MEMORANDUM

TO: Members, CWCB

FROM: Bill McDonald

DATE: January 13, 1987

SUBJECT: Agenda Item 15, January 22-23, 1987, Board Meeting—
S.B. 5 Groundwater Studies

Introduction

In the attached correspondence, we described three study
alternatives for groundwater studies. The response from the
Senate and House Ag committee chairmen is also attached. Their
response asks for further recommendations from the Board during
the 1987 legislative session.

Discussion

The three studies set forth in the Board's letter were
necessarily described in general terms, in part because no
additional staffing or funding were provided by S.B. 5. With
the chairmen's suggestion that we consider utilizing a portion
of the monies which are to become available on or after July 1,
1988, from the construction fund, there is an issue of whether
or not the Board is comfortable proposing groundwater studies
with construction fund money. If the Board is willing to do
so, then it may be appropriate to recommend to the General
Assembly that we undertake certain studies well before July 1,
1988, since existing monies in the construction fund are
sufficient to cover such studies.

Based on discussions with the State Engineer's Office,
there are two situations which warrant immediate consideration
within the context of the three study alternatives reported to
the Ag committees by the Board.
First, the Bureau of Land Management is funding the U.S. Geological Survey to identify the nature and amounts of groundwater underlying BLM lands in western Colorado. State involvement in the research may be a timely and cost effective way to partially effect the first study alternative. A preliminary discussion on potential federal-state cooperation was held in December, 1986, and another meeting is scheduled for January 27, 1987. After the meeting, it should be possible to prepare a specific proposal.

Second, the need to obtain the information required for permitting and regulation in the Denver basin remains a very high priority. Furthermore, this work could be done concurrently with the conduct of study alternative 1.

Recommendation

I recommend that the Board direct the staff to prepare, in consultation with the State Engineer, more detailed proposals for effectuating study alternatives 1 and 2, said proposals to be reviewed at the March Board meeting in anticipation of their being forwarded to the General Assembly with the recommendation that they be funded from the construction fund in FY 87-88.

/bj
Attachments: as stated
cc: Bob Longenbaugh
February 19, 1986

The Honorable Tilman M. Bishop  
Chairman, Committee on Agriculture,  
Natural Resources, and Energy

The Honorable Walt Younglund  
Chairman, Committee on Agriculture,  
Livestock, and Natural Resources

Colorado General Assembly  
State Capitol  
Denver, CO 80203

Dear Gentlemen:

S. B. 5 (1985 session) added a new subsection (3) to section 37-60-115, C.R.S., which directed the Board, after consultation with your two committees, "... to study the state's ground water resource, particularly that water that may prove to be nontributary, both within the Denver basin and throughout the state, including nontributary ground water quality." In order to initiate the consultation process, the Board, with the advice of the State Engineer, has prepared for your consideration an analysis of alternative approaches to the study of the state's ground water resource (enclosed).

Since S.B. 5 did not carry with it any appropriations or personnel authorizations, the Board has outlined three study alternatives for your review and consideration. These range from short term, relatively inexpensive efforts to long term programs requiring substantial funding. Of the three alternative approaches set forth in the enclosure, the Board recommends the first of these as the priority need for funding.

I would be pleased to discuss these alternatives with both committees further. Please let me know how you would like to proceed.

Sincerely,

J. William McDonald  
Director

Enc: as stated
cc: Members of the Committee  
    Members, CWCB  
    Representative Chris Paulson  
    Mr. Gary Broetzman
With the enactment of section 37-60-115 (3), CRS, in 1985, the Colorado Water Conservation Board (CWCB) was:

... authorized and directed, after consultation with the agriculture, livestock, and natural resources committee of the house of representatives and the agriculture, natural resources, and energy committee of the senate ... to study the state's ground water resource, particularly that water that may prove to be nontributary, both within the Denver basin and throughout the state, including nontributary ground water quality.

In furtherance of the required consultation, the Board has prepared for the committee's consideration a brief analysis of alternative approaches which could be taken in carrying out such studies. These are set forth below.

**Study 1: INVENTORY, ANALYSIS, AND EVALUATION OF EXISTING DATA ON NONTRIBUTARY GROUNDWATER**

**Scope and Purposes:** The investigation would be limited to an inventory of existing data on nontributary groundwater quantity and quality. Significant data are available from a variety of sources, but they have never been assembled and analyzed to portray the total knowledge about the state's nontributary groundwater. The primary purpose would be to describe the distribution, depth, quantity, and chemical properties of nontributary groundwater in Colorado based upon existing knowledge.
A secondary purpose would be to evaluate the adequacy and consistency of nontributary groundwater data for management and administration decisions to be made by the State Engineer.

Method: The CWCB would employ a consulting engineering firm to perform the inventory and analysis. Management of the study would be coordinated with the Division of Water Resources. Advice and liaison would be sought and maintained with the Division of Water Quality Control, the Colorado Geological Survey, and the U.S. Geological Survey.

Anticipated Results: A report on known quantities and distribution of nontributary groundwater with accompanying information in water quality would be prepared. The report would also evaluate the adequacy of the existing information for development and management of the resource. Recommendations for further research would be provided.

Time and Cost:

Estimated cost: $75-100,000
Project duration: 18 months

Study 2: COLLECTION OF ADDITIONAL DATA FOR THE DENVER BASIN

Scope and Purposes: The scope would be limited to the Denver Basin nontributary groundwater resource. One purpose would be to conduct a thorough investigation to determine the appropriate specific yield. A second purpose would be to design an observation well program to accumulate accurate information for management and conservation of the resource. A third purpose would be to establish an operational data network for administration and management by the State Engineer.

Method: The CWCB would employ a consulting engineering firm to perform the research. Advisory liaison would be included as in the study 1 alternative. Existing wells would be identified and evaluated for an observation well network.

The study would be conducted in three elements. The first would be directed toward establishing the specific yield of the nontributary aquifers in the Denver Basin. Further research is essential to refine and close gaps in existing knowledge. The analytical work would concentrate on core sample testing to provide information on quantity and thereby to determine yield.

The second element would be to design an observation well network. First, attention would be directed to creating a system based upon existing wells from which data could be available through agreements with owners. If that approach is insufficient, then additional wells could be proposed, but at a significantly greater cost.
The final element would be to initiate a continuous observation well data network.

The results would include:

(1) For element one, a report describing the specific yield of the aquifers of the Denver Basin, upon which continuing administration would be performed by the State Engineer. This information would refine and augment the extensive data already gathered during development of new regulations required under S.B. 5.

(2) Under the second element, the design of and program for an observation well network would be proposed with primary reliance on a network of existing wells.

(3) The third element would result in a proposal for a continuous data network on nontributary groundwater in the Denver Basin.

**Time and Cost:**

<table>
<thead>
<tr>
<th>Element</th>
<th>Cost</th>
<th>Duration</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>$550,000</td>
<td>24 months</td>
</tr>
<tr>
<td>2</td>
<td>$25,000</td>
<td>12 months</td>
</tr>
<tr>
<td>3</td>
<td>$11,000</td>
<td>continuous</td>
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</table>

**Study 3: STATEWIDE NONTRIBUTARY GROUNDWATER RESEARCH**

A comprehensive study of the 17-19 nontributary aquifers could be conducted. However, the data deficiencies and research needs cannot be determined unless the initial inventory study is completed. Further, if the results are to be developed for use in groundwater administration similar to that now provided in the Denver Basin according to S.B. 5, then the research process would be scheduled according to immediate and anticipated needs for such management. For instance, it can be anticipated that about 3 to 5 detailed studies will be needed over the next 20 years. Depending upon the extent of existing data and the complexity of management requirements, each study should cost between $250,000 and $1 million. Therefore, a preliminary estimate of research costs is from $1 million to $5 million over the next 20 years.
Colorado Water Conservation Board  
Department of Natural Resources  
721 State Centennial Building  
1313 Sherman Street  
Denver, CO 80203

Dear Gentlemen:

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... authorized and directed, after consultation with the agriculture, livestock and natural resources committee of the house of representatives and the agriculture, natural resources, and energy committee of the senate ... to study the state's ground water resource, particularly that water that may prove to be nontributary, both within the Denver basin and throughout the state, including nontributary ground water quality.

Pursuant to this requirement, both committees of reference recently had an opportunity to consult jointly with Mr. Bill McDonald, executive director, and several members of the Water Conservation Board regarding a study of the state's ground water. At this public meeting, three study alternatives were outlined and consideration was given as to a source of funding for the study.

With respect to the funding of the ground water study, the joint committee proposes that a portion of the moneys made available by the enactment of House Bill 1340, 1986 session, be used for this purpose. This bill raises revenue for future years.
June 24, 1986
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by continuing the suspension of the one-half percent income tax credit through December 31, 1990, and designates that specific amounts raised by this suspension be transferred to the Capital Construction Fund, Water Conservation Board Construction Fund (WCBCF) and the Colorado Water Resources and Power Development Authority during the additional three years of suspension. The following amounts are expected to accrue to the WCBCF.

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
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<tr>
<td>1988 and 1989</td>
<td>$7.5 million</td>
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<tr>
<td>1990</td>
<td>$12.5 million</td>
</tr>
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Concerning the actual scope of the ground water study, the joint committee suggests that the Water Conservation Board bring one of the three study alternatives along with a specific proposal for funding before the joint Agriculture committees sometime during January of 1987. At that time, the specifics of the study can be discussed. Although the nature of water data to be included in the ground water study was discussed in general terms, the committee wishes to emphasize the importance of a comprehensive study of the nontributary aquifers in order to determine the total yield, capacity and water quality of these deep aquifers.

On behalf of the committee members we would like to thank Mr. McDonald and the members of the Water Conservation Board for their active interest and participation in this essential study of one of the state's most important natural resources.

Very truly yours,

Tilman Bishop
Senator Tilman Bishop
Chairman
Senate Agriculture Natural Resources and Energy

Walter Younglund
Representative Walter Younglund
Chairman
House Agriculture, Livestock and Natural Resources

TB/JRH/pn