

TECHNICAL MEMORANDUM

TO: *WWDC* DATE: *May 12, 2010*
FROM: *MWH* REFERENCE: *Wind-Bighorn Basin Plan*
SUBJECT: *Task 7 – Approach to Developing Opportunities and Strategies*

The purpose of this technical memorandum is to describe the process used to identify future water use opportunities and strategies to meet the needs of the Wind-Bighorn Basin (Basin) that have been identified to as part of the Wind-Bighorn Basin Plan Update (Basin Plan Update). The memorandum provides a brief review of information from both the previous Wind Bighorn Basin Plan (previous Basin Plan) and Framework Water Plan, and the approach for incorporating that information into the Basin Plan Update. Selected future water use opportunities and strategies incorporated into the Basin Plan Update are described in Technical Memorandum 6 – Future Water Use Opportunities and Strategies.

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Section 1 – Introduction

A number of approaches could be used to organize potential solutions to water resource issues identified in the Basin Plan Update. Water resources issues and potential strategies were identified by the Basin Advisory Group (BAG), and are documented in Technical Memorandum 3G – Basin Advisory Group Issues and Strategies. In this report, potential solutions will be organized in two categories: project opportunities and program strategies. These terms are defined as follows:

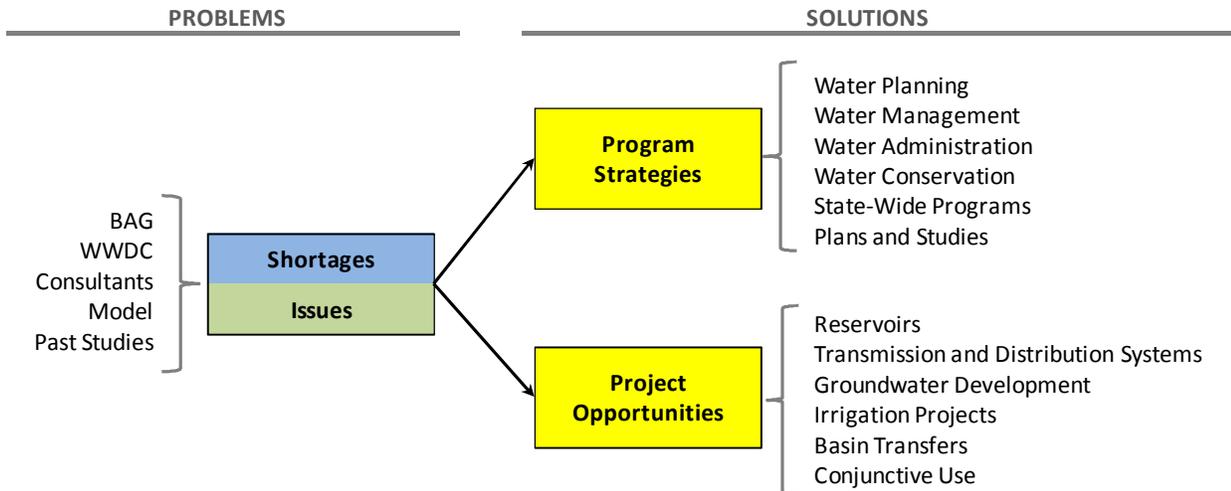
Project Opportunities – Specific projects tied to specific areas or locations and identifiable on-the-ground activities. Examples include reservoirs, irrigation system improvements, water distribution system improvements, groundwater development, water transfers, and conjunctive use.

Program Strategies – Generally state-level or regional-level approaches not tied to specific projects or locations; activities performed by the Wyoming Water Development Commission (WWDC) or other state/federal agencies; and management approaches rather than project approaches. Examples include water planning, water administration, data collection, data management, water conservation, and future studies.

Project opportunities and program strategies are two categories of potential solutions to address water resources problems identified for the Basin. They are generated based on known water supply

shortages, potential future water shortages, issues identified in past studies, and issues identified in the Basin Plan Update process. Figure 1 shows that both approaches will be pursued in parallel, with project opportunities generally representing more structural approaches and program strategies generally representing more non-structural approaches. Actual opportunities and strategies recommended for the Basin Plan Update are presented in Technical Memorandum 6 – Future Water Use Opportunities and Strategies.

Figure 1. Relationship of Project Opportunities and Program Strategies



The emphasis of the previous Basin Plan was to identify, evaluate and develop a short-list of “future water use opportunities.” This list of opportunities included both specific projects (what are now called project opportunities) and regional or state-wide management programs (what are now called program strategies). Technical Memorandum 6 – Future Water Use Opportunities and Strategies reviews, discusses and presents a summary of this work. The previous Basin Plan intended the long-list and short list as a “place to start,” with the anticipation that it could help initiate investigations leading to the selection of an opportunity from the list or a new opportunity that had not been previously identified (BRS, 2003).

Volume II of the WWDC Framework Water Plan dealt specifically with the second objective of the Framework Planning process, which was to “provide future water resource planning direction to the State of Wyoming” (WWC, 2007). The Framework Plan presented strategies to meet existing and future needs on both a basin-wide and state-wide scale. Planning direction was formed using results from the following:

- BAG process;
- a three-tiered planning survey of water management and agency leaders;
- a survey of the water planning process for other western states;
- observations and notes of the Framework consulting team;
- ideas and opinions of state agency staff, including WWDC, State Engineer’s Office and the Water Resources Data System.

Several outcomes of these investigations are presented below, and will guide the specific strategies adopted for the Basin Plan Update.

- Outreach plans developed during original basin plans should be continued and improved.

- River basin planning information should be presented electronically use in internet-based systems, including the development of a GIS/database tool.
- Coordination with local, state, and federal agencies should be promoted, and involvement with the BAGs should be encouraged.
- River basin plans should consider moving away from spreadsheet models to more sophisticated models.
- River basin planning should incorporate a longer water supply period of record to account for drought periods and climate variability.
- Future basin planning efforts and updates should focus on areas of substantial change within the basin.
- River basin plan updates should focus on defining and evaluating groundwater resources within basins, describe infrastructure maintenance and improvement needs, and incorporate better socioeconomic forecasting methodologies.

In addition to general state-wide recommendations regarding the planning process, additional recommendations were presented for each basin. Recommendations for the Wind-Bighorn Basin include (WWC, 2007):

- Project future agricultural and municipal water system needs and compare to current and future water availability.
- Evaluate and describe groundwater resources of the Basin.
- Study current groundwater supplies to determine safe yield and prevent groundwater mining
- Maintain existing agricultural and municipal water supply infrastructure.
- Evaluate the potential for conservation in agricultural and municipal water uses.

Many of the agency staff and agency leader recommendations and specific basin recommendations have been actively followed in both the scoping and performance of the Basin Plan update. Examples include the establishment of a hydrologic database that can be easily updated from other agency data sources and be extended to more sophisticated models, devoting half of the appropriated budget for the plan to a groundwater analysis by the Wyoming State Geological Survey, and continuing to enhance and improve the BAG meetings. However additional strategy and subsequent work will be required to fully meet the recommendations in the Framework Plan. The remainder of this technical memorandum focuses on the discussion of these strategies as they relate to the Basin.

Section 2 – Process for Developing Project Opportunities and Program Strategies

This section gives an overview of the methodology for selecting and organizing project opportunities and program strategies.

Process for Developing Project Opportunities

The process for identifying project opportunities for the Basin Plan Update is described in the following steps.

1. Review results of the hydrologic modeling performed for the Basin Plan Update, future water needs within the Basin, the list of issues identified at a sub-basin level to determine the opportunities and strategies required.
2. Begin with the long list of opportunities from the original Basin Plan. Determine which of these items belong in the current list of project opportunities (i.e., structural projects) and which should be moved to the list of program strategies (i.e., non-structural approaches).
3. Review the Framework Water Plan and incorporate any new specific projects (e.g., potential reservoirs, irrigation efficiency improvements) into the short-list of opportunities.

4. Based on types and locations of water shortages identified by the modeling, augment the short-list with additional projects that could be implemented to address these shortages.
5. Present the short-list to the BAG and solicit input on additional projects that should be included.
6. Develop a final list of project opportunities organized by sub-basin and water use category (e.g., municipal and industrial, agricultural, recreation). To the extent possible, tie project opportunities to specific identified shortage areas or other water management issues. No ranking or prioritization will be performed.

Process for Developing Program Strategies

The process for selecting program strategies for the Basin Plan Update is described in the following steps.

1. In conjunction with the BAG, establish a list of issues and proposed strategies for addressing these issues. This has been completed and is discussed in Technical Memorandum 3G – Basin Advisory Group Issues and Strategies.
2. Review Framework Water Plan for lists of issues and recommendations both within the Wind-Bighorn Basin and the basin planning process as a whole, and develop strategies to address these issues and recommendations.
3. Merge the lists of strategies from items (1) and (2) above, combining strategies where there is overlap and refining to meet the issues identified.
4. Develop an initial list of strategies that includes all strategies from item (3) above, defining the strategy itself, ownership of the strategy.
5. Review the list of strategies with the BAG.
6. Develop a final list of program strategies that includes the information prepared in item (4) above with modifications based on BAG input. Organize strategies by sub-basin and water use category.

Application of these two processes is presented in Technical Memorandum 6.

Section 3 – References

BRS, Inc. 2003. "Task 5 Future Water Use Opportunities: Project Summaries." Technical Memorandum, Wind/Bighorn Basin Plan. Prepared in conjunction with Lidstone & Associates, Inc. Riverton, Wyoming. February 27.

WWC Engineering, et al. 2007. Wyoming Framework Water Plan. Prepared for the Wyoming Water Development Commission. October.