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**Special**  
**Water**  
**Committee**

**Report to the**  
**COLORADO**  
**GENERAL ASSEMBLY**

**Colorado Legislative Council**  
**Research Publication No. 444**  
**November 1998**

**RECOMMENDATIONS FOR 1999**

**SPECIAL WATER COMMITTEE**

**Report to the  
Colorado General Assembly**

**Research Publication No. 444  
November 1998**

# COLORADO GENERAL ASSEMBLY

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## LEGISLATIVE COUNCIL

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DENVER, COLORADO 80203-1784  
303-866-3521 FAX: 303-866-3855 TDD: 303-866-3472

November 1998

To Members of the Sixty-second General Assembly:

Submitted herewith is the final report of the Special Water Committee. This committee was created pursuant to Section 37-90-137.5, C.R.S.

At its meeting on October 15, 1998, the Legislative Council reviewed the report of this committee. A motion to forward this report and the bills therein for consideration in the 1999 session was approved.

Respectfully submitted,

/s/ Representative Chuck Berry  
Chairman  
Legislative Council

CB/DB/eg

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# **SPECIAL WATER COMMITTEE**

## **Members of the Committee**

Senator Don Ament,

Chair

Senator Joan Johnson

Senator Richard Mutzebaugh

Senator Ed Perlmutter

Representative Jeanne Adkins

Representative Ken Gordon

Representative Marilyn Musgrave

Representative Jack Taylor

Representative Brad Young

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Senior Fiscal Analyst

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Pamela Cybyske

Senior Attorney

# EXECUTIVE SUMMARY

## Committee Charge

Pursuant to Section 37-90-137.5, C.R.S., the Special Water Committee was established to investigate Denver Basin groundwater management and South Platte River Basin issues. The committee is charged with defining the scope of a technical study of the river basin and the Denver Basin aquifers by the State Engineer and the Director of the Colorado Water Conservation Board. As specified in law, the study includes an inventory of surface and groundwater resources in the South Platte River Basin; an assessment of long term impacts on water rights from the use of nontributary and not nontributary groundwater; and an examination of programs to protect endangered species on the Platte River. The committee is authorized to recommend legislation based on the final report and public testimony. It is authorized to meet until July 1, 1999.

## Committee Activities

This is the first report on the activities of the Special Water Committee. The committee was created in 1996. In the first year, the committee defined the scope of the technical study of the South Platte River Basin and the Denver Basin aquifers. In the second year, the committee received briefings on the study's preliminary results and heard testimony. In 1998, the committee received the final results of the study, heard testimony, and considered policy responses.

### **Chronology of Committee Activities Since 1996**

- defined the scope of the technical study and received testimony, *September, 1996*;
- reviewed progress on the technical study, *April, 1997*;
- toured the South Platte River Basin, *July, 1997*;
- received draft report of the technical study and testimony, *December, 1997*;
- received final report of the technical study, *April, 1998*; and
- considered proposed legislation and received testimony, *October, 1998*.

**1998 committee activities.** The committee met once during the 1998 legislative interim to receive testimony from the public and the Colorado Department of Natural Resources and to consider legislation. The department described the federal review process of the cooperative agreement between Colorado, Wyoming, and Nebraska for the recovery of endangered species on the Platte River. The department also identified and evaluated policies for increasing water supply through cooperative agreements between metropolitan water providers. The State Engineer proposed additional studies of the Denver Basin



aquifers; explained policy options for administering increased runoff from roads, buildings and other impervious surfaces; and summarized alternative water replacement standards for depletions caused by the pumping of the Denver Basin aquifers. The State Engineer also explained that the study's Peer Review Committee recommends making improvements to the ground water model of the Denver Basin aquifers. Finally, the committee considered legislation pertaining to further studies of Denver Basin aquifers and well pumping practices, delay of more stringent augmentation requirements, and an extension of the Special Water Committee's repeal date until July 1, 2001.

### **Committee Recommendation**

---

Based on the results of the technical study of the Denver Basin Aquifer and the South Platte Basin and public testimony, the committee recommends the following bill.

***Bill A — Augmentation Requirements For Water Well Pumping in the Denver Basin Aquifers.*** This bill delays, until July 1, 2001, the effective date for temporary water replacement requirements for not nontributary ground water wells in the Denver Basin aquifers. It also provides for an appropriation for the Department of Natural Resources to collect well pumping data and improve a ground water model of the Denver Basin aquifers. The bill extends the repeal date of the Special Water Committee from July 1, 1999, to July 1, 2001.

# STATUTORY AUTHORITY AND RESPONSIBILITIES

Pursuant to Section 37-90-137.5, C.R.S., the Special Water Committee was created to investigate Denver Basin ground water management and South Platte River Basin issues. The committee consists of nine members of the General Assembly whose districts use the water being studied or who may be affected by policy responses to the study (five from the House and four from the Senate). The statute directs the committee to:

- define the scope of the technical study administered by the State Engineer and the Director of the Colorado Water Conservation Board;
- review and comment on the draft report issued by the State Engineer and the Director of the Colorado Water Conservation Board;
- review and comment on the evidence and testimony received at the public hearing prior to the issuance of the final draft of the technical study; and
- recommend legislation, if necessary, based on the technical report.

Pursuant to Section 37-90-137.5, C.R.S., the State Engineer and the Director of the Colorado Water Conservation Board are required to complete a peer reviewed study that includes the following:

- an inventory of surface water and groundwater resources in the South Platte River Basin;
- the effect of existing efficiencies and conjunctive management of surface water and groundwater resources on future supply and on local and regional existing water rights above the Henderson gauge;
- the effect of existing water reuse on future supply and on existing water rights;
- a review of distribution system infrastructure in the Denver metropolitan area to identify ways to promote maximum utilization of the water resources available to the South Platte Basin above the Henderson gauge;
- the effect on existing water rights of current recharge technology and practices in Denver Basin aquifers;
- the impact of de minimis standards for injury based upon an annual depletion standard;
- the effect of the four percent replacement and the two percent relinquishment requirements in current law on future water supplies and on existing water rights, and the need for replacement of post pumping depletions resulting from withdrawal of Denver Basin groundwater;
- the use of nontributary groundwater and its long-term impact on water rights;

- an assessment of the need for Colorado to participate in a recovery program for endangered species on the Platte River in Nebraska;
- an assessment of opportunities for the application of local and regional water use efficiency and reuse technologies to enhance the reliability and yield of water rights in the South Platte River Basin and Denver Basin; and
- an assessment of surface and groundwater development in the lower South Platte River in accordance with the South Platte River Compact.

In addition to these requirements, the committee requested that the study also include an assessment of:

- the combined impact to the South Platte River from groundwater pumping in the Denver Basin aquifers and runoff from impervious surfaces such as roads and buildings; and
- the economic life of the Denver Aquifer.

# COMMITTEE ACTIVITIES

## Defining the Scope of the Technical Study

*Scope of issue.* In 1996, the committee approved the scope of a technical study to be conducted by the State Engineer and the Director of the Colorado Water Conservation Board. The study included an inventory of surface and ground water resources in the South Platte River Basin, an assessment of long term impacts on water rights from the use of groundwater from the Denver Basin aquifers, and an examination of programs to protect endangered species on the Platte River. This study was completed in April 1997. It will be used by the General Assembly to determine whether current law protects water rights in the South Platte River Basin, and will help ensure a stable, long-term water supply.

*Interrelation of water supply issues.* A representative from the Colorado Department of Natural Resources explained that many water policy issues are interrelated and noted that policy responses to the technical study should reflect this. For example, the Denver Basin aquifers may provide Colorado's growing urban population with a large and stable water supply for many years. However, pumping from these aquifers may impact senior surface water rights in the South Platte River Basin. Transbasin diversions from the Colorado River may satisfy growing demand from front range cities but such diversions may also limit development in the Colorado River Basin.

*Overview of water resources in the South Platte River Basin.* The primary users of the South Platte River's water are agriculture, municipalities, and industry. Surface water in the river basin was fully appropriated by the 1870s, and approximately 3.6 million acre-feet of water a year is used in the basin. This amount is more than twice the South Platte River's virgin flow of approximately 1.4 million acre-feet a year. Virgin flow is the amount of water in a river without supplements from other sources, such as transbasin diversions and nontributary groundwater. Water diverted from other basins, such as the Colorado River Basin, provides approximately 417,000 acre-feet annually to the South Platte River Basin. The difference between the amount of water used in the basin and the basin's virgin flow is the result of repeated use of all types of water including virgin flows and transbasin diversions. For example, return flows from Denver's waste water treatment facilities are used by downstream farms and municipalities.

*Geology of the Denver Basin aquifers.* The Denver Basin aquifers cover approximately 6,700 square miles. The aquifers extend from Colorado Springs on the south to Greeley on the north and from the foothills in the west to Limon on the east. The aquifers contain nontributary and not nontributary water that is largely unconnected to surface streams. For example, when withdrawn, nontributary groundwater depletes a stream at a rate less than one-tenth of one percent of the amount pumped during the year. The basin consists of five bowl-shaped aquifers: the Dawson, Denver, Arapahoe, Laramie and Laramie-Fox Hills. Each aquifer has different geologic characteristics, water qualities, quantities, and hydrostatic pressures. Hydrostatic pressure refers to water pressure within

an aquifer that may be reduced by well pumping. As the pressure declines, pumping becomes more expensive. Some wells on the shallow edges of the aquifers have already experienced declines in hydrostatic pressure or have lost it altogether. Also, surface stream flows may be impacted by declining hydrostatic pressure. A primary objective of the study is to assess the decline in hydrostatic pressure and determine its impact on surface flows and water rights.

***Endangered species recovery program.*** The federal government has determined that Colorado, Wyoming, and Nebraska must participate in a recovery program for endangered species on the Platte River in Nebraska. Colorado is negotiating with the federal government to protect the endangered species and avoid the implementation of a more onerous recovery program mandated by the federal government. Without an agreement, federal efforts to protect endangered species may preclude Colorado from developing its own solution to this and other of the state's water supply challenges. Developing a cooperative, basin-wide recovery program has several benefits including minimization of the uncertainty and delays that often accompany compliance with complex regulatory programs such as the Endangered Species Act. The committee expressed concern about the cost and equity of a settlement to protect endangered species.

***Public testimony about water supply issues and the technical study.*** The committee heard testimony from persons and organizations that use water from the South Platte River or the Denver Basin aquifers. They explained that the technical study will examine many issues of importance to their members including methods for promoting maximum use of water within the South Platte River Basin and an assessment of water reuse on future supply and existing water rights. Others endorsed the study because it will help determine whether senior surface water rights are being injured by groundwater withdrawals from the Denver Basin aquifers.

***Recommendations.*** In addition to the statutory requirements for the study, the committee requested that the study include an assessment of the impact on stream flows from impervious surfaces such as buildings, roads, and parking lots. The committee also requested that the study determine how long the Denver Basin aquifers will remain an economically viable resource.

## **Overview of the Technical Study**

***Scope of the issue.*** The technical study was completed in April 1998. It appears to indicate that legally allowed pumping of the Denver Basin aquifers has not injured existing water rights. The study determined that stream flows in the South Platte River have been increasing at the same time that pumping of these aquifers has increased. It also determined that the Denver Basin aquifers contain more than a 1,000 year supply of water under current demand. However, the study recommends that further technical studies of the aquifers and surface streams be conducted to determine whether existing water rights will continue to be protected as the delayed effects of pumping reaches the river and water use practices change.

***Increasing flows in the South Platte River.*** The technical study determined that annual stream flows in the South Platte River have steadily increased. The report attributes this increase to wastewater discharge, return flows from transbasin diversions, groundwater pumping from Denver Basin aquifers, and runoff from impervious surfaces. The report notes that changes in water management policies allowed under current law could affect this trend. For example, municipalities may reduce return flows by increasing the reuse of transbasin water. Increased water conservation may also reduce stream flows. As part of the study, an illustrative tool was developed to assist with water management decisions. This tool illustrates the effect on the South Platte River Basin and the Denver Basin aquifers from changes in population, water demands, and water supply sources. For example, this tool can help determine the impact on stream flows from increasing water reuse and decreasing the use of nontributary groundwater.

***Estimated life of the Denver Basin aquifers.*** The technical study determined that the Denver Basin aquifers contain a 1,000 year supply at the current rate of withdrawal. Specifically, the study determined that the aquifers contain approximately 300 million acre-feet of drainable storage. This amounts to a reservoir 15 times greater than Lake Powell in Utah and 400 times greater than the storage of the Blue Mesa Reservoir in Colorado.

The report estimates that total pumping of groundwater from the Denver Basin aquifers in 1996 was 56,000 acre-feet. Under current law, annual pumping rates must not exceed one percent of the total volume of water in the Denver Basin aquifers. This law was enacted in 1985 to ensure that the aquifers remain productive for at least one hundred years. The study determined that the pumping rate for the Denver Basin aquifer in 1996 of 60,000 acre-feet was less than two percent of the annual allowable depletion rate of 3,000,000 acre-feet. Well development and population growth are projected to increase groundwater use to 300,000 acre-feet per year by the year 2100. This rate is about 10 percent of the amount allowed under the 100-year aquifer life requirement of current law. However, the report cautioned that the life of the aquifers could change significantly if population and water use practices change. The life span of wells throughout the basin may differ depending on a well's location. Already, some wells located on the shallow edges of the Denver Basin aquifers have begun to lose hydrostatic pressure or run dry.

***Assessment of the impact from pumping of the Denver Basin aquifers on surface water rights.*** The report concludes that groundwater pumping from the Denver Basin aquifers does not appear to impact existing water rights in the South Platte River. As evidence it cites the increased flow in the South Platte River caused by return flows from water pumped from the Denver Basin aquifers. The study also appears to indicate that potential impacts on surface streams from the pumping of the aquifers may be delayed by the geology separating surface streams in the South Platte River Basin from the Denver Basin aquifers. The report states: "legislative decisions regarding changing existing statutes that deal with the Denver Basin aquifers and impacts on senior water rights do not appear to be necessary at this time." However, better information, including a more thorough understanding of potential causes of injury to senior water rights on the South Platte River, is needed to determine whether water rights will continue to be protected.

## **Comments and Policy Responses to the Technical Study**

***Scope of the issue.*** The committee concluded that additional technical studies about the Denver Basin aquifer's characteristics and pumping practices are needed to determine whether current law will continue to protect water rights in the South Platte River Basin. Additional testimony and committee discussion is needed to address the results of this study and to consider several policy questions concerning the administration of water rights.

***Unresolved policy questions.*** The study quantified the net impact of urbanization on stream flows and determined that stream flows are increasing along with population. Urbanization has increased runoff to streams by replacing vegetation with roads, buildings, and other impervious surfaces. Subsequently, rain and snow become runoff instead of being used by native vegetation. Return flow from lawn irrigation also has increased runoff. However, Colorado water law does not specify how to administer some of this runoff. One alternative would be to administer this runoff as new water that is available for appropriation. Another alternative would be to use this water as an offset for water depletions caused by wells in Denver Basin aquifers.

Another policy question that remains to be addressed pertains to the development of a de minimis standard for water replacement requirements. Some uses of groundwater have a relatively small impact on senior water rights. However, the law requires that some types of out of priority depletions be replaced, regardless of how small those depletions may be. Out of priority depletion occurs when pumping by a well prevents a senior water right from receiving its full allocation of water. A de minimis standard would quantify the amount that a well could pump or deplete before being required to provide replacement water.

***Need for additional information about well pumping and aquifer characteristics.*** The committee heard testimony about the need for a more detailed inventory of water use in the Denver Basin aquifers and the South Platte River Basin to implement the recovery program for endangered species on the Platte River. A bill was requested that would fund a study of well pumping practices in the South Platte River Basin and provide staff to improve a ground water model of the Denver Basin aquifers. This information may help protect endangered species on the Platte River and better enable the state to defend itself in related litigation. A bill should also delay the commencement of more stringent water replacement requirements for the Denver Basin aquifers and extend the repeal date for the Special Water Committee.

***Testimony about policy responses to the technical study.*** The committee heard testimony about the merits of a program that would use surplus surface waters during wet years to recharge nontributary aquifers for use later during droughts. This policy, called conjunctive use, may reduce the need for transbasin diversions from the Colorado River and provide additional water for endangered species and other needs. Other testimony explained the merits of high altitude water storage and recommended that Colorado develop the water that it is entitled to under interstate compacts.

## **Tour of the South Platte River Basin**

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***Scope of issue.*** To better understand the development and management of water resources in the South Platte River Basin, the committee toured the area and met with municipal water providers, viewed agricultural operations, examined irrigation methods, and visited reservoirs and other water projects. The committee learned that groundwater from the South Platte River Basin has become an increasingly important resource for agriculture, municipalities, and industry.

***Testimony about water supply challenges.*** Municipal water providers described population growth in their cities and presented plans for acquiring additional water supplies to meet this new demand. These plans include water exchange projects, underground storage of surplus surface waters, transbasin diversions, and the purchase of agricultural water rights. The committee heard testimony about efforts by agricultural interests to conserve water by implementing new irrigation practices and recharging alluvial aquifers. Alluvial aquifers, also known as tributary aquifers, are hydraulically connected to surface streams.

Testimony indicated that use of tributary groundwater and surface water in the South Platte River Basin may reduce surface flows and impact endangered species that are downstream in Nebraska's Platte River. The committee learned that Colorado and groundwater users in the South Platte Basin have implemented programs to conserve the basin's waters and increase state line flows for the preservation of endangered species.

***Funding alternatives for the recovery of endangered species.*** The committee discussed several options to fund a cooperative agreement between Wyoming, Nebraska, Colorado, and the United States Department of Interior for the recovery of endangered species on the Platte River in Nebraska. The agreement is a proactive measure that may prevent expensive litigation with the federal government, Wyoming, and Nebraska. It is projected to cost Colorado \$20 million over the lifetime of the program. Funding options for the recovery program include appropriations from the General Fund, water-use surcharges on municipal customers, development impact fees, ad valorem taxes, and a tax on water right changes or transfers. Some of this money may be used to pay for a project that would provide water for endangered species in Nebraska. This proposal would pump surplus surface water into recharge ponds near the river. The water would then percolate from the ponds to the water table where it would return to the river later when it is most beneficial to endangered species.

***Testimony about the management of designated groundwater basins.*** The committee also heard testimony regarding the management of designated groundwater basins under Colorado's eastern plains. A designated groundwater basin is an area where the use of groundwater is assumed by law not to impact the major surface river basin to which the designated basin would otherwise be tributary. The committee learned that the Groundwater Commission regulates the pumping of designated basins. It determined that the Groundwater Commission faces significant policy questions as water levels in the



designated basins decline. The committee concluded that the commission must remain active in order to ensure the efficient use of the basins' remaining water.

***Recommendations.*** Legislation to provide funding for endangered species recovery programs and increase compensation for groundwater commissioners was recommended by the Interim Committee on Water and Land Resource Issues in 1997 and approved by the General Assembly in 1998.

## SUMMARY OF RECOMMENDATION

As a result of the committee's activities, the following bill is recommended to the Colorado General Assembly.

### **Bill A — Augmentation Requirements for Water Well Pumping in the Denver Basin Aquifers**

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The committee discussed the need to continue to investigate Denver Basin groundwater management and South Platte Basin issues. It learned that additional information about pumping practices in the Denver Basin aquifers is needed to determine whether current law will continue to protect water rights. The committee determined that additional public comment and committee discussion are necessary to address several remaining policy questions concerning the administration of water rights. The committee also determined that more stringent augmentation plans concerning pumping from the Denver Basin aquifers should be delayed until the additional studies have been completed.

Bill A delays, until July 1, 2001, the effective date for temporary water replacement requirements for not nontributary ground water wells in the Denver Basin aquifers. The bill also authorizes the State Engineer to promulgate rules by July 1, 2000, for the collection of pumping data and water level measurements from wells in the Denver Basin Aquifer. This data and an improved ground water model may eventually become components of a decision support system for the South Platte River. A similar system assists with administration of water rights on the Colorado River and is being developed for the Rio Grande. This bill also extends the repeal date for the Special Water Committee from July 1, 1999, to July 1, 2001, to oversee the new studies and recommend legislation if necessary.

Bill A provides for an appropriation for the Department of Natural Resources to acquire information about the Denver Basin aquifers and improve a ground water model. Specifically, the bill requires the State Engineer and the Director of the Colorado Water Conservation Board to investigate the hydrologic connection between surface streams and the Denver Basin aquifer. Preliminary studies indicate that surface streams in the South Platte River Basin and the Denver Basin aquifers are connected. A greater understanding of this connection should enable the State Engineer to better administer water rights in the Denver Basin aquifers and the South Platte River Basin.

Bill A provides a General Fund appropriation of \$1.45 million and 6.0 FTE to the Department of Natural Resources for Fiscal Year 1999-00. This appropriation is based on a preliminary estimate prepared by the department during the October committee meeting. However, subsequent fiscal analysis by the department and Legislative Council staff determined that a General Fund appropriation of \$2.1 million and 5.0 FTE to the Department of Natural Resources may be necessary to implement the bill. The original estimate did not consider the full cost of the study and assumed that gifts and grants would become available.

# MATERIALS AVAILABLE

The following meeting summaries and reports are available from Legislative Council staff.

<u>Meeting Summaries</u>	<u>Topics Discussed</u>
September 11, 1996	Public Testimony and Defining the Scope of the Technical Study
April 16, 1997	Progress Report on the Technical Study
December 18, 1997	Briefing on Draft Report of the Technical Study and Public Testimony
April 22, 1998	Overview of the Final Report of the Technical Study
September 5, 1998	Briefing on South Platte River Basin and Denver Basin Aquifer Issues and Consideration of Proposed Legislation

## Reports

*Denver Basin and South Platte River Basin Technical Study*, Colorado Department of Natural Resources, April 1998.

*Briefing Report On The Platte River Endangered Species Program Agreement Between the States of Colorado, Nebraska, and Wyoming and the United States Department of the Interior*, Colorado Department of Natural Resources, September 11, 1997.

*Funding Options for Platte River Recovery Implementation Program*, Colorado Department of Natural Resources, August 27, 1997.

**Bill A**

By Senator Ament

**A BILL FOR AN ACT**

CONCERNING AUGMENTATION REQUIREMENTS FOR WATER WELL PUMPING IN  
THE DENVER BASIN AQUIFERS, AND MAKING AN APPROPRIATION.

**Bill Summary**

**"Denver Basin Aquifer Well Pumping"**

*(Note: This summary applies to this bill as introduced and does not necessarily reflect any amendments that may be subsequently adopted.)*

Special water committee. Extends the repeal date of the special water committee to July 1, 2001.

Extends the commencement of more stringent augmentation plans for pumping from Denver basin aquifers to July 1, 2001.

Authorizes the special water committee to oversee the state engineer and the director of the Colorado water conservation board studies of streambed conductance, stream gain-loss measurements, and improved simulation of stream-aquifer interaction.

Requires the state engineer and the director of the Colorado water conservation board to develop an improved ground water model and improved data collection program to support the development of a decision support system for the South Platte river basin.

Authorizes the state engineer to promulgate rules to enhance the collection of data from wells in the Denver basin aquifers.

*Be it enacted by the General Assembly of the State of Colorado:*

**SECTION 1.** 37-90-137 (9) (c) (II) and (9) (c.5) (II), Colorado Revised Statutes, are amended to read:

**37-90-137. Permits to construct wells outside designated basins - fees - permit no ground water right - evidence - time limitation - well permits - repeal.** (9) (c) (II) This paragraph (c) shall not be in effect from July 1, ~~1999~~ 2001, until July 1, ~~2002~~ 2004. during which time paragraph (c.5) shall apply.

(c.5) (II) This paragraph (c.5) is effective July 1, ~~1999~~ 2001, and is repealed, effective July 1, ~~2002~~ 2004.

**SECTION 2.** 37-90-137.5 (6), Colorado Revised Statutes, is amended, and the said 37-90-137.5 is further amended BY THE ADDITION OF THE FOLLOWING NEW SUBSECTIONS, to read:

**37-90-137.5. Special water committee - creation - study - repeal.**  
(1.5) THE GENERAL ASSEMBLY HEREBY AUTHORIZES THE SPECIAL WATER COMMITTEE TO INVESTIGATE DENVER BASIN GROUND WATER MANAGEMENT AND SOUTH PLATTE RIVER BASIN ISSUES BY OVERSEEING STUDIES TO BE ADMINISTERED BY THE STATE ENGINEER AND THE DIRECTOR OF THE COLORADO WATER CONSERVATION BOARD AS DESCRIBED IN SUBSECTION (4.5) OF THIS SECTION, TO HOLD PUBLIC HEARINGS ON THE DRAFT REPORT ISSUED PURSUANT TO SUBSECTION (4.5) OF THIS SECTION, AND TO REVIEW AND COMMENT ON THE DRAFT REPORT ISSUED BY THE STATE ENGINEER AND THE DIRECTOR OF THE COLORADO WATER CONSERVATION BOARD. THE COMMITTEE MAY MAKE RECOMMENDATIONS FOR LEGISLATION BASED UPON THE FINAL REPORT AND THE HEARINGS.

(4.5) THE STATE ENGINEER AND THE DIRECTOR OF THE COLORADO WATER CONSERVATION BOARD SHALL ADMINISTER A STUDY OF ISSUES TO DETERMINE MORE RELIABLE ESTIMATES OF STREAMBED CONDUCTANCE, STREAM GAIN-LOSS MEASUREMENTS, AND IMPROVED SIMULATION OF STREAM-AQUIFER INTERACTION OF THE DENVER BASIN AQUIFERS AND REPORT THE RESULTS OF THAT STUDY TO THE SPECIAL WATER COMMITTEE NO LATER THAN JUNE 1, 2000. THE PURPOSE OF THE STUDIES IS TO IMPROVE THE GROUND WATER FLOW MODELS OF THE DENVER BASIN AQUIFERS TO PROVIDE BETTER ESTIMATES OF NOT NONTRIBUTARY AND NONTRIBUTARY WATER REPLACEMENT AND RELINQUISHMENT VALUES. IT IS THE INTENT OF THE GENERAL ASSEMBLY THAT THESE STUDIES UTILIZE THE LATEST METHODOLOGIES, INCLUDING HYDROLOGIC MODELING, TO DEVELOP THE INFORMATION SUBMITTED TO THE COMMITTEE. IT IS ALSO THE INTENT OF THE GENERAL ASSEMBLY THAT EACH PHASE OF THE STUDY BE SUBJECTED TO PEER REVIEW AND WRITTEN COMMENTS BY QUALIFIED HYDROLOGISTS, GEOLOGISTS, AND ENGINEERS WITH SUCH COMMENTS AVAILABLE FOR REVIEW BY THE COMMITTEE AND THE PUBLIC.

(6) This section is repealed, effective July 1, 1999 2001.

**SECTION 3.** Article 90 of title 37, Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW SECTION to read:

**37-90-137.7. Denver basin aquifer ground water model - South Platte river decision support system study - Colorado water conservation board - state engineer - rules.** (1) THE STATE ENGINEER AND THE DIRECTOR OF THE COLORADO WATER CONSERVATION BOARD SHALL DEVELOP AN IMPROVED GROUND WATER MODEL FOR THE DENVER BASIN AQUIFERS TO IMPROVE THE GROUND WATER FLOW MODELS OF THE DENVER BASIN AQUIFERS

TO PROVIDE BETTER ESTIMATES OF NOT NONTRIBUTARY AND NONTRIBUTARY WATER REPLACEMENT AND RELINQUISHMENT VALUES. THE STATE ENGINEER AND THE DIRECTOR OF THE COLORADO WATER CONSERVATION BOARD SHALL UTILIZE DATA COLLECTED IN THE STUDIES CONDUCTED PURSUANT TO SECTION 37-90-137.5 (4.5) AND SHALL DEVELOP AN IMPROVED DATA COLLECTION PROGRAM TO SUPPORT SUCH GROUND WATER MODELS.

(2) THE STATE ENGINEER AND THE DIRECTOR OF THE COLORADO WATER CONSERVATION BOARD SHALL UTILIZE THE GROUND WATER MODELS CREATED PURSUANT TO SUBSECTION (1) OF THIS SECTION IN THE DEVELOPMENT OF A SUPPORT SYSTEM FOR THE SOUTH PLATTE RIVER BASIN.

(3) (a) THE STATE ENGINEER, TO COLLECT THE DATA NECESSARY TO COMPLETE THE STUDIES REFERENCED IN SECTION 37-90-137.5 AND SUBSECTION (1) OF THIS SECTION, MAY, BY JULY 1, 2000, PROMULGATE RULES CONCERNING COLLECTION OF THE FOLLOWING DATA FROM THE DENVER BASIN AQUIFER:

(I) AQUIFER PUMPING DATA AND THE VERIFICATION OF THE ACCURACY OF WATER MEASURING DEVICES OR OTHER METHODS USED TO MEASURE WATER;

(II) AQUIFER TEST DATA FOR NEW OR REPLACEMENT WELLS;

(III) ACQUISITION OF AQUIFER CORE DATA.

(b) THE STATE ENGINEER MAY, BY JULY 1, 2000, PROMULGATE RULES REQUIRING THE INSTALLATION OF AIR LINES OR SIMILAR WATER LEVEL MEASURING DEVICES THAT COMPLY WITH REQUIREMENTS ESTABLISHED BY THE STATE BOARD OF EXAMINERS OF WATER WELL CONSTRUCTION AND PUMP INSTALLATION CONTRACTORS, CREATED IN SECTION 37-91-103 ON NONEXEMPT WELLS IN THE DENVER BASIN AQUIFER.

**SECTION 4. Appropriation.** In addition to any other appropriation, there is hereby appropriated, out of any moneys in the general fund not otherwise appropriated, to the department of natural resources, for the fiscal year beginning July 1, 1999, the sum of one million four hundred fifty thousand dollars (\$1,450,000) and 6.0 FTE, or so much thereof as may be necessary, for the implementation of this act.

**SECTION 5. Safety clause.** The general assembly hereby finds, determines, and declares that this act is necessary for the immediate preservation of the public peace, health, and safety.

Colorado Legislative Council Staff

**STATE  
FISCAL IMPACT**

General Fund Expenditure Impact

**Drafting Number:** LLS 99-0121 **Date:** November 4, 1998  
**Prime Sponsor(s):** Sen. Ament **Bill Status:** Interim Special Water  
**Fiscal Analyst:** Will Meyer 303-866-4976  
**Committee:**

**Title:** CONCERNING AUGMENTATION REQUIREMENTS FOR WATER WELL PUMPING IN THE DENVER BASIN AQUIFERS, AND MAKING AN APPROPRIATION.

Fiscal Impact Summary	FY 1999/2000	FY 2000/2001
State Revenues General Fund		
State Expenditures General Fund	\$2,105,529	\$314,144
FTE Position Change	5.0 FTE	5.0 FTE
Other State Impact: None identified		
Effective Date: Upon signature of the Governor		
Appropriation Summary for FY 1999-2000 Department of Natural Resources: \$2,105,529 General Fund and 5.0 FTE		
Local Government Impact: None identified		

**Summary of Legislation**

This bill would authorize the Special Water Committee, created by the General Assembly in Senate Bill 96-74, to oversee studies administered by the State Engineer, Division of Water Resources and the Director, Colorado Water Conservation Board (CWCB), Department of Natural Resources. The studies would include a number of the Denver basin aquifer issues; specifically, more reliable estimates of streambed conductance, stream gain-loss measurements, and improved simulation of stream-aquifer interaction. The bill also would authorize the committee to review and comment on the draft report of the studies, and to make recommendations for legislation based upon public hearings and the final report. The bill would require that such report of the study be made available to the committee no later than June 1, 2000.

The bill would require the state engineer and the CWCB director to develop an improved ground water model and improved data collection program and to use that information to support

the development of a Decision Support System (DSS) for the South Platte river basin. The bill would also authorize the state engineer to promulgate rules to collect data from wells in the Denver basin aquifers.

This bill would extend the repeal date of the Special Water Committee by two more years, from July 1, 1999 to July 1, 2001 and would extend the commencement of more stringent augmentation plans for pumping from the Denver basin aquifers to coincide with the committee repeal date, July 1, 2001.

### **State Revenues**

The Division of Water Resources has indicated its intent to enter into agreements with cost-share partners to help finance the costs of these studies. To the extent that the division is successful in its efforts to secure cost-share partners or receives grant or gifts to assist with the studies, the General Fund expenditure identified in this fiscal note would be reduced. Any such grants or gifts would be received and expended as cash fund exempt and would be exempt from revenue and spending limitation constraints.

### **State Expenditures**

The Division of Water Resources would require additional experienced staff to administer the studies (described below) and develop a layered and calibrated ground water flow model of four Denver basin aquifers and gather data from the basins for this model. Specifically, the additional staff initially would be used to: 1) collect and interpret more accurate pumpage data; 2) collect and analyze aquifer-test data to better define the transmissivity and specific yield data; 3) collect and analyze core samples to better define the transmissivity; and 4) continue to expand the ground water level measuring program. The bill allows the state engineer to promulgate data collection rules and water level measurement device rules for the Denver basin by July 1, 2000. Upon promulgation of such rules, a portion of the division's staff activities would shift toward enforcement of the newly promulgated rules. It is not anticipated that the division would require additional staff resources to promulgate the rules. However, depending on the rules that are adopted, additional legal resources may be required beginning in FY 2000/01. It is estimated that the division would require 5.0 FTE to implement the provisions of the bill, including 1.0 FTE Professional Engineer III (116), 1.0 FTE Physical Science/Research Scientist III (109) and 3.0 FTE Engineer Physical Science Technician II (87). It is estimated that the additional staff and related expenses would cost a *total* of \$338,529 in FY 1999/00 and \$314,144 in FY 2000/2001.



<b>TOTAL ESTIMATED EXPENDITURES TO IMPLEMENT BILL A</b>		
	<b>FY 1999-2000</b>	<b>FY 2000/2001</b>
Personal Services: Total - 5.0 FTE	\$286,845	\$286,845
Operating Expenses	14,615	14,615
Leased Vehicle and Office Expenses	12,684	12,684
Non-recurring Expenses: Office Equipment	24,385	
Denver Basin Studies: Contract	1,767,000	
<b>Total Expenses</b>	<b>\$2,105,529</b>	<b>\$314,144</b>

In addition to the staff costs, it is estimated that it would cost \$1,767,000 in FY 1999/00 to contract with outside consultants to conduct the studies required by the bill. It is estimated that the outside consultants would require approximately two years to complete the studies.

The bill includes a General Fund appropriation to the Department of Natural Resources of \$1,450,000 and 6.0 FTE in FY 1999/00. However, based on this analysis of the bill, the Department of Natural Resources would require an appropriation of \$2,105,529 and 5.0 FTE in FY 1999/00.

**State Appropriations**

This fiscal note implies that \$2,105,529 and 5.0 FTE should be appropriated out of the General Fund to the Department of Natural Resources, Division of Water Resources, in FY 1999/00.

**Departments Contacted**

Natural Resources