Mailing Address:
Water Resources Data System
University of Wyoming, Dept 3943
1000 E University Avenue
Laramie, WY 82071

Physical Address:
Wyoming Hall, Room 249
University of Wyoming
Laramie, WY 82071

Phone: (307) 766-6651
Fax: (307) 766-3785

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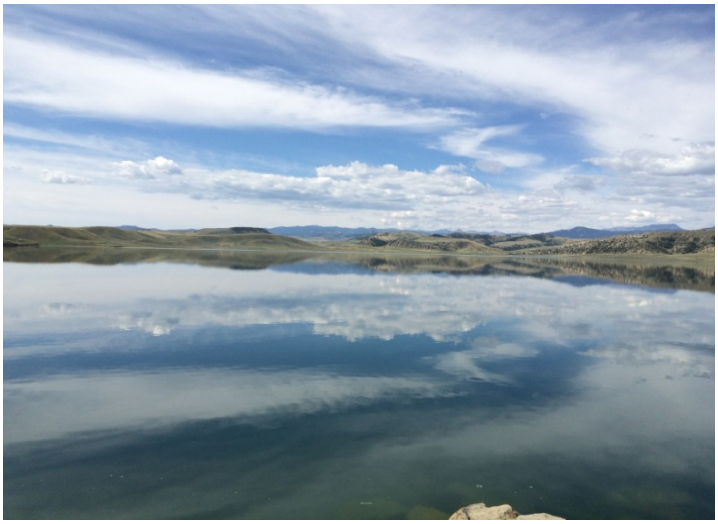
EXECUTIVE SUMMARY

GREYBULL VALLEY IRRIGATION DISTRICT STORAGE ENLARGEMENT, LEVEL II, PHASE I STUDY



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Wyoming Water Development Commission
6920 Yellowtail Road
Cheyenne, WY 82002

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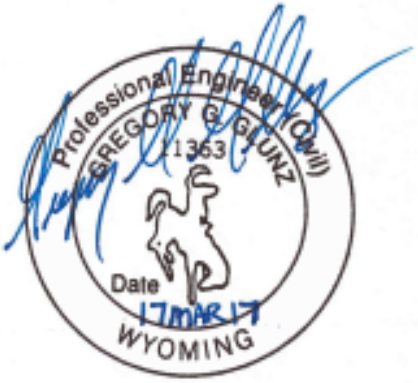

AECOM
6200 S. Quebec St.
Greenwood Village, CO 80111

WENCK Associates
1904 E 15th Street
Cheyenne, WY 82001

This Level II, Phase 1 report documents the development and screening evaluation of water storage alternatives for the Greybull Valley Irrigation District (GVID). The following key topics are presented in the report:

- Water availability and demand (hydrologic analyses)
- Alternatives development and evaluation
- Alternatives screening
- Permitting considerations
- Economic analyses

The hydrologic analyses confirmed that the Greybull River watershed operates as a water-short system based on the current estimate of approximately 72,700 irrigated acres. The average annual shortage of available water for the currently irrigated acres scenario (Baseline Scenario) in the watershed is 22,900 acre-feet (ac-ft). This water-short situation would only be further compounded if the additional 24,500 acres that are permitted within the watershed but currently not irrigated were to be brought into production.

The average annual yield of the Greybull River watershed is 236,000 ac-ft. The hydrologic analyses indicate the average annual water available within the Greybull River watershed varies between approximately 18,000 ac-ft and 29,000 ac-ft depending on location within the watershed. The GVID operates three water supply reservoirs that total 144,905 ac-ft of storage. The hydrologic analyses evaluated firm yield impacts for reservoir storage enlargements between 5,000 ac-ft and 60,000 ac-ft. In addition, conservation scenarios were modeled to identify associated firm yield impacts for comparison with the storage alternatives.

The storage alternatives identified for screening included alternatives evaluated previously as part of the Roach Gulch Dam Environmental Impact Statement (EIS) completed in the 1990s. The alternatives included the three existing reservoirs and two new reservoirs. One new reservoir involved the Blackstone Gulch site, which was one of the sites evaluated in the EIS. The other new reservoir site was located in one of drainages to the west of Roach Gulch that could be filled using existing GVID facilities. The alternatives were screened using the following categories:

- Cost
- Logistics/Technology/Practicability
- Biological and Cultural

The results of the screening analyses indicate that the overall highest (best) scoring alternative was the enlargement of Lower Sunshine Reservoir. Conversely, the overall lowest (worst) scoring alternative was the new reservoir at Blackstone Gulch. Upper and Lower Sunshine Reservoirs scored noticeably better than the other alternatives under the "logistics/technology/practicability" criterion. Lower Sunshine had the highest score under the "biological and cultural" criterion. The other alternatives, except for the new reservoir at Blackstone Gulch, scored only slightly less on the "biological and cultural" criterion.

Construction cost estimates for a 5-foot dam raise and a 30,000 ac-ft reservoir enlargement at each of the three existing reservoirs were prepared to provide a range of costs. The reservoir

enlargement storage costs ranged between $1,500 and $3,000 per ac-ft, with a total project cost between $15M and $85M.

Economic analyses were performed to estimate the economic benefits (direct and indirect) associated with the additional firm yield that would be created for the various alternatives considered. The total economic benefits for reservoir enlargements between 5,000 ac-ft and 30,000 ac-ft were estimated to range between $21.8M and $56.6M. This resulted in a benefit/cost ratio range between 2.4 and 0.6 for the 5,000 to 30,000 ac-ft reservoir enlargements.

A questionnaire was mailed to GVID shareholders to aid in gauging the interest in additional water storage. Approximately 10 percent of the questionnaires were completed and returned. Given the relatively limited response, it is difficult to gauge the overall interest in additional storage. It appears that the upper end of interest in additional storage could be in the range of 20,000 ac-ft, which also generally aligns with a benefit/cost ratio of about one. Assuming new water storage is assessed at $20 per ac-ft, the grant-to-loan ratio required based on initial cost estimates would range between 72 and 77 percent for Upper Sunshine Reservoir, and 81 and 84 percent for Lower Sunshine Reservoir.

The results of this study indicate that there is additional water available in the Greybull River watershed that can be stored to reduce shortages based on the current irrigation demand in the watershed. The screening analyses and economic analyses indicated that raises to Lower and Upper Sunshine Reservoirs are the top two choices for providing this additional storage. Both sites are fairly comparable, with Lower Sunshine Reservoir scoring slightly better. It is recommended that additional studies be performed to confirm the assumptions and corresponding costs for the Lower Sunshine Reservoir enlargement. If the assumptions or new information indicates that Lower Sunshine Reservoir is not practical, then Upper Sunshine Reservoir should be evaluated in more detail.