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Executive Summary
Town of Lingle
Water Supply Master Plan
Level 1 Project
November 1, 1998

Executive Summary
Town of Lingle
Water Supply Master Plan
Level I Project
TABLE OF CONTENTS

1.0 Introduction
2.0 Summary
1.0

INTRODUCTION
1.0 INTRODUCTION

1.01 Purpose of the Study

This report presents the results of a Level I reconnaissance investigation to develop a water supply master plan for the Town of Lingle. In 1997, the Town of Lingle submitted a request to the WWDC for the study. This study, which was approved by the Wyoming legislature in the Spring of 1998, was conducted for the Town of Lingle under the direction and funding of the Wyoming Water Development Commission (WWDC) by BENCHMARK OF TORRINGTON, P.C.

The objective of the Level I study is to develop a water supply master plan for the Town of Lingle and project water supply needs for the next 30 years. The study includes an inventory of the existing water supply system, identification of alternatives, and preparation of preliminary designs and cost estimates for the preferred alternatives. The study will also evaluate Lingle’s treatment, storage, transmission and distribution systems with the preparation of recommendations for needed system additions and improvements. The master plan is designed to act as a guide and working document that will provide the Town with an outline of the water system problems and recommended solutions.

1.02 Background

Lingle is located approximately in the center of Goshen County. The Town of Lingle is on U.S. Highway 26/85, roughly 10 miles northwest of Torrington and 10 miles southeast of Fort Laramie. The community was established along the railroad about 2 miles north of the North Platte River. The North Platte River Valley has been agriculturally-oriented for centuries. Indian tribes lived in the valley where they grew crops and hunted on the uplands. They were driven out by nomadic tribes and eventually trappers and traders took over this strategic location. Today, Goshen County cultivates more cropland than any other Wyoming county.

The establishment of Lingle is related to the demise of a small community called Wyncote. Wyncote
was located about 5 miles northwest of the present Lingle. It was also a railroad town, established around 1900. The community of Wyncote did not last long, dying out about 1910. As Wyncote dwindled away, Lingle was started and began to grow. In fact, between 1908 and 1910 some of the buildings, including the railroad section house, were moved from Wyncote to Lingle. Thus, in some ways, Lingle is a direct descendant of Wyncote.

Lingle was first platted in 1910, when Goshen County was still part of Laramie County. The Town was named after Hiram Lingle, who owned a lot of farmland adjacent to the Town. Over the next few years there was much activity and growth in Lingle due to the construction of the two large Bureau of Reclamation irrigation canals.

There are very few records of the development of the Town’s infrastructure, including the development of the Town’s water system. The vast majority of the Town’s transmission system was originally constructed with 4 inch diameter iron pipe and very little of the original system has been replaced. Historically the Town has experienced low pressures and numerous problems with water supply for fighting fires.

In 1978 the Town constructed the 126,000 gallon water tank northwest of town and a transmission line connecting the tank to the Town’s system. Following that project, in 1983 Well No. 6 (also known as Well No. 3) was constructed just below the Lucerne Canal on the west side of McDowell Avenue. Most of the transmission lines in the southeast corner of Lingle were upgraded to 8 inch diameter PVC during the Summer of 1997 and Spring of 1998 as a result of 1% Capital Facilities Improvement sales tax. These projects were completed without the benefit of a current and comprehensive “Water System Master Plan”.

BENCHMARK OF TORRINGTON, P.C.
2.0

SUMMARY
2.0 SUMMARY

2.01 Water Supply and Demand

The population of Lingle has fluctuated between approximately 445 and 475 persons since 1970 census to 1990 census. Based on projections computed by the Wyoming Department of Administration and Information and extending those projections, Lingle is expected to have a population of approximately 557 by the year 2028.

The Town water system does not include individual water meters nor does it include water meters at the wells. Therefore, actual quantities of water consumption for the Town was estimated based on Wyoming Department of Environmental Quality / Water Quality Division regulations. The estimated current average water demand is 61,000 gpd and the projected average water demand for the year 2028 is approximately 70,000 gpd.

Water samples collected and analyzed over the last 5 years indicate that the quality of the Town’s water supply is good.

2.02 Existing Infrastructure

The Town of Lingle is served by three wells which are generally evenly spaced throughout the town. Well No. 4 is located on the east side, Well No. 5 is located in the middle of town near the old elevated storage tank, and Well No. 6 is located on the west side of town near the newer storage tank. The Town currently uses two storage tanks; the older elevated one being located in the middle of town, and the newer tank being located at the northeast corner of Lingle. The transmission lines vary in size from 4" diameter to 10" diameter and are cast iron, ductile iron and PVC plastic.

Currently, the Town has approximately 9,250 feet of 4" diameter lines, 9,800 feet of 6" diameter lines, 7,500 feet of 8" diameter lines, and 1,250 feet of 10" diameter lines for a total of 27,850 feet
of transmission lines. Due to the large amount of inadequately sized 4" diameter lines, Lingle experiences fire flow and pressure problems at several fire hydrants throughout the Town.

The water storage for Lingle is contained in two steel storage tanks. The 40,000 gallon capacity water tank and tower are centrally located in Lingle Proper. The 126,000 gallon capacity water tank is located just northwest of North Lingle. The tower tank became operational in 1967 and was last cleaned in 1991. The large water tank was operational in 1981 and has yet to be cleaned.

2.03 Water Supply Alternatives

Based on projected demands and on an analysis for fire protection storage, emergency storage, and peaking storage, the one 126,000 gallon storage tank provides adequate supply for the Town of Lingle. The projected demand is estimated to be 121,000 gallons. Therefore, the elevated storage tank (40,000 gallons) could be removed from the system.

2.04 Water Transmission Alternatives

The water distribution/transmission modeling analyses indicated that the 4" mains are the predominant feature that is resulting in inadequate fire flows. Therefore, to increase fire flows throughout the Town, many of the 4" mains will need to be replaced with larger mains. The modeling and common engineering practice indicates the place to start enhancing the system is at the source of supply (the 126,000 gallon water storage tank).

In the evaluation of improvements to a transmission system similar to Lingle’s, the system can be analyzed using a grid system with primary mains and secondary mains. Instead of replacing all the existing mains, larger (primary) transmission mains could be strategically placed to provide a proper looped system and allow for the smaller (secondary) distribution mains to feed off of the larger mains without much distance between the two. In evaluating a grid system for the Town, it was determined that more benefits would be obtained by installing 8" primary/transmission mains in 1st Street, 3rd Street, 5th Street, 7th Street, McDowell Avenue, Connely Avenue, and along the south side of Town.
Currently, there is a new a 8" main in Connely Avenue and a new one would not need to be installed. This grid system provides adequate looping of the system and generally covers the boundaries of the Town. In addition, the majority of the fire hydrants served by 4" lines could be replaced and tied to the 8" primary mains.

Since most of the deficiencies in the system are a result of the inadequate sized 4" mains, there are few "alternatives" to select from, but the sequencing of the improvements has a significant impact on the system (i.e., starting at the storage tank).

2.05 Wellhead Protection Plan

Following the identification of potential contamination sources, the sources are typically prioritized according to their potential to contaminate groundwater. The sources identified within the Lingle WHPAs have been prioritized according to their proximity to the main well for the Town, Lingle Well No. 4. The following Table lists the prioritized contaminant sources and gives the approximate distance from the source to the well. The distances to the major transportation routes and the railroad are given to their nearest point to Lingle Well No. 4.

Prioritized PCSS Located in the Lingle WHPAS

<table>
<thead>
<tr>
<th>Rank</th>
<th>Type of Potential Source</th>
<th>Approximate Distance from Well*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abandoned gas station/Farm implement storage yard</td>
<td>375 feet</td>
</tr>
<tr>
<td>2</td>
<td>Transportation routes</td>
<td>525 feet</td>
</tr>
<tr>
<td>3</td>
<td>Implement servicing business/AST</td>
<td>605 feet</td>
</tr>
<tr>
<td>4</td>
<td>Abandoned gas station/auto repair business</td>
<td>680 feet</td>
</tr>
<tr>
<td>5</td>
<td>USTs/PCB contaminated transformer storage</td>
<td>905 feet</td>
</tr>
<tr>
<td></td>
<td>Component</td>
<td>Distance</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>6</td>
<td>Fertilizer plant</td>
<td>1,055 feet</td>
</tr>
<tr>
<td>7</td>
<td>Lingle Town Shop/AST</td>
<td>1,130 feet</td>
</tr>
<tr>
<td>8</td>
<td>Apparent small-engine repair shop</td>
<td>1,170 feet</td>
</tr>
<tr>
<td>9</td>
<td>Railroad</td>
<td>1,280 feet</td>
</tr>
<tr>
<td>10</td>
<td>Water Well</td>
<td>1,705 feet</td>
</tr>
<tr>
<td>11</td>
<td>Water Well</td>
<td>1,810 feet</td>
</tr>
<tr>
<td>12</td>
<td>Container of used motor oil</td>
<td>1,960 feet</td>
</tr>
<tr>
<td>13</td>
<td>Water well</td>
<td>2,035 feet</td>
</tr>
<tr>
<td>14</td>
<td>AST</td>
<td>2,110 feet</td>
</tr>
<tr>
<td>15</td>
<td>Septic system</td>
<td>2,110 feet</td>
</tr>
<tr>
<td>16</td>
<td>Water Well and septic system</td>
<td>2,675 feet</td>
</tr>
<tr>
<td>17</td>
<td>Water Well and septic system</td>
<td>2,750 feet</td>
</tr>
<tr>
<td>18</td>
<td>Water Well and septic system</td>
<td>2,790 feet</td>
</tr>
<tr>
<td>19</td>
<td>Water Well and septic system</td>
<td>2,940 feet</td>
</tr>
<tr>
<td>20</td>
<td>Septic system</td>
<td>2,415 feet</td>
</tr>
<tr>
<td>21</td>
<td>Landfill</td>
<td>3,320 feet</td>
</tr>
<tr>
<td>22</td>
<td>Water Well and septic system</td>
<td>3,580 feet</td>
</tr>
<tr>
<td>23</td>
<td>Feedlot</td>
<td>3,770 feet</td>
</tr>
<tr>
<td>24</td>
<td>Water well</td>
<td>3,845 feet</td>
</tr>
<tr>
<td>25</td>
<td>Feedlot</td>
<td>4,975 feet</td>
</tr>
</tbody>
</table>

### 2.06 Preliminary Cost Estimates

Preliminary cost estimates were prepared for each component of the two alternatives. A summary of the cost estimates is as follows:
Alternative 1

Project No. One - Replace 6" main with 8" main $ 67,000
Project No. Two - New 8" (McDowell, 3rd St., and 5th St.) $361,000
Well Chlorination System $ 40,000
Total Alternative 1 $468,000

Alternative 2

Project No. Three - New 8" (1st St. and Clover) $354,000
Project No. Four - Water Meters $215,000
Total Alternative 2 $569,000

2.07 Economic Analysis

Assistance with funding for design and construction of water supply system improvements can be made available by the Wyoming Water Development Commission, the Farm Loan Board, and the Rural Utilities Service. The following breakdown indicates grant assistance that may be made available, possible loan terms for the remainder, and the annual cost to Lingle for the proposed improvements.

WWDC Eligible Costs - Alternate 1
(for itemized cost breakdown reference Table 10.1 & 10.2 - totals include all items EXCEPT for chlorination, service connections and fire hydrants)

Project Number One + Project Number Two $ 360,087.50
WWDC Grant (50%) $ 180,043.75
WWDC Loan (50%) $ 180,043.75
Town’s Annual Cost (20 years @ 7.25%) $ 17,326.48
Monthly Cost per EDU $ 4.98
WWC In-Eligible Costs - Alternate 1
(for itemized cost breakdown reference Table 10.1 & 10.2 - INCLUDES costs for chlorination, service connections and fire hydrants)

Well Chlorination, Service Connections & Fire Hydrants $107,912.50
FLB Loan (50%) $53,956.25
FLB Grant (50%) $53,956.25
Town’s Annual Cost (30 years @ 7.25%) $4,457.84
Monthly Cost per EDU $1.28

If the above described financing scenario was successful, the approximate increase in cost per EDU for Alternative 1 would be $6.26 per month.

WWDC Eligible Costs - Alternate 2
(for itemized cost breakdown reference Table 10.3 - totals include all items EXCEPT for service connections and fire hydrants)

Project Number Three $290,612.50
WWDC Grant (50%) $145,306.25
WWDC Loan (50%) $145,306.25
Town’s Annual Cost (20 years @ 7.25%) $13,983.52
Monthly Cost per EDU $4.02

WWDC In-Eligible Costs - Alternate 2
(for itemized cost breakdown reference Table 10.3 & 10.4 - INCLUDES costs for service meters, service connections and fire hydrants)

Service meters, service connections & fire hydrants $278,387.50
FLB Loan (50%) $139,193.75
FLB Grant (50%) $139,193.75
Town’s Annual Cost (30 years @ 7.25%) $11,500.13
Monthly Cost per EDU $3.31

If the above described financing scenario was successful, the approximate increase in cost per EDU for Alternative 2 would be $7.33 per month.