EXECUTIVE SUMMARY --

LEVEL 1

TETON COUNTY WATER SUPPLY MASTER PLAN

TETON COUNTY, WYOMING

Jorgensen Engineering and Land Surveying, P.C.
Jackson, Wyoming
EXECUTIVE SUMMARY

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TETON COUNTY WATER SUPPLY
MASTER PLAN

TETON COUNTY, WYOMING

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FEBRUARY 1999
EXECUTIVE SUMMARY

TABLE OF CONTENTS

PURPOSE ........................................................................................................................................... 1
STUDY AREA ...................................................................................................................................... 1
METHODOLOGY ................................................................................................................................. 1
EXISTING SYSTEMS .......................................................................................................................... 1
FUTURE WATER NEEDS ..................................................................................................................... 3
GROUNDWATER RESOURCES .......................................................................................................... 3
REGULATORY ISSUES ........................................................................................................................ 6
SUMMARY OF RECOMMENDED NEEDS ............................................................................................. 6
CONCLUSIONS AND RECOMMENDATIONS ......................................................................................... 8

TABLE 1 SUMMARY OF COSTS FOR RECOMMENDED IMPROVEMENTS BY SERVICE AREA .......... 7

FIGURE 1 GENERAL LOCATION MAP ................................................................................................. 2
FIGURE 2 GIS MAPPING OF PUBLIC WATER SYSTEMS .................................................................... 4
FIGURE 3 WELL DISTRIBUTION AND GENERAL GEOLOGY ............................................................ 5
PURPOSE

This Level I reconnaissance study was funded by the Wyoming Water Development Commission (WWDC) and describes present and future potable water supply issues for Teton County, the project sponsor, through the year 2020. The information presented is intended to assist in the future management of the resources, including planning and designing new water supplies in an area that has experienced rapid growth for the last ten years.

Groundwater is emphasized in this report as essentially all existing supplies have well or spring sources. There are no known public water supply systems that utilize direct surface water diversions in Teton County. Similarly, groundwater is anticipated to continue as the primary water supply source for the foreseeable future.

STUDY AREA

The overall study area includes private lands south of Grand Teton National Park together with the unincorporated area of Kelly and private lands east of the Idaho/Wyoming state line near Alta, Wyoming. Figure 1 shows the general location of the study area in relation to the publicly owned lands. This study did not include the Moran/Buffalo Valley area, public systems within Grand Teton National Park or the National Forest or remote private inholdings within the National Forest or National Park.

METHODOLOGY

The study focuses on the larger existing community public water supply systems where most of the future higher density development is anticipated. To make the best use of the available resources, detailed analyses were made for ten identified service areas described below:

<table>
<thead>
<tr>
<th>Service Area</th>
<th>Reasons for Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Jackson/South Park</td>
<td>Area of Future Growth</td>
</tr>
<tr>
<td>2) Teton Village</td>
<td>Area of Future Growth</td>
</tr>
<tr>
<td>3) Aspens/Teton Pines/Wilson</td>
<td>Area of Future Growth/Existing Small Lots</td>
</tr>
<tr>
<td>4) JH Golf and Tennis</td>
<td>Area of Future Growth</td>
</tr>
<tr>
<td>5) Kelly</td>
<td>Existing Small Lots with Wells and Septic Systems</td>
</tr>
<tr>
<td>6) Hoback Junction</td>
<td>Existing Small Lots with Wells and Septic Systems</td>
</tr>
<tr>
<td>7) Hog Island</td>
<td>Existing Small Lots with Wells and Septic Systems</td>
</tr>
<tr>
<td>8) Alta/Grand Targhee</td>
<td>Area of Future Growth/Older System</td>
</tr>
<tr>
<td>9) Rivermeadows</td>
<td>Older System</td>
</tr>
<tr>
<td>10) Indian Paintbrush</td>
<td>Older System</td>
</tr>
</tbody>
</table>

The general locations of these service areas are shown on Figure 1. Specific recommendations were provided for each area along with a general discussion of several community systems located outside of the ten areas.

EXISTING SYSTEMS

A detailed list and inventory of community and selected non-community water systems was developed in the first phase of the project. Currently, a total of twenty-nine (29) systems satisfies or potentially satisfies the EPA definition for a community system which was used as the criteria in this study. This includes systems that serve year round residents with 25 or more persons or 15 or more service connections.
LAND OWNERSHIP
AND GENERAL LOCATION MAP
FIGURE 1
The location of these systems and their service areas are shown on Figure 2, a reduced version of the Geographic Information System (GIS) map developed for this project. This figure includes as background information the Teton County property ownership mapping and shaded relief mapping of the area developed from digital terrain data obtained from the USGS. An additional group of 48 non-community water systems is also included in the GIS data although not emphasized on this specific figure. The non-community systems serve 25 or more members of the public who are not residents for a minimum of 60 days per year.

Using data from EPA sanitary surveys of the various public systems and information obtained from owners and operators, a water system database was developed in the study. The database includes both general system information and technical data regarding the system facilities. The database was developed in a digital format to facilitate its use and allow for its expansion or modification in the future. Portions of the database were also linked to the GIS mapping to assist with future planning efforts.

**FUTURE WATER NEEDS**

Present and future water supply needs were projected for the ten service areas selected for this study. These needs were based upon detailed development projections developed by the Teton County Planning Office for specific traffic area zones created in conjunction with the ongoing Teton County Transportation Plan. Although the traffic zone boundaries did not often coincide with water supply needs boundaries, the development projections provided a detailed and area specific analysis of future residential and commercial growth in the county.

Water use criteria were also developed for the study based upon water flow data obtained from the larger systems that keep more systematic records. Particular emphasis was given to the Town of Jackson which, in addition to providing water use records, represents the largest water supply system in the study area with the greatest potential for future growth.

With this information, water use projections were developed for the present and future (2020) conditions using conservatively high factors in most cases. Although water use is expected to more than double by the year 2020, the findings indicate that potable water supply needs will still represent only a fraction of the total water resources available to the study area. In general water supply is readily available for most of the study area where future populations will be concentrated. Minor exceptions apply to some outlying highlands and mountainous areas that are remote or disconnected from the main Snake River aquifer. However, future development in these areas is anticipated to be limited.

**GROUNDWATER RESOURCES**

Virtually all domestic, municipal, and commercial water supplies in Teton County utilize groundwater, developed either through construction of wells or development of spring collection facilities. Given the increasing expense and regulatory complexity of water supplies based on the diversion and treatment of surface water, and the relatively easy access to substantial groundwater supplies of good quality in most of the developable portions of the county, it is unlikely that future water supply development in the county will be anything but groundwater based.

Figure 3 presents the distribution density of water-supply wells on a background of geology. Most of the wells in the study area have been developed in the highly-productive alluvial materials associated with the Snake River and its tributaries, at densities of less than one well per 2-acre parcel. Outlying areas of development are served by groundwater from older aquifers with quite variable water quantity and water quality characteristics.
Community Systems

<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town of Jackson</td>
</tr>
<tr>
<td>Teton Village</td>
</tr>
<tr>
<td>Rafter J Ranch Subdivision</td>
</tr>
<tr>
<td>Aspens</td>
</tr>
<tr>
<td>Melody Ranch Subdivision</td>
</tr>
<tr>
<td>Spring Creek Ranch Subdivision</td>
</tr>
<tr>
<td>Jackson Hole Golf and Tennis</td>
</tr>
<tr>
<td>Gros Ventre North Subdivisions</td>
</tr>
<tr>
<td>Gros Ventre West / Bar Y</td>
</tr>
<tr>
<td>Skyline Ranch</td>
</tr>
<tr>
<td>Indian Paintbrush</td>
</tr>
<tr>
<td>Squaw Creek</td>
</tr>
<tr>
<td>Teton Shadows Condominiums</td>
</tr>
<tr>
<td>Rivermeadows Subdivision</td>
</tr>
<tr>
<td>Evans Trailer Park</td>
</tr>
<tr>
<td>Bar-B-Bar Subdivision</td>
</tr>
<tr>
<td>Saddle Butte Tract</td>
</tr>
<tr>
<td>South Park Village</td>
</tr>
<tr>
<td>High Country Subdivision</td>
</tr>
<tr>
<td>Millward Trailer Park</td>
</tr>
<tr>
<td>Highland Park Subdivision</td>
</tr>
<tr>
<td>Indian Springs Subdivision</td>
</tr>
<tr>
<td>J-W Subdivision</td>
</tr>
<tr>
<td>Little Horsehoe Canyon Subdivision</td>
</tr>
<tr>
<td>Snake River Mobile Home Park</td>
</tr>
<tr>
<td>G-V School for Disabled Youth</td>
</tr>
<tr>
<td>Alta Community Pipeline</td>
</tr>
<tr>
<td>Grand Targhee Resort</td>
</tr>
<tr>
<td>Targhee Town Water Co., Inc.</td>
</tr>
<tr>
<td>Wilson Meadows</td>
</tr>
</tbody>
</table>

Water Systems

- Community Systems
- Non-Community Systems

Teton County
Public Water Systems

Scale: 1" = 15,000
Number of Wells by Quarter Quarter Section
(with yields greater than 0)

- 1-2 wells
- 3-9 wells
- 10-19 wells
- 20 or more wells

Geology
- - Approximate boundary of the Principal Snake River Aquifer
  Qaf - Quaternary alluvial deposits
  Qo - Quaternary other deposits: glacial, colluvial, swamp, terrace, volcanic
  Tu - Tertiary rocks, undivided
  Mu - Mesozoic rocks, undivided
  Pzo - Paleozoic rocks, undivided
  pCU - Precambrian rocks, undivided

Water-Supply Well Distribution and General Geology
Southern Teton County
Due to the characteristics of the main aquifer, most of the study area is highly vulnerable to groundwater contamination from surface sources. Consideration of local and seasonal variations in groundwater flow direction and the breadth of groundwater development indicate the need for a general address to "aquifer protection" in addition to the approach of individual "wellhead protection" evaluations.

Records of the Wyoming Department of Environmental Quality show that Teton County has been relatively free of significant groundwater contamination. Fuel is the most common contaminant, released either through transportation accidents or fuel tank leaks. Agricultural chemicals have been the source of water well contamination in isolated cases.

REGULATORY ISSUES

Although data indicates that water is generally of good quality and with minor exceptions within applicable standards, all public water systems face an array of state and federal regulations that require extensive monitoring and reporting. Most requirements for public systems originate from the federal Safe Drinking Water Act and its amendments, which among other requirements sets standards for over 85 contaminants. The SDWA also establishes rules that will potentially require many groundwater systems to in the future install disinfection facilities.

At the state level, the Wyoming Department of Environmental Quality Water Quality Division sets standards that primarily affect the construction of new or modified systems. Most recently, the DEQ has proposed standards for "capacity development" that will in addition affect systems applying for certain types of state funding. Capacity development is defined as a planning process to identify system deficiencies and subsequently correct these deficiencies. This effort requires owners to perform a detailed and comprehensive analysis of their system and includes managerial and financial issues as well as the more common technical considerations.

In Teton County, the most significant regulations affecting water supply systems relate to the county fire protection resolution. New subdivisions with 30 or more lots averaging less than 3 acres in size require central water systems with fire hydrants spaced at 500 foot intervals and capable of delivering 1000 gpm for two hours. These requirements dictate the need for extensive supply and distribution systems for new larger developments.

SUMMARY OF RECOMMENDED NEEDS

An analysis was done of each of the ten selected service areas to determine present and future needs and identify system deficiencies. This effort resulted in the development of a number of recommendations and suggested improvements for the various systems and areas investigated. The recommended improvements were developed at the concept level to provide some indication of future resource needs. Three categories were identified for the improvements and related costs.

Current Needs: To be addressed in the next five years (1999-2004).

Future Needs: To be addressed in a ten-year period (2005-2010).

Long Term Needs: To be addressed beyond a ten-year period (2011-2020).

This effort resulted in the development of preliminary cost estimates for approximately seventy (70) water system improvements for the various service areas. Itemized costs estimates were
developed for each improvement and prioritized, based upon the three categories, for each service area. This effort also included recommendations for several older systems outside of the identified service areas. Table 1 summarizes total costs for each category by service area for the recommended improvements.

It should be recognized that the costs and recommendations developed in this effort are preliminary and likely to change as more detailed information is developed. These cost estimates also include significant contingencies and factors for engineering design, permitting and construction administration.

### TABLE 1
SUMMARY OF COSTS FOR RECOMMENDED WATER SUPPLY IMPROVEMENTS BY SERVICE AREA

<table>
<thead>
<tr>
<th>SERVICE AREA</th>
<th>CURRENT NEEDS (1) 1999-2004</th>
<th>FUTURE NEEDS (2) 2005-2010</th>
<th>LONG TERM NEEDS (3) 2011-2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jackson / South Park (1)</td>
<td>$628,000</td>
<td>$2,476,000</td>
<td>$5,800,000</td>
</tr>
<tr>
<td>Teton Village (2)</td>
<td></td>
<td>$1,030,000</td>
<td>$1,295,000</td>
</tr>
<tr>
<td>Teton Pines/ Wilson (3)</td>
<td>$420,000</td>
<td>$1,411,000</td>
<td>$1,760,000</td>
</tr>
<tr>
<td>JH Golf and Tennis (4)</td>
<td>$825,000</td>
<td>$453,000</td>
<td></td>
</tr>
<tr>
<td>Kelly (5)</td>
<td></td>
<td>$220,000</td>
<td>$1,860,000</td>
</tr>
<tr>
<td>Hog Island (6)</td>
<td>$690,000</td>
<td>$1,550,000</td>
<td></td>
</tr>
<tr>
<td>Hoback Junction (7)</td>
<td>$630,000</td>
<td>$1,710,000</td>
<td></td>
</tr>
<tr>
<td>Alta/ Grand Targhee (8)</td>
<td>$256,000</td>
<td>$2,669,000</td>
<td>$900,000</td>
</tr>
<tr>
<td>Rivermeadows (9)</td>
<td>$1,008,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian Paintbrush (10)</td>
<td>$400,000</td>
<td>$657,000</td>
<td></td>
</tr>
<tr>
<td>Other Areas (11)</td>
<td>$340,000</td>
<td>$665,000</td>
<td>$435,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$3,877,000</td>
<td>$10,901,000</td>
<td>$15,310,000</td>
</tr>
</tbody>
</table>

Note: See Section VIII of the Final Report for a detailed listing of improvements and Appendix D for itemized cost estimates. All estimates are concept level and preliminary.
CONCLUSIONS AND RECOMMENDATIONS

The following represent the principal conclusions and recommendations developed as a part of the Teton County Master Plan.

General Study Area

1. Groundwater of adequate quantity and quality is available in most areas where higher density future growth is anticipated in Teton County, limiting the potential for large regional systems even with anticipated increased development, and largely precluding the need to consider surface-based water supplies.

2. Land use trends are expected to favor continued residential development with limited pockets of commercial intermixed. This type of development has not to date caused significant groundwater quality problems. However, the principal aquifer serving the study area is generally highly vulnerable to contamination. To insure the continued high-quality of the study area groundwater supply:
   - "wellhead protection" should be included as a "finding" for all future development proposals in both Teton County and the Town of Jackson;
   - design and construction standards for wastewater disposal systems should be strictly followed and existing wastewater disposal systems should be well maintained; and
   - expanded or new land use management activities throughout the study area should be reviewed in terms of adequate aquifer protection.

3. Many public water systems in Teton County lack disinfection facilities. With the pending implementation of EPA groundwater disinfection regulations in 2002, a number of systems will be in need of system upgrades. Some of these systems may have a greater incentive to share or combine water supplies as a result of the new requirements.

4. Water supply for fire protection is also lacking in many areas, particularly older systems constructed before the 1991 Teton County fire protection regulations. These needs will also increase as development increases, particularly in the more remote areas, which have numerous small pre-existing lots and no nearby municipal water system.

5. The data, information and GIS maps developed as a part of this study will be helpful to many of the public systems in Teton County which will be required to provide detailed information in compliance with specific requirements related to the Safe Drinking Water Act and Amendments. This information will also be helpful to the agency responsible for administering the Safe Drinking Water Act in Teton County.

6. There are presently a number of public water systems in Teton County that rely on springs for a portion of their water supply. A vulnerability analysis should be performed for these systems to determine the risk of their continued use versus the development of properly constructed groundwater supply wells.

7. The principal exposure of study-area groundwater supplies to contamination is through accidental spills and improper application of agricultural chemicals. Although neither of these has historically been a large problem, the status of transportation safety, emergency response, and proper chemical application programs should be reviewed.

8. In addition to attention to wellhead and aquifer protection, water system vulnerability to contamination can be generally reduced by extraction of groundwater from deeper zones...
of the aquifer and by development of multiple-well systems. Consolidation into larger water-supply systems should consider retention of dispersed groundwater production facilities as emergency supplies.

**Service Area Issues**

9. The main area of groundwater quality concern for individual wells and septic systems is in Wilson and along the Teton Village Road where seasonal groundwater levels are high, soils are extremely permeable, and numerous small acreage platted lots exist. Areas such as Wilson and the Nethercott Subdivision represent the highest concentration of wells and leachfields and are prime candidates for construction of a common sewer system.

10. The most likely places for expanded community water systems include South Park, where higher densities are anticipated, the Aspens/Teton Pines area where numerous non-community water supplies operate nearby in areas of individual wells and leachfields and the Wilson and Nethercott areas where higher density residential and commercial development is taking place on smaller lots with individual wells and leach fields.

11. The potential for community systems in outlying areas such as Kelly, Hog Island, Hoback Junction (which also involve small lots with individual wells and leachfields), and Alta is low given the relatively high cost to extend common water in these areas where future development is expected to be limited and satisfactory individual on-site water supplies have to date been developed.

12. Several smaller older community systems should consider connections to nearby larger more established facilities to both insure better control of water quality and provide for a more efficient operation. These include the Teton View Trailer Park, the South Park Village Subdivision, the Hi Country Subdivision, Teton Shadows, and the Targhee Town Subdivision. Funding incentives for the systems involved in the connections should be provided.

13. A wide range of possible water system improvements have been identified for the study area requiring extensive resources to implement. Priority should be given to improvements within areas that will affect larger segments of present and future population. These include the major development nodes in the County along with several resort developments.

14. Water system improvements will be required for a number of isolated community systems that have no feasible alternative to connect to a larger adjacent system. These include the Rivermeadows Water District, the Indian Paintbrush Subdivision, and the Grand Targhee Ski Resort.