

STATE OF COLORADO

Colorado Water Conservation Board

Department of Natural Resources

1313 Sherman Street, Room 721
Denver, Colorado 80203
Phone: (303) 866-3441
Fax: (303) 866-4474
www.cwcb.state.co.us



TO:	Colorado Water Conservation Board Members	John W. Hickenlooper Governor
FROM:	Rebecca Mitchell, Water Supply Planning Section Chief Jacob Bornstein, Water Supply Planning Section Brent Newman, Water Supply Planning Section	Mike King DNR Executive Director James Eklund CWCB Director
DATE:	January 13, 2014	
SUBJECT:	Agenda Item 33, January 27-28, 2014 Board Meeting Water Supply Planning Section – Statewide Water Supply Initiative 2016 Update	

This is an informational item only.

Background

Since the November CWCB meeting, staff has continued work on Statewide Water Supply Initiative 2016. Meetings have been ongoing with consultants, and monthly internal meetings of Water Supply Planning Section staff and other Section Chiefs to monitor and provide input on the process have proven invaluable.

Included as an attachment is the latest draft version of the SWSI Descriptive Outline. In this version, staff hopes to establish a more narrative-driven framework, providing a more streamlined structure while maintaining the level of useful information that SWSI has presented in the past. Key to this iteration of SWSI are the ongoing work on Colorado's Water Plan, the Basin Implementation Plans, and the introduction of scenario planning. Given these other parallel processes, staff believes this more narrative-driven structure makes for a more coherent report, one that will complement the other work while retaining the universal usefulness of past SWSI efforts.

Staff will also provide a brief update of the Basin Implementation Planning process.

Statewide Water Supply Initiative 2016

DRAFT Descriptive Outline

Background and Purpose: The Colorado Water Conservation Board (CWCB) officially approved the Statewide Water Supply Initiative (SWSI) 2010 Report in January 2011. Like the original SWSI study completed in 2004, the purpose of SWSI 2010 was to provide a comprehensive statewide analysis of water supply, demand, and resulting gaps. In addition, SWSI 2010 continued the inventory of local solutions to meet water supply gaps. At the completion of SWSI 2010 the Board recommended a six year planning cycle for updating SWSI. These periodic updates are important so that SWSI can continue to provide the basis for tracking demands, supplies and other drivers that inform which future scenario Colorado is entering and therefore which water strategies should be implemented.

In 2013, the Governor has requested that a Colorado Water Plan (CWP) be completed by the end of 2015. This outline for SWSI 2016 has been developed to accommodate this timeline and articulate how the each chapter of SWSI 2016 will incorporate and inform the CWP, Basin Implementation Plans, Colorado River Water Availability Study phase II (CRWAS phase II), and other efforts. Each of the chapters outlined below will be submitted for Board review as they are completed.

In addition to incorporating the basin implementation plans and the CRWAS, new aspects of SWSI 2016 will include:

- Incorporation of scenario planning and adaptive management
- Incorporation of climate change into demand and supply analyses
- Hydrologic variability (examine droughts and floods in addition to average conditions)
- Agricultural gap
- Nonconsumptive gap

Relation to Other Pieces: It is envisioned that SWSI 2016 will serve as the primary technical basis for the development of the CWP, which in turn will focus on addressing key policy issues. SWSI 2016 will build off information from the previous SWSI reports and other efforts completed in the interim, such as the adaptive management and scenario planning work of the IBCC and basin roundtables (BRT's).

In addition, SWSI 2016 will incorporate the forthcoming Basin Implementation Plans which will serve as primary inputs to a number of its chapters. The Basin Implementation Plans will focus on projects and methods recommended by the roundtables to address their consumptive and nonconsumptive needs. As such, they are intended to help basins proactively meet water needs, with currently planned projects, re-prioritized projects, and new projects, operational agreements, flow protections, or other methods. The Basin Implementation Plans will also likely include more detailed modeling analysis done via the CRWAS phase II or WSRA-funded studies in basins outside of the CRWAS area. Other aspects of the CRWAS phase II, such as its comprehensive review of similar ongoing water studies, will be referenced as well.

Executive Summary

Scheduled CWCB Review: March 2015

Content: The executive summary will focus on capturing the conclusion and recommendations. In addition it will concisely articulate how the report incorporates and informs the CWP, Basin Implementation Plans, Colorado River Water Availability Study Continuation (CRWAS Continuation), and other efforts. An 8 to 12 page fact sheet summary for broader public distribution will also be developed.

Chapter 1: Introduction

Scheduled Draft for CWCB Review: December 2013

Content: This chapter answers the question “Who are we and what are we trying to do?” The chapter will describe SWSI2016’s purpose, CWCB’s history and mission, historical information about SWSI, the Water for the 21st Century Act, and associated stakeholder processes.

1.1 CWCB History and Mission

This section will provide a concise summary of the CWCB’s history and mission, updated from SWSI 1 and SWSI 2010, perhaps with reference to the “Defend and Develop” book.

1.2 History of the Statewide Water Supply Initiative

Summary of the SWSI process to date including: legislation, funding, timelines, BRT involvement, nature of analysis, etc. This section will emphasize the evolution of SWSI from an inaugural supply and demand study with a final chapter on “Implementation” to the 2010 update with projections extended to 2050, and finally to the current focus on “implementation” via the Basin Implementation Plans and CWP.

1.3 Overview of the Water for the 21st Century Act

This section will provide a concise summary of HB-1177, related legislation, and the process it created, with updated from information included in SWSI 2010

1.4 Purpose of the Statewide Water Supply Initiative 2016

This section will articulate how SWSI 2016 will serve as the technical basis for the Colorado Water Plan, while incorporating basin-specific data and recommendations developed via the Basin Implementation Plans. In addition, SWSI 2016 will compile important aspects of numerous planning efforts such as the adaptive management and scenario planning work of the IBCC and basin roundtables (BRT’s), and CRWAS. Like previous SWSI studies, SWSI 2016 will refine statewide water supply and demand projections, inventory projects and methods planned to meet forecasted needs, and detail resulting water supply gaps. To build on previous efforts SWSI 2016 will include more information and emphasis on implementable projects and methods recommended by the roundtables to meet their consumptive and nonconsumptive water supply gaps.

1.5 Overview of Report

For quick reference, this section will provide a brief overview of the purpose of each chapter.

1.6 Acknowledgements

Chapter 2: Colorado's Water Landscape

Scheduled CWCB Review: March 2014

Content: This chapter answers the question “What has Colorado done in the past and, broadly speaking, what are the issues?” The chapter will begin with an overview of the Colorado water landscape: the basin descriptions, and state and federal entities that operate in this environment. This chapter will also broadly identify progress since the inaugural SWSI study was commissioned. It will build off recommendations of SWSI 1, SWSI 2010, and the SWSI 2010 Work Plan.

2.1 Background on Colorado's Water Resources

This broad overview of each basin will be updated from information included in SWSI 1, SWSI 2010, and pertinent information from each of the Basin Implementation Plans.

2.2 State and Federal Water Institutions

This section will provide the context of the various state and federal institutions that deal with water. It will incorporate and update information from SWSI 1. It will also include concise and pertinent updates on permitting or legislative changes.

2.3 Evolution of HB 1177

This section will note the achievements of the 1177 process, highlighting how attitudes and communication within each basin and across basins have evolved.

2.4 Infrastructure Improvements and Deficits

This section will provide summary data and key examples of completed and evolving IPP's. New and looming infrastructure needs will also be noted, along with issues that have resulted in stagnation for some water supply projects.

2.5 Institutional Achievements

This section will detail the programmatic, legislative, policy, and funding success of various state and local programs, such as ATM studies, the WSRA program, etc.

2.6 Purpose and Composition of Basin Implementation Plans

This section will summarize the impetus for creating the Basin Implementation Plans. It will also describe the main components of the plans, the process of their creation, and which items are required or optional.

2.7 How Basin Implementation Plans are Used in SWSI 2016

This section will detail where and how the components of the plans are used in SWSI 2016.

Chapter 3: Scenario Planning

Scheduled CWCB Review: September 2014

Content: This chapter answers the question “How much water supply and demand may Colorado have in the future?” The chapter will explain the concept of scenario planning, and why the decision was made to use this tool in SWSI 2016. In order to demonstrate how scenario planning can be advantageous on a statewide basis, the concept will first be explained, development of the scenarios detailed, and an explanation of the additional information this gives us for statewide and basin wide water management planning.

3.1 Scenario Planning Overview

This section will summarize the scenario planning and portfolio development work of the IBCC and BRT's in order to better inform discussions about Colorado future water supply. These previous scenario planning efforts will also be further refined.

This section will explore the concept that planning for the future is uncertain and that change is continuous, requiring a thoughtful consideration of uncertainty. Uncertainties will be examined and catalogued in order to generate a more reliable and comprehensive adaptive management framework. This discussion will frame the need for an adaptive management/scenario planning framework and the potential benefits it can provide. Some of the factors that will be considered are:

- Demand Uncertainty
- Supply Uncertainty
- Natural Disasters (Flood, Drought, Wildfire, etc.)
- Climate Variability
- Political Drivers

3.2 Quantification of Scenarios

This section will provide a detailed explanation of and definitions (qualitatively and quantitatively) for the primary and second drivers that comprise the five individual scenarios, and discuss the implication of each scenario at the statewide and basin level.

3.2.2 Statewide Consumptive and Nonconsumptive Needs

This section will summarize and update the consumptive needs from SWSI with new information on how these demands may vary based on climate variability. This will include data from HB 1051, updated passive savings, updated industrial uses (recent oil and gas development, mining, etc.), and updated data on agricultural water use. Data will be compiled in the Basin Needs Decision Support System (BNDSS) for archiving and gap analysis performed in Chapter 6. In addition, this section will incorporate the municipal, industrial, and agricultural goals and measurable outcomes, as defined in the Basin Implementation Plans.

This section will also summarize nonconsumptive needs by updating the focus area mapping, instream flows, endangered species, and wild and scenic river programs. It will incorporate additional work by basin roundtables, such as the goals and measurable outcomes developed as part of the Basin Implementation Plans, and any work done by the basin roundtables using the Watershed Flow Evaluation Tool. Lastly, it will describe how climate variability may impact nonconsumptive needs.

3.2.3 Statewide Water Supplies (Surface and Groundwater)

Surface supplies will be analyzed under dry, average, and wet hydrology (including historical, climate adjusted, and paleo hydrology for each basin). In addition, an analysis of storage will be done for each basin by evaluating the basin's firm yield using a simplified modeling approach. Inputs from the adaptive management framework and modeling efforts done via the CRWAS phase II and/or the Basin Implementation Plan process will be included as appropriate.

This section will detail groundwater resources throughout the state along with an analysis of the existing and projected uses of the aquifers. The use of the Denver Basin for aquifer storage and recovery and conjunctive use will also be examined.

3.2.4 Statewide Social Values

This section will explain the concept of social values and how they fit into a scenario planning approach. The section will use CWCB's Value of Water survey information to establish the baseline of Colorado's current social values.

3.3 Quantified Scenario Comparison

This section will explain how the five selected scenarios interrelate, and how they work together to provide a broad spectrum of possible futures for Colorado at 2050. These scenarios and the range of plausible futures they represent is the basis of the SWSI 2016 planning process.

Chapter 4: Adaptive Strategies

Scheduled CWCB Review: September 2014

Content: This chapter will answer the question "What broad strategies can Colorado rely upon in the near and long term?" The chapter will be based on the work of the IBCC, BRT's, and the CWCB Board. The adaptive strategies chapter describes how, in broad terms, Colorado can move forward in the near and long term in an adaptive manner.

4.1 Portfolio Development

This section will review how the Basin Roundtables developed portfolios, and the methods by which the IBCC developed ten representative portfolios. The section will also describe which portfolios fit into which scenarios.

4.2 No & Low Regrets

Taking the set of portfolios that fit into each of the five scenarios, a no and low regrets portfolio will be examined. The portfolio reflects the common elements found across the portfolios and represents those strategies that need to be implemented in the near term.

4.3 Adaptive Strategies Framework

The Adaptive Strategies framework will lay out a statewide plan with "sign posts" noting important future decision points based on factors such as changes in water demand, supply, and attitudes. These strategies may be necessary in the long term.

Chapter 5: Basin Roundtable Implementation Plan Summaries

Scheduled CWCB Review: March 2015

Content: This chapter answers the question "What specific projects and methods are planned to meet Colorado's consumptive and nonconsumptive needs?" The chapter will describe each basin's goals and measurable outcomes. It will then summarize the projects and methods the Basin Roundtables have identified in their Basin Implementation Plans to meet their future needs. It will contextualize these projects and methods within the no and low regrets and adaptive strategies

framework. Finally, it will include the 3-5 page summaries of each Basin Implementation Plan, noting their major issues and implementation strategies.

Chapter 6: Statewide Gap Analysis

Scheduled CWCB Review: March 2015

Content: This chapter will answer the question, “How well did the adaptive strategies and Basin Implementation Plans do in meeting Colorado’s future needs?” The chapter brings together the quantified scenarios, adaptive strategies, and Basin Implementation Plan summaries to determine the remaining gaps. The updated water use and supply data, along with the initial hydrologic shortage analysis performed via the Basin Implementation Plans will be used to inform a traditional structural gap analysis building on previous SWSI efforts. Methodologies for the development of an agricultural gap and nonconsumptive gap will be determined by the CWCB Board with input from Basin Roundtables. The prototype BNDSS will be refined and used to perform the structural gap analysis.

6.1 Municipal and Industrial Gap Analysis

The section will describe the amount of future M&I needs not met by the adaptive strategies and Basin Implementation Plans. Gaps will vary both by scenario and by how much the no and low regrets / Basin Implementation Plans are implemented.

This section will include water use data and water supply data to assess the gap between water supply and water demands for municipal water providers. Data collected through the implementation of HB 1051 guidelines and the Basin Implementation Plans will inform this gap analysis.

6.2 Agricultural Gap Analysis

The section will describe the difference between what the basin indicates it wants to achieve with regard to agriculture, as defined in the Basin Implementation Plan goals and measurable outcomes, and what projects and methods they have determined could be implemented to meet those needs. Gaps may vary by scenario and the success of the Basin Implementation Plan identified projects and methods.

6.3 Nonconsumptive Gap Analysis

The section will describe the difference between what the basin indicates it wants to achieve with regard to meeting their nonconsumptive needs, as defined in their goals and measurable outcomes, and what projects and methods they have determined could be implemented to meet those needs. Gaps may vary by scenario and the success of the Basin Implementation Plan identified projects and methods.

Chapter 7: Recommendations

Scheduled CWCB Review: May 2015

Content: This chapter will serve as the culmination of the report and the summary of how to most effectively implement water supply solutions in Colorado. It will include summary recommendations and a timeline for implementation will focus the work of the report.

Chapter 9: References

As each chapter is completed references will be noted with each draft.

Appendices

Content: The appendices will include additional information gathered in the SWSI 2016 process

- **A1 Glossary of Terms**
- **A2 Basin Implementation Plans**
- **A3 Addressing SWSI 2010 Recommendations**

This section will discuss the recommendations that came from the previous iteration of SWSI, and how portions of these recommendations may have already been accomplished through the work of the CWCBC and basin roundtables. Other recommendations may be addressed through Colorado's Water Plan or SWSI 2016.