLY SUPERVISED THE PREPARATION OF THESE REPORTS AND THAT WE ARE DULY REGISTERED PROFESSIONALS IN THE STATE OF WYOMING.



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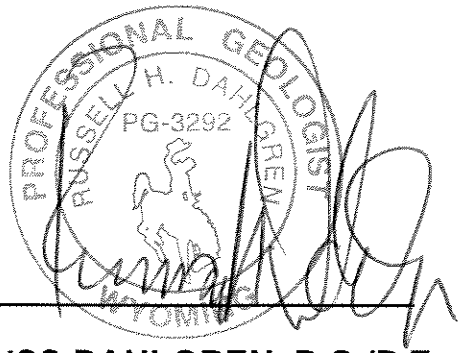

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FORT LARAMIE
WATER SUPPLY REHABILITATION
LEVEL II STUDY

● *INTRODUCTION* ●

A. Authorization and Purpose:

In August, 2006 the Town of Fort Laramie submitted an application to the Wyoming Water Development Commission (WWDC) requesting assistance in determining the feasibility and cost of upgrading the Town's municipal water supply, storage, and distribution system. WWDC included the Fort Laramie project in its 2007 Omnibus Planning Bill. The Legislature appropriated $95,000 for a Level II Water System Rehabilitation Study to evaluate the Town's system, identify deficiencies, prioritize recommended improvements, develop conceptual plans, and prepare cost opinions. AVI Professional Corporation (AVI) was selected by WWDC to complete the Level II Study.

B. Project Location and Summary:

The Town of Fort Laramie is located in west-central Goshen County, near the Fort Laramie National Historic Site and the North Platte River. US Highway 26 and State Highway 160 intersect within the Town limits.

The 2000 Census reported the town population at 243, which is unchanged from the 1990 census. Town officials estimate the 2008 population at 260.

The Town's first public water system, which consisted of the Fort Laramie #1 Well and a small distribution system, was constructed in the early 1950's. In

1962 the distribution system was expanded, and a 50,000-gallon storage tank was constructed. By the late 1960's a second well was needed, and the Fort Laramie #2 was drilled in 1967. No other major improvements were made until after a system-wide evaluation was conducted by Baker and Associates in 2002. Based on recommendations in this study, significant system upgrades were completed in 2003. Most distribution lines smaller than 2" were replaced and a portion of the transmission line between the wells and the storage tank was placed in a bore under the Fort Laramie Canal. The distribution system was looped on the south side of town by boring under the railroad tracks in two places, eliminating several dead-end lines. Ten new fire hydrants were installed, meters were placed on 175 service connections, and approximately 3,000 feet of 6" PVC water line was installed.

In 2006, the Town decided to pursue additional improvements in the system because of inadequate storage capacity, low operating pressures, and problems with disinfection caused by the single line between the wells and the storage tank.

The current Level II study identifies additional structural upgrades and administrative changes which would improve the operation and management of the water system and benefit the Town's water users. This report prioritizes improvements and provides cost opinions for those recommendations requiring infrastructure construction.

The Town has identified its priorities as follows:

1. Increase storage capacity from the existing 50,000 gallons to 150,000 gallons.

2. Increase system pressures to improve fire suppression capability and resolve consumer complaints of inadequate point-of-use pressure.

3. Replace the existing 6" asbestos-cement (AC) line between the wells and the storage tank with two lines at least 8" in diameter.

4. Evaluate existing operation and maintenance practices and make recommendations for improvements in administering the system.

5. Develop a rate structure that will support a repair, maintenance, and replacement plan for system components.

In addition to addressing the Town's priorities, the WWDC contract calls for investigation of and reporting on the following issues which may impact the feasibility and cost of system improvements:

1. Environmental Report. Since no disturbances were associated with this phase of the study and the location of future disturbances will depend on which project alternative is selected, no environmental report was prepared.

2. Land Use, Permitting, and Easements. No significant change in land use is anticipated in conjunction with any project alternative evaluated in this report. Construction of an elevated tank in the Town Park will require security fencing which will eliminate public access to the immediate area at the base of the tank.

   No permits were required for any activity conducted during this study. The Town's well permits are described in Section 2. A discussion of problems with the easement agreement for the

storage tank and transmission line is found in Section 2 under "Existing System Deficiencies." Easements required for the project components selected for construction will depend on the alternative chosen by the Town.

3. Water Rights Inventory. Water rights information for the three Fort Laramie wells is included in Section 2.

4. Geotechnical Analysis. No geotechnical analysis was required for this study level because no construction alternative has been selected. An USDA Natural Resources Conservation soils report for the Fort Laramie area was generated addressing soil suitability for the shallow excavations necessary for utilities trenching. Over 80% of soils in the area where construction is anticipated are rated extremely limited for stability of open cuts. Compliance with OSHA regulations governing work in open trenches will be required during project construction.

   A site-specific geotechnical analysis will be required to determine the suitability of soils and subsurface materials for construction of a storage tank when the location has been determined.

5. Surveying. Hydrants were surveyed and locations/elevations recorded.

6. System GIS. A limited GIS map of the system components inventoried during this study was prepared and provided to the WWDC. The GIS component includes only maps and aerial photos in the public domain, maps acquired from the Town, and surveyed hydrant locations. The water system GIS layer was taken from information developed by Baker Engineering during the 2002 study

because it was the best source available. Bid documents for water system improvements from September, 2002 were also used to make estimates about the present configuration of the system. Verification of information obtained from the Town was beyond the scope of this study.

C. Conditions for WWDC Funding

This study was unable to evaluate Fort Laramie's water system and make recommendations for improvements because the Town's records were incomplete and inaccurate. As a result, WWDC established the following conditions which the Town must meet in order to be eligible for financial assistance.

1. The Town must accumulate 12 consecutive months of accurate and consistent well production and water use records. Town personnel are responsible for reviewing records monthly to ensure that anomalies in water system operation and data reporting have been resolved. These records must be provided to WWDC for use in Level III pre-design evaluation and analysis.

2. The Town must meet WWDC criteria requiring ownership or exclusive control of real property where system improvements are to be constructed. The existing easement agreement for the tank and transmission line from the wells does not provide the required level of exclusive control.

3. The Town must adopt a rate structure that:

    - Covers normal system operating expenses including personnel, water treatment, pumping costs, retirement of existing debt, etc.

- Generates enough revenue to repay project construction loans for the system improvements requested by the Town.

- Maintains an emergency fund and a major maintenance/repair fund to pay for future major repairs and replacement of system components such as hydrants, valves, and well pumps.

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● SECTION 1 ●

SERVICE AREA IDENTIFICATION AND DEMAND PROJECTIONS

INTRODUCTION

The first task of the Level II Water Supply Rehabilitation Study was to verify the Town's present service area and water use, then estimate future water demand.

A. SERVICE AREA

The water service area for the Fort Laramie system is confined to the Town's corporate limits with the exception of three service connections. Town billing records show 226 accounts serving an estimated population of 260. Only about 175 water accounts are actually using water. The number of active accounts increases slightly in the summer. The Town provides ¾" taps to two private residences and one commercial location outside the town limits.

See Plate 1 for a schematic of the Town's service area and water system.

B. PRESENT DEMAND AND WATER USE

An accurate determination of water demand in Fort Laramie was impossible because no reliable well production or point-of-use records were available.

Typically, two data sets are used to determine current water use, predict future demand, and provide the basic information necessary to evaluate conditions in a municipal water supply system:

1. The amount of water delivered to end users. This information is normally obtained from meter readings and billing records.

2. The amount of water produced by the system's source, in this case, two wells in the North Platte alluvium.

Inadequacy of Point-of-Use Records

Records documenting monthly use by water customers are generated by point-of-use meters which were installed on 175 service connections as part of the system-wide upgrade in 2003. The Town uses Black Mountain Software Utility Billing System to track usage and to generate customer bills. The meters are read monthly by the Maintenance Supervisor or his assistant with a handheld wand. Data from the mobile reader are downloaded into a desktop unit which transfers information to the Town Clerk's computer. Water bills for individual users are generated from the software system by the Clerk. Meters are read and usage recorded even for accounts that are not billed, such as the Town Hall, maintenance shop, fire hall, sprinkler systems in the town parks, and public restrooms.

Records for February 2008 show a total of 266 accounts. Of that number, 15 are Town accounts. No water usage was recorded for 81 accounts. The Town Clerk reported that these 81 inactive accounts were houses occupied only in the summer, were vacant for other reasons, have a domestic well and receive other utility bills generated by the same software, or the meter is simply not hooked up.

Verification of current water use was attempted. The Town has only a short period of record for point-of-use meters. A computer system failure in February or March of 2007 destroyed electronic records, so only the usage information generated after March 2007 was available. Some of the records for the period between March, 2007 and May 2008 are incomplete. The Town had no electronic backup and was unable to locate any hard copy records.

Discrepancies in Well Production Records

Water production records are generated through a SCADA system supplied by MicroComm Digital Control Technology of Olathe, Kansas.

These records initially appeared to be a source of information from which water use could be extrapolated. Unfortunately, no records were available prior to October 2006 and only partial records are available for March 2007, August 2007, February 2008, and March 2008.

At the request of the Town, AVI arranged for MicroComm to have a service technician inspect the system, the well meter, and the software program. In the process of reviewing the SCADA setup, the technician determined that the software was improperly calibrated. It's possible that some of the anomalies in the well meter reports were caused by these errors made during the initial installation in 2003. In addition, the well meter was over 20 years old and its accuracy was questionable.

During the site visit, the technician identified an additional problem with the well production recording system. The Town's bulk water sales hydrant was located between the well and the well meter, and turned the meter backward when bulk water was dispensed. This caused the meter records to show less water than was actually pumped from the ground.

The MicroComm technician recommended that the existing well meter be replaced with a new model compatible with the SCADA system and that the well house be re-plumbed to place the hydrant for bulk water sales past the metering point. Unfortunately, the Town's computer failed while MicroComm was correcting the software calibration. No well production data was recorded for the several weeks in February and March of 2008 while the Town acquired a new computer and reinstalled the MicroComm SCADA software.

Recording Procedures and Discrepancies

Unfortunately, neither set of records for the Town of Fort Laramie is complete or reliable. An analysis of available records revealed serious discrepancies both within and between the two data sets. These discrepancies preclude evaluating the system to determine the impacts of system upgrades such as increasing line size, system pressures, and storage capacity. It is also impossible to estimate leakage losses in the system.

A review of available point-of-use meter records revealed apparent gross anomalies. For example, the records show that the Town Park Restroom (Account 00580-00) used 0 gallons in May 2007, 177,860 gallons in June 2007, 778,700 gallons in July 2007, and 0 gallons in August 2007. A similar error is evident in the meter reports for South Park Hydrants #1 and #2. Meter records for Hydrant #1 (Account 02380-00) show 0 gallons of usage for all months of available record, except for July 2007 when use of 643,250 gallons was reported. Records for Hydrant #2 (Account 00683-00) report 0 gallons used for all months of record, except 394,960 gallons were used in April 2007 and 356,750 gallons in July 2007. The Town did not produce records to indicate when or if hydrants were flushed as a part of a routine maintenance program.

Using the limited information available, an analysis was attempted comparing water production to water consumption. The results were inconclusive. In some months, reports provided by the Town showed more water metered out than was produced by the wells. In other months, records indicated the wells produced substantially more water than was metered to end users. Records were also internally inconsistent, as described below.

It may be significant or only coincidental that April and July of 2007 (excessive use reported at Hydrants #1 and #2) are the two months in available records when the meter use amount also exceeds the well production records, although

not by the amounts shown as metered through Hydrants #1 and #2. April 2007 shows 363,736 more gallons metered out than recorded by the well meter. July 2007 shows 492,217 more gallons recorded through the point-of-use meters than were produced by the well.

Town records for June 2007 show that the wells produced about 650,000 gallons more than was delivered through the point-of-use meters. Data for September 2007 show well production exceeding point-of-use meter totals by 378,000 gallons.

During the February site visit, the Assistant Town Clerk offered an explanation of the gross errors in point-of-use meter reports. The Maintenance Supervisor had been replacing frozen, cracked, or otherwise non-functional meters with units pulled from other locations. He did not inform the billing clerk that he had made these changes. Because she was not given the readings for either the meter taken out of service or its replacement, end of month readings had no relationship to actual water use at that location. This distortion could also account for some of the discrepancies reported between metered use and well production.

At this point in the study, it was decided that existing Town records were not accurate enough for a precise analysis of the system and could be used only to make a very rough approximation of the quantities produced and used.
Refer to Appendix A, Water Production and Use for details on the discrepancies in data sets. These spreadsheets cover the period from October 2006 through October 2007 and indicate where data are missing and where discrepancies exist.

Based on the limited data described above, only a reasoned estimate of key data points such as maximum daily demand (MDD) or average daily demand (ADD) can be made. No reliable information is available to estimate peak hour and

average hour demands. Errors would be compounded by manipulation of suspect data. However, using the MDD amount from point-of-use meter records (189,089 gallons) and the MDD amount from the well meter records (218,244 gallons on July 7, 2007), a reasonable estimate of MDD is 200,000 gallons. This figure is accurate enough to recommend optimum system storage capacity. See the discussion of storage tank capacity in Section 2, Inventory of Existing System.

Available data does indicate that water usage declined substantially since meters were installed. The Baker study ("*Water System Master Plan and Environmental Assessment" July 31, 2001*) estimated water usage from well pump meter records for the years 1999 and 2000. The two high months during that period of record were August of 1999 at 12.7 million gallons and July of 2000 at 12 million gallons. By contrast, the high month after meters were installed, based on limited records of questionable accuracy, was 5.7 million gallons produced by the wells for the month of July 2007. This figure does not include any estimate of the water dispensed through the bulk sales hydrant, which caused the well meter to run backwards and reduced the amount of water recorded as produced by the wells.

An evaluation of wastewater discharge was briefly considered as a verification of water use, but the Town's wastewater system is gravity flow to a lagoon system and is not metered.

Attempts to Generate Usable Information

AVI and WWDC held several meetings to assist the Town in developing the capability to monitor water production and consumption. This information is important to achieving the purposes of this study. Of greater significance, however, is that the Town needs accurate and reliable records to manage its system efficiently.

AVI and WWDC met with the Mayor and members of the Town Council on December 17, 2007. Issues with the discrepancies in well production and point-of-use meters were discussed. The Mayor requested that AVI get in touch with Black Mountain Software and MicroComm, Inc. to arrange for training of Town staff in the use of the software associated with the point of use meters and well meters. Black Mountain is the vendor that sold the meter recording and billing software program to the Town. MicroComm supplied the Supervisory Control and Data Acquisition (SCADA) system that controls the well pumps and maintains the storage tank level.

In January 2008, AVI contacted both venders and requested technical support and training be provided to the Town. Black Mountain contacted the Town staff and walked them through the steps necessary to produce the water use reports in the format requested by AVI and WWDC. With the assistance of Black Mountain, the Town produced one report which contained 12 consecutive months of data (water use for the current month and the previous 11 months.) Subsequent reports, with one exception, were for the previous month only.
On March 23, 2008 a new well production meter was installed and the bulk sales hydrant moved to a point where it would not interfere with meter readings.

A meeting with the Town, WWDC, and AVI was held on May 23, 2008. Following this meeting, the Town agreed to take responsibility for checking water system reports for accuracy and obvious errors. However, the well production and point-of-use meter reports submitted by the Town for May, 2008 showed 2,800,000 more gallons metered out than were produced by the wells.

As of June, 2008, there was insufficient information on water produced or consumed to allow a full analysis of the Town's system. WWDC and AVI agreed to proceed with the study using the best available data. An assessment of alternatives for meeting the Town's priorities was prepared, and cost opinions developed for the various alternatives.

C. FIRE FLOWS AND ISO CLASSIFICATION

One of the Town's objectives is to improve its rating from the Insurance Service Office (ISO) for the Town's structure fire suppression delivery system. Insurance companies use the ISO classification rating to establish fire insurance premiums for the community. In some cases, the information in the report can be used to improve the system's fire suppression capability. If fire suppression capability is sufficiently enhanced and the community's ISO rating is increased, it is possible that the cost of insurance to homeowners could be reduced.

The ISO conducted a Public Protection Classification (PPC) survey of Fort Laramie's fire suppression system on June 6, 2005, and issued the classification report to the Town on October 12, 2007. Fire flow tests conducted by ISO at five of the Town's hydrants revealed inadequate flows and residual pressures. Further analysis and system modeling is necessary to determine what changes to the system would be needed to achieve recommended fire flows and pressures. Possibilities include increasing the size of transmission and distribution lines, looping lines to provide a dual feed to hydrants, and increasing system pressure through booster pumps, a standpipe, or an elevated storage tank.

ISO bases its rating on numerous aspects of the community's fire suppression system. Procedures for receiving and responding to fire alarms account for 10% of the rating. Characteristics of the community fire department, including training of personnel and type and condition of the fire department's equipment, account for 50%. The water supply system accounts for the remaining 40% of the rating. Fort Laramie's water system scored 22.21% of the possible 40%, while the fire department received 18.85% of the possible 50%. The Town's fire department rating has a greater impact on the ISO classification than does the water supply system. System improvements to enhance the ability to respond aggressively to

structural fires is a vital community asset whether or not such improvements result in a better ISO rating and reduced premiums.

See Appendix B for the complete ISO report.

D. POPULATION PROJECTIONS

Accurate population projections for rural Wyoming communities are difficult to make. Unanticipated energy development, industrial activity, or a downturn in a local industry can reverse statewide or regional trends.

The population of Fort Laramie has been relatively stable for the past two decades. The Census Reports for 1990 and 2000 list the population for those years at 243. The high population for the last 50 years was a peak of 356 in 1980. Town officials estimate the current population at 260. According to the web site City-Data.Com, there were no new housing starts in Fort Laramie in the last 10 years. A site visit to the community did not identify any recent residential or commercial construction, or any construction currently underway.

There is little reason to expect that Fort Laramie will experience either dramatic growth in population or substantial commercial/industrial development within the planning horizon. It is also unlikely that the population will decline substantially.

E. ABILITY OF SYSTEM TO MEET FUTURE DEMAND

While major growth in Fort Laramie is unlikely, there are critical infrastructure components that ought to be addressed to enhance system operation: Distribution lines smaller than 4” replaced with lines 6” or larger, storage capacity increased, and the operational problems caused by the single line between the wells and storage tank corrected.

Refer to Section 2, “Inventory of Existing System” for more information on the Town’s system, and to Section 7, “Recommendations” for detailed suggestions on system improvements.

The Town’s existing wells can accommodate a substantial increase in demand. Even in periods of peak use, the wells have excess production capability. For example, in the peak demand month of July of 2007, Well #1 operated an average of 3.3 hours per day. Well #2 operated an average of 3.1 hours per day. Peak day run times for July 2007 were 5.0 hours for Well #1 and 4.2 hours for Well #2. Peak run times for each well did not occur on the same day. Section 2 contains detailed information on the Town’s wells.

Further documentation of well capacity to meet future demands can be inferred from the production records reported for 1999 and 2000, which was prior to the installation of water use meters. In July 1999 and August of 2000, the wells were reported to have produced over 12 million gallons per month. The peak month reported in 2007 was 4.5 million gallons. During the site visit on February 6, 2008 AVI conducted a flow test on the Fort Laramie wells. The tests verified that each well is independently capable of producing 450 to 500 gpm.

At the end of May and the first week in June, 2008, the pumps in both Town wells failed. Sargent Drilling Company of Broken Bow, Nebraska installed 30 HP submersible pumps in Well #2 on May 29 and in Well #1 on June 12. Sargent conducted short-term tests of the new pumps and produced between 530 and 590 gallons per minute from each well. A long-term pump test would be necessary to determine if this production could be sustained over time. However, available information indicates that the wells are capable of supporting a service population of double the current number of residents.

Ability to meet future demands would be further enhanced by a municipal water conservation plan. Conservation represents both an additional “source” of water

and a way to reduce costs associated with pumping and treatment. For the limited period of record available, average water use in Fort Laramie was calculated at 325 gallons per capita per day (gpcpd). The WWDC's "Water System Survey Report" says the average usage for water systems participating in the survey was 241.5 gpcpd in 2004 and 225.4 gpcpd in 2007. While the Town's use is not particularly excessive in comparison to other Wyoming communities, a tiered water rate structure, alternate day watering schedule, and other conservation measures could reduce water use. Water rates will be discussed in greater detail in Section 6, Operation, Maintenance, and Management Issues.

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● SECTION 2 ●

INVENTORY OF EXISTING SYSTEM

INTRODUCTION

The Town's first public water supply system was constructed in the early 1950's. The water supply was the Fort Laramie well #1, which was permitted in 1949. Significant system improvements were made in 1962 when Burke Moving and Storage of Cheyenne installed over 12,000 LF of 4" and 6" AC pipe, 16 fire hydrants, along with the valves and other appurtenances necessary for system operation. A 50,000-gallon storage tank was constructed at the same time on private property approximately half a mile north of Town. A second supply well was drilled and placed in operation in 1967. Additional improvements were made in 2003 and will be described in the appropriate subsections below.

A. WATER SUPPLY, WELL PERMITS, AND WATER RIGHTS

Fort Laramie has permits for three wells, all producing from the North Platte alluvium. Information on individual wells in the numbered paragraphs below is taken directly from the well permits.

1. Permit No. P95G. Fort Laramie #1 well was dug with a sand bucket to a depth of 80' on June 1, 1949. The borehole was 24" in diameter and was cased with galvanized steel casing. Lithology was reported as alternating layers of sand and gravel with a static water level 35' Below Ground Level (BGL). Well yield was estimated at 1,000 gpm but was limited by pump production capacity to approximately 600 gpm.

2. Permit No. UW 2066. Fort Laramie Well #2 was drilled to a depth of 82' on October 26, 1967. An 8-hour pump test conducted on November 18, 1967 achieved average discharge of 2,000 gpm. Static water level was recorded at 32' BGL. The permit reported the lithology as 8' of topsoil, then alternating layers of sand, gravel, coarse gravel, and chalk rock. The water-bearing zone occurred between 32' and 82' BGL. A 16" steel casing was installed with perforations from 42' to 82' BGL.

3. Permit No. UW 62637. Fort Laramie Well #3 drilled to a depth of 95' on June 2, 1980. A 5" PVC casing was installed with .032 slots from 85' BGL to 95' BGL. Lithology was reported as 3' of sandy topsoil, 12' of sandy clay, then alternating sand and gravel with intermingled boulders. The well was metered for a three-month period, producing an average of 2 gpm. A windmill powered a pump set at 53' BGL. This well is not incorporated into the Town's supply system.

Fort Laramie Wells #1 and #2 are located in two well houses about 50 feet apart at the intersection of Bliss Street and Laramie Avenue near the Town Hall. No records exist to verify when or if well pumps were replaced in the past. The pump in Well #2 was replaced Sargent Drilling of Broken Bow, Nebraska on May 29, 2008 with a submersible Goulds three-stage pump with 6" discharge diameter. The pump motor is a 30 HP three-phase Franklin. The pump was set at a depth of 60' BGL. Sargent Drilling also replaced the pump in Well #1 on June 12, 2008 with the same pump and motor as used in Well #2. This pump was also set at 60' BGL.

Flow tests of both wells conducted on February 6, 2008 confirmed that each well was capable of producing 450 to 500 gpm for the short duration of the flow test. Short-term flow tests conducted by Sargent Drilling following installation of pumps and motors obtained yields between 530 and 590 gpm.

Based on analysis of existing records, the on-site flow test, and the flow tests conducted during the installation of the new pumps, the existing wells are producing sufficient water to meet present demand. Water rights do not impose any limitations at current levels of use.

See table below for summary of wells and water rights. Appendix C contains copies of well permits and statements of completion.

SUMMARY OF FORT LARAMIE WELLS AND WATER RIGHTS

Permit #	Priority	Status	Township	Range	Section	Applicant	Facility Name	Uses	Yield	Well Depth	Static Depth
95	12/8/1950	ADJ	26N	64W	23	TOWN OF FORT LARAMIE	FT. LARAMIE #1 WELL	MUN	1000	82	35
P2066W	10/3/1967	ADJ	26N	64W	23	TOWN OF FORT LARAMIE	FORT LARAMIE #2	MUN	500	82	27
P62637W	12/30/1981	UNA	26N	64W	22	TOWN OF FORT LARAMIE	FORT LARAMIE #3	MUN	2	95	35

B. STORAGE TANK

Fort Laramie's existing storage tank was erected by Mcguire Iron of Sioux Falls SD in 1962 on private property about a half mile north of the wells and east of Fort Laramie Road. A plaque on the side of the tank gives the dimensions as 20' OD, 21'6" in height with a capacity of 50,000 gallons. The dimensions were verified by field inspection. The tank level is controlled by a pressure gage which starts a well pump when the tank level drops to 15.2' (estimated storage volume of 36,177 gallons). Pumps are turned off when the water level reaches 19.2' (estimated working volume of 45,698 gallons). The pressure gage is located in a manhole on the transmission line immediately west of the tank. Tank foundation elevation is approximately 4,350 feet above MSL based on an estimate derived from the Fort Laramie Quadrangle, USGS 7.5-Minute Topographic map.

Mcguire Iron has a contract to service the tank on a three-year rotation and refurbished the tank inside and out in March, 2008. The tank is in excellent

condition. However, it is too small to meet DEQ recommendations for maximum day demand and fire flow requirements. See the System Deficiencies section below for a discussion of issues with the existing tank.

The wells and storage tank communicate with a MicroComm SCADA system which was installed in 2003 and recalibrated in February, 2008 as a part of this study.

C. TRANSMISSION LINES

The Town wells, storage tank, and distribution system are connected by approximately 2800 Linear Feet (LF) of 6" AC pipe that conveys water from the wells to the tank and also from the tank to the distribution system.

Prior to 2003, a portion of the transmission main between the wells and the tank was suspended under the Fort Laramie Road bridge crossing the Interstate Canal. The hanging portion appeared to be near failure, and was subject to freezing during cold weather. As part of the 2003 improvements, the exposed portion of the line was replaced with an 8" PVC line installed in a bore under the canal. The remaining lines are the original 6" AC pipe installed in the early 1960's.

An additional 11,000 LF of 6" AC pipe serves as the transmission mains for the backbone of the Fort Laramie water distribution system.

D. DISTRIBUTION SYSTEM

Neither maps nor records of the current configuration of pipes in the distribution system were provided by the Town. The best information obtainable for this report came from the Water System Improvement Map (Plate 1) prepared by

Baker and Associates as part of their 2002 Study and from the contract documents for system improvements dated September, 2002.

Extrapolating from these two sources, it is estimated that the system now consists of approximately 730 LF of 8" PVC (in bores under the railroad tracks and under the Fort Laramie Canal), 3,000 LF of 6" PVC, 13,800 LF of 6" AC transmission mains (including the line between the wells and tank), and 6,000 LF of 4" or smaller AC distribution lines. The locations of the Town's 42 fire hydrants were surveyed during the course of the study.

As part of system improvements made in 2003, 1" PVC service lines and ¾" meters were installed at 175 locations. Two 2" connections provide water to the Town parks and one 1" meter serves a commercial structure.

The Town purchased a meter billing system from Black Mountain Software which generates records of water usage and utility bills for the active service accounts. The software maintains 266 accounts for water, sewer, and trash collection. Of the total, 175 accounts receive water bills. Water use is recorded for additional active accounts, including 15 Town accounts for the Town Hall, parks, the fire facility, maintenance shop, and public restrooms in the parks. These accounts, and the private residence of the tank site landowner, do not receive water bills.

For the majority of months were records were available, no water usage was recorded for 81 of the 266 accounts. The Town Clerk reported that these accounts were houses occupied only in the summer, houses vacant for other reasons, lots that have a domestic well and receive bills generated by the same software for other utilities. In some cases, the meter is not connected.

As a part of the 2003 improvements, the southern portion of the system was looped, requiring two borings under the railroad tracks. Two dead end lines were

eliminated. Meters were installed on all service connections and a meter reading and billing software system was purchased from Black Mountain Software.

All service connections are 3/4" with the exception of two 2" connections providing irrigation water to Town parks, and one 1" connection serving a commercial structure. Three service connections outside the town limits are supplied from the system.

E. WATER TREATMENT

The Town's only treatment is disinfection provided by a sodium hyperchlorate injection system at each wellhead. Chlorine residual is regularly monitored at the tap in the Town maintenance shop and less frequently at locations at the far end of the distribution system.

The single line between the wells and tank prevents effective system disinfection and may preclude compliance with EPA regulations.

Depending on when chlorine is introduced into system, the Town's water may be under or over chlorinated. If water is disinfected when flowing to the tank, contact time is sufficient but residuals may be low. If water is chlorinated directly from the wells to the distribution system, contact time may not be achieved and consumers close to the wellheads may receive more than the recommended level of chlorine. Other issues can affect chlorine residuals and system safety, including usage rates, time in storage, and ambient temperature.

F. WATER QUALITY

A review of Fort Laramie's water quality reports confirm that all monitored contaminants have consistently been below the Maximum Contaminant Level (MCL). There is no record of a water quality test where an MCL was exceeded.

Water quality samples as required by EPA regulations are taken by the Town Maintenance Supervisor. The Town is current with all mandated tests and is on schedule for a new cycle of testing that began in January, 2008. The Town provided copies of its "*Annual Drinking Water Quality Report*" for calendar years 2004, 2005, and 2006. The Report for 2006 is included as Appendix E.

While all contaminants are within regulatory limits, a potentially significant trend is the increase in nitrate levels in the Town's wells in the period of record. In 2004, nitrates were reported at 2.4 parts per million (ppm). The level had increased to 3.3 ppm in 2005, and was reported at 3.3 in the Town's 2006 Consumer Confidence Report. A water sample taken on February 28, 2007 registered nitrate levels at 4.8 ppm. While this level is below the MCL of 10, the Town should continue to monitor nitrate levels on a regular schedule.

Nitrates are an issue for public drinking water systems drawing ground water from alluvial sources, especially in areas subject to contamination by runoff from cultivated areas where nitrogen fertilizers used. Over fertilization of domestic lawns can also contribute to accumulations in ground water. The Town of Torrington, located about 20 miles down stream from Fort Laramie, was required to install a complex and expensive water treatment system because of elevated nitrate levels in water drawn from the same North Platte River alluvium that supplies Fort Laramie.

G. EXISTING SYSTEM DEFICIENCIES

Storage Capacity

Storage capacity for municipal water systems is determined in part by DEQ requirements for construction and operation of public water systems. Before a public water system can be constructed or rehabilitated, the plans for such work must be reviewed and approved. If the plans meet the regulations and standards, DEQ issues a Permit to Construct. DEQ rules, Chapter XII, Design

and Construction Standards for Public Water Systems, Section 13, Finished Water Storage, must be considered when recommending storage capacity.

Paragraph (a) (i) (B) of Section 13 states that: “Water systems serving from 50,000 to 500,000 gallons on the average daily demand shall provide system storage capacity equal to the average daily demand plus fire storage, based on recommendations established by the State Fire Marshall or local fire agency.”

The State Fire Marshall’s Office recommends that storage for a small municipality should provide fire flows of 1500 gpm for two hours at 20 psi, plus the Average Day Demand (ADD). Meeting the fire storage recommendation would require 180,000 gallons of storage, plus the ADD estimated at 35,000 to 50,000 gallons.

An exception to DEQ regulations is provided in Paragraph (a)(i)(D) of Section 13: “Storage need not be provided in a well supply system where a minimum of two wells are provided and the maximum hour demand or fire demand, which ever is greater, can be supplied with the largest well out of service.” Each of the existing wells is capable of delivering 500 gpm into the system. This capability would reduce the fire flow required from storage to 1000 gpm for two hours, which could be provided by 120,000 gallons in storage.

Limitations in the Fort Laramie supply, storage, transmission, and distribution system could preclude total compliance with the most restrictive of these standards. Lou Harmon, the Senior Engineer in charge of reviewing plans for municipal water system construction, said DEQ would give full credit for the pumping capacity of the Town’s wells plus the recommended storage capacity. Harmon cautioned that total storage should not exceed five to six days of winter consumption to avoid stagnation and other water quality problems. He agreed that 150,000 gallons of storage was a reasonable compromise between the requirements for fire flow storage and the water quality issues associated with storage in excess of five to six days of demand.

Transmission Line Between Wells and Storage Tank

A single line conveys water from the wells to the tank and from the tank to the distribution system. At any time, the line may be feeding the tank or delivering water into the distribution system. See the Water Treatment section above for a discussion of chlorination and water quality issues that above would be solved by two lines between the wells and the tank. The single line forces the system to operate in a way that prevents the system from consistent compliance with EPA water treatment regulations.

Line sizing

With the exception of the 730 LF of 8" PVC installed in 2003, lines in the existing system are undersized and do not meet current industry standards and DEQ requirements.

Condition of pipes

The condition of the AC lines installed in 1962, which comprise about 85% of the total system, is unknown. Evaluation of line integrity was not included in the scope of work for this study. The amount of water loss in the system would be one indication of the condition and remaining useful life of existing pipes, however incomplete records precluded an estimate of leakage losses.

System Pressure

System pressures and flows are inadequate to meet fire flow standards. As noted in Section 1, the ISO conducted a Public Protection Classification (PPC) survey of Fort Laramie's fire suppression system in 2005. The ISO reported flows in some cases less than half of the recommended level. Residual pressure

was at or below the recommended level of 20 PSI at four of the five test locations.

The results of the ISO Hydrant Flow Tests are summarized below:

HYDRANT FLOW DATA SUMMARY							
			FLOW GPM	**PRESSURE PSI**		**FLOW AT 20 PSI**	
TEST NO.	**TYPE DISTRICT**	**TEST LOCATION**		**STATIC**	**RESIDUAL**	**NEEDED**	**AVAIL.**
1	Comm.	100 Fire House Road	580	45	18	750	550
2	Comm.	Otis Street and Brooke Ave.	820	55	34	2250	1100
3	Comm.	Merriam St and Laramie Ave	650	52	20	1250	650
4	Comm.	Highway 160 and Pioneer Court	530	55	18	750	500
5	Resid.	Fort Street and Lawton Ave.	530	58	10	1000	550

The Town also receives consumer complaints about low pressure at some points of use. Inadequate pressure may be attributed to several factors, including system head loss in undersized transmission or distribution lines, dead end lines, system bottlenecks caused by mismatched line sizes, and inadequate elevation of the Town's storage tank.

System Leaks

No determination of water loss in the system could be made because of the discrepancies in records of production and use. While some water loss can be expected, losses of more than 10% indicates excessive leakage which should be corrected. According to Town officials, no leak testing has been performed on the system.

Record Keeping

Records of water production and use are an important contribution to efficient management of a municipal water system. The lack of complete and accurate

records was an impediment to this study process and to developing recommendations for system improvements.

Point of Use Meter Freezing

A Maintenance Supervisor reported removing 42 meters that have frozen and cracked the housing since the meters were installed in 2003. This situation is caused in part because meters are plumbed in near the top of the meter pit and are not insulated.

Easement Agreement for Tank and Transmission Line

The storage tank is located on private property approximately 2,800 feet north of the Town's wells. In 1962, the Town negotiated an Easement Agreement with the landowner "…for the construction, installation, maintenance, and operation of municipal water storage tank and a municipal water transmission pipe line together with all necessary fixtures, equipment, and appurtenances upon the following described real property, to wit: SW¼ SW¼ of Section 14 Township 26 North Range 64 West of 8th P.M., Goshen County, State of Wyoming."

As a condition of the easement agreement, the Town agreed to "…furnish the grantors a standard ¾ inch connection on such facilities and further agrees to furnish to grantors, without charge, water for domestic and livestock watering purposes. It is specifically understood that no water will be furnished through said tap for irrigation."

The landowner who is party to the easement agreement recently denied a request from the Town to construct security fencing around the storage tank. The landowner also declined an offer from the Town to purchase three acres of land encompassing the tank site.

While the easement agreement is not a technical system deficiency, the conflict between the Town and the landowner could delay or even prevent construction of a replacement tank or transmission lines in the present location. As of the date of this report, the Town has initiated condemnation proceedings to obtain title to a portion of the 40-acre easement sufficient for project construction.

An additional easement problem is that a portion of the transmission line between the tank and the wells is located in the NW1/4NW1/4 of Section 23 and is not covered in the Easement Agreement. (See Appendix D.)

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● SECTION 3 ●

ANALYSIS OF ALTERNATIVES

INTRODUCTION

This Section will discuss the alternatives available for improvements to the Fort Laramie's water supply system. Both the Town's priorities and the deficiencies identified during this study will be addressed.

A. WATER SUPPLY

The Town initially expressed an interest in incorporating the Fort Laramie #3 well into the water system. Flow tests on the existing #1 and #2 wells verified that these two wells are adequate to meet existing and future demands. Connecting the #3 well to the system would not add a significant supply. According to permit documents, the #3 well was completed with 5" plastic casing and a 2½" brass cylinder was installed and pumped by a windmill. Production from the well was estimated at 2 gpm. The cost of connecting the #3 well would outweigh any benefit. No alternative supply is required for the Town to continue to provide reliable water service to consumers.

B. STORAGE TANK

The Town's existing storage tank is in excellent condition, but the capacity does not meet recommendations for fire storage plus one day's average demand. The height of the existing tank contributes to problems with pressures for fire flows and working service pressures at some locations in the system.

As noted in Section 2, 150,000 gallons of storage would meet capacity requirements without compromising water quality during periods of low demand.

The following definitions apply to storage facility alternatives discussed in this report:

Conventional Tank: A storage tank that is relatively short in relation to its diameter. The Town's existing tank is 20' in diameter and 21.5' in height and is an example of a convention tank as the term is used in this report.

Standpipe: A storage tank that is taller than its diameter. The technical definition of a standpipe includes other uses and configurations such as small storage units for residential or industrial applications. One of the alternatives evaluated in this report is a standpipe 70' tall and 20' in diameter. This tank would contain the 150,000 gallons need to meet DEQ regulations and fire storage requirements.

Elevated Tank: A storage tank on a raised platform or pedestal, the "golf ball on a tee" configuration. An elevated tank is often used in areas where no hills or bluffs are available to provide sufficient elevation to pressurize a water system.

The Town has three viable alternatives to obtain the recommended amount of storage and increase pressure available to the distribution system.

1. Decommission and remove the existing tank and construct a standpipe at the current location.

2. Decommission the existing tank and construct a standpipe on the knoll directly west across the County road from the tank's present location. This location has not been surveyed for elevation. An estimate taken from the U.S. Geological Survey Fort Laramie Quadrangle map of the area indicates that the west site would be about 10' lower than the existing site. A standpipe at either site would increase pressure entering the distribution system.

Construction of a storage tank on the alternative site would require negotiation of an easement, right-of-way agreement, or purchase contract with the landowner for the tank and pipeline (s).

3. Decommission the existing tank and build an elevated storage tank on property owned by the Town, possibly at the park directly across the street from the wells. An elevated tank at this location would make additional pressure available to the system and allow the Town to abandon the 6" AC transmission line between the tank and the wells.

There is no provision in the easement agreement between the Town and the landowner requiring removal of the existing tank and pipeline if the Town selects an alternative location. However, the tank may have salvage value and its removal may be a step in mending the Town's relationship with the landowner.

C. TRANSMISSION LINES

There are two segments of transmission lines to be considered. The first is the transmission line between the tank and the wells. This 6" AC line is approximately 2800 LF in length and was installed in 1962 when the storage tank was constructed. The condition and remaining useful life of the line is unknown. One of the priorities listed by the Town is replacement of the old line and adding a second line. Using one line to both fill the tank and provide water to the system creates problems with chlorine residual and contact time. When the wells are feeding chlorinated water directly into the distribution system, some customers close to the wells may receive excessive levels of chlorine but inadequate contact time. When the wells are pumping water to the tank, chlorine residuals in the system may be insufficient to maintain adequate water quality.

The second segment of transmission lines serve as the framework for the Town's distribution system. There is approximately 11,000 LF of 6" AC transmission

pipe along the following streets: Otis, Bliss, Brooke, Lawton, Miles, State, Merriam, and Laramie from Bliss to South Street (Refer to Plate 1). Laramie Street north of Bliss is included in the measurement for the line between the wells and the tank. The Fort Laramie system cannot be adequately evaluated because the Town has been unable to generate the necessary production and use records required to establish water use parameters. Therefore, the effects on transmission mains and distribution lines of increasing system pressures by raising the operating elevation of the storage tank cannot be ascertained. Because the AC pipe is now almost 50 years old, an increase in pressure could induce failures at multiple locations.

Three options are available to the Town to address the pressure issue.

1. Replace all 11,000 LF of existing 6" AC pipe with 8" PVC. The ability of the existing pipe to withstand an increase in system pressure is unknown and cannot readily be determined. The pipe is almost 50 years old and the structural integrity may vary at different locations within the system.

2. Accumulate 12 consecutive months of accurate water production and use data so the system can be modeled to determine the impacts of increased pressure on the distribution system. Even if system pressures can be accurately predicted, the capacity of the pipe to withstand increased pressure cannot easily be determined.

3. Install a pressure-reducing valve (PRV) between the new storage tank and the distribution system, or place PRVs at selected locations in the distribution system. The PRVs should be adjusted to keep the pressure in the system at present levels until the AC pipe is replaced.

D. DISTRIBUTION SYSTEM

In addition to the 11,000 LF of 6" AC lines discussed above, there is about 6,000 LF of 4" or smaller AC distribution lines remaining in system. While replacing these small lines is not a high priority for the Town, 4" and smaller lines contribute to inadequate fire flows, residual pressures, and low pressure at points of use.

E. ALTERNATIVES TO UPGRADE SYSTEM STORAGE AND DISTRIBUTION

ALTERNATIVE A

Replace the existing tank with a taller 150,000-gallon standpipe at or near the existing location.

The advantages of this alternative are:

1. A standpipe is less expensive than an elevated tank.

2. This alternative would place the new tank at the best available elevation in reasonable proximity to the wells and distribution system and would allow continued use of the transmission line to Town in its present location and configuration.

There several disadvantages to placing a new tank at or near the existing site:

1. The existing site is not owned or exclusively controlled by the Town. See comments in Section 2 regarding the Easement Agreement for the tank and transmission line.

2. Cost and availability of the site across the road is unknown.

3. If two transmission lines are constructed to resolve system operational issues, the total cost is about the same as an elevated tank in the Town Park.

4. A taller tank would increase pressure in distribution system. The impact of increased pressures on system components is unknown.

5. The Town has initiated condemnation proceedings to obtain access to a portion of the property described in the Easement Agreement. Condemnation proceedings can be lengthy and may delay or even prevent construction of a new storage tank at the present location.

ALTERNATIVE B

Decommission the existing tank and construct a 150,000 gallon elevated tank in Town Park. This alternative has the two advantages over other alternatives:

1. Eliminates requirement for 5600 LF of transmission lines between the wells and the storage tank.

2. Could be constructed on property already owned by the Town, eliminating the need to purchase or condemn land for tank and pipelines.

Alternative B has one disadvantage:

1. An elevated tank is more expensive to service and maintain than a standpipe or conventional tank.

ALTERNATIVE C

Replace existing line between wells and tank with two 8" PVC lines. The advantages of this alternative include:

1. The potential for an interruption in water service due to a failure of the existing 50-year-old AC pipes would be eliminated.

2. Two lines between the wells and tank would enhance the effectiveness of disinfection procedures by allowing chlorine feed into the line supplying the tank. Chlorine contact time and chlorine residuals could be more closely controlled, ensuring that water delivered to end users meets Safe Drinking Water Act requirements.

The disadvantage of Alternative C is:

1. Construction of new lines would require either purchase of property and rights of way, or a binding easement agreement with a landowner

ALTERNATIVE D

Replace 11,000 LF of 6" AC transmission mains in the distribution system with 8" PVC. The advantage of this Alternative is that a weak component of the Town's distribution system would be corrected.

The disadvantage is that replacing the AC pipe in one project represents a substantial expense. However, the Town could take advantage of financing available now and avoid maintenance expenses as the AC pipe deteriorates over time.

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● SECTION 4 ●

COST OPINIONS

INTRODUCTION

This Section will provide cost opinions for system improvements prioritized by the Town. Cost opinions are conservative and expressed in 2008 dollars.

A factor of 10 to 15% or more should be added annually to accommodate inflation occurring between the date of this report (June, 2008) and the anticipated date of bidding the construction work. For example, suppliers of storage tanks contacted for cost estimates during this study reported that steel prices doubled between December 2007 and June 2008.

Cost opinions in this section are intended for use in comparing alternative construction projects, establishing options for project financing, and determining water system revenues necessary to support improvements.

As per the requirements of the contract, costs eligible for WWDC funding have been identified.

A. IMPROVEMENTS PRIORITIZED BY THE TOWN OF FORT LARAMIE

The Town expressed three priorities for system upgrade:

1. Storage. Increase the amount of water storage from the existing 50,000 gallons to 150,000 gallons to meet average day demand and fire flow requirements.

2. Transmission. Replace the line from the wells to the tank with two new 8" lines. This upgrade would also resolve problems with chlorination contact time and residuals. These lines would not be necessary if an elevated tank is constructed in the Town Park.

3. System Pressure. Increase system operating pressure to enhance fire flows and resolve customer complaints. Undersized pipes in the system, dead end lines, and inadequate tank height are major contributors to low pressure.

B. ALTERNATIVE SYSTEM UPGRADE COST OPINIONS

ALTERNATIVE A. Construct a 150,000-gallon standpipe tank at or near the existing tank.

TABLE 4.1

ALTERERNATIVE A - CONSTRUCT NEW 150,000-GALLON TANK AT EXISTING SITE

ITEM NO.	ITEM	UNIT	QTY	UNIT PRICE	SUBTOTAL	ELIGIBLE	NON-ELIGIBLE
1	PERFORMANCE BOND	LS	1	$5,940.00	$5,940.00	$5,940.00	
2	CONTRACTOR TESTING	LS	1	$5,000.00	$5,000.00	$5,000.00	
3	POTHOLING UTILITIES	EA	5	$500.00	$2,500.00	$2,500.00	
4	TRAFFIC CONTROL	LS	1	$500.00	$500.00	$500.00	
5	MOBILIZATION	LS	1	$30,000.00	$30,000.00	$30,000.00	
6	EASEMENTS/LAND PURCHASE	LS	1	$10,000.00	$10,000.00	$10,000.00	
7*	150K GALLON STANDPIPE	LS	1	$275,000.00	$275,000.00	$275,000.00	
8	MISCELLANEOUS FITTINGS	LS		$15,000.00	$15,000.00	$15,000.00	
9	SCADA RETRO FIT	LS	1	$5,000.00	$5,000.00	$5,000.00	
10	SECURITY FENCING/GATES	LF	400	$20.00	$8,000.00	$8,000.00	
11	GEOTECH ANALYSIS	LS	1	$5,000.00	$5,000.00	$5,000.00	
12	PRESSURE REDUCING VALVE	LS	1	$15,000.00	$15,000.00	$15,000.00	
13	SALVAGE EXISTING TANK	LS	1	$25,000.00	$25,000.00	$25,000.00	
	COST OF PROJECT COMPONENTS				**$376,940.00**	**$376,940.00**	**$0.00**
	ENGINEERING (10%)				$37,694.00	$37,694.00	$0.00
	SUBTOTAL				**$414,634.00**	**$414,634.00**	**$0.00**
	CONTINGENCY (25%)				$103,658.50	$103,658.50	$0.00
	TOTAL CONSTRUCTION COSTS				**$518,292.50**	**$518,292.50**	**$0.00**
	FINAL PLANS AND SPECIFICATIONS (20%)				$103,658.50	$103,658.50	
	PERMITTING AND MITIGATION				$7,500.00	$7,500.00	$0.00
	LEGAL FEES				$25,000.00	$25,000.00	$0.00
	TOTAL PROJECT COST				**$654,451.00**	**$654,451.00**	**0.00**
	TOWN PORTION 33% OF TOTAL PROJECT COST					**$215,968.83**	
	WWDC PORTION 67% OF TOTAL PROJECT COST					**$438,482.17**	

***Cost is for a 20'x70' glass-lined steel standpipe**

ALTERNATIVE B. Construct a 150,000-gallon elevated tank at the Town Park.

TABLE 4-2

ALTERNATIVE B - CONSTRUCT 150,000 GALLON ELEVATED TANK AT TOWN PARK

ITEM NO.	ITEM	UNIT	QTY	UNIT PRICE	SUBTOTAL	ELIGIBLE	NON-ELIGIBLE
1	PERFORMANCE BOND	LS	1	$11,742.00	$11,742.00	$11,742.00	
2	CONTRACTOR TESTING	LS	1	$5,000.00	$5,000.00	$5,000.00	
3	POTHOLING UTILITIES	EA	5	$500.00	$2,500.00	$2,500.00	
4	TRAFFIC CONTROL	LS	1	$500.00	$500.00	$500.00	
5	MOBILIZATION	LS	1	$50,000.00	$50,000.00	$50,000.00	
6	150K GALLON ELEVATED	LS	1	$600,000.00	$600,000.00	$600,000.00	
7 (1)	WATERMAIN 8" PVC	LF	800	$46.00	$36,800.00	$36,800.00	
8	MISCELLANEOUS FITTINGS	LS		$20,000.00	$20,000.00	$20,000.00	
9	SCADA RETROFIT	LS	1	$15,000.00	$15,000.00	$15,000.00	
10	GEOTECH SITE ANALYSIS	LS	1	$5,000.00	$5,000.00	$5,000.00	
11	PRESSURE VALVE (PRV)	LS	1	$15,000.00	$15,000.00	$15,000.00	
12	SECURITY FENCING/GATES	LF	400	$20.00	$8,000.00	$8,000.00	
13	SALVAGE EXISTING TANK	LS	1	$25,000.00	$25,000.00	$25,000.00	
				COST OF PROJECT COMPONENTS	**$794,542.00**	**$794,542.00**	**$0.00**
				ENGINEERING (10%)	$79,454.20	$79,454.20	$0.00
				SUBTOTAL	**$873,996.20**	**$873,996.20**	**$0.00**
				CONTINGENCY (25%)	$218,499.05	$218,499.05	$0.00
				TOTAL CONSTRUCTION COSTS	**$1,092,495.25**	**$1,092,495.25**	**$0.00**
				FINAL PLANS AND SPECIFIACTIONS (20%)	$218,499.05	$218,499.05	
				PERMITTING AND MITIGATION	$7,500.00	$7,500.00	$0.00
				LEGAL FEES	$5,000.00	$5,000.00	$0.00
				TOTAL PROJECT COST	**$1,323,494.30**	**$1,323,494.30**	**0.00**
				TOWN PORTION 33% OF TOTAL PROJECT COST		**$ 436,753.12**	
				WWDC PORTION 67% OF TOTAL PROJECT COST		**$ 886,741.18**	

(1) Assumes tank located in Town Park across street from wells

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ALTERNATIVE C. Construct two 8" PVC lines between the wells and a new tank at or near the existing tank site.

TABLE 4.3

ALTERNATIVE C - REPLACE 6" LINE FROM TANK TO WELLS WITH TWO 8" LINES

ITEM NO.	ITEM	UNIT	QTY	UNIT PRICE	SUBTOTAL	ELIGIBLE	NON-ELIGIBLE
1	PERFORMANCE BOND	LS	1	$6,084.00	$6,084.00	$6,084.00	
2	CONTRACTOR TESTING	LS	1	$5,000.00	$5,000.00	$5,000.00	
3	POTHOLING UTILITIES	EA	5	$500.00	$2,500.00	$2,500.00	
4	TRAFFIC CONTROL	LS	1	$500.00	$500.00	$500.00	
5	MOBILIZATION	LS	1	$50,000.00	$50,000.00	$50,000.00	
6	WATER MAIN 8" PVC	LF	5600	$46.00	$257,600.00	$257,600.00	
7	MISC. FITTINGS AND VALVES	LS	1	$20,000.00	$20,000.00	$20,000.00	
8	EASEMENTS/LAND PURCHASE	LS	1	$50,000.00	$50,000.00	$50,000.00	
9	GEOTECH SITE ANALYSIS	LS	1	$20,000.00	$20,000.00	$20,000.00	
10	HYDRANTS	EA	3	$3,500.00	$10,500.00	$0.00	$10,500.00
11	18" BORES UNDER CANAL	LF	400	$325.00	$130,000.00	$130,000.00	
	COST OF PROJECT COMPONENTS				**$552,184.00**	**$541,684.00**	**$10,500.00**
	ENGINEERING (10%)				$55,218.40	$54,168.40	$1,050.00
	SUBTOTAL				**$607,402.40**	**$595,852.40**	**$11,550.00**
	CONTINGENCY (25%)				$151,850.60	$148,963.10	$2,887.50
	TOTAL CONSTRUCTION COSTS				**$759,253.00**	**$744,815.50**	**$14,437.50**
	FINAL PLANS AND SPECIFIACTIONS (20%)				$151,850.60	$148,963.10	$2,887.50
	PERMITTING AND MITIGATION				$7,500.00	$7,500.00	$0.00
	LEGAL FEES				$25,000.00	$25,000.00	$0.00
	TOTAL PROJECT COST				**$943,603.60**	**$926,278.60**	**$17,325.00**
	TOWN PORTION 33% OF TOTAL PROJECT COST					**$305,671.94**	
	WWDC PORTION 67% OF TOTAL PROJECT COST					**$620,606.66**	

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ALTERNATIVE D. Replace the existing 6" AC transmission mains in the Town system with 8" or larger PVC lines. Cost opinions are based on 8" lines.

TABLE 4.4

ALTERNATIVE D - REPLACE ALL 6" ASBESTOS-CEMENT LINES IN DISTRIBUTION SYSTEM

ITEM NO.	ITEM	UNIT	QTY	UNIT PRICE	SUBTOTAL	ELIGIBLE	NON-ELIGIBLE
1	PERFORMANCE BOND	LS	1	$10,965.00	$10,965.00	$10,965.00	
2	CONTRACTOR TESTING	LS	1	$5,000.00	$5,000.00	$5,000.00	
3	POTHOLING UTILITIES	EA	5	$500.00	$2,500.00	$2,500.00	
4	TRAFFIC CONTROL	LS	1	$10,000.00	$10,000.00	$10,000.00	
5	MOBILIZATION	LS	1	$50,000.00	$50,000.00	$50,000.00	
7	WATERMAIN 8" PVC	LF	11000	$46.00	$506,000.00	$506,000.00	
8	MISC. VALVES/FITTINGS	LS		$100,000.00	$100,000.00	$100,000.00	
9	GEOTECH ANALYSIS	LS	1	$5,000.00	$5,000.00	$5,000.00	
10	VALVES AND HYDRANTS	EA	15	$3,500.00	$52,500.00	$0.00	$52,500.00
				COST OF PROJECT COMPONENTS	**$741,965.00**	**$689,465.00**	**$52,500.00**
				ENGINEERING (10%)	$74,196.50	$68,946.50	$5,250.00
				SUBTOTAL	**$816,161.50**	**$758,411.50**	**$57,750.00**
				CONTINGENCY (25%)	$204,040.38	$189,602.88	$14,437.50
				TOTAL CONSTRUCTION COSTS	**$1,020,201.88**	**$948,014.38**	**$72,187.50**
				FINAL PLANS AND SPECIFICATIONS	$211,000.00	$211,000.00	
				PERMITTING AND MITIGATION	$7,500.00	$7,500.00	$0.00
				LEGAL FEES	$5,000.00	$5,000.00	$0.00
				TOTAL PROJECT COST	**$1,243,701.88**	**$1,171,514.38**	**72,187.50**
				TOWN PORTION 33% OF TOTAL PROJECT COST		**$ 386,599.74**	
				WWDC PORTION 67% OF TOTAL PROJECT COST		**$ 784,914.63**	

C. SUMMARY OF ALTERNATIVES

The cost opinions above are for system upgrades which would address the priorities established by the Town. Because inadequate records prevented a complete analysis of system operating conditions, there is no guarantee that any combination of the alternatives described above would resolve all operating issues. In particular, providing adequate pressure throughout the system could require extensive modeling to determine a workable solution which might require replacing the 4" and smaller lines in the distribution system with 6" or 8" pipe.

The Table 4.5 below summarizes the cost and WWDC eligibility of system improvements.

TABLE 4.5

SUMMARY OF PROJECT ALTERNATIVES AND COSTS

ALTERNATIVE	CONSTRUCTION COST	WWDC ELIGIBLE	WWDC INELIGIBLE
A. Standpipe at existing site	$654,451.00	$654,451.00	$0.00
B. Elevated tank at Town park	$1,323,494.30	$1,323,494.30	$0.00
C. Two new lines, wells to tank	$943,603.60	$943,603.60	$17,325.00
D. Replace 6" AC with 8" PVC	$1,243,701.88	$1,171,514.38	$72,187.50

The following section, “Economic Analysis, Ability to Pay, and Project Financing,” assesses the Town’s financial situation and evaluates rate structures required to retire the debt associated with the construction options in Table 4.5. In addition, rate increases to establish funds for emergencies and major maintenance/repairs are calculated.

● SECTION 5 ●

ECONOMIC ANALYSIS, ABILITY TO PAY, PROJECT FINANCING

INTRODUCTION

Calculations addressing various aspects of the Town's fiscal situation were difficult to make because financial information supplied by the Town was incomplete and difficult to interpret.

In addition, there were discrepancies between the budget data the Town provided for this study and the fiscal information the Town submitted to the Wyoming Department of Audit. For example, the Town reported to the Department of Audit that it had no outstanding debt in fiscal 2006 or 2007, but the Town's budget information for 2005 through 2008 shows a loan payment of $22,000 annually under expenses for water. The State Loan and Investment Board confirmed that the Town has an outstanding Drinking Water Loan for $270,501.31 with an annual payment of $17,351.88.

A. ECONOMIC ANALYSIS

Preparing a detailed analysis of Fort Laramie's financial status was complicated because the Town did not provide records of actual income and expenditures. Instead, a budget summary was supplied in which total annual expenses were reported to be about $38,000 including $22,000 for a loan payment. These expenses did not include any allocation for overhead or for Town employees who spend some portion of their time on water system work.

The budget summary reported annual water system revenues of approximately $50,000. For the purpose of this report, it was assumed that this amount covers

all current operating expenses including debt retirement, personnel costs, overhead, administration, and materials. However, it is does not appear that the Town budget contains any provision to set funds aside for water system repairs or maintenance. The budget documents show an allocation to an emergency fund, but it is not specifically earmarked for the water system.

B. ABILITY TO PAY

As with most small municipalities, Fort Laramie's ability to pay for improvements is limited by the size of its consumer base. The Town reported 175 active water service accounts. Major capital improvements will require a substantial increase in water rates even if favorable financing packages are available from the WWDC or other sources.

In addition, WWDC's new project prioritization criteria requires applicants for funding to demonstrate the ability to repay construction loans and to fund reserve accounts sufficient to cover emergencies, major system maintenance, and repairs. This requires a rate structure which makes the system self-supporting and generates dedicated repair and maintenance accounts derived from water system revenues.

C. PROJECT FINANCING

WWDC's future funding decisions will be based on a detailed analysis of the Town's rate structure and system financing. In many cases, water systems are subsidized from the municipality's general fund or by grants and low interest loans from government agencies. WWDC will give a priority to assisting communities with self-sufficient systems.

As a test case for WWDC's new project criteria, funding options were developed that move Fort Laramie toward a self-supporting system. The calculations used

to arrive at water rates for the Town are displayed in the tables at the end of this Section.

Table 5.1

Table 5.1, "Costs and Loan Amounts for Priority Alternatives," was created to display construction cost opinions of various project alternatives, WWDC loan amounts, and the increase in the base water rate required to accommodate debt service. For the purposes of this report, it was assumed that the WWDC funding package would be a grant for 67% of the construction cost and a loan for the remainder for 30 years at 4%. At the time construction funding is requested, WWDC has the option of recommending other grant and loan conditions.

Table 5.1 is organized as follows:

Column 1. Alternatives to address the water system issues prioritized by the Town.

Column 2. Construction cost opinions for the prioritized alternatives. Costs are in 2008 dollars. 10% to 15% should be added to these estimates annually until the option is ready to bid.

Column 3. Amount of a WWDC loan for 33% of the total construction cost.

Column 4. The annual payment to retire a WWDC loan for the amount in Column 3.

Column 5. The monthly water rate increase necessary to pay WWDC loan. The amount in Column 4 is divided by 175 water service accounts and 12 months to calculate the increase.

Table 5.2

Table 5.2, “Emergency and Major Repair Funding – Eligible and Non Eligible Non Priority Components,” was created to calculate emergency and major repair/maintenance fund contributions for project components not identified by the Town as a priority for construction. Eligibility determination was based on WWDC project criteria and input from the WWDC project manager.

Table 5.2 is organized as follows:

Column 1. Displays components of the Fort Laramie water system which could reach the end of service life in the 20-year planning window. If the Town does not replace the 11,000 LF of existing 6” AC pipe as shown under Alternative D on Table 5.1, then it is assumed that 50% of 6” AC lines will be replaced over 20 years. The cost to replace 6,000 LF of 4” and smaller AC lines is included in the non eligible section.

Column 2. Contains the cost opinion for the component in Column 1.

Column 3. Shows the loan amount for components eligible for WWDC assistance. While the 6” AC pipe could be considered transmission lines and eligible for WWDC assistance, replacement would have to be organized as a project. Piecemeal installation of new line segments due to leaks or other failures would be considered routine maintenance and ineligible for WWDC funding.

Column 4. Shows the annual payment to retire a WWDC loan for the amount shown in Column 3.

Column 5. Displays the increase in the base water rate required to repay a loan for components eligible for WWDC funding. It is unknown if WWDC loans or grants would be available when the component

requires replacement. However, water rate increase is used as a factor in recommending the Town's contribution to the major maintenance and repair fund. See explanation for Columns 7 and 8, below.

Column 6. $0.60 is the recommended increase in water rates to create an Emergency Fund using WWDC criteria of 2.5% of the system's annual budget of $50,000. When the final base water rate for the alternative or alternatives is calculated, the $0.60 would be added only once. This contribution will generate $1,250 annually, which may be insufficient given the age of most of the Town's system.

Column 7. This column represents the amount added to the base rate to accumulate a sinking for the total construction cost for this component over 20 years. For simplicity, it was assumed that inflation would be offset by compounding interest in the fund. Note that the total rate increase is $32.59 above the base rate and does not include the increase necessary to repay a loan for prioritized improvements. This column is included for information only.

Column 8. Contains the recommended increase of the existing base rate to create the emergency and major maintenance and repair funds. This column assumes that the Town would support the maintenance/repair fund with a rate increase equivalent to the amount necessary to repay a WWDC loan for 33% of construction costs. If the Town increases the water rate by the amounts in this column ($18.88) and puts the revenue in the major maintenance/repair fund, they would accumulate approximately 40% of the construction cost for WWDC eligible items over 20 years. For non eligible items, the recommended increases would accumulate 100% of construction costs. The column total is carried into Table 5.3, except for those options including replacement of all

the 6" AC pipes in the distribution system as part of the initial project. For those alternatives, the major maintenance/repair fund amount is decreased from $18.88 to $12.63. All calculations assume that the effects of inflation on construction costs will be offset by the interest accumulated in the funds.

Table 5.3

Table 5.3, "Estimates of Rates for Debt Service and Emergency/Major Maintenance Funds," consolidates the information in Tables 5.1 and 5.2. Table 5.3 shows the total base rate required to repay construction loans and support the accounts recommended by WWDC for major maintenance/repair and emergency funds. These estimated rates address only WWDC guidelines. Other funding agencies may have additional water rate or system financing requirements.

Table 5.3 is organized as follows:

Column 1. Lists the system alternatives required to meet the priorities established by the Town at the beginning of this study. The second section lists combinations of alternatives.

Column 2. Gives the cost opinion for the alternative or combination of alternatives.

Column 3. Displays the water rate increase necessary to repay a WWDC loan for 33% of the total construction cost at 4% for 30 years.

Column 4. $0.60 is the recommended increase in water rates to create an emergency fund using WWDC criteria of 2.5% of the system's annual budget.

Column 5. The major maintenance and repair fund portion of the base water rate is intended to accumulate resources to replace system components, make significant repairs, and perform expensive maintenance tasks. As displayed in Table 6.2, the calculated major maintenance and repair fund is $12.63 if the Town replaces all the 6" AC pipe in an initial project and $18.88 assuming 50% will be replaced in the 20-year planning period.

Column 6. This column is the sum of columns 3, 4, and 5. This total is the recommended increase in the base water rate for the project option in Column 1.

Column 7. This is the Town's current base rate for use between 1,000 and 11,999 gallons per month.

Column 8. This column is the sum of columns 6 and 7. This is the total estimated base water rate for 11,999 gallons required to retire a WWDC loan, create an emergency fund, and generate a major maintenance/repair fund. The recommended water rates may create "sticker shock" as the Town considers moving from an average water bill of $25.00 to a monthly base rate between $44.00 and $58.00. An increase of this magnitude will encounter resistance from system customers and possibly Town officials. Water consumers will have difficulty accepting the reality of paying the actual costs of operating their water system. However, it is WWDC's intention to require municipalities seeking State financial assistance to demonstrate that the water utilities are supported by the rate structure.

D. CONDITIONS FOR WWDC FUNDING

Because Fort Laramie was unable to provide accurate water production and use data for analysis during the Level II Study, WWDC made future construction grants and loans contingent on the Town meeting the following performance measures:

1. The Town must accumulate 12 consecutive months of accurate and consistent well production and water use records. Town personnel are responsible for reviewing records monthly to ensure that anomalies in water system operation and data reporting have been resolved. These records must be provided to WWDC for use in possible future pre-design evaluation and analysis.

2. The Town must meet WWDC criteria requiring ownership or exclusive control of real property where system improvements are to be constructed. The existing easement agreement does not provide the required level of exclusive control. Some Federal funding agencies require outright ownership of project sites.

3. The Town must adopt a rate structure that:

   - Covers normal system operating expenses including personnel, water treatment, pumping costs, retirement of existing debt, etc.

   - Generates enough revenue to repay project construction loans for proposed system improvements.

   - Maintains an emergency fund and a major maintenance/repair fund to pay for future major repairs and replacement of system

components such as hydrants, valves, and well pumps over the projected life cycle of the component.

This report contains recommendations for a rate structure that meets the above requirements.

The Town should provide the WWDC with documentation that the above conditions are being met well in advance of the August 1, 2009 deadline for requesting WWDC funding in the 2010 cycle.

E. ASSUMPTIONS USED CALCULATE WATER RATE RECOMMENDATIONS

The following additional assumptions were made to facilitate calculating water rates:

1. The Town will request WWDC funding for a project option that addresses the priorities defined by elected officials during the course of the study. Refer to Table 5.1 to compare costs of alternatives and combinations.

2. In addition to the components prioritized by the Town, other system elements will likely require replacement in the 20-year planning window specified by WWDC. These components include the 6" AC transmission lines, the 4" and smaller pipes in the distribution system, the wells, the well pumps, and the SCADA system. Regular maintenance of the storage tank is also included. Elements eligible for WWDC funding have been identified.

3. Several factors contribute to the recommended base rate. The rate must address paying the WWDC loan for project construction, supporting an emergency fund, and maintaining a major maintenance/repair fund.

4. WWDC recommends that contributions to the emergency fund be calculated at 1% to 2.5% of the Town's total water budget. Assuming

system revenues of $50,000, the emergency fund require a $0.60 increase in the base water rate and would accumulate $1,250 annually. This amount may be insufficient for even minor emergencies. The Town replaced two well pumps and motors in a 10-day period in June of 2008 at a cost of almost $20,000. Since a relatively small amount is accrued using 2.5% of the water system budget, the Town may consider making a larger payment to the emergency fund.

5. The life cycle of newly constructed system components is expected to exceed the 20-year planning window, so the only major maintenance repair fund contribution recommended was routine maintenance of the storage tank.

6. Calculations for the emergency fund and the major maintenance and repair fund assume inflation will be offset by compounding interest in the two accounts.

It is unlikely that the worst-case scenario will occur and all system components not constructed under the next project phase fail simultaneously. Because the need for funds from the emergency and major maintenance/repair is likely to occur over time, the Town could implement a gradual increase in rates beginning immediately and continuing until recommended rate levels are reached. This approach would ease the impact of increased water rates on residents.

F. FUNDING SOURCES

Wyoming municipalities are fortunate that several different agencies have grant and loan funds available to assist with infrastructure improvements.

In addition to the WWDC grant and loan package, the Town may be eligible for funding assistance from these agencies to defray its share of construction costs.

1. The Rural Utilities Service (RUS) of United States Department of Agriculture. Contact: Alana Cannon, 307-233-6709. RUS provides loans, grants, and loan guarantees for drinking water, sanitary sewer, solid waste, and storm drainage facilities in rural areas and cities and towns of 10,000 or less. Eligibility for funding and loan/grant conditions is dependent on average family income in the community seeking assistance. RUS may require a community to meet a certain level of indebtedness to qualify for assistance and pass a bond election to secure the loan. Communities must take a loan from RUS in order to qualify for a grant.

2. State Loan and Investment Board (SLIB). Contact: Rob Tompkins, 307-777-6629. The State Legislature has allocated to Wyoming Counties grant and loan funds previously available directly to municipalities. SLIB still administers the State Revolving Loan Fund (see below).

3. State Revolving Loan Fund (SRF). Contact: Brian Mark, 307-777-6371. Fort Laramie is included in SRF Intended Use Plan and therefore eligible to receive a 20 year loan at 2.5% interest from this source. No grant funds are available from SRF. To compare SRF annual payments for a water system loan with WWDC, assume a $400,000.00 loan from each lender. The annual payment to SRF would be $25,658.85. A WWDC loan would require an annual payment of $23,132.00. The SRF advantage is apparent over the term of the loan in that total payment of principal and interest to SRF would be $513,177.00 while the total WWDC payment would be $693,960.00, a difference of $180,783.00.

4. Wyoming Business Council. Contact: Susan Flobeck, 777-2813. The Business Council administers the Community Development Block Grant program (CDBG) which makes grants for water system improvements.

There is a limited amount of funding available and the applicant must meet income guidelines to be eligible for assistance.

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COSTS AND LOAN AMOUNTS FOR PRIORITY ALTERNATIVES

1. PRIORITY ALTERNATIVE	2. TOTAL CONSTRUCTION COST	3. WWDC ELIGIBLE AMOUNT	3. TOWN'S SHARE WITH 33% WWDC LOAN	4. ANNUAL WWDC LOAN PAYMENT (1)	5. WATER RATE INCREASE TO PAY WWDC LOAN (2)
A 150,000 gallon tank at present location	$654,451.00	$654,451.00	$215,968.83	$12,489.48	$5.95
B 150,000 gallon elevated tank at Town Park	$1,323,494.30	$1,323,494.30	$436,753.12	$25,257.43	$12.03
C Replace existing line to tank with two 8" PVC	$943,603.60	$926,278.60	$305,671.94	$17,677.01	$8.42
D Replace 6" AC lines with 8" PVC	$1,243,701.88	$1,171,514.38	$386,599.75	$22,357.06	$10.65

COSTS AND LOAN AMOUNTS FOR COMBINATIONS

A, C, and D New tank at existing location, two lines, and replace All 6" AC	$2,841,756.48	$2,752,243.98	$908,240.51	$52,523.55	$25.01
A and C 150,000 gallon tank and two 8" PVC lines to wells	$1,598,054.60	$1,580,729.60	$527,358.02	$30,497.11	$14.52
B and D Elevated Tank, Replace Remaining 6" PVC	$2,567,196.18	$2,495,008.68	$823,352.86	$47,614.50	$22.67

(1) Assumes loan for Town's share for 30 years at 4%.
(2) Annual payment divided by 12 months and 175 service accounts

TABLE 5.1
CONSTRUCTION COST OPINIONS AND WWDC LOAN AMOUNTS

EMERGENCY AND MAJOR REPAIR FUNDING - ELIGIBLE NON PRIORITY COMPONENTS

1. SYSTEM COMPONENT	2. TOTAL CONSTRUCTION COST	3. TOWN'S SHARE WITH 33% WWDC LOAN	4. ANNUAL WWDC LOAN PAYMENT	5. WATER RATE INCREASE TO PAY WWDC LOAN	6. WATER RATE INCREASE EMERGENCY FUND	7. WATER RATE INCREASE IF TOWN FUNDS 100%	8. RECOMMENDED RATE INCREASE ABOVE BASE RATE
Replace 50% of existing 6" AC pipe with 8" PVC	$621,850.00	$193,299.88	$11,178.53	$5.32	$0.60	$14.81	$5.92
Replace #1 well with new construction	$350,000.00	$115,500.00	$6,679.37	$3.18		$8.33	$3.18

EMERGENCY AND MAJOR REPAIR FUNDING, NON ELIGIBLE NON-PRIORITY COMPONENTS

Replace remaining 4" and smaller lines	$240,000.00	Not eligible	NA	NA		$5.71	$5.71
Replace two well pumps and appurtenances	$20,000.00	Not eligible	NA	NA		$0.48	$0.48
Replace/upgrade well and tank control system	$15,000.00	Not eligible	NA	NA		$0.36	$0.36
Routine tank maintenance (Three year interval)	$70,000.00	Not eligible	NA	NA		$1.67	$1.67
Replace 30% of fire hydrants	$52,000.00	Not eligible	NA	NA		$1.24	$1.24
EMERGENCY AND MAJOR MAINTENANCE/REPAIR RATE INCREASES						**$32.59**	**$18.56**

Calculations assume that inflation will be offset by compounding interest in the maintenance and sinking funds

TABLE 5.2
EMERGENCY AND REPAIR FUND CALCULATIONS

ESTIMATES OF RATES FOR DEBT SERVICE AND EMERGENCY/MAJOR MAINTENANCE FUNDS

1 SYSTEM COMPONENT ALTERNATIVES	2 CONSTRUCTION COST	3 RATE INCREASE, WWDC LOAN	4 RATE INCREASE, EMERGENCY FUND (1)	5 RATE INCREASE, MAJOR MAINTENANCE AND REPAIR	6 INCREASE IN BASE RATE FOR THIS ALTERNATIVE	7 CURRENT BASE WATER RATE FOR 12,000 GALLONS	8 TOTAL ESTIMATED BASE WATER RATE 12,000 GALLONS
A New 150,000 tank, existing location	$654,451.00	$5.95	$0.60	$18.88	$25.43	$19.00	$44.43
B Elevated 150,000 tank	$1,323,494.30	$12.03	$0.60	$18.88	$31.51	$19.00	$50.51
C Two PVC lines between tank and wells	$943,603.60	$8.58	$0.60	$18.88	$28.06	$19.00	$47.06
D Replace all 6" AC transmission lines with 8" PVC	$1,243,701.88	$10.65	$0.60	$12.63	$23.88	$19.00	$42.88

ESTIMATES OF RATES FOR COMBINATIONS OF COMPONENTS

A, C and D New tank at existing location, 2 lines to tank and all 6" AC replaced	$2,841,756.48	$25.17	$0.60	$12.63	$38.40	$19.00	$57.40
A and C New tank at existing location and 2 new lines to tank	$1,598,054.60	$14.52	$0.60	$18.88	$34.00	$19.00	$53.00
B and C Elevated tank, replace all 6" ACP transmission lines	$2,567,196.18	$22.68	$0.60	$12.63	$35.91	$19.00	$54.91

(1) Add to base rate only once.

TABLE 5.3
ESTIMATES OF RATES FOR DEBT SERVICE AND REPAIR FUNDS

● SECTION 6 ●

OPERATION, MAINTENANCE, AND MANAGEMENT ISSUES

INTRODUCTION

This Section examines management of Fort Laramie's water system.

A. WATER PRODUCTION AND USE RECORDS

The absence of accurate data on water use and water production posed a major difficulty in evaluating the Town's water system for future upgrades. This lack of information prevented a thorough analysis of the system. If this data were available, the Town could use it to more efficiently manage its system and determine the amount of water losses, if any. A monthly comparison of water pumped from the wells and water metered out to users would give early warning of problems, such as leaks in the distribution or water loss through the well pumps or drop pipes.

B. MAINTENANCE RECORDS

The Town has no procedure in place for recording either regular system maintenance or replacement of system components. For example, no information was available concerning when the well pumps were installed. Pump manufacturer, horsepower rating, or other specifications could not be determined. Since both pumps were replaced in the spring of 2008, this information is now available to the Town and should be maintained future reference. No data was available on leak repairs or other routine system upkeep. Inadequate records of point-of-use meter replacement contributed to discrepancies in water use records.

Accurate records of system maintenance would help the Town budget and plan for future repairs and replacement rather than responding as component failures occur.

There are no water system operating manuals, as-built plans, or meter calibration records available. The Town's operator must learn how to work the system through on-the-job experience, trial and error, and information from past system operators.

C. FISCAL RECORDS AND BUDGET

The fiscal records and budget data provided by Fort Laramie for this study did not contain enough information to determine whether or not the current rate structure is sufficient to cover expenses and make the system self supporting. When asked for fiscal information, the Town did not provide records of actual income and expenditures, but instead submitted a budget summary for three fiscal years.

The major water system expense in the budget information is an annual loan payment of $22,000. However, the Annual City and Town Financial Reports submitted to the Wyoming Department of Audit for fiscal 2006 and 2007 says the Town has no long-term outstanding debt. The fiscal 2006 report shows $9,406 under the line item "Bonds retired, or long-term loans repaid during this fiscal year." The 2007 report shows this same amount under the same line item but in a column headed "Sewer Utility." Under the same line item for bonds retired or loans repaid, the 2007 report shows $31,456 under the "Water Utility" column.

Rebecca Webb of the State Loan and Investment Board confirmed that the Town received a loan for water system improvements on August 8, 2002 in the amount of $270,501.31 for 20 years at 2.5% interest. The annual payment is $17,351.88, and as of June, 2008 the Town had an outstanding balance of $249,057.88. The

difference of $4,648.12 between the annual payment and the budget item for $22,000 is not explained.

If the $22,000 loan payment is subtracted from of the Town's budget for "Water" for 2007-08, water system expenses are $16,000. This budget amount does not include any allocation for personnel, power, or overhead costs. The Maintenance Supervisor is the water system operator and the Town Clerk/Treasurer maintains water use records and generates water bills, so some portion of staff time should be debited to the water account.

Water system income for 2006-07 is budgeted at $49,100, the bulk of which is $42,000 from water user fees. Rough calculations based on the Town's rate structure and estimated water use indicates this is probably a relatively accurate figure. The Department of Audit Reports shows "Water Utility Charges" for 2006 at $48,925, and $49,715 for fiscal 2007.

The 2007-08 Income Budget contains line items for "Rainy Day Account," ($30,000) and "Emergency Funds" ($10,000). These accounts may be available for major water system repair and replacement, but are not earmarked as such.

D. CERTIFICATION OF WATER SYSTEM OPERATORS

The Town is required to have a primary and back-up operator certified as Level I Water System Operators. The Town recently hired a new system operator, and should ensure that their operators receive appropriate training to meet certification requirements.

E. WATER RATES

The Town's current water rates are $19.00 for the first 1000 gallons, then no charge beyond the base rate for the next 10,999 gallons. Usage beyond that

point is charged at the rate of $1.00 per 1000 gallons. Using fiscal data submitted by the Town, it is impossible to determine if this rate covers water system operating expenses. As noted above, there is no verification that the Town maintains a dedicated account for emergencies or for major maintenance and repairs. See Section 7 for recommended changes in the water rate structure.

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● SECTION 7 ●

RECOMMENDATIONS

INTRODUCTION

In the course of this study of Fort Laramie's water system, numerous deficiencies were identified in both physical infrastructure and management practices. Management deficiencies prevented detailed analysis of the system and are indicative of the need for improved operational practices. This section will recommend improvements to both infrastructure and system management.

A. STORAGE

Storage capacity should be increased to 150,000 gallons. The option of an elevated tank in the Town Park across from the wells would eliminate problems associated with the current tank site and the single transmission line between the wells and tank.

B. TRANSMISSION LINES

If the Town elects to pursue construction of a new storage tank at or near the present site, the single transmission line should be replaced with dual lines to solve the disinfection problems caused by the single line.

C. DISTRIBUTION SYSTEM

The Town should address two issues in the distribution system. The estimated 6,000 LF of 4" and smaller lines should be prioritized for replacement. Although system pressures could not be analyzed, it is likely that these smaller lines are

contributing to low pressures that restrict fire suppression capability and result in consumer complaints.

The remaining 11,000 LF of 6" AC transmission pipe in the Town's system should be scheduled for replacement over the next few years. The lines are almost 50 years old and condition is unknown. An increase in system pressure from a taller tank or a booster pump may damage these pipes. In addition, these lines are undersized according to current water system standards and are likely to be restricting system pressure.

D. RECORD KEEPING

The Town should take the steps necessary to ensure that accurate records of well production and point of use demands are maintained. Accomplishing this task may include purchase of a service contract with MicroComm and Black Mountain to provide upgrades to system software, regular training to Town personnel, and technical assistance in resolving operational difficulties.

Accurate and complete water system records are important for several reasons:

1. By comparing the amount of water the system produces to the water metered to end users, system managers can determine the extent of system losses. If more than 10% of the water produced is not metered out, a leak detection program should be conducted to locate and eliminate leaks.

2. Before major changes are made to system components or operating practices, the system should be modeled to determine the impact of the changes on transmission mains, distribution system, pressures, etc.

3. Water system managers need to know how the system is working to minimize operation and management costs and to use available resources efficiently.

The Town should implement a procedure to track and record routine system maintenance, repairs, and replacements. The Town should establish a schedule for replacement of hydrants and valves.

Attempts to determine the financial status of the Town's water system was handicapped by discrepancies between the budget information provided for the study and the forms submitted to the Wyoming Department of Audit. A complete audit of the Town's fiscal records and bookkeeping practices by an independent third party is recommended.

E. TRAINING FOR SYSTEM PERSONNEL

Many of the management and system operation deficiencies identified in Section 5 could be addressed by providing additional training to system personnel. The Maintenance Supervisor should receive the training necessary for certification as Level One Water System Operator as soon as possible. Chapter 5 of DEQ Regulations requires Fort Laramie to have a certified chief operator and a certified back-up operator.

Town personnel should take advantage of the technical assistance available from Black Mountain Software and Micro-Comm for operation and maintenance of the utility billing and SCADA systems.

Assistance in accounting, budgeting, and fiscal management is available at no cost from State Agencies, the Wyoming Association of Municipalities, and the Wyoming Association of Rural Water Systems. See Subsection M. "Resources" below for a more detailed description of available technical assistance.

F. WATER RATES

Best management practices for municipal water systems suggest that fixed costs should be covered by the base rate and variable costs by the incremental rates for use above the base amount. Examples of fixed costs are debt retirement, personnel salary and benefits, insurance, vehicle depreciation/loan payments, annual training, water quality testing, etc. Fixed costs covered by the base rate should also include contributions to a reserve fund for the routine maintenance of the system and for a repair and replacement fund that accumulates sufficient revenues to repair or replace major system components. Variable costs fluctuate based on the amount of water produced and other factors. Examples are power for pumps, water purchase (if applicable), and disinfection materials.

Fort Laramie's current water rate structure includes a base amount of $19.00 which allows consumers to use up to 11,999 gallons per month. There is a $1.00 charge for each additional 1000 gallons with no upper limit. If the Town decides to pursue any of the major system upgrades described in this report, the WWDC may require the Town to demonstrate the ability to make loan payments from the base rate. This increase in the base rate would be an opportune time for the Town to adopt a progressive rate structure that would encourage water conservation, reduce waste, decrease operating costs, and position the Town to keep its water system self-supporting.

It is recommended that the Town adopt a rate structure similar to the following example:

Base rate for 11,999 gallons:	$19.00
12,000 to 14,999 gallons	$1.00 per 1000
15,000 to 17,999 gallons	$1.25 per 1000
18,000 to 20,999 gallons	$1.50 per 1000
Above 21,000 gallons	$2.00 per 1000

This rate structure assumes no changes in the Town's current debt. If the Town elects to pursue any of the major system improvements discussed in this report, the recommended increase in the base rates displayed in Table 5.3 (following section 5) should be implemented.

The Town reported total water utility income of $48,925 for the fiscal year ending June 30, 2006. Assuming this income is primarily water rate revenue from 175 active taps, the average monthly water bill for 16,000 gallons a month is approximately $23.29. A substantial increase in water rates will be required regardless of the construction option selected. It is recommended that the Town begin an immediate but gradual increase in water rates in anticipation of the revenue that will be required to support system upgrades.

G. WATER TREATMENT

Disinfection of the Town's water supply is compromised by the single line between the wells and the storage tank. Unfortunately, there is no technical or mechanical solution that can be implemented while decisions are pending on the future configuration of the storage tank and transmission lines. In the absence of an interim solution, the water system operator must be relied on to diligently monitor chlorine concentrations delivered to users. Construction alternatives that would resolve this problem will not be in place before 2010 or 2011

H. SYSTEM SECURITY

The Town should take steps to protect the integrity of its water system from malicious damage and accidental contamination. Because the Town's two wells are only 50 feet apart, any spill or other surface contamination could affect both wells. The well buildings should be enclosed with security fencing and a secure locking gate. Town staff should be trained in the handling of hazardous materials and directed to keep those materials away from the well area. A specific area

should be designated for the handling of pesticides, petroleum products, and other materials that might pose a risk to the water supply.

The Town's storage tank is vulnerable to damage and to the introduction of foreign material into the tank itself. The tank should be protected with security fencing. If such fencing is installed, the area enclosed should be large enough to accommodate the service trucks needed to work on the tank.

I. LEAK DETECTION PROGRAM

Because no determination could be made of system losses, the Town should conduct a leak detection program to determine where water loss is occurring. A leak detection program is relatively inexpensive and the expense is recouped through savings in pumping and disinfection costs if significant system losses are identified and corrected.

J. SERVICE AND MAINTENANCE CONTRACTS

Service contracts are available from both Micro-Comm and Black Mountain Software. These contracts cover replacement of system components and technical assistance beyond that currently available at no charge from these vendors. Coverage provided by these contracts would protect the Town from a lightning strike, power surge, or other major mishap which could cost more in component replacement than the annual contract amount.

K. PROTECTION OF METER PITS

The Town should take measures to insulate meters and meter pits to prevent freezing. Many municipalities install the same fiberglass batting used for residential construction. Wrapping the meter body and filling the meter pit with this material would reduce the incidence of meters freezing and cracking.

L. REHABILITATION OF IRRIGATION SYSTEM

Fort Laramie pays an annual fee to divert water from the Fort Laramie Canal to supply a surface water irrigation system that serves a portion of the Town. Elected officials have expressed a concern that an increase in water rates require to pay for system improvements may cause residents to discontinue lawn watering at the expense of the overall appearance of the community. Sections of the irrigation system are in disrepair, limiting or preventing water delivery. The Town should consider restoring the system to provide raw water for lawn maintenance. Continued use of surface water for irrigation would also protect the Town's water right.

M. RESOURCES

A variety of agencies and organizations can provide technical assistance to Fort Laramie at no cost or for a moderate charge.

1. Wyoming Association of Municipalities (WAM). Contact: Ginger Newman, 307-632-0398. WAM sponsors workshops and an annual convention to provide information on key municipal policy and management issues. Publications available from WAM include Handbooks for Mayors and Council Members, Handbook for Clerks and Treasurers, and a Budget Preparation Handbook. WAM's professional staff can provide answers to specific questions and can refer local officials to other sources of information or assistance. WAM can also hold workshops or staff retreats on site to deal with specific local issues.

2. Wyoming Association of Rural Water Systems (WARWS). Contact: Jim Van Dorn, 306-436-8636. WARWS offers a variety of water system management assistance and training for small water systems. The Association has a circuit rider program that provides one-on-one on-site

technical assistance on a variety of water system operation and maintenance topics.

3. Wyoming Department of Environmental Quality (DEQ) Contacts: Brian Mark, 307-777-6371. The State Revolving Fund provides financing for water system rehabilitation and repair. Lou Harmon, 307-777-7088. Mr. Harmon reviews permits for construction of public water system improvements, and can provide guidance regarding DEQ rules and regulations addressing system operation. Kim Parker, 307-777-6128. Ms. Parker coordinates training and certification of water system operators.

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● SECTION 8 ●

REFERENCES

"*Contract Documents, Town of Fort Laramie Water System Improvements, Baker and Associates, September 2002"*

"Custom Soil Resource Report for Goshen County, Wyoming, Northern Part; and Goshen County Wyoming, Southern Part." Fort Laramie Area. USDA Natural Resources Conservation Service. May, 2008.

"*Micro-Comm Radio Telemetry & Controls Engineering Data Submittal for Fort Laramie, WY, July 2002."*

Platte Goshen Regional Master Plan Level I Study, Lidstone and Associates, Inc., September, 2004."

"*Proposal for Water Supply System, Town of Fort Laramie, Burke Moving and Storage, April 1962".*

"*Town of Fort Laramie, Wyoming Water System Master Plan and Environmental Assessment, Baker and Associates, July 31, 2001."*

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• APPENDIX A •

Water Production and Use Records

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Ft. Laramie Pump Calculations, 10/06

Daily Production is total runtime x Average GPM x 60 minutes

Date	Runtimes		Av GPM		Daily Prod
10/1/2007	1.4	1.2	332.58	60	51,882
10/2/2007	1.3	1.4	370.00	60	59,940
10/3/2007	0.9	1.2	342.92	60	43,208
10/4/2007	0.9	0.9	378.95	60	40,927
10/5/2007	0.8	0.8	325.79	60	31,276
10/6/2007	0.8	0.9	328.00	60	33,456
10/7/2007	0.8	0.8	347.22	60	33,333
10/8/2007	1.0	0.9	391.05	60	44,580
10/9/2007	0.8	0.4	339.29	60	24,429
10/10/2007	0.4	0.8	394.17	60	28,380
10/11/2007	0.4	0.4	351.11	60	16,853
10/12/2007	0.9	0.4	386.15	60	30,120
10/13/2007	0.4	0.4	350.00	60	16,800
10/14/2007	0.5	0.8	326.67	60	25,480
10/15/2007	0.9	0.4	355.00	60	27,690
10/16/2007	0.4	0.4	308.00	60	14,784
10/17/2007	0.5	0.4	384.44	60	20,760
10/18/2007	0.4	0.4	348.89	60	16,747
10/19/2007	0.4	0.4	307.00	60	14,736
10/20/2007	0.4	0.8	356.15	60	25,643
10/21/2007	0.4	0.1	307.00	60	9,210
10/22/2007	0.4	0.4	391.25	60	18,780
10/23/2007	0.8	0.4	363.08	60	26,142
10/24/2007	1.0	0.4	385.71	60	32,400
10/25/2007	0.4	0.7	376.36	60	24,840
10/26/2007	0.5	0.4	384.44	60	20,760
10/27/2007	0.5	0.8	354.29	60	27,635
10/28/2007	0.9	0.4	337.33	60	26,312
10/29/2007	0.5	0.8	355.71	60	27,745
10/30/2007	0.5	0.4	384.44	60	20,760
10/31/2007	0.8	0.4	361.54		26,031

Calculated Well Production: **861,637**

Metered usage reported:

Discrepancy **Incomplete records**

Ft. Laramie Pump Calculations, 11/06

Date	Runtimes		Av GPM		Daily Prod
11/1/2006	0.4	0.4	310.00	60	14,880
11/2/2006	0.4	0.8	325.71	60	23,451
11/3/2006	0.4	0.4	390.00	60	18,720
11/4/2006	0.5	0.4	347.00	60	18,738
11/5/2006	0.8	0.4	360.00	60	25,920
11/6/2006	0.5	0.8	360.00	60	28,080
11/7/2006	0.5	0.4	384.44	60	20,760
11/8/2006	0.4	0.4	341.11	60	16,373
11/9/2006	0.5	0.4	388.89	60	21,000
11/10/2006	0.3	0.4	331.25	60	13,913
11/11/2006	0.5	0.4	338.00	60	18,252
11/12/2006	0.4	0.4	390.00	60	18,720
11/13/2006	0.5	0.4	336.00	60	18,144
11/14/2006	0.5	0.4	339.00	60	18,306
11/15/2006	0.5	0.4	382.22	60	20,640
11/16/2006	0.8	0.0	314.00	60	15,072
11/17/2006	0.5	0.4	332.73	60	17,967
11/18/2006	0.4	0.4	306.00	60	14,688
11/19/2006	0.7	0.5	318.00	60	22,896
11/20/2006	0.4	0.9	336.43	60	26,242
11/21/2006	0.4	0.8	391.67	60	28,200
11/22/2006	0.8	0.5	356.43	60	27,802
11/23/2006	0.4	0.4	306.00	60	14,688
11/24/2006	0.6	0.4	310.77	60	18,646
11/25/2006	0.5	0.4	391.11	60	21,120
11/26/2006	0.5	0.4	381.11	60	20,580
11/27/2006	0.5	0.4	371.11	60	20,040
11/28/2006	0.4	0.4	346.67	60	16,640
11/29/2006	0.4	0.4	386.25	60	18,540
11/30/2006	0.4	0.4	340.00	60	16,320

Calculated Well Production: **595,338**

Metered usage reported:

Discrepancy **Incomplete records**

Ft. Laramie Pump Calculations, 12/06

Date	Runtimes		Av GPM		Daily Prod
12/1/2006	0.5	0.4	380.00	60	20,520
12/2/2006	0.5	0.4	376.67	60	20,340
12/3/2006	0.0	0.4	387.50	60	9,300
12/4/2006	0.4	0.4	386.25	60	18,540
12/5/2006	0.8	0.4	328.57	60	23,657
12/6/2006	0.4	0.8	353.85	60	25,477
12/7/2006	0.8	0.0	345.56	60	16,587
12/8/2006	0.6	0.5	386.36	60	25,500
12/9/2006	0.6	0.4	352.73	60	21,164
12/10/2006	0.5	0.8	382.31	60	29,820
12/11/2006	1.0	1.0	353.81	60	42,457
12/12/2006	0.4	0.3	341.25	60	14,333
12/13/2006	0.9	0.4	383.08	60	29,880
12/14/2006	0.5	0.8	357.86	60	27,913
12/15/2006	0.5	0.4	338.00	60	18,252
12/16/2006	0.8	0.4	333.57	60	24,017
12/17/2006	0.4	0.4	388.75	60	18,660
12/18/2006	0.4	0.8	330.00	60	23,760
12/19/2006	0.5	0.4	336.00	60	18,144
12/20/2006	0.8	0.4	327.86	60	23,606
12/21/2006	0.4	0.8	387.50	60	27,900
12/22/2006	0.9	0.4	355.00	60	27,690
12/23/2006	0.5	0.4	380.00	60	20,520
12/24/2006	0.4	0.8	389.17	60	28,020
12/25/2006	0.4	0.4	335.56	60	16,107
12/26/2006	0.5	0.4	336.00	60	18,144
12/27/2006	0.5	0.1	398.33	60	14,340
12/28/2006	0.5	0.4	376.67	60	20,340
12/29/2006	0.4	0.4	375.00	60	18,000
12/30/2006	0.4	0.4	345.56	60	16,587
12/31/2006	0.4	0.4	336.67	60	16,160

Calculated Well Production: **675,735**

Metered usage reported:

Discrepancy **Incomplete records**

Ft. Laramie Pump Calculations, 01/07

Date	Runtimes		Av GPM		Daily Prod
1/1/2007	0.4	0.4	385.00	60	18,480
1/2/2007	0.0	0.4	385.00	60	9,240
1/3/2007	0.5	0.0	368.00	60	11,040
1/4/2007	0.0	0.4	387.50	60	9,300
1/5/2007	0.4	0.3	303.33	60	12,740
1/6/2007	0.8	0.1	406.25	60	21,938
1/7/2007	0.4	0.4	344.44	60	16,533
1/8/2007	0.5	0.4	336.00	60	18,144
1/9/2007	0.5	0.4	377.78	60	20,400
1/10/2007	0.0	0.4	385.00	60	9,240
1/11/2007	0.4	0.4	382.00	60	18,336
1/12/2007	0.4	0.3	279.00	60	11,718
1/13/2007	0.9	0.4	354.29	60	27,635
1/14/2007	0.5	0.4	376.67	60	20,340
1/15/2007	0.0	0.4	385.00	60	9,240
1/16/2007	0.4	0.4	342.22	60	16,427
1/17/2007	0.5	0.4	351.11	60	18,960
1/18/2007	0.4	0.4	382.50	60	18,360
1/19/2007	0.4	0.4	372.50	60	17,880
1/20/2007	0.4	0.4	383.75	60	18,420
1/21/2007	0.5	0.0	370.00	60	11,100
1/22/2007	0.4	0.4	381.25	60	18,300
1/23/2007	0.5	0.4	375.56	60	20,280
1/24/2007	0.5	0.4	378.89	60	20,460
1/25/2007	0.4	0.4	336.67	60	16,160
1/26/2007	0.4	0.3	337.50	60	14,175
1/27/2007	0.5	0.4	377.78	60	20,400
1/28/2007	0.4	0.5	358.89	60	19,380
1/29/2007	0.4	0.4	342.22	60	16,427
1/30/2007	0.0	0.4	385.00	60	9,240
1/31/2007	0.4	0.4	313.33	60	15,040

Calculated Well Production: **505,332**

Metered usage reported:

Discrepancy **Incomplete records**

Ft. Laramie Pump Calculations, 02/07

Date	Runtimes		Av GPM		Daily Prod
2/1/2007	0.5	0.4	377.78	60	20,400
2/2/2007	4.1	0.4	206.88	60	55,858
2/3/2007	0.3	0.4	370.00	60	15,540
2/4/2007	0.7	0.4	352.50	60	23,265
2/5/2007	1.2	0.4	330.00	60	31,680
2/6/2007	1.6	0.7	370.00	60	51,060
2/7/2007	2.0	0.2	355.65	60	46,946
2/8/2007	0.9	1.1	350.45	60	42,054
2/9/2007	1.6	0.7	350.00	60	48,300
2/10/2007	1.5	0.9	351.48	60	50,613
2/11/2007	1.0	0.8	369.47	60	39,903
2/12/2007	1.3	0.9	367.39	60	48,495
2/13/2007	0.9	0.9	352.00	60	38,016
2/14/2007	0.9	1.4	362.92	60	50,083
2/15/2007	0.9	1.0	380.53	60	43,380
2/16/2007	1.3	0.9	340.00	60	44,880
2/17/2007	1.0	1.3	380.00	60	52,440
2/18/2007	0.9	1.0	379.47	60	43,260
2/19/2007	1.4	0.8	387.73	60	51,180
2/20/2007	1.0	1.2	370.43	60	48,897
2/21/2007	1.0	0.9	360.50	60	41,097
2/22/2007	1.3	0.9	351.67	60	46,420
2/23/2007	0.8	1.2	355.91	60	42,709
2/24/2007	1.4	0.9	338.46	60	46,707
2/25/2007	0.9	1.2	351.30	60	44,264
2/26/2007	0.9	0.8	330.00	60	33,660
2/27/2007	1.4	0.8	369.57	60	48,783
2/28/2007	0.6	0.6	353.64	60	25,462

Calculated Well Production: **1,175,353**

Metered usage reported:

Discrepancy **Incomplete records**

Ft. Laramie Pump Calculations, 03/07

Date	Runtimes		Av GPM		Daily Prod
3/1/2007	0.5	0.9	373.57	60	31,380
3/2/2007	0.4	0.4	342.22	60	16,427
3/3/2007	0.5	0.4	333.00	60	17,982
3/4/2007	0.5	0.4	374.44	60	20,220
3/5/2007	0.5	0.4	333.00	60	17,982
3/6/2007	0.9	0.4	354.29	60	27,635
3/7/2007	0.5	0.9	382.14	60	32,100
3/8/2007	0.9	0.9	359.47	60	38,823
3/9/2007	0.8	0.4	314.00	60	22,608
3/10/2007	0.5	0.8	350.71	60	27,355
3/11/2007	0.4	0.5	343.00	60	18,522
3/12/2007	0.9	0.9	318.70	60	34,420
3/13/2007	0.8	0.4	334.29	60	24,069
3/14/2007	0.8	0.7	337.65	60	30,389
3/15/2007	1.0	0.8	345.00	60	37,260
3/16/2007	0.4	0.9	324.67	60	25,324
3/17/2007	0.9	0.9	365.79	60	39,505
3/18/2007	0.5	0.9	385.00	60	32,340
3/19/2007				60	0
3/20/2007				60	0
3/21/2007				60	0
3/22/2007				60	0
3/23/2007				60	0
3/24/2007				60	0
3/25/2007				60	0
3/26/2007				60	0
3/27/2007				60	0
3/28/2007				60	0
3/29/2007				60	0
3/30/2007				60	0
3/31/2007				60	0

Calculated Well Production: **494,339**

Metered usage reported: **644,222**

Discrepancy **-149,883**

Ft. Laramie Pump Calculations, 4/07

	Runtimes		Av GPM		Daily Prod
4/1/2007	0.4	0.4	343.33	60	16,480
4/2/2007	0.5	0.5	334.00	60	20,040
4/3/2007	0.4	0.8	326.43	60	23,503
4/4/2007	0.5	0.4	335.00	60	18,090
4/5/2007	0.8	0.4	354.62	60	25,533
4/6/2007	0.4	0.8	328.57	60	23,657
4/7/2007	0.5	0.4	376.67	60	20,340
4/8/2007	0.9	0.4	377.69	60	29,460
4/9/2007	0.5	0.7	381.67	60	27,480
4/10/2007	0.5	0.5	386.00	60	23,160
4/11/2007	0.8	0.5	352.86	60	27,523
4/12/2007	0.5	0.7	353.85	60	25,477
4/13/2007	1.0	0.4	352.00	60	29,568
4/14/2007	0.9	0.8	362.78	60	37,004
4/15/2007	1.0	1.3	370.83	60	51,175
4/16/2007	1.0	0.9	378.42	60	43,140
4/17/2007	1.0	0.8	327.62	60	35,383
4/18/2007	1.3	0.8	366.96	60	46,237
4/19/2007	0.4	0.8	351.54	60	25,311
2/20/2007	1.5	0.9	353.85	60	50,954
4/21/2007	1.9	1.4	362.35	60	71,745
4/22/2007	1.3	1.4	336.77	60	54,557
4/23/2007	0.4	0.8	357.69	60	25,754
4/24/2007	0.9	0.4	324.67	60	25,324
4/25/2007	0.5	0.9	386.43	60	32,460
4/26/2007	0.9	0.4	348.57	60	27,188
4/27/2007	0.9	0.8	351.05	60	35,807
4/28/2007	0.8	1.3	353.48	60	44,538
4/29/2007	1.5	1.3	367.93	60	61,812
4/30/2007	1.5	1.5	369.35	60	66,483

Calculated Well Production: **1,045,184**

Metered usage reported: **1,408,920**

Discrepancy **-363,736**

Ft. Laramie Pump Calculations, 5/07

	Runtimes		Av GPM		Daily Prod
5/1/2007	1.3	1.6	349.69	60	60,846
5/2/2007	1.8	1.6	331.62	60	67,650
5/3/2007	0.9	0.4	356.43	60	27,802
5/4/2007	0.9	0.9	336.00	60	36,288
5/5/2007	0.9	0.9	339.00	60	36,612
5/6/2007	0.4	0.8	356.92	60	25,698
5/7/2007	0.9	0.8	345.79	60	35,271
5/8/2007	1.5	0.9	364.40	60	52,474
5/9/2007	0.8	0.8	366.47	60	35,181
5/10/2007	1.5	1.3	368.00	60	61,824
5/11/2007	1.5	2.2	320.00	60	71,040
5/12/2007	1.5	1.4	359.35	60	62,527
5/13/2007	1.8	1.5	369.43	60	73,147
5/14/2007	0.9	1.1	366.67	60	44,000
5/15/2007	2.1	1.8	381.50	60	89,271
5/16/2007	2.0	1.8	355.00	60	80,940
5/17/2007	1.5	2.0	352.82	60	74,092
5/18/2007	2.3	2.2	384.57	60	103,834
5/19/2007	2.7	2.7	378.04	60	122,485
5/20/2007	2.8	2.1	368.49	60	108,336
5/21/2007	1.5	1.8	369.71	60	73,203
5/22/2007	0.9	0.4	352.14	60	27,467
5/23/2007	1.4	1.4	313.89	60	52,734
5/24/2007	2.1	2.4	367.50	60	99,225
5/25/2007	2.5	1.8	360.00	60	92,880
5/26/2007	2.1	2.1	344.38	60	86,784
5/27/2007	2.7	2.6	381.27	60	121,244
5/28/2007	2.8	2.9	378.67	60	129,505
5/29/2007	1.5	1.2	356.33	60	57,725
5/30/2007	2.2	1.9	376.28	60	92,565
5/31/2007	1.5	1.3	376.21	60	63,203

Calculated Well Production: **2,105,007**

Metered usage reported: **1,563,830**

Discrepancy **541,177**

Ft. Laramie Pump Calculations, 6/07

Date	Runtimes		Av GPM		Daily Prod
6/1/2007	2.0	1.3	360.56	60	71,391
6/2/2007	2.1	2.0	375.12	60	92,280
6/3/2007	2.7	2.6	375.18	60	119,307
6/4/2007	3.1	3.2	395.47	60	149,488
6/5/2007	2.7	1.8	351.37	60	94,870
6/6/2007	1.5	1.7	363.43	60	69,779
6/7/2007	1.5	1.0	392.80	60	58,920
6/8/2007	2.2	2.5	361.37	60	101,906
6/9/2007	3.1	2.6	371.15	60	126,933
6/10/2007	3.4	3.3	385.43	60	154,943
6/11/2007	3.5	3.3	381.11	60	155,493
6/12/2007	2.7	2.0	357.31	60	100,761
6/13/2007	2.9	3.1	372.03	60	133,931
6/14/2007	2.7	2.5	367.86	60	114,772
6/15/2007	3.7	3.3	397.57	60	166,979
6/16/2007	2.9	2.5	365.59	60	118,451
6/17/2007	2.6	2.0	380.83	60	105,109
6/18/2007	3.7	3.8	399.73	60	179,879
6/19/2007	3.5	3.0	379.71	60	148,087
6/20/2007	3.8	3.4	369.37	60	164,035
6/21/2007	2.8	3.2	370.00	60	133,200
6/22/2007	3.1	2.6	381.50	60	130,473
6/23/2007	3.4	3.2	384.12	60	152,112
6/24/2007	3.9	3.2	371.03	60	158,059
6/25/2007	4.4	3.3	378.43	60	174,835
6/26/2007	3.9	4.2	388.49	60	188,806
6/27/2007	4.2	3.5	389.49	60	179,944
6/28/2007	3.0	3.2	393.17	60	146,259
6/29/2007	3.6	2.7	388.92	60	147,012
6/30/2007	3.8	4.0	382.93	60	179,211

Calculated Well Production: **4,017,224**

Metered usage reported: **3,173,636**

Discrepancy **843,588**

Ft. Laramie Pump Calculations, 7/07

	Runtimes		Av GPM		Daily prod.
7/1/2007	4.4	3.3	371.90	60	171,818
7/2/2007	4.8	4.2	390.53	60	210,886
7/3/2007	3.7	3.9	386.00	60	176,016
7/4/2007	4.6	3.6	389.00	60	191,388
7/5/2007	3.0	3.3	381.36	60	144,154
7/6/2007	2.9	2.0	382.75	60	112,529
7/7/2007	3.6	3.3	376.22	60	155,755
7/8/2007	5.0	4.2	395.37	60	218,244
7/9/2007	2.1	2.3	365.63	60	96,526
7/10/2007	2.8	2.8	383.73	60	128,933
7/11/2007	2.7	2.1	373.33	60	107,519
7/12/2007	2.9	3.2	376.92	60	137,953
7/13/2007	2.6	2.4	363.21	60	108,963
7/14/2007	3.6	2.8	383.58	60	147,295
7/15/2007	3.8	3.8	393.97	60	179,650
7/16/2007	4.4	3.8	381.84	60	187,865
7/17/2007	3.0	3.1	380.77	60	139,362
7/18/2007	4.0	3.4	361.33	60	160,431
7/19/2007	2.7	3.4	382.81	60	140,108
7/20/2007	3.2	3.6	380.55	60	155,264
7/21/2007	3.5	3.2	385.00	60	154,770
7/22/2007	3.4	3.0	359.45	60	138,029
7/23/2007	3.3	2.5	380.98	60	132,581
7/24/2007	3.6	4.0	370.00	60	168,720
7/25/2007	3.5	2.6	346.44	60	126,797
7/26/2007	2.2	2.4	357.84	60	98,764
7/27/2007	2.1	1.9	377.86	60	90,686
7/28/2007	2.0	1.7	379.23	60	84,189
7/29/2007	2.6	1.9	375.83	60	101,474
7/30/2007	3.3	3.1	374.00	60	143,616
7/31/2007	3.6	4.0	400.39	60	182,578
	3.3	3.1			
Calculated Well Production:					**4,492,864**
Metered usage reported:					**4,985,080**
Discrepancy					**-492,216**

Ft. Laramie Pump Calculations, 8/07

Date	Runtimes		Av GPM		Daily Prod
8/1/2007				60	0
8/2/2007				60	0
8/3/2007				60	0
8/4/2007				60	0
8/5/2007				60	0
8/6/2007				60	0
8/7/2007				60	0
8/8/2007				60	0
8/9/2007				60	0
8/10/2007				60	0
8/11/2007				60	0
8/12/2007				60	0
8/13/2007				60	0
8/14/2007				60	0
8/15/2007				60	0
8/16/2007				60	0
8/17/2007				60	0
8/18/2007				60	0
8/19/2007				60	0
8/20/2007				60	0
8/21/2007	1.5	1.5	361.63	60	65,093
8/22/2007	2.5	1.9	361.63	60	95,470
8/23/2007	1.6	1.4	366.67	60	66,001
8/24/2007	1.6	1.3	353.64	60	61,533
8/25/2007	1.4	1.7	367.35	60	68,327
8/26/2007	2.6	2.1	383.27	60	108,082
8/27/2007	2.9	3.0	362.39	60	128,286
8/28/2007	2.0	2.1	319.20	60	78,523
8/29/2007	2.2	1.9	372.50	60	91,635
8/30/2007	2.5	2.0	365.80	60	98,766
8/31/2007				60	0

Calculated Well Production: **861,717**

Metered usage reported: **2,785,197**

Discrepancy **Incomplete records**

Ft. Laramie Pump Calculations, 9/07

Date	Runtimes		Av GPM		Daily Prod
9/1/2007				60	0
9/2/2007	0.0	0.7	400.00	60	16,800
9/3/2007	2.3	1.9	365.22	60	92,035
9/4/2007	2.2	2.3	384.47	60	103,807
9/5/2007	2.5	1.8	327.17	60	84,410
9/6/2007	1.3	1.8	365.88	60	68,054
9/7/2007	2.0	1.9	375.85	60	87,949
9/8/2007	2.0	1.8	379.00	60	86,412
9/9/2007	1.4	1.3	379.64	60	61,502
9/10/2007	2.1	1.4	374.05	60	78,551
9/11/2007	1.4	1.4	353.55	60	59,396
9/12/2007	2.6	2.3	363.77	60	106,948
9/13/2007	2.0	1.8	372.20	60	84,862
9/14/2007	2.1	1.7	387.95	60	88,453
9/15/2007	1.8	1.9	375.13	60	83,279
9/16/2007	2.0	1.9	378.29	60	88,520
9/17/2007	2.1	1.8	365.00	60	85,410
9/18/2007	2.7	2.4	399.02	60	122,100
9/19/2007	1.7	2.0	371.54	60	82,482
9/20/2007	1.8	1.9	399.73	60	88,740
9/21/2007	2.0	2.0	389.10	60	93,384
9/22/2007	2.6	1.9	364.29	60	98,358
9/23/2007	1.5	1.7	364.57	60	69,997
9/24/2007	1.5	1.5	357.88	60	64,418
9/25/2007	1.4	0.9	372.50	60	51,405
9/26/2007	1.8	1.6	372.22	60	75,933
9/27/2007	1.5	1.3	379.31	60	63,724
9/28/2007	1.6	1.8	372.78	60	76,047
9/29/2007	1.4	1.2	369.64	60	57,664
9/30/2007	1.3	1.3	369.54	60	57,648

Calculated Well Production: **2,278,288**

Metered usage reported: **1,899,891**

Discrepancy **378,397**

Ft. Laramie Pump Calculations, 10/07

Daily Production is total runtime x Average GPM x 60 minutes

Date	Runtimes in hours		Av GPM	Min/hour	Daily Prod
10/1/2007	1.4	1.2	367.86	60	57,386
10/2/2007	0.9	0.5	368.00	60	30,912
10/3/2007	0.9	1.3	350.40	60	29,434
10/4/2007	1.4	1.2	378.53	60	59,051
10/5/2007	1.5	1.3	377.59	60	63,435
10/6/2007	0.8	0.8	395.00	60	37,920
10/7/2007	0.9	0.8	370.00	60	37,740
10/8/2007	1.3	1.4	331.21	60	53,656
10/9/2007					
10/10/2007					
10/11/2007					
10/12/2007					
10/13/2007					
10/14/2007					
10/15/2007					
10/16/2007					
10/17/2007					
10/18/2007					
10/19/2007					
10/20/2007					
10/21/2007					
10/22/2007					
10/23/2007					
10/24/2007					
10/25/2007					
10/26/2007					
10/27/2007					
10/28/2007					
10/29/2007					
10/30/2007					
10/31/2007					

Calculated Well Production: **369,534**

Metered usage reported: **Incomplete records**

Discrepancy

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• APPENDIX B •

Insurance Services Office Report

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111 NORTH CANAL STREET SUITE 950 CHICAGO, IL 60606-7270
TEL: (312) 930-0070 (800) 444-4554 FAX: (312) 930-0017

October 12, 2007

Don Foote, Mayor
Town of Ft Laramie
100 E Bliss St
Ft Laramie, WY 82212

RE: Public Fire Protection
Ft Laramie, Goshen County, WY

Dear Mayor Foote:

We wish to thank you and the other community officials for your cooperation during our recent Public Protection Classification (PPC) survey. ISO is the leading supplier of statistical, underwriting, and actuarial information for the property/casualty insurance industry. Most insurers use the PPC classifications for underwriting and calculating premiums for residential, commercial and industrial properties.

ISO has completed its analysis of the structure fire suppression delivery system provided in your community. We would like to report that the resulting classification is a Class 6. This classification number applies to all properties in the classified area with a needed fire flow of 3,500 gpm or less. The private and public protection at properties in the jurisdiction with larger fire flows is individually evaluated and may vary from the jurisdiction classification. Congratulations on your commitment to serve the needs of your community's property owners and residents.

ISO will advise its subscribing insurers of this classification change within the next 30-days and assign an effective date of February 1, 2008. This date allows insurers the necessary lead time to incorporate the Public Protection Classification change into their policy rating systems.

Enclosed is a summary of the ISO analysis of your fire suppression services. If you would like to know how your community's classification could improve, or if you would like to learn about the potential effect of proposed changes to your fire suppression delivery system, please call us at the phone number listed below.

The PPC program is not intended to analyze all aspects of a comprehensive structure fire suppression delivery system program. It is not for purposes of determining compliance with any state or local law, nor is it for making recommendations about loss prevention or life safety.

If you have any questions about your classification, please let us know.

Very truly yours,

Derrick A. Thomas
Community Mitigation Analyst
(800) 930-1677 x 6209 Fax (312) 930-0038

cc: Pete Howes, Fire Chief

INSURANCE SERVICES OFFICE, INC.

CLASSIFICATION DETAILS

Graded Area: Ft Laramie FPD
County: Goshen State: Wyoming
Date Surveyed: June, 2005 Total Credit: 43.32 Class: 6 / 9 Pop.: 508

RECEIVING AND HANDLING FIRE ALARMS

This section of the Fire Suppression Rating Schedule reviews the facilities provided for the general public to report fires, and for the operator on duty at the communication center to dispatch fire department companies to the fires.

	Credit	
	Actual	Maximum
1. Credit for Telephone Service (Item 414)		
This item reviews the facilities provided for the public to report fires, including the listing of fire and business numbers in the telephone directory.	1.90	2.00
2. Credit for Operators (Item 422)		
This item reviews the number of operators on-duty at the communication center to handle fire calls.	1.50	3.00
3. Credit for Dispatch Circuits (Item 432)		
This item reviews the dispatch circuit facilities used to transmit alarms to fire department members.	2.50	5.00
4. Total Credit for Receiving and Handling Fire Alarms:	5.90	10.00
Relative Classification for Receiving and Handling Fire Alarms:	5	

CLASSIFICATION DETAILS

Graded Area: Ft Laramie FPD
County: Goshen State: Wyoming
Date Surveyed: June, 2005 Total Credit: 43.32 Class: 6 / 9 Pop.: 508

FIRE DEPARTMENT

This section of the Fire Suppression Rating Schedule reviews the engine and ladder-service companies, equipment carried, response to fires, training and available fire fighters.

	Credit	
	Actual	Maximum
1. Credit for Engine Companies (Item 513)		
This item reviews the number of engine companies and the hose equipment carried.	4.42	10.00
2. Credit for Reserve Pumpers (Item 523)		
This item reviews the number of reserve pumpers, their pump capacity and the hose equipment carried on each.	0.00	1.00
3. Credit for Pump Capacity (Item 532)		
This item reviews the total available pump capacity.	5.00	5.00
4. Credit for Ladder-Service Companies (Item 549)		
This item reviews the number of ladder and service companies and the equipment carried.	3.56	5.00
5. Credit for Reserve Ladder-Service Companies (Item 553)		
This item reviews the number of reserve ladder and service trucks, and the equipment carried.	0.39	1.00

Graded Area: Ft Laramie FPD
County: Goshen State: Wyoming
Date Surveyed: June, 2005 Total Credit: 43.32 Class: 6 / 9 Pop.: 508

FIRE DEPARTMENT
(continued)

	Credit Actual	Credit Maximum
6. Credit for Distribution (Item 561)		
This item reviews the percent of the built-upon area of the city which has an adequately-equipped, responding first-due engine company within 1.5 miles and an adequately-equipped, responding ladder-service company within 2.5 miles.	2.20	4.00
7. Credit for Company Personnel (Item 571)		
This item reviews the average number of equivalent fire fighters and company officers on duty with existing companies.	2.78	15.00+
8. Credit for Training (Item 581)		
This item reviews the training facilities and their use.	0.45	9.00
9. Total Credit for Fire Department:	18.80	50.00+
Relative Classification for Fire Department:	7	

+ This indicates that credit for company personnel is open-ended, with no maximum credit for this item.

CLASSIFICATION DETAILS

Graded Area: Ft Laramie FPD
County: Goshen State: Wyoming
Date Surveyed: June, 2005 Total Credit: 43.32 Class: 6 / 9 Pop.: 508

WATER SUPPLY

This section of the Fire Suppression Rating Schedule reviews the water supply system that is available for fire suppression in the city.

	Credit	
	Actual	Maximum
1. Credit for the Water System (Item 616)		
This item reviews the supply works, the main capacity and hydrant distribution.	18.82	35.00
2. Credit for Hydrants (Item 621)		
This item reviews the type of hydrants, and method of installation.	1.80	2.00
3. Credit for Inspection and Condition of Hydrants (Item 631)		
This item reviews the frequency of inspections of hydrants and their condition	1.59	3.00
4. Total Credit for Water Supply:	22.21	40.00
Relative Classification for Water Supply:	5	

Grading Sheet For: Ft Laramie FPD, Wyoming
Goshen County
Public Protection Class: 6 / 9 Surveyed: June, 2005

Feature	Credit Assigned	Maximum Credit
Receiving and Handling Fire Alarms	5.90%	10.00%
Fire Department	18.80%	50.00%
Water Supply	22.21%	40.00%
*Divergence	-3.59%	
Total Credit	43.32%	100.00%

The Public Protection Class is based on the total percentage credit as follows:

Class	%
1	90.00 or more
2	80.00 to 89.99
3	70.00 to 79.99
4	60.00 to 69.99
5	50.00 to 59.99
6	40.00 to 49.99
7	30.00 to 39.99
8	20.00 to 29.99
9	10.00 to 19.99
10	0 to 9.99

*Divergence is a reduction in credit to reflect a difference in the relative credits for Fire Department and Water Supply.

The above classification has been developed for use in property insurance premium calculations.

INSURANCE SERVICES OFFICE, INC.

HYDRANT FLOW DATA SUMMARY

City Ft Laramie
County Goshen State Wyoming Witnessed by: Insurance Services Office, Inc. Date June 6, 2005

TEST NO.	TYPE DIST.*	TEST LOCATION	SERVICE	FLOW - GPM $Q=(29.83(C(d^2)p^{0.5}))$ INDIVIDUAL HYDRANTS			TOTAL	PRESSURE PSI STATIC	PRESSURE PSI RESID.	FLOW -AT 20 PSI NEEDED **	FLOW -AT 20 PSI AVAIL.	REMARKS***
1	Comm	100 Fire House Rd	Main	580			580	45	18	750	550	
2	Comm	Otis St & Brooke Ave	Main	820			820	55	34	2250	1100	(B)-(976 gpm)
3	Comm	Merriam St & Laramie Ave	Main	650			650	52	20	1250	650	(B)-(976 gpm)
4	Comm	Hwy 160 & Pioneer Ct	Main	530			530	55	18	750	500	
5	Res	Fort St & Lawton Ave	Main	530			530	58	20	1000	550	(B)-(976 gpm)

THE ABOVE LISTED NEEDED FIRE FLOWS ARE FOR PROPERTY INSURANCE PREMIUM CALCULATIONS ONLY AND ARE *NOT* INTENDED TO PREDICT THE MAXIMUM AMOUNT OF WATER REQUIRED FOR A LARGE SCALE FIRE CONDITION. THE AVAILABLE FLOWS ONLY INDICATE THE CONDITIONS THAT EXISTED AT THE TIME AND AT THE LOCATION WHERE TESTS WERE WITNESSED.

*Comm = Commercial; Res = Residential.

**Needed is the rate of flow for a specific duration for a full credit condition. Needed Fire Flows greater than 3,500 gpm are not considered in determining the classification of the city when using the Fire Suppression Rating Schedule.

***Available facilities limit flow to gpm shown plus consumption for the needed duration of (B)-2 hours.

PUBLIC PROTECTION CLASSIFICATION

IMPROVEMENT STATEMENTS
FOR
Ft Laramie FPD
Goshen County, Wyoming

Prepared by
INSURANCE SERVICES OFFICE, INC.
111 North Canal St., Ste 950, Chicago, IL 60606
312-930-0070 FAX 800-711-6431

The following statements are based upon the criteria contained in our Fire Suppression Rating Schedule and upon conditions in Ft Laramie FPD, Wyoming during June, 2005. They indicate the performance needed to receive full credit for the specific item in the Schedule, and the quantity you have provided. Partial improvement will result in receiving a partial increase in the credit. These statements relate only to the fire insurance classification of your fire district. They are not for property loss prevention or life safety purposes and no life safety or property loss prevention recommendations are made.

RECEIVING AND HANDLING FIRE ALARMS

Credit For Telephone Service (Item 414).

Actual = 1.90%; Maximum = 2.00%

For maximum credit in the Schedule, both the number to report a fire and the fire department business number should be listed under the name of the fire district in the white pages directory (or government section of the white pages). Your fire number is listed but your business number is not listed under the name of the fire district.

Credit For Operators (Item 422).

Actual = 1.50%; Maximum = 3.00%

For maximum credit in the Schedule, 2 operators are needed on duty at all times. You have an average of 1 operator on duty.

Credit For Dispatch Circuits (Item 432).

Actual = 2.50%; Maximum = 5.00%

For maximum credit in the Schedule, the primary alarm dispatch circuit should be monitored for integrity in accordance with National Fire Protection Association Standard, 1221.

For maximum credit in the Schedule, the alarm dispatch circuit should have an emergency power supply in accordance with National Fire Protection Association Standard, 1221.

Total credit for Receiving and Handling Fire Alarms (Item 440)

Actual = 5.90%; Maximum = 10.00%

FIRE DEPARTMENT

Credit For Engine Companies (Item 513).

Actual = 4.42%; Maximum = 10.00%

For maximum credit in the Schedule, 1 engine company is needed in your fire district.
This is calculated as follows:

1 for the Basic Fire Flow of 750 gpm.

You have 1 engine company in service.
It is calculated as follows:

44 percent for Engine 4 because of insufficient equipment.
Additionally Engine 4 is lacking: a minimum of 1200' of hose carried (of which 800' needs to be 2½ in. or larger), an adequate hose testing program, an adequate pump testing program.

Credit For Reserve Pumpers (Item 523).

Actual = 0.00%; Maximum = 1.00%

For maximum credit in the Schedule, 1 fully-equipped reserve pumper is needed. You have 0 reserve pumpers.

Credit For Pump Capacity (Item 532).

Actual = 5.00%; Maximum = 5.00%

Credit For Ladder And Service Companies (Item 549).

Actual = 3.56%; Maximum = 5.00%

For maximum credit in the Schedule, 1 service company is needed in your fire district.

This is calculated as follows:

1 service company due to method of operation.

You have 1 service company.
This is calculated as follows:

71 percent for Service 1&3 because of insufficient equipment.

Credit For Reserve Ladder And Service Companies (Item 553).

Actual = 0.39%; Maximum = 1.00%

For maximum credit in the Schedule, 1 fully-equipped reserve service truck is needed.
You have 1 reserve service truck.
This is calculated as follows:

38 percent for Service 3 because of insufficient equipment.

Credit For Distribution (Item 561).

Actual = 2.20%; Maximum = 4.00%

For maximum credit in the Schedule, all sections of the fire district with hydrant protection should be within 1½ miles of a fully-equipped engine company and 2½ miles of a fully-equipped ladder, service, engine-ladder or engine-service company. The distance to be measured along all-weather roads.

Credit For Company Personnel (Item 571).

Actual = 2.78%; Maximum = 15.00%

An increase in the average response of fire department members by one person will increase the fire department credit by 0.56.

Credit For Training (Item 581).

Actual = 0.45%; Maximum = 9.00%

For maximum credit in the Schedule, the training program should be improved. You received 5 percent credit for the current training program and the use of facilities.

For maximum credit in the Schedule, pre-fire planning inspections of each commercial, industrial, institutional and other similar-type building should be made twice a year by company members. Records of the inspections should include complete and up-to-date notes and sketches.

Total credit for Fire Department (Item 590)

Actual = 18.80%; Maximum = 50.00%

WATER SUPPLY

Credit For Supply System (Item 616).

Actual = 18.82%; Maximum = 35.00%

For maximum credit in the Schedule, the needed fire flows should be available at each location in the fire district. Needed fire flows of 2500 gpm and less should be available for 2 hours, 3000 and 3500 gpm for 3 hours and all others for 4 hours. See the attached table for an evaluation of fire flow tests made at representative locations in your fire district.

All AWWA standard hydrants within 1000 feet of a building, measured as hose can be laid by apparatus, are credited; 1000 gpm for hydrants within 300 feet; 670 gpm for 301 to 600 feet; and 250 gpm for 601 to 1000 feet. Credit is reduced when hydrants lack a pumper outlet, and is further reduced when they have only a single 2½-inch outlet.

Credit For Hydrants (Item 621).

Actual = 1.80%; Maximum = 2.00%

For maximum credit in the Schedule, all hydrants should: have a 6-inch or larger branch connection.

Credit For Inspection and Condition of Hydrants (Item 631).

Actual = 1.59%; Maximum = 3.00%

For maximum credit in the Schedule, all hydrants should be inspected twice a year, the inspection should include operation and a test at domestic pressure. Records should be kept of the inspections. Hydrants should be conspicuous, well located for use by a pumper, and in good condition.

Total credit for Water Supply (Item 640)

Actual = 22.21%; Maximum = 40.00%

FIRE FLOW TESTS

Ft Laramie FPD, Wyoming

Tests witnessed on June 6, 2005

Test No.	Needed Fire Flow† gpm	Limited By Supply Works, gpm	Limited by Distribution Mains (flow tests), gpm	Limited By Hydrant Spacing, gpm
1	750		550	
2	2250	976	1100	
3	1250	976	650	
4	750		500	
5	1000	976	550	

†Needed fire flows exceeding 3500 gpm are not considered in determining the classification of the municipality

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• APPENDIX C •

Well Permits and Statements of Completion

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WELLHEAD PROTECTION SURVEY

NAME: Town of Fort Laramie
ADDRESS: P.O. Box 177
CITY: Ft. Laramie,
COUNTY: Goshen
PHONE: 837-2711

Contact:
Victor Hasfurther
Wyoming Water Research Center
P.O. Box 3067, University Station
Laramie, WY 82071 (307) 766-2143

Name/# of Ea. Well Serving System - (1 well per line)	Location of Well* (T,R,S, 1/4S)	Well Permit # (if known, optional)	Other Information, Optional (depth, dia. of well, etc.)
Ft. Laramie #1 Well	SW¼NW¼Sec.23 T26N	95	80ft. 24 inches
	R 64 W		
Ft. Laramie #2 Well	SW¼ NW¼ Sec.23	9902	82ft. 16 inches
	T26 N. R 64 W		
Ft. Laramie #3 Well	NE¼ NE¼ sec.22	62637	95 ft. 5 inches
	T 26N.,R64 W.		

*If township, range and sections for well location is not known please describe location as technically as possible.

THE STATE OF WYOMING

Certificate of Appropriation of Ground Water

Proof No. U.W. U-58

Certificate Record No. U.W. 1, Page 58

WHEREAS, Town of Fort Laramie has presented to the Board of Control of the State of Wyoming proof of the appropriation of ground water from the Enlargement Fort Laramie No. 2 Well located in the SW¼NW¼ of Section 23 T. 26 N., R. 64 W., , under Permit , No. U.W. 9902 , for municipal use ~~irrigation of the lands herein described, lying and~~ being in Goshen County, Wy

NOW KNOW YE, That the State Board of Control, under the provisions of the Statutes of Wyoming, has, by an order duly made and entered on the 31st January, A. D. 19 72, in Order Record No. 19, Page 211, determined and established the priority and amount of such appropriation as ows:

Name of Appropriator Town of Fort Laramie ; Mailing Address Fort Laramie 82212, Wyoming;

Date of Appropriation August 4, 1971 ; Total Acreage None ;

Amount of Appropriation 300 gallons per minute; Description ~~of lands to be irrigated and~~ for which this appropriation is determined and established:

TWP.	RANGE	SEC.	NE¼				NW¼				SW¼				SE¼				TOTAL
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
26 N	64 W	22				X	---POINT OF USE								X	----POINT OF USE			
26 N	64 W	23							X	---POINT OF USE									
26 N	64 W	23									X	X	--- POINT OF USE						
																			GOSHEN
			This enlargement is for 300 g.p.m., total including original well Permit No. U. W.																COUNTY
			2066 is 300 g.p.m.																

Water from this well is commingled with water from Well Registration No. U. W. 95 and Permit No. U. W. 2066 for municipal purposes for the Fort Laramie water system.

591101

FILED Apr 24th 1972

RECORDED BOOK 123A PAGE 90

12:02 P.M.

The right to water hereby confirmed and established is limited to ~~irrigation~~ municipal use and the use is restricted to the place where acquired and to the purpose for which acquired and shall not exceed the amount of the appropriation stated above.

IN TESTIMONY WHEREOF, I, FLOYD A. BISHOP, President of the State Board of Control, have hereunto set my hand this 31st day of January, A. D. 19 72, and caused the seal of said Board to be hereunto affixed.

Attest: George L. Christopulos Ex-officio Secretary.

Floyd A. Bishop President.

#2

#2

Form U.W. 8

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

PROOF OF APPROPRIATION AND BENEFICIAL USE OF GROUND WATER

The owner is responsible for submitting Parts I and II of this form. Part III will be prepared by a State Engineer Representative at time of inspection.

PART I

WATER DIVISION 1

~~STATEMENT OF CLAIM~~

PERMIT NO. U.W. ~~2066~~

~~WELL REGISTRATION~~

NAME OF WELL Fort Laramie No. 2

U.W. DISTRICT Lower North Platte

DATE OF PRIORITY Oct. 3, 1967

LOCATION SW ¼ NW ¼ of Section 23

T. 26 N., R. 64 W.

1. Name of Claimant(s) Town of Fort Laramie % Hayden E. Morgan

2. Address Fort Laramie, Wyoming Zip Code 82212

3. For What Purpose(s) is Water Used? Use: Municipal Date First Used: Season 19 71

Use: _____ Date First Used: _____ 19____ Use: _____ Date First Used: _____ 19____

If use is for irrigation, give date irrigation was completed on all lands under this Permit: Season 1971

4. Give legal subdivisions of land owned or controlled by you on which water has been used, and if an appropriation of water for irrigation is claimed, give the acreage which has been irrigated in each legal subdivision in compliance with terms of this permit. Show by abbreviation if water is original (O.S.) or supplemental supply (S.S.) to acreage.

Township	Range	Sec.	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
6	64	22				X									X				
6	64	23							X		X	X							

5. In what county are these lands situated? Goshen

6. The well has been constructed on land owned by: Town of Fort Laramie

7. The water has been used on lands owned by: Town of Fort Laramie

8. What is the quantity of ground water being appropriated for the use and land shown above?

X 1280 Gallons Per Minute or _____ Cubic Feet Per Second

9. If water is supplemental to other rights, describe these rights _____

10. Describe means of conveyance of water Buried Water Mains with connections to Property Owners

THE HILES COMPANY, CHEYENNE 127214

10. Actual cost of well and pumping equipment $2,597 Dollars.

11. If well is for irrigation purposes, and acreage to be served by well differs from lands described in permit, please re-describe lands in space below:

12. Depth at which main zone of water was encountered is 40 feet to 70 feet, and the water bearing formation is Sand and Gravel
(Sand, gravel, shale, clay, limestone, sandstone, etc.)

13. If other water zones were found, give depth to each:
____ feet to ____ feet.
____ feet to ____ feet.

14. LOG OF WELL. (If additional space is needed attach extra sheet).

TYPE OF MATERIAL ENCOUNTERED (Give color and tell whether hard or soft)	DEPTH IN FEET From	DEPTH IN FEET To	Thickness in feet	REMARKS (Especially information as to water found)
Top Soil	0	8	8	
Sand and Gravel	8	12	4	
Chalk rock	12	14	2	
Course Gravel	14	40	26	
Sand and Gravel	40	70	30	
Chalk Rock (loose)	70	74	4	
Sand and Gravel	74	80	6	
Total Depth, 82' - logged to 80'				

REMARKS: ____

(Signed) Wm Thompson

THE STATE OF WYOMING,
County of Laramie } ss.

I hereby certify that the foregoing statement was signed in my presence and sworn to before me by Wm Thompson this 22nd day of January, 19 68

My Commission Expires November 15, 19 70. Florence M Lorau
Notary Public.

Date of Receipt: January 22, 19 68

George L. Christopulos
George L. Christopulos, Deputy State Engineer.

THE STATE OF WYOMING
Certificate of Appropriation of Ground Water

Proof No. U.W. U-56

Certificate Record No. U.W. 1, Page 56

WHEREAS, Town of Fort Laramie has presented to the Board of Control of the State of Wyoming proof of the appropriation of ground water from the Fort Laramie No. 1 Well located in the SW¼NW¼ of Section 23 T.26 N., R. 64 W., , under Well Registration, No. U.W. 95, for municipal use ~~irrigation of the lands hereinafter described, lying and being~~ in Goshen County, Wyoming.

NOW KNOW YE, That the State Board of Control, under the provisions of the Statutes of Wyoming, has, by an order duly made and entered on the 31st day of January, A. D. 1972, in Order Record No. 19, Page 211, determined and established the priority and amount of such appropriation as follows:

Name of Appropriator Town of Fort Laramie; Mailing Address Fort Laramie 82212, Wyoming;

Date of Appropriation December 8, 1950; Total Acreage None;

Amount of Appropriation 825 gallons per minute; Description ~~of land to be irrigated and~~ for which this appropriation is determined and established:

TWP.	RANGE	SEC.	NE¼				NW¼				SW¼				SE¼				TOTAL
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
26 N	64 W	22				X	---POINT OF USE								X	----POINT OF USE			
26 N	64 W	23							X	---POINT OF USE									
26 N	64 W	23									X	X	---POINTS OF USE						

Water from this well is commingled with water from Permit No. U. W. 2066 and Permit No. U. W. 9902 for municipal purposes for the Fort Laramie water system.

GOSHEN FILED April 26 73

COUNTY RECORDED BOOK 233

12:05 P.

The right to water hereby confirmed and established is limited to ~~irrigation~~ municipal use the use is restricted to the place where acquired and to the purpose for which acquired and shall not exceed the amount of the appropriation stated above.

IN TESTIMONY WHEREOF, I, FLOYD A. BISHOP, President of the State Board of Control, have hereunto set my hand this 31st day of January, A. D. 1972, and caused the seal of said Board to be hereunto affixed.

Attest: George L. Christopulos Ex-officio Secretary.

Floyd A. Bishop President.

#1 REGISTRATION OF WELL

FOR

APPROPRIATION AND USE OF UNDERGROUND WATER

(Under Chapter 107, Session Laws of Wyoming, 1947)

DIVISION NO. 1

Leo Erschebek

Fort Laramie, County of Goshen, State of Wyoming, being duly swo
to law upon my oath say:

Name of the registrant: TOWN OF FORT LARAMIE.

Postoffice address of the registrant: Fort Laramie, Wyoming.

Use to which the water has been applied is: Irrigation and Municipal.
(State whether for irrigation, municipal, railway, industrial, domestic, stock)

Name of the well: Fort Laramie No. 1 Well.
(Designate by name and number)

Well is located (700) ft. North and (60) ft. East from (
(Give course and distance)
or W.
at corner of NW/ corner of Section 23 T. 26 N., R. 64 W., and is in the SW¼NW¼
(Describe subdivision)
section 23, T. 26 N., R. 64 W. Or in lot (7) block (3) second addition
Town of Fort Laramie, Fort Laramie, Wyo
Type of well is Dug with sand-bucket
(Drilled, dug, driven or jetted)

Depth of the well is 80 feet. As reported June 1, 1949 As measured 77 ft. June 1,194
Bottom filled with cobbl

Depth to water in the well below land surface is 31 feet. As reported on June 1,1949, 19-
As measured on June 1,1949.

Diameter of well at top is 24 inches, and at bottom 24 inches.

Kind of casing used, if any, is galvanized steel.

Type of pump, if any Turbine, Capacity of pump 600 Gal. per mi
(Centrifugal, turbine, rotary, plunger)

Kind of operation Electric motor. Horsepower of engine or motor 15 horsepower.
(Electrical motor, steam or gasoline engine)

Amount of water claimed cubic feet per second or 1000 gallons per minu

Estimated yield of water per minute 1000 gallo

Cost of well and pumping equipment $2200.00 Dolla

(a) Date of completion of well June 1, 1949

(b) Date water was first used for beneficial purposes July 15, 1949

The land irrigated is described in the following tabulation: (Give irrigable acreage in each legal subdivision and designate ownersh
land. If not used for irrigation, state location of place of use.)

Twp.	Range	Sec.	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
26 N.	64 W.	22				16.85									19.77				36.62
26 N.	64 W.	23						36.				36.41							72.41

TOTAL NUMBER OF ACRES TO BE IRRIGATED 109.03

Depth at which main source of water was encountered is 35 feet, and the water bearing formation
sand and gravel
(Sand, gravel, shale, clay, limestone, sandstone, etc.)

If other water sources were found give depth to each. None feet. fe

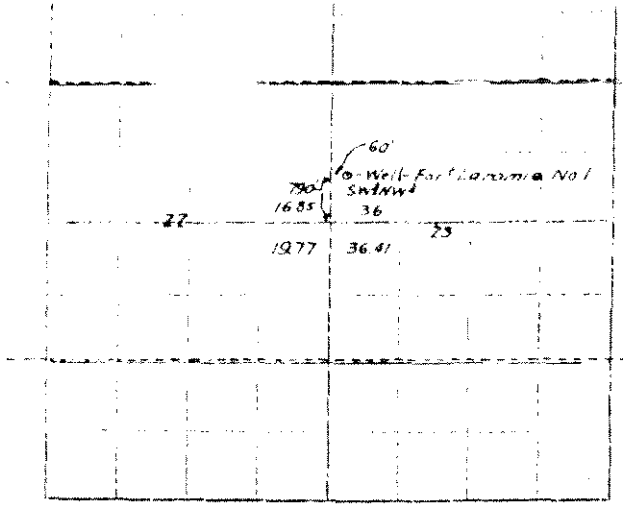
(Signed) Leo M. Erschabek

Leo Erschebek (Mayor)

STATE OF WYOMING }
County of GOSHEN } ss.

Subscribed and sworn to before me by

#1



Locate well and acreage of irrigated land on plat.
Scale: 2 inches = 1 mile

REMARKS:

Sand and gravel was encountered seven feet down. The remainder of the well consisted of 2 feet of sand and 1 foot of gravel in layers except for the last 10 feet several large pieces of chalk rock was brought up.

LOG OF WELL

KIND OF ROCK OR OTHER MATERIAL (Give color and tell whether hard or soft)	DEPTH IN FEET From	To	THICKNESS IN FEET	REMARKS (Especially information as to water flow

See Remarks for data on formations encountered.

THE STATE OF WYOMING, State Engineer's Office, } ss.

This instrument was received and filed for record on the 8th day of December, A. D. 1:25 o'clock P. M.

State E

Recorded in Book 1 of Underground Water, Well Registrations, on Page 95

June 14, 1971 - Notice of Proof of Appropriation and Beneficial use, Season 1951 received.

NOTE: "DO NOT FOLD THIS FORM. — ONLY FORMS COMPLETED WITH TYPEWRITER OR NEATLY LETTERED WITH WATERPROOF INK WILL BE ACCEPTED."

Form U. W. 3-A

Temp. Filing No. U. W. 2-4-315

APPLICATION FOR PERMIT TO APPROPRIATE UNDERGROUND WATERS IN THE STATE OF WYOMING

(Under Chapter 169, Session Laws of Wyoming, 1957)

PERMIT NO. U. W. 2066 **NAME OF WELL** Fort Laramie # 2

WATER DIVISION NO. 1 **UNDERGROUND WATER DISTRICT** Lower North Platte

We Florence A. Bay, Clerk and Wm. Thompson Mayor of Town of Fort Laramie, County of Goshe, State of Wyoming, being duly sworn according to law, upon my oath say:

1. The name of the applicant Town of Fort Laramie, Wyoming

2. The postoffice address of the applicant Fort Laramie, Wyoming 82212

3. The use to which the water is to be applied is: Irrigation ( ), Municipal (X), Industrial ( ), Other

4. Name: Designate the well by name and number Fort Laramie # 2

5. The well is to be located in the SW ¼ NW ¼ of Section 23, T. 26N N., R. 64W W., of the 6th P.M., Wyoming. Well located in Lot 9, Block 3, 2nd Add. to Town of Fort Laramie

6. The type of the proposed well is: Drilled (X), Dug ( ), Driven ( ), Jetted ( ), Other

7. The estimated depth of the well is to be 80 feet.

8. The approximate depth to the water table below land surface is 32 feet.

9. The diameter of well at top is to be 28 inches, and at bottom 28 inches.

10. The kind of casing (a) lbs. per ft., (b) diameter 16, (c) new casing (X), used casing ( ).

11. Type of pump, if any, 6 in. turbine (Centrifugal, turbine, rotary, plunger), Capacity of pump 480 Gal. Per Min.

12. Type of power electric and gasoline (Electric motor, steam or gasoline engine, etc.). Horsepower of engine or motor 25 H. P.

13. Construction of well will begin within one year from date of approval of this application.

14. Completion of the construction and completion of the application of water to the beneficial uses stated in this application will be made by December 31 of the second year after approval of this application.

15. Estimated yield of water from proposed well ~~480~~ 775 against See Part III, Form U.W. 3 gallons per minute.

16. Estimated cost of well and pumping equipment $3500.00 Dollars.

17. The well is to be constructed on lands owned by: Town of Fort Laramie, Wyoming

18. The water is to be used on lands owned by: Town of Fort Laramie, Wyoming

U.W. 2066

19. If for irrigation, the land proposed to be irrigated should be described in the following tabulation.

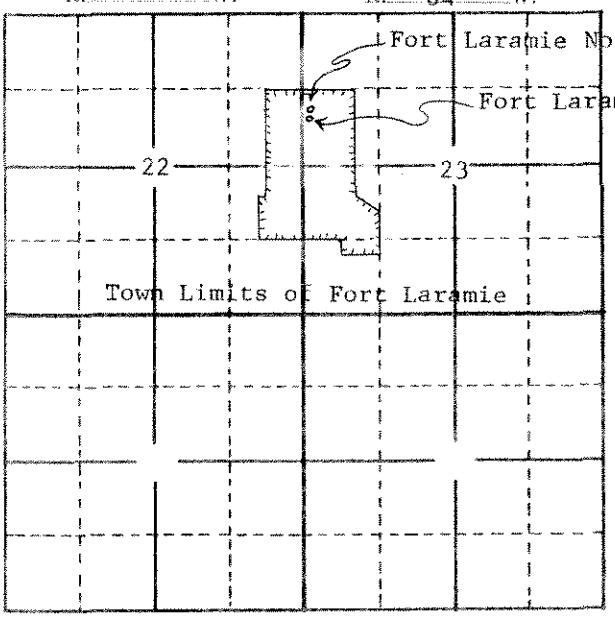
(Give irrigable acreage in each legal subdivision. If proposed use is for supplemental supply for lands with a right from another source, indicate in the tabulation the priority or Permit Number, the source of supply and the name of the ditch or other well.)

If not used for irrigation, state type, method and place of use.

Township	Range	Sec.	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
26N	64W	23							X										
			X = Well location For municipal purposes only. Supplemental supply for the following points of use located within the town limits of the Town of Fort Laramie, with original supply under Well Registration No. U.W. 95, Fort Laramie No. 1 Well, priority Dec. 8, 1950.																
26N	64W	22				X										X			
26N	64W	23							X		X	X							

TOTAL NUMBER OF ACRES TO BE IRRIGATED

Locate well and acreage to be irrigated as accurately as possible on the following plat: If use is for purposes other than irrigation, show, in addition to well location, the point of use.



T. 26 N.

Scale: 2" = 1 Mile

T. N.

REMARKS: The pump to be used as supplemental municipal water for the townsite of Fort Laramie, also to be used for standby purposes for the Town of Fort Laramie, should the present system become inoperative. The present water system is supplied by Fort Laramie No. 1 Well, Well Registration No. U.W. 95

Water to be used for municipal purposes only within the town limits of the Town of Fort Laramie

The well is located in Lot 9, Block 3, 2nd Addition to the Town of Fort Laramie.

(Signed) Mrs. Thompson
Mayor of Fort Laramie

Clerk of Fort Laramie

THE STATE OF WYOMING,
County of [illegible] } ss.

I hereby certify that the foregoing application was signed in my presence and sworn to before me by [illegible] this [illegible] day of [illegible], 19[illegible].

My Commission Expires [illegible], 19[illegible]. [illegible]
Notary Public.

THIS SECTION IS NOT TO BE FILLED IN BY APPLICANT

THE STATE OF WYOMING, }
STATE ENGINEER'S OFFICE } ss.

This instrument was received and filed for record on the 3rd day of October, A. D. 19 67, at 9:30 o'clock A. M.

Floyd A. Bishop
Floyd A. Bishop State Engineer.

Recorded in Book 13 of Underground Water Permits, on Page 11.

THE STATE OF WYOMING, }
STATE ENGINEER'S OFFICE } ss.

THIS IS TO CERTIFY that I have examined the foregoing application and do hereby grant the same subject to the following limitations and conditions:

The right to be acquired under this permit shall not include the right to have the water level or artesian pressure at the point of diversion maintained at any level higher than that required for maximum beneficial use of available water in the source of supply.

If the well is a flowing artesian well it shall be so equipped that the flow may be shut off when not in use. Provision shall also be made for a threaded tap to which a pressure gage may be attached for determining shut-in pressure when desired.

This permit is granted subject to the condition that it shall not interfere with prior valid and existing rights to the use of the waters of said underground source, and use of water hereunder is subject to the further provisions of Chapter 169, Session Laws of Wyoming, 1957.

Since information furnished in this application indicates that the well under this application may withdraw water from an aquifer which is interconnected with a surface source, this permit is issued subject to correlation with priorities of surface water rights and possible control or regulation, as provided by law.

Construction of proposed work shall begin within one year from the date of approval.

The time for completing the work and completing the application of water to beneficial use shall terminate on December 31, 19 69.

The amount of appropriation shall be limited to the quantity to which permittee is entitled as determined at time of proof of application of water to beneficial use.

Witness my hand this 12th day of October, A. D. 19 67.

Floyd A. Bishop
State Engineer.

Permit No. U. W. 2066

Page No. 11

PERMIT NO. U. W. 2066

PERMIT STATUS

Priority Date October 3, 1967 Approval Date October 12, 1967

October 30, 1967 - Notice of commencement on October 26, 1967, received.

January 22, 1968 - Statement of completion on December 4, 1967, received.

January 22, 1968 - Notice of beneficial use on December 4, 1967, received.

FINAL RECORD U.W. 1 . . 57 M. C-Municipal

PROOF NO. U.W. . . 57 . .

MADE NOV 1 '72

PLOTTED

NOTICE

This application must be accompanied by a filing fee of two dollars.

Section 7, Chapter 169, Session Laws of Wyoming, 1957, provides in part: "Any person who after March 1, 1958, intends to acquire the right to beneficial use of any underground water in the State of Wyoming, except for those purposes specifically exempted by provisions, of Section 2 shall, before commencing construction of any well or performing any work in connection with said construction or proposed appropriation or any manner utilizing said water for beneficial purposes, file with the State Engineer an application for a permit to make such appropriation and shall not proceed with any of such construction or work until a permit is granted by the State Engineer, provided, that whenever any well constructed for any other purpose shall be found to be suitable for the withdrawal of underground water, such application shall be filed before said water is utilized for beneficial use - - - -."

Final proof may be submitted in accordance with the provisions of Sections 7 and 12, Chapter 169, Session Laws of Wyoming, 1957, after which Certificate of Appropriation will be issued by the State Board of Control.

The granting of a permit does not constitute the granting of right of way. If any right of way is necessary in connection with this application it should be understood that this responsibility is the applicant's.

NOTE: "DO NOT FOLD THIS FORM. — ONLY FORMS COMPLETED WITH TYPEWRITER OR NEATLY LETTERED WITH WATERPROOF INK WILL BE ACCEPTED."

Form UW4-A

STATEMENT OF COMPLETION OR ABANDONMENT OF PERMIT NO. U. W. 2066

UNDERGROUND WATERS

UNDER CHAPTER 169, SESSION LAWS OF WYOMING, 1957

WATER DIVISION NO. 1 **UNDERGROUND WATER DISTRICT** Lower North Platte

I, Wm. Thompson of Fort Laramie, County of Goshen, State of Wyoming, being duly sworn according to law, upon my oath say:

1. The name of the permittee or present owner Town of Fort Laramie

2. The postoffice address of the permittee or present owner Fort Laramie, Wyoming 82212

3. The name of the well is Fort Laramie #2 (Designate by name and number)

4. Description of well: Location 10' FNL, and 20' FWL of Lot 9 ~~feet from the~~ **Block 3 ~~corner~~ of Section 23 T. 26 N., R. 64 W., and is in the SW ¼ NW ¼ of Section 23 T. 26 N., R. 64 W.; the type of well is: Drilled (X), Dug ( ), Driven ( ), Jetted ( ), Other ____.

** 2nd Addition to Town of Fort Laramie, Wyoming

CASING RECORD

Diameter Inches	Lbs. Per Foot	DEPTH Top	DEPTH Bottom	PERFORATIONS From	PERFORATIONS To
16	8 ga.	0'	82'	42'	82'

CEMENTING RECORD

DEPTH IN FEET From	DEPTH IN FEET To	No. Sacks Cement	Method Used

Total depth of well 82 feet, depth to static water level in well 27 feet.

FLOWING ARTESIAN WELLS ONLY: Is well equipped with gate valve? Yes ( ) No ( ).

Name and address of driller Reizenstein Drilling Co. Route 1 Torrington, Wyoming

Date of commencement of well October 26, 19 67.

Date of completion of well December 4, 19 67

5. If well under this permit is to be abandoned, please state reasons for abandonment. (If well has been abandoned, it will not be necessary to complete the balance of this form, except for log of well, Item 14, and signature before a Notary Public).

6. Description of pump: Make Western Land Roller type Turbine (Centrifugal, turbine, rotary, plunger) rated capacity of pump 75 480~ gal. per minute.

7. Description of power plant: Method of operation Propane Gas (Electric motor, steam or gasoline engine, etc.) Horsepower of engine or motor 60 H.P.

8. Give date pump and power plant were installed and works completed December 4, 19 67

9. Record of Pumping Test (to be supplied by person or firm making test). Name and address of person making test. Reizenstein Drilling Co., Torrington, Wyoming

date of test, November 18, 19 67; depth to water before test, 27 feet, and immediately afterward 67 feet; Length of test, 8 hours; average discharge, 2,000 gal. per minute.

Permit No. U. W. 2066 Page No. 11

U W. 2066

10. Actual cost of well and pumping equipment $2,597 Dollars.

11. If well is for irrigation purposes, and acreage to be served by well differs from lands described in permit, please re-describe lands in space below:

12. Depth at which main zone of water was encountered is 40 feet to 70 feet, and the water bearing formation is Sand and Gravel
(Sand, gravel, shale, clay, limestone, sandstone, etc.)

13. If other water zones were found, give depth to each:
_____ feet to _____ feet.
_____ feet to _____ feet.

14. LOG OF WELL. (If additional space is needed attach extra sheet).

TYPE OF MATERIAL ENCOUNTERED (Give color and tell whether hard or soft)	DEPTH IN FEET From	To	Thickness in feet	REMARKS (Especially information as to water found)
Top Soil	0	8	8	
Sand and Gravel	8	12	4	
Chalk rock	12	14	2	
Course Gravel	14	40	26	
Sand and Gravel	40	70	30	
Chalk Rock (loose)	70	74	4	
Sand and Gravel	74	80	6	
Total Depth, 82' - logged to 80'				

REMARKS: _____

(Signed) [illegible]

THE STATE OF WYOMING,
County of [illegible] } ss.

I hereby certify that the foregoing statement was signed in my presence and sworn to before me by [illegible] this 22nd day of January, 19 68.

My Commission Expires [illegible], 19 [illegible]. [illegible]
Notary Public.

Date of Receipt: January 22, 19 68

George T. Christopulos
George T. Christopulos, Deputy State Engineer.

FORM U.W. 5
Rev. 3/79
FILING FEE SCHEDULE
ON REVERSE SIDE

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
BARRETT BUILDING
CHEYENNE, WYOMING 82002

MADE / FILED DEC 22 '82

APPLICATION FOR PERMIT TO APPROPRIATE GROUND WATER

FOR OFFICE USE ONLY

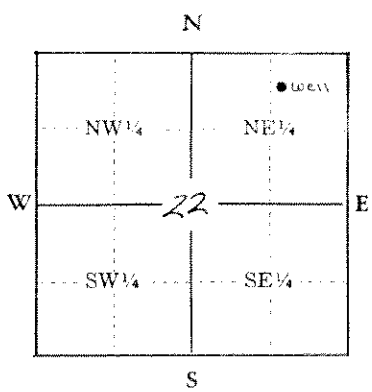
PERMIT NO. U.W. 62637
WATER DIVISION NO. 1 DISTRICT 24
U.W. DISTRICT Lower North Platte Dist.

Temporary Filing No. U.W. 16-82-140

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.
ALL ITEMS MUST BE COMPLETED BEFORE APPLICATION IS ACCEPTABLE.

NAME AND NUMBER OF WELL Fort Laramie #3

1. Name of applicant(s) Town of Fort Laramie Phone: 837-2711
2. Address of applicant(s) P. O. Box 177, Fort Laramie, Wyo. 82212 Zip: 82212
3. Name & address of agent to receive correspondence and notices Joyce Gilchriest, Town Clerk, P. O. Box 177, Fort Laramie, Wyo. 82212
4. Use to which the water will be applied: Domestic [ ] Stock Watering [ ] Irrigation [ ] Municipal [XX] Industrial [ ] Miscellaneous [ ] (Describe completely and accurately)
5. Location of the well: (NOTE: Quarter-quarter (40-acre subdivision) MUST be shown. EXAMPLE: SE¼NW¼ of Sec. 12, Township 14 North, Range 68 West.) Goshen County, NE ¼ NE ¼ of Sec. 22 T. 26 N., R. 64 W. of the 6th P.M. (or W.R.M.), Wyoming. If located in a platted subdivision, also provide Lot ______, Block ______ of the ______ Subdivision (or Add'n) of ______.



Scale: 2" = 1 mile

Above diagram represents one full section. Locate well accurately in small square representing 40 ac.

6. Mark the well location on the section grid to the right. LOCATION SHOWN IN ITEM 5 MUST AGREE WITH GRID. If the proposed well is for irrigation use, sketch and label all irrigation ditches and canals, stream, reservoirs and other wells. Indicate the point of use or lands to be irrigated from other sources.
7. Estimated depth of the well is 95 feet.
8. MAXIMUM quantity of water to be developed and beneficially used: 20 gallons per minute. NOTE: If for domestic or stock use, this application will be processed for a maximum of 25 gallons per minute. SPRINGS: Only springs flowing 25 gallons per minute or less, where the proposed use is domestic or stockwatering, will be considered as ground water appropriations. After approval of this application, some type of artificial diversion must be constructed to qualify for a water right.
9. If use is not irrigation, mark the point(s) or area(s) of use in the tabulation below.
10. If for irrigation use:
    a. Describe MAXIMUM acreage to be irrigated in each 40 acre subdivision in the tabulation below.
    b. [ ] Land will be irrigated from this well only.
    c. [ ] Land is irrigated from existing water right(s) with water from this well to be additional supply. Describe existing water right(s) under REMARKS.

Town ship	Range	Sec	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
26	64	22	X		X	X									X				
26	64	23						X	X		X	X	X	X					

Water from this well will be commingled in the Town of Fort Laramie's water system with the Fort Laramie No. 1 well, WRUW45, Fort Laramie #2, UW2046 and Fort Laramie No. 2 Enl. UW7102, and used for municipal purposes within the Town of Fort Laramie.

11. If for irrigation use, describe method of irrigation, i.e. center pivot sprinkler, flood, etc. ______

Permit No. U.W. 62637 **SEE REVERSE SIDE** Book No. 406 Page No. 68

12. The well is to be constructed on lands owned by Town of Fort Laramie
(The granting of a permit does not constitute the granting of right of way. If any easement or right of way is necessary in connection with this application, it should be understood that the responsibility is the applicant's. A copy of the agreement should accompany this application, if the land is privately owned and the owner is not a co-applicant.)

13. The water is to be used on lands owned by Residents of the Town of Fort Laramie
(If landowner is not the applicant, a copy of the agreement relating to usage of appropriated water on the land should be submitted to this office. If the landowner is included as a co-applicant on the application, this procedure need not be followed.)

REMARKS: ~~See~~ This well was originally drilled as Fort Laramie #3 Test Well, ~~T.F.~~ No. U.W. 14-5-320, U.W. 52449 permit no. which is to be canceled.

Under penalties of perjury, I declare that I have examined this application and to the best of my knowledge and belief it is true, correct and complete.

Wm. Thompson (mayor) — Signature of Applicant or Authorized Agent

Dec. 29, 19 81 — Date

THE LEGALLY REQUIRED FILING FEE MUST ACCOMPANY THIS APPLICATION

DOMESTIC AND/OR STOCK WATERING USES (Domestic use is defined as a single-family dwelling and the watering of lawns and gardens not exceeding one (1) acre)	$10.00
IRRIGATION, MUNICIPAL, INDUSTRIAL, MISCELLANEOUS	$25.00
MONITOR (For water level measurements or chemical quality sampling)	NO FEE

IF WELL WILL SERVE MULTIPLE USES, SUBMIT ONLY ONE (THE HIGHER) FILING FEE.

THIS SECTION IS NOT TO BE FILLED IN BY APPLICANT

THE STATE OF WYOMING)
) ss.
STATE ENGINEER'S OFFICE)

This instrument was received and filed for record on the 30 day of Dec., A.D. 19 81, at 9:30 o'clock A. M.

Permit No. U.W. [illegible]

for State Engineer

THIS IS TO CERTIFY that I have examined the foregoing application and do hereby grant the same subject to the following limitations and conditions:

This application is approved subject to the condition that the proposed use shall not interfere with any existing rights to ground water from the same source of supply and is subject to regulation and correlation with surface water rights, if the ground and surface waters are interconnected. The use of water hereunder is subject to the further provisions of Chapter 169, Session Laws of Wyoming, 1957, and any subsequent amendments thereto.

Granting of a permit does not guarantee the right to have the water level or artesian pressure in the well maintained at any specific level. The well should be constructed to a depth adequate to allow for the maximum development and beneficial use of ground water in the source of supply.

If the well is a flowing artesian well, it shall be so constructed and equipped that the flow may be shut off when not in use, without loss of water into surface formations or at the surface.

Special attention is called to paragraph one (1) of these limitations and conditions as outlined above relating to the interconnection of ground water and surface water sources. NOTICE OF COMMENCEMENT IS WAIVED.

~~Approval of this application may be considered as authorization to proceed with construction of the proposed well.~~

~~Construction of well will begin within one (1) year from date of approval.~~ A Statement of Completion will be filed within thirty (30) days of completion of construction, including pump installation.

Completion of construction and completion of the beneficial use of water for the purposes specified in Item 4 of this application will be made by December 31, 19 83.

The amount of appropriation shall be limited to the quantity to which permittee is entitled as determined at time of proof of application of water to beneficial use.

Witness my hand this 3RD day of DECEMBER, A.D. 19 82

George L. Christopulos — George L. Christopulos State Engineer

July 21, 1983 - Statement of Completion on June 2, 1980 received.
July 21, 1983 - Proof of Beneficial use on February 1982 received.

MICRO FILMED SEP '83

RECEIVED
JUL 21 1983
STATE ENGINEER
Cheyenne, Wyo.

Form U.W. 6
Rev. 12-81

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 62637 NAME OF WELL Fort Laramie #3

1. NAME OF OWNER Town of Fort Laramie

2. ADDRESS P. O. Box 177, Fort Laramie, Wyo. Zip Code 82212

3. USE OF WATER: Domestic [ ] Stock Watering [ ] Irrigation [ ] Municipal [X] Industrial [ ] Miscellaneous [ ]

4. LOCATION OF WELL: NE ¼ NE ¼ of Section 22, T. 26 N., R. 61 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically See survey plat (Bearing and Distance)

or ..... ft. North / South and ..... ft. East / West from the ..... corner of Section ..., T. ... N., R. ... W.
(Strike out words not needed)

5. TYPE OF CONSTRUCTION: Drilled [X] Rotary (Type of Rig) Dug [ ] Driven [ ] Jetted [ ]

Other .....

6. CONSTRUCTION: Total Depth of Well 95 ft. Depth to Static Water Level 35 ft.

a. Casing Schedule New [X] Used [ ]

8" diameter from 0 ft. to 95 ft. Material Plastic Gage .....

..... diameter from ..... ft. to ..... ft. Material ..... Gage .....

..... diameter from ..... ft. to ..... ft. Material ..... Gage .....

b. Perforations: Type of perforator used 32 Gauze screen

Size of perforation: ..... inches by ..... inches.

Number of perforations and depths where perforated:

..... perforations from 25 ft. to 95 feet.

..... perforations from ..... ft. to ..... feet.

c. Was well screen installed? Yes [X] No [ ]

Diameter: ... slot size: .022 ... set from 85 feet to 95 feet.

Diameter: ... slot size: ... set from ... feet to ... feet.

d. Was well gravel packed? Yes [X] No [ ] Size of gravel 1/2 inch

e. Was surface casing used? Yes [X] No [ ] Was it cemented in place? Yes [ ] No [X]

7. NAME & ADDRESS OF DRILLER [illegible]

8. DATE OF COMPLETION OF WELL (including pump installation) 7-07-83

9. PUMP INFORMATION: Manufacturer [illegible] Type 4" Vertical Turbine Electric

Source of power Electric Horsepower 10 Depth of Pump Setting 80'

Amount of Water Being Pumped 50 Gallons Per Minute. (For springs or flowing wells, see item 11.)

WAS A 48 HR. Test was entered for a three month period yielding an average of 50,000 gallons per month.

Permit No. U.W. 62637 Book No. 406 Page No. 68

C.W.R. 62637

10. PUMP TEST: Was a pump test made? Yes ( ) No ( )

If so, by whom ..... Address .....

Yield: ..... gal./min. with ..... foot drawdown after ..... hours.

Yield: ..... gal./min. with ..... foot drawdown after ..... hours

11. FLOWING WELL (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is ..... gal./min. Surface pressure is ..... lb./sq. inch. or ..... feet of water.

The flow is controlled by: valve ( ) cap ( ) plug ( )

Does well leak around casing? Yes ( ) No ( )

12. LOG OF WELL: Total depth drilled 95 feet

Depth of completed well ..... 95 ..... feet. Diameter of well ..... inches.

Depth to first water bearing formation ..... 40 ..... feet.

Depth to principal water bearing formation: Top 45 ..... feet to Bottom ..... 95 ..... feet.

Ground Elevation, if known .....

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	3	sandy top soil			
3	10	sandy clay	pit casing diameter 4 ft. conc. tiles		
10	20				
20	30	sand and gravel - boulders			
30	75	sand and gravel - boulders			
75	95	sand and gravel - boulders			

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes ( ) No (X)

If so, please include a copy of the analysis with this form.

If not, do you consider the water as: Good (X) Acceptable ( ) Poor ( ) Unusable ( )

U.W. 62632

13. TABULATION

a. If for irrigation, the land proposed to be irrigated should be described in the following tabulation. Describe in the "Remarks" section, under Item 14, the means of conveying the water to the lands and the method of irrigation.

(Give irrigable acreage in each legal subdivision. If proposed use is for additional supply for lands with a right from another source, indicate in the tabulation the priority or permit number, the source of supply and the name of the ditch or other well.)

b. If not used for irrigation, show the area and point(s) of use and location of well in the tabulation below. Also describe the method of conveyance in the "Remarks" section under Item 14.

Town Ship	Range	Sec	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
[illegible]	[illegible]	22	X		X	X									X				
[illegible]	[illegible]	23						X	X		X	[illegible]	[illegible]	X					

Water from this well will be connected [illegible] Town of Fort Laramie water system with the Fort Laramie No. 1 well, [illegible], Fort Laramie #2, [illegible] and Fort Laramie No. 2 [illegible] [illegible] and used for municipal purposes within the Town of Fort Laramie.

TOTAL NUMBER OF ACRES TO BE IRRIGATED

Original Supply ______ acres

Additional Supply ______ acres

14. PLAT

a. If the well is to be used for irrigation, industrial, miscellaneous or municipal use, show the location of the well on the plat below. For such uses, a plat certified by a licensed engineer or land surveyor is required to be submitted at the time the Proof of Appropriation and Beneficial Use of Ground Water is submitted.

b. For other uses, accurately show the well location, point of use or uses and describe method of conveyance of water to points of use on plat and in "Remarks" section below. Make certain location on plat agrees with written description.

c. A separate map may be submitted if the information required cannot be shown on this plat.

R. ____ W. R. ____ W.

Scale: 2" = 1 Mile

T. ____ N.

T. ____ N.

REMARKS:

C.U. 6263

15. IF WELL IS TO BE ABANDONED, complete Items 1 through 8, Item 12 (Log of Well) and state reason for abandonment below.

It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

R. W. Mansfield Mgr. — 7-12-83, 19 83
Signature of Owner or Authorized Agent — Date

Date of Receipt JUL 21 1983, 19

Date of Priority December 30, 19 81

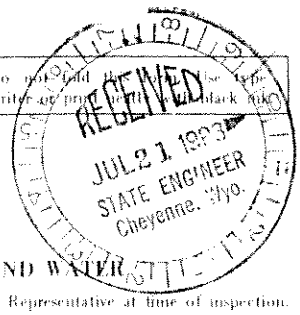
Date of Approval August 17, 19 83

for State Engineer

Form U.W. 8
Rev. 2-82

MICRO FILMED SEP 7 '83

NOTE: Do not fold this form. Use typewriter or print with black ink.



STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

PROOF OF APPROPRIATION AND BENEFICIAL USE OF GROUND WATER

The owner is responsible for submitting Parts I and II of this form. Part III will be prepared by a State Engineer Representative at time of inspection.

PART I

WATER DIVISION 1 (14)

U.W. DISTRICT Lower North Platte District

STATEMENT OF CLAIM

PERMIT NO. U.W. 68864

WELL REGISTRATION

NAME OF WELL Fort Laramie #3

DATE OF PRIORITY December 30, 1982

LOCATION NE ¼ SE ¼ of Section 22

T. 24 N., R. 64 W.

1. Name of Claimant(s) Town of Fort Laramie

2. Address P.O. Box 177, Fort Laramie, Wyoming Zip Code 82212

3. For What Purpose(s) is Water Used? Use: Municipal Date First Used February, 19 82

Use: Date First Used: , 19 Use: Date First Used , 19

If use is for irrigation, give date irrigation was completed on all lands under this Permit:

PART II

For Irrigation, Industrial, Municipal and Miscellaneous Wells

A plat which has been certified by a licensed professional engineer or land surveyor shall be submitted to accompany this form. The plat shall be in accordance with Sec. 33-29-111 Wyoming Statutes 1977 or see Chapter V and VI, Manual of Regulations and Instructions issued by the State Engineer's Office. (Minimum scale shall be 2" = 1 mile.) The map shall be prepared with waterproof black ink on tracing linen or an acceptable equivalent and shall show on a suitable scale the legal subdivisions, the accurate location of the well or wells, storage facilities, if any, main canals, streams, highways and other important cultural features. Land ownership will be shown, if there is more than one owner under the permit.

IRRIGATION WELLS

Acreage irrigated under terms of this permit will be clearly shown with a distinctive pattern and a distinction clearly made between lands having an original supply and those provided a supplemental supply. Where use is for supplemental supply for lands with a right from another source, indicate the priority or permit number of the source, the source of supply and the name of the ditch, pipe line or other well. Conveyance system will be shown and described. Indicate method of irrigation being used.

INDUSTRIAL WELLS

In addition to the information outlined above, industrial users will locate and describe conveyance facilities to the point(s) of use, giving as accurately as possible the location of points of use. Permits for other sources of water must be identified.

MUNICIPAL WELLS

The plat will show the area of use and show and describe the means of conveyance of the water from the well to the connection with the distribution system for a municipal water system.

MISCELLANEOUS WELLS

(1) The linen plat for wells where the use is described as miscellaneous and where the yield flow of the well exceeds twenty-five (25) gallons per minute must show the area of use and describe and show the means of conveyance from the well to the distribution system and/or points of use.

(2) The plat for wells where the use is described as miscellaneous and where the yield or flow is twenty-five (25) gallons per minute or less may be a 7½ minute United States Geological Survey Quadrangle map in lieu of a linen tracing provided the U.S. Geological Survey Quadrangle map is in compliance with the following conditions.

(a) The entire United State Geological Survey quadrangle map must be submitted to the State Engineer's Office.

(b) The scale on said quadrangle map must be one to twenty-four thousand.

(c) An identified section corner or quarter corner must be shown on said quadrangle map along with Section, Township and Range.

(d) The section in which the well is located and the section(s) where the area(s) or point(s) of use are located must be subdivided into forty (40) acre tracts and the well location and area(s) or point(s) of use clearly labeled and described.

(e) Said quadrangle map showing the well location and area(s) or point(s) of use must be certified by a professional engineer or land surveyor licensed to practice within the State of Wyoming.

C.U. 62632

A "CERTIFICATE OF OWNERSHIP" FROM THE COUNTY CLERK'S OFFICE SHOWING OWNERSHIP OR CONTROL OF LAND(S) INVOLVED MUST ACCOMPANY THIS FORM.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

W W Mauffray Mayer
Signature of Owner or Authorized Agent

7-19-83, 19 83
Date

JUL 21 1983

Date of Receipt: _____, 19 ____

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• APPENDIX D •

Tank and Pipeline Easement Agreement

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EASEMENT AGREEMENT

(Transcribed Copy from Original)

THIS AGREEMENT made and entered into this _____ day of April, 1962, by and between ERNEST GARHART and MARGARET L. GARHART, Husband and Wife, and JOHN O'BRIEN, A Single Man, of Fort Laramie, Wyoming, hereinafter referred to as the grantors, and the TOWN OF FORT LARAMIE, A Municipal Corporation, Fort Laramie, Wyoming, hereinafter referred to as the grantee.

WITNESSETH:

That for and in consideration of the sum of $1.00 and other good and valuable consideration, it is mutually understood and agreed between the parties, as follows:

1. That the grantors do, by these presents, hereby grant unto the grantee an easement for the construction, installation, maintenance, and operation of a municipal water storage tank and a municipal water transmission pipe line along with all necessary fixtures, equipment and appurtenances upon the following described real property, to-wit;

SW1/4SW1/4 of Section 14, Township 26 North, Range 64 West of 8th P.M., Goshen County, State of Wyoming

Together with rights of ingress and egress and such other rights as may be necessary to enable the grantee/operate the above described fixtures and equipment to store upon said property and to transmit from said property municipally owned water for the service of water users of the grantee.

2. That the grantee does, by these presents, agree to furnish to the grantors a standard ¾ inch connection on such facilities and further agrees to furnish to grantors, without charge, water for domestic and livestock watering purposes. It is specifically understood that no water will be furnished through said tap for irrigation. It is further understood that this covenant to furnish water shall inure to the benefit of the grantors, their heirs, executors, administrators, successors, and assigns and shall continue for so long as the grantee uses the above premises for the purposes herein enumerated.

3. That the grantors hereby waive and relinquish any and all rights of Homestead herein.

IN WITNESS WHEREOF the parties on the day and year first above set forth, have hereunto affixed their hands and seal.

_____

_____

_____

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• APPENDIX E •

2006 Annual Drinking Water Report

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0185

CFR 6/18/07

Consumer Confidence Report for 2006

Town of Fort Laramie
P. O. Box 173
Fort Laramie, Wyoming 82212
(307) 837-2711

We are pleased to present this year's Annual Quality Water Report. This report is designed to inform you about the quality water and services we deliver to you everyday. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources. We are committed to ensuring the quality of your water. Our water source consists of two ground water wells.

If you have any questions about this report or concerning your water utility, please contact **Ray Wise** at **837-2711.** We want our valued customers to be informed about their water utility. If you want to learn more, please attend any of our regularly scheduled meetings held on the **first Tuesday of every month at 7:00 p. m. located at the Fire Station.**

Town of Fort Laramie routinely monitors for constituents in your drinking water according to Federal and State laws. This table shows the results of our monitoring for the period of January 1st to December 31st, 2006. As water travels over the land or underground, it can pick up substances or contaminants such as microbes, inorganic and organic chemicals, and radioactive substances. All drinking water, including bottled drinking water, may be reasonably expected to contain at least small amounts of some constituents. It is important to remember that the presence of these constituents does not necessarily pose health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water hotline at 1-800-426-4791.

In the attached table you will find many terms and abbreviations you might not be familiar with. To help you better understand these terms we have provided the following definitions:

Parts per Million (ppm) or Milligrams per Liter (mg/l) - one part per million corresponds to one minute in two years or a single penny in $10,000.

Parts per Billion (ppb) or Micrograms per Liter - one part per billion corresponds to one minute in 2,000 years or a single penny in $10,000,000.

Action Level - the concentration of a contaminant, which if exceeded, triggers or other requirements which a water system must follow.

Maximum Contaminant Level - (mandatory language) - the "Maximum Allowed" (MCL) is the highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLG's as feasible using the best available treatment technology.

Maximum Contaminant Level Goal - (mandatory language) - the "Goal" (MCLG) is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety.

As you can see by the **attached table**, our system had no Maximum Contaminate Level Violations. We are proud that your drinking water meets or exceeds all Federal and State requirements. We have learned through our monitoring and testing that some constituents have been detected. The EPA has determined that your water **IS SAFE** at these levels.

We test for a total of 76 contaminants. Those of which were undetected, are not included in the table. A list is available upon request.

Some of our data in the tables are more than one year old, since certain chemical contaminants are monitored less than once a year. Our sampling frequency complies with EPA drinking water regulations. The sources of drinking water included rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it can dissolve naturally occurring minerals and, in some cases, radioactive materials. The water can also pick up substances such as:

1) Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural operations, and wildlife.

2) Inorganic contaminants, such as salts and metals, which can be naturally - occurring or result from urban storm water runoff, industrial or domestic waste discharges, oil and gas production, mining or farming.

3) Pesticides and herbicides which may come from agriculture, urban storm water runoff, and residential uses.

4) Organic chemical contaminants which can come from industrial processes, gas stations, urban storm water runoff, and septic systems.

5) Radioactive contaminants which can be naturally occurring or the result of oil and gas production and mining activities.

In order to insure that tap water is safe to drink, EPA establishes regulations, which limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration establishes limits for contaminants in bottled water.

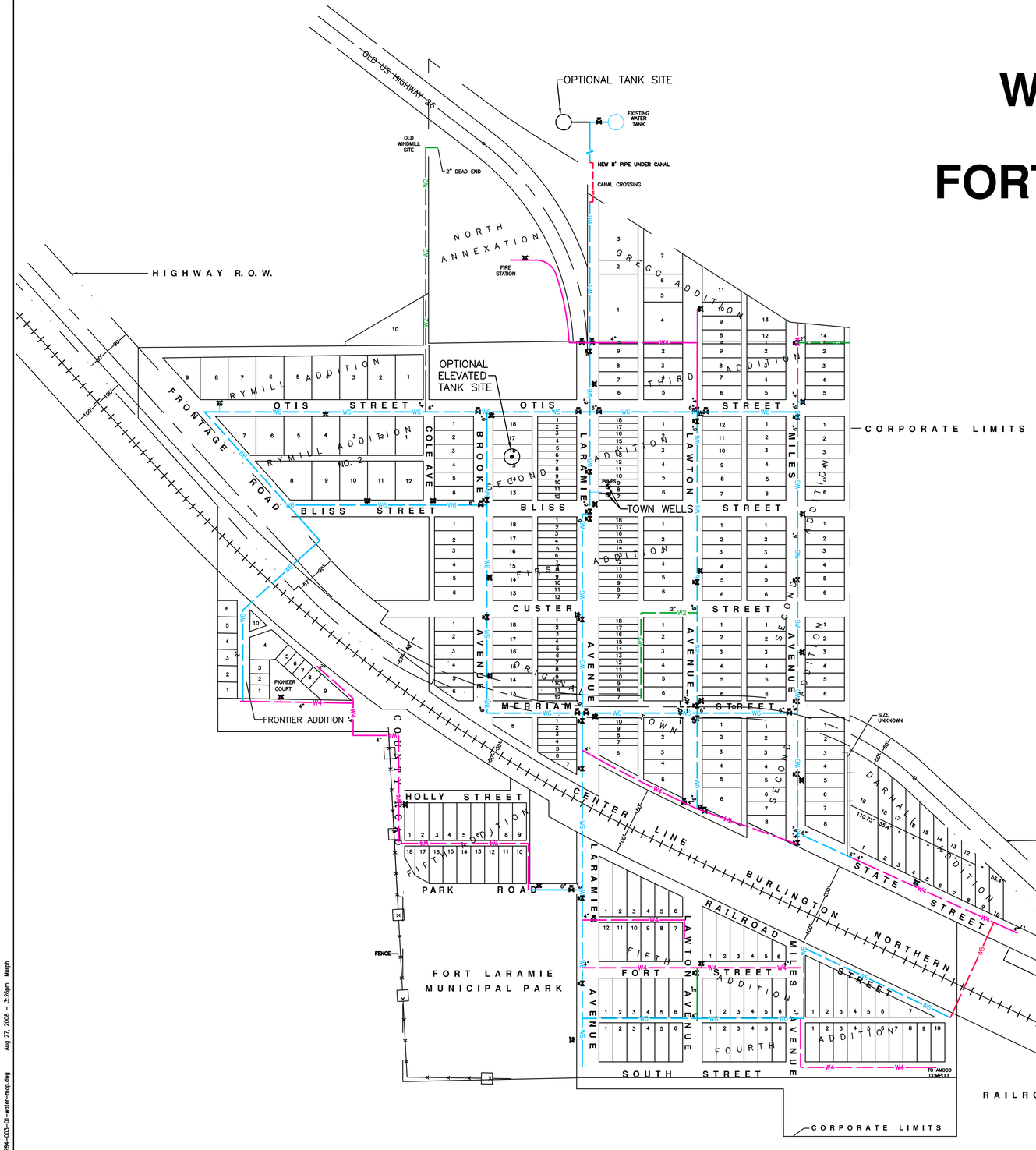
MCL's are set at very stringent levels. To understand the possible health effects described for many regulated constituents, a person would have to drink a half gallon of water everyday at the MCL level for lifetime to have a one-in-a-million chance of having the described health effect.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDS guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water hotline at 1-800-426-4791 or EPA 1-800-227-8917.

We at the **Town of Fort Laramie** work around the clock to provide top quality water to every tap. We ask that all our customers help us protect our water sources, which are the heart of our community, our way of life, and our children's future.

Contaminant	Violation Y/N	Level	Unit Measurement	MCLG	MCL	Likely Source of Contamination
Microbiological Contaminants						
Total Coliform Bacteria	N	NEG	N/A	0	Presence of coliform bacteria in 5% of monthly samples	Naturally present in the environment
Inorganic Contaminants						
Asbestos	N/A	ND	MFL	7	7	Decay of asbestos cement water mains; erosion of natural deposits
Copper (Pb & Cu Rule/Tap Monitoring)	N	0.07	PPM	1.3	AL = 1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Fluoride	N	0.4	PPM	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Lead (Pb & Cu Rule/Tap Monitoring)	N	2	PPB	0	AL = 15	Corrosion of household plumbing systems, erosion of natural deposits
Nitrate (as Nitrogen)	N	3.3	PPM	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Sodium	N	48	PPM	20	20	Natural occurring
Volatile Organic Contaminants						
TTHM (total trihalomethanes)	N	1.9	PPB	0	80	By-product of drinking water chlorination
Disinfectants and Disinfection Byproducts						
TTHM (total trihalomethanes)	N	11	PPB	N/A	80	By-product of drinking water chlorination
HAA5 (Haloacetic Acids)	N	31	PPB	N/A	60	By-product of drinking water chlorination

WATER SYSTEM MAP
for
FORT LARAMIE, WYOMING



- W6 — EXISTING FIRE HYDRANT
- W6 — EXISTING WATER VALVE
- W8 — EXISTING 8" WATER MAIN
- W6 — EXISTING 6" WATER MAIN
- W4 — EXISTING 4" WATER MAIN
- W2 — EXISTING 2" WATER MAIN

SCALE: 1" = 200'
0' 100' 200' 400'

NOTE:
EXISTING SYSTEM LAYOUT FROM "TOWN OF FORT LARAMIE FACILITY PLAN WATER MAP"
SEPTEMBER 17, 2002
BAKER & ASSOCIATES
SCOTTSBLUFF, NEBRASKA

NO.	REVISION	DATE

PREPARED FOR:
WYOMING WATER DEVELOPMENT COMMISSION
6920 YELLOWSTONE ROAD
CHEYENNE, WY. 82002

PROJECT:
TOWN OF FORT LARAMIE
WATER SUPPLY REHABILITATION STUDY
FINAL REPORT

DRAWING TITLE:
PLATE #1
WATER SYSTEM MAP

PRELIMINARY PLAN
NOT FOR CONSTRUCTION
these plans are for review only and not to be used for the construction of any improvements either public or private.
AVI pc accepts no liability for any unauthorized use of these plans

avi p.c.
engineering planning surveying
PHONE (307) 637-6017
2035 WESTLAND ROAD
CHEYENNE, WY 82001

DESIGNED BY:	DRAWN BY:
CHECKED BY:	DATE:

JOB NO.: 2864

DRAWING NO. OF

H:\2864\Baker Water System Map\284-003-01-water-map.dwg Aug 27, 2008 - 3:29pm Murph