HOBACK JUNCTION
WATER SUPPLY STUDY, LEVEL I
FINAL REPORT EXECUTIVE SUMMARY

PREPARED FOR THE
WYOMING WATER DEVELOPMENT COMMISSION

PREPARED BY

NELSON ENGINEERING
430 SOUTH CACHE STREET
P.O. BOX 1599
JACKSON, WY 83001

IN ASSOCIATION WITH
LIDSTONE & ASSOCIATES, INC.

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EXECUTIVE SUMMARY

A. General

The Hoback Junction Level I Water Supply Study is funded by the Wyoming Water Development Commission. Its sponsor is Teton County on behalf of the citizens of the greater Hoback Junction area located within Teton County. The study was commissioned to identify potable water supply options in the Hoback Junction vicinity and prepare preliminary designs and cost estimates for a water supply system in the area. The study area is shown on the map on the next page of this summary.

B. Background

The primary residential and commercial subdivisions within Hoback Junction proper were platted as much as forty-five years ago, in an era when considerably less focus was given to the issues of adequate water supply and possible contamination of water wells by septic disposal of wastewater than is the case today. This is not to say that health standards applicable to wells and septic systems did not exist; they did, but compliance with those standards was not necessarily assured. The promulgation of the regulations that the Wyoming Department of Environmental Quality (DEQ) enforces today (as modified over the years since), following on the heels of the adoption of the Federal Clean Water Act in 1972 and the Wyoming Environmental Quality Act in 1973, was only just beginning when the last of these subdivisions was platted. Further, the requirement that a professional engineer state on a subdivision plat that adequate water supply and sewage treatment facilities exist to serve the subdivision being created by virtue of the plat was still fifteen years away when the last of these subdivisions was platted. Thus, circumstances existed that could lead to development either inadequately supplied with water or development that held the potential to pollute its drinking water supply with its septic wastes. This concern was explicitly put into print in the 1999 Teton County Water Supply Master Plan Level I Study prepared by Jorgensen Engineering and Land Surveying, P.C., which states on page 65 in its Section VI (Water Supply Needs by Service Area) that:

“Several ... areas identified are at the present time predominantly using individual on-site wells and septic systems. These areas also have a number of pre-existing small lots less than 1/2-acre that may make the continued use of both individual wells and leach fields more difficult in the future... This group includes Kelly, Hog Island, Hoback Junction, and Alta.” (Emphasis added)

Beyond potential contamination of drinking water wells by septic disposal of wastewater, for years some residents of Hoback Junction have had additional concerns about their drinking water. As properties within the area developed and use of water for landscaping in the summer months increased, so, too, did complaints about water smelling of sulfur.
And owners of commercial lots in the area worried about having an adequate supply to serve their properties should they develop them to the extent that the zoning on the properties allowed.

In January of 2002, a four-day public design charrette commissioned by Teton County and led by a consultant team headed by Design Workshop of Jackson, Wyoming was held in the Hoback Junction community. Its focus was on the exploration of possibilities to enhance Hoback Junction as a community, addressing both the highway corridor that passes through the area and the community as a whole. On page 30 of the report that documented the results of the charrette was the following text:

“Water is an issue in the area, and geologic conditions, increased demand, and current drought conditions have affected the volumes and quality of well water for several of the residential properties. It is recognized that community water system alternatives need to be explored. The eventual formation of a water district with funding alternatives available from the Wyoming Water Development Commission should be explored.” (Emphasis added)

At a point in time after the public design charrette, the community, in the form of a number of prominent citizens, informally petitioned the Teton County Commission (TCC) to make a request on their behalf to the Wyoming Water Development Commission (WWDC) to undertake a Level I study to determine the water supply options in the Hoback Junction vicinity and prepare preliminary designs and cost estimates for a water supply system in the area. This was done. Following an exchange of thoughts between the TCC and the Board of the WWDC regarding the appropriate reach of the boundaries of the project study area, a study area that was large in scope was adopted, and in May of 2005, after a consultant selection process was conducted, a team of consultants led by Nelson Engineering (NE) and including Lidstone and Associates, Inc. (LA), VLA, Inc. (VLA), and Carol Lacey was selected to perform the study.

On June 30th of 2005, a well-attended public scoping meeting was held by the Nelson Engineering team at the Hoback Junction fire hall at which public comment was sought on the general subject of a potential water supply system for the Hoback Junction area. (Minutes for this meeting and the later public progress meeting held in September are found in the Appendixes section of this report.) A wide range of matters were discussed, but the primary ones revolved around the following five questions:

1. Can water in sufficient quantity to serve the domestic use needs of the study area be found?
2. Can water in sufficient quantity to serve the fire protection needs of the study area be found?
3. Can water in adequate quality to serve the study area be found?
4. Can a water storage structure site (or sites) to serve the study area be found?
5. Can water in sufficient quantity and quality to meet the study area’s needs be developed such that it can be provided to the study area residents and businesses at an affordable cost?
The Nelson Engineering team spent the months of July, August, and September attempting to develop answers to these questions. The results of the team’s work to date were presented in a public progress meeting on September 26th, again at the Hoback Junction fire hall. Those results are set forth in detail in the final report and are summarized in this executive summary.

C. Purpose

The purpose of the Hoback Junction Level I Water Supply Study is straightforward: determine the potable water supply options in the Hoback Junction vicinity and prepare preliminary designs and cost estimates for a water supply system in the area.

D. Setting

Hoback Junction is set at the confluence of rivers and roadways at the very southern end of Teton County. The Hoback and Snake Rivers meet here at an approximate altitude of 5,900 feet above sea level, and US Routes 26, 89, 189, and 191 intersect here as well. Although what might be described as “Hoback Junction proper” is no more than roughly 500 acres (or about 0.75 square miles) in size, the overall project study area is approximately 7,340 acres (or 11.5 square miles) in size. Elevations within the study area range from a low of approximately 5,800 feet to above 8,000 feet above sea level. The vast majority of the land (over 80%) within the study area boundaries is owned by public agencies, including (in diminishing order of the land held by each agency) the U.S. Forest Service, the Wyoming Game and Fish Commission, the State of Wyoming, and the U.S. Bureau of Land Management. A significant portion of the remaining lands are held by trusts, foundations, or similar entities. Of those lands that are privately held, approximately half have been developed. Within Hoback Junction proper, this percentage climbs to over 80%. The Teton County zoning designations applicable to the properties within the project study area are limited to just seven, with the great majority of the land area covered by the properties belonging to just two. In order of the amount of land area devoted to each, they are: RU (Rural), NC-SF (Neighborhood Conservation, Single-Family), MH-NC (Mobile Home Park), SU (Suburban), BC (Business Conservation), AC (Auto-Urban Conservation), and BP (Business Park). Within Hoback Junction proper, 140 parcels are zoned NC-SF, thirteen AC, four RU, and two BC.

In general terms, the study area could be characterized by the following description: “pockets of rural type development separated by several miles of sparse-to-no development.”

E. Sponsor Involvement

The formally recognized sponsor for the Hoback Junction Level I Water Supply Study project is Teton County. However, those who will directly benefit from any infrastructure construction project that arises out of the study will clearly be the residents and property owners within the study area boundaries. It was individuals within this group who informally petitioned the Teton County Commission to make a request on their behalf to the Wyoming Water Development Commission to undertake a Level I
study to determine the water supply options in their area of the county. And it has been members of this group who have attended the project meetings to date and who will be asked to form a legal entity (i.e., a special district) that can move forward into a Level II study and, ultimately, project construction should that be deemed feasible and desirable from both engineering and financial vantage points at the conclusion of the study.

F. Prior Studies

There exist several previously prepared studies of significant scope addressing the issue of providing potable water in the Hoback Junction study area. The first, which is by far the more general in nature, is one to which reference has already been made in this summary—the Teton County Water Supply Master Plan Level I Study prepared by Jorgensen Engineering and Land Surveying, P.C., in 1999 for the Wyoming Water Development Commission. Although that study’s focus was broader than the current study, it has a significant body of information upon which the current study has drawn for reference. The use of this information is gratefully acknowledged.

In addition to the Teton County Water Supply Master Plan Level I Study, the WWDC has also funded Level II and Level III studies to the benefit of residents on the Game Creek Plateau within the Game Creek and Squaw Creek Subdivisions. This area lies within the Hoback Junction study area, but was dropped from extended consideration within this study because it is now satisfactorily served by a community water system of its own and would have no need of connection to a regional system except for the purposes of fire protection.

Other prior investigations addressing the issue of providing high-quality potable water in quantity to all or part of the project study area have been limited to those associated with well-drilling for selected areas within the overall study area (e.g., the Hog Island Subdivision).

G. Authority

Nelson Engineering has conducted this study under the authority of that contract executed with the Wyoming Water Development Commission (WWDC), dated June 15, 2005.

H. Demand

For this study, six types of demand were considered: domestic, commercial, fire, irrigation, existing, and potential. The first two are obvious when considering the required volumes the system will be designed to deliver. The third and fourth are less obvious, but still necessary to evaluate. Of these four, at least in small study areas, fire demand has the greatest influence on the sizing of storage and supply (well pump) capacity as well as transmission main sizing. The last two types of demand listed are really different forms of the first four and are readily understood to be the demand that exists as the properties within the study area are currently developed and the demand that would exist if each property within the study area were developed to the maximum potential allowed to it by its applicable zoning.
I. Supply

Two viable supply options exist with respect to providing the Hoback Junction study area with high-quality potable water in quantity—surface water and ground water. Both options are feasible from an engineering standpoint; both options have positives and negatives associated with them. However, because ground water sources appear to be promising with respect to numbers of prospects and the potential production capacity of those prospects, because demand within the study area will not be so great as to eliminate ground water sources in favor of surface water sources, because surface water requires more extensive (and expensive) treatment than does ground water, and because support infrastructure demands for either option do not argue persuasively in favor of one or the other, it makes sense to pursue a ground water supply option for the study area.

J. Alternatives

The two primary source alternatives for providing the Hoback Junction study area with potable water in quantity are surface water and ground water. As was just discussed, ground water is the alternative that was pursued in the course of this study.

The two primary delivery system alternatives for providing the Hoback Junction study area with potable water in quantity are (1) an integrated system serving all (or nearly all) of the study area and (2) a discontinuous system that only serves parts of the overall study area or that serves the entire study area, but as a disconnected set of parts.

The alternatives considered in this study include a study area-wide integrated system and a variety of discontinuous elements serving Hoback Junction, Camp Davis, and North of Hoback Junction on both the east and west sides of the Snake River. (See enclosed plan.)

K. Cost

Obviously, cost will be a major determinant in whether the Hoback Junction Water Supply Project, in any form, will be a viable project. In terms of cost, the project has a number of factors that compromise its viability. These include the large service area, the low overall population density within the project area, and the topographic, geographic, and geologic constraints and impediments within the project area. Nonetheless, it is important to develop cost figures in order to have an informed deliberation on whether pursuing the project makes sense. Several types of cost figures must be developed in such an effort. They include:

- Construction-only costs,
- Full project construction-related costs (construction costs plus associated costs such as design, administration, permitting, legal fees, etc.), and
- Operation, maintenance, and long-term infrastructure replacement costs.

What follows are a series of summary tables that set forth those costs with respect to supply, transmission, storage, and distribution systems serving the entire project study area and a number of study sub-areas.
## Executive Summary Cost Table No. 1
### Summary of Opinion of Probable Construction Costs in 2005 $

<table>
<thead>
<tr>
<th>Alternative No. and Service Area Description</th>
<th>Supply, Transmission, and Storage</th>
<th>Distribution</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Entire Study Area</td>
<td>$7,381,900</td>
<td>$5,622,600</td>
<td>$13,004,500</td>
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<tr>
<td>2a Hoback Junction</td>
<td>$3,991,900</td>
<td>$2,360,228</td>
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<tr>
<td>2b Camp Davis</td>
<td>$1,674,145</td>
<td>$1,564,000</td>
<td>$3,238,145</td>
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<tr>
<td>2c North of Hoback Junction and West of Snake River</td>
<td>$2,019,400</td>
<td>$1,436,300</td>
<td>$3,455,700</td>
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<tr>
<td>2d North of Hoback Junction and East of Snake River</td>
<td>$2,200,600</td>
<td>$262,100</td>
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<td>2e North of Hoback Junction Combined Service Area</td>
<td>$2,904,500</td>
<td>$1,698,400</td>
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## Executive Summary Cost Table No. 2
### Summary of Opinion of Probable Construction Costs in 2010 $

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<thead>
<tr>
<th>Alternative No. and Service Area Description</th>
<th>Supply, Transmission, and Storage</th>
<th>Distribution</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
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<td>$10,334,660</td>
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<tr>
<td>2a Hoback Junction</td>
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<td>2b Camp Davis</td>
<td>$2,343,803</td>
<td>$2,189,600</td>
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<td>2c North of Hoback Junction and West of Snake River</td>
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<td>2d North of Hoback Junction and East of Snake River</td>
<td>$3,080,840</td>
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<td>2e North of Hoback Junction Combined Service Area</td>
<td>$4,066,300</td>
<td>$2,377,760</td>
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## Executive Summary Cost Table No. 3
### Summary of Full Project Construction-related Cost Estimates

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<thead>
<tr>
<th>Alternative No. and Service Area Description</th>
<th>Project Cost</th>
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<tbody>
<tr>
<td></td>
<td>2005 $</td>
</tr>
<tr>
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<td>$19,311,683</td>
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<tr>
<td>2a Hoback Junction</td>
<td>$9,432,910</td>
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<td>2b Camp Davis</td>
<td>$4,808,645</td>
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<td>2c North of Hoback Junction &amp; West of Snake River</td>
<td>$5,131,715</td>
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<td>$3,657,110</td>
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<td>2e North of Hoback Junction Combined Service Area</td>
<td>$6,835,307</td>
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### Executive Summary Cost Table No. 4

**Summary: Operation/Maintenance/Long-term Infrastructure Replacement Costs**

<table>
<thead>
<tr>
<th>Alternative No. and Service Area Description</th>
<th>Annual Costs</th>
<th>Monthly Costs</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2005 $</td>
<td>2010 $</td>
</tr>
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<td>1 Entire Study Area</td>
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<td>$285,881</td>
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<td>2a Hoback Junction</td>
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<td>2b Camp Davis</td>
<td>$60,630</td>
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<td>$64,220</td>
<td>$89,908</td>
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<td>$48,605</td>
<td>$68,047</td>
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<td>2e North of Hoback Junction Combined Service Area</td>
<td>$80,580</td>
<td>$112,812</td>
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</table>

### L. Funding

The funding sources tapped for constructing, operating, and maintaining a potential Hoback Junction water supply, transmission, storage, and distribution system will be critical in determining the viability of such a project. Whatever the scope of project pursued, the numbers of potential users set against the construction cost will require that outside sources of funding be secured to make construction of the project feasible.

Assuming sufficient funds can be found to finance the construction of a project, two further issues then must be satisfactorily addressed:

- Can the repayment of construction funds other than outright grant monies be borne by the system users? And
- Can the system users afford to fund in perpetuity the system’s operation, maintenance, and long-term infrastructure replacement?

Of the six potential system funding scenarios examined, Scenario No. 5 (as it was identified in the full report; here it is identified as the Preferred Funding Scenario) comes the closest to achieving all of the following desirable objectives:

- A community water system that serves the needs of the system users at an affordable system user price,
- A system that is fiscally sound over the long term,
- Maximum beneficial use is made of the WWDC grant-loan program,
- Use is made of locally-derived funding (SPET funds) to finance a significant portion of the project,
- System users will participate to some extent in the system’s initial (construction) financing, and
- System users are asked to fund in perpetuity system maintenance, operation, and long-term infrastructure replacement.
Executive Summary
Preferred Funding Scenario

Assumptions:

1. Supply, transmission, and storage infrastructure financed through WWDC 67% grant-33% loan financing, with 30-year, 4% interest loan terms, repaid entirely by system users.
2. Distribution infrastructure 100% financed through local Specific Purpose Excise Tax (SPET) revenues.

<table>
<thead>
<tr>
<th>Service Area</th>
<th>Potential Number of EDUs</th>
<th>Supply, Transmission, and Storage Infrastructure Cost Repayment</th>
<th>Distribution Infrastructure Cost Repayment</th>
<th>Operation, Maintenance, and Long-term Infrastructure Replacement</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire Study Area</td>
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<td>$25.54</td>
<td>$0</td>
<td>$0</td>
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<td>Hoback Junction</td>
<td>358</td>
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<tr>
<td>Camp Davis</td>
<td>186</td>
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<td>$31.61</td>
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<td>$0</td>
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<td>$0</td>
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<td>North of Hoback Junction, Combined Service Area</td>
<td>460</td>
<td>$15.49</td>
<td>$21.69</td>
<td>$0</td>
<td>$0</td>
</tr>
</tbody>
</table>
M. Conclusions

1. There appears to be sufficient ground water supply to serve all of the individual Hoback Junction study sub-areas and the study area as a whole.

2. There is more public support to implement a community water system within Hoback Junction proper than in some of the other study sub-areas.

3. Identifying suitable storage tank sites is a challenging task in the project area due to geologic hazards. The best site so far identified (without having yet talked to the property owner on whose property the tank would be located) is the Ross Plateau on the west side of the Snake River north of Hoback Junction proper.

4. Any system serving the Hoback Junction Water Supply Project study area, whether it be integrated or discontinuous, and whether it serves the entire study area or only some portion of it, will encounter difficult construction circumstances. Of particular concern are areas within the study area that are geologically unstable. That said, at the level of examination consistent with a Level I study, it appears the engineering concerns so far raised are possible to address.

5. User density in the project area is low enough to make the financial feasibility of the project questionable. However, utilization of WWDC grant and loan funding on its most attractive terms offered on recent projects (67% grant-33% loan, 30-year loan term, and 4% interest) and local Specific Purpose Excise Tax (SPET) revenues may make it possible to fully finance the project, establish the system with a sound long-term financial plan, and put in place a manageable user fee schedule.

6. Despite the concerns raised during the course of conducting the Level I Study, the project shows sufficient viability that it should proceed to a Level II Study.

N. Recommendations

1. A water district, as opposed to an improvement and service district, should be formed in accordance with Wyoming statute, with an initial service boundary encompassing the area identified in this study as the Hoback Junction sub-area (or Hoback Junction “proper”).

   - A water district requires only 25% of the landowners (who shall also own not less than 25% of the assessed valuation) within the proposed district to sign the initiating petition to form a district, whereas 60% is the threshold for an improvement and service district.

   - A water district, under Wyoming statute, has the power of eminent domain, whereas an improvement and service district does not. This
power may be of value, in that the prospective well sites so far identified are almost all located on private property. While it may be that the exercise of the power of eminent domain will not be necessary (and the hope would be that it would not need to be exercised), it is still helpful to have the power if its use becomes necessary.

- The residents of the Hoback Junction proper sub-area have consistently expressed greater interest in a community water system than the residents of the other study sub-areas.

- The Hoback Junction proper sub-area is more fully developed than are the other study sub-areas and, as such, has a higher potential initial system participation level than do the other sub-areas.

- Should additional sub-areas desire to annex to the district following its formation, this can be accomplished readily through procedures set forth in Wyoming statute.

2. In establishing the initial water district boundaries for the purpose of circulating a formation petition, the residents of Deer Creek Palmer Creek Subdivision, Deer Creek Heights, and the Double R Ranch Subdivision should be surveyed to ascertain their interest in joining the district at its outset.

3. Similarly, the residents and commercial interests near Horse Creek should be surveyed to determine their interest in joining the district at its outset.

4. The target date for the district formation election should be the general election date in 2006 (which will be the first Tuesday of November—November 7, 2006).

5. As the water district is in the process of being established, an application should be submitted to the WWDC for completion of a Level II study (contingent upon the successful formation of the district). The application will be due by August 15, 2006.

6. Also as the water district is in the process of being established, an application should be submitted to the WWDC to fund a test well under the WWDC’s Groundwater Exploration Program, again contingent upon the successful formation of the district.

7. Once the water district has been established, it should actively position itself to seek local Specific Purpose Excise Tax (SPET) funding to pay for distribution infrastructure for which WWDC funding cannot be utilized.

8. During the course of the Level II study, WYDOT should be contacted in an effort to determine its construction schedule for highway improvements on US Highway 189 north of Hoback Junction proper. This information will be valuable in any construction coordination effort between the water district and WYDOT.