

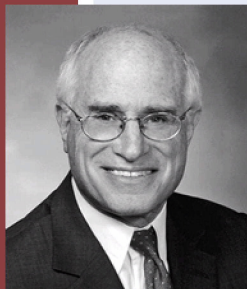


# Colorado's Water Supply Future

Bill Ritter, Jr. – Governor  
Harris D. Sherman – DNR Executive Director



## Interbasin Compact Process *Quarterly Newsletter - 2nd Quarter 2007*



**From Harris Sherman**  
Executive Director of DNR and  
Director of Compact Negotiations

My thanks to all of you for your support and dedication to the Basin Roundtable (BRT) and Interbasin Compact Process. As we enter the second quarter of 2007, we continue

to make progress toward our goal of completing basin-wide water needs assessments by the end of 2008. Additionally, water activities funded through the Water Supply Reserve Account (WSRA) are addressing specific needs for each basin. This work has allowed the program to build a foundation at the grassroots level and has been very effective increasing the understanding within each basin and addressing local water challenges.

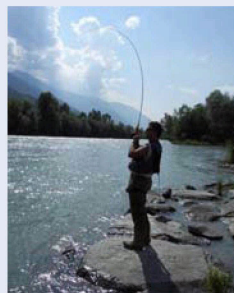
Although the process has been helpful in solving water problems within each basin, it is also necessary to engage in cross-basin dialogue on key water issues that are of statewide importance. Understanding these issues across basins will be tantamount to our success.

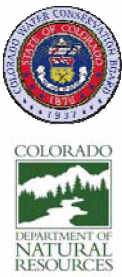
In addition to the needs assessment and WSRA work occurring at the Basin Roundtable level, there are three other efforts that are integral to the Interbasin Compact Process addressing statewide issues on a common technical platform. These include: 1) technical work on consumptive water uses, 2) technical work on

non-consumptive water uses, and 3) water supply availability. The challenge ahead is to take on these issues of statewide importance while continuing to support a grass roots process.

This newsletter summarizes the basin-by-basin progress we have made on needs assessments and implementing water activities through the WSRA. It also summarizes an overall approach for developing consumptive and non-consumptive needs assessments and a supply availability study. The strategy builds on the Statewide Water Supply Initiative (SWSI) Phase 1 and 2, and the work of each BRT in developing their basin-wide water needs assessments. The strategy also addresses issues of a common technical platform which the Interbasin Compact Committee (IBCC) and the Colorado Water Conservation Board (CWCB) have committed to help develop. Implementation of these efforts, in conjunction with the continued work on the basin-wide water needs assessments and the WSRA, will advance the overall goals of the Interbasin Compact Process.

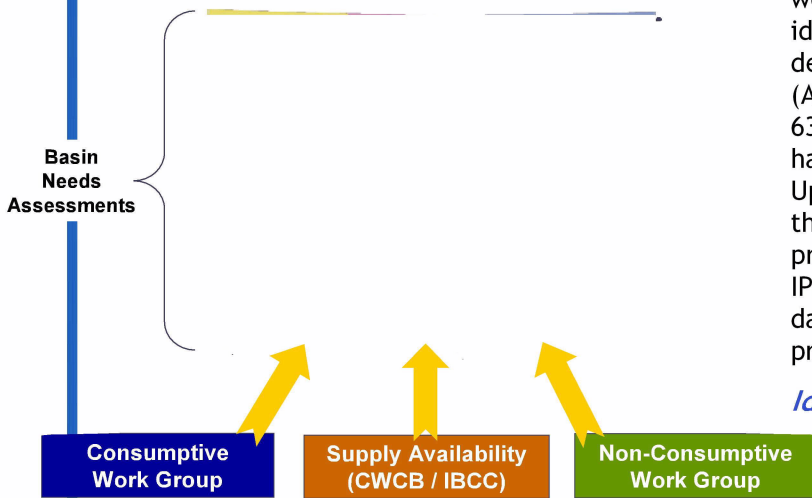
The Interbasin Compact Process is a bold experiment and it is a uniquely Colorado experiment. It is bringing together people all over the state and asking them to work together on Colorado's water supply future. It is a risky process, but it has a real chance of succeeding in helping Colorado provide a sustainable water supply for its residents and environment.





# Roles of Basin Roundtables and Consumptive and Non-consumptive Needs Assessment Group

To address common technical platform and to maintain consistency between roundtables when completing their needs assessments, two statewide work groups will be formed – a non-consumptive work group and a consumptive work group. In addition, the CWCB will be doing a Supply Availability Study. These three technical elements will serve to support the Basin Roundtables with their Basin Needs Assessments as depicted in this figure.



## Common Technical Platform

The issues of common technical platform are important in developing the Basin Needs Assessments for both consumptive and non-consumptive uses. These issues are described in further detail below.

### Strategy for Consumptive Needs Assessment

#### Goal

The goal of this group is to assist the Basin Roundtables in their consumptive use needs assessments through the development of a common technical platform and water supply alternatives on a statewide basis.

#### Quantifying Municipal & Industrial (M&I) Demands to 2050

SWSI projected water demands to 2030. It was understood at the time of SWSI that demands will continue to grow beyond 2030. Since that time it has been the desire of several BRTs to take demands of their basins out to 2050. This has been the case particularly on the West Slope where the basins are not nearly as built out as on the Front

Range. In addition, several Environmental Impact Statements for Front Range water providers examine demands to 2050. An updated statewide analysis is needed to ensure wise water resource planning. This group would work to ensure that a consistent statewide methodology is used for this update to demands.

#### Status of IPPs

In SWSI the Identified Projects and Processes (IPPs) were identified. IPPs are projects or processes identified by water providers to meet new water demands. The IPPs accounted for 511,800 acre-feet (AF) of new supply to address the demands of 630,000 AF out to 2030. The Basin Roundtables have requested that this information be reviewed. Up-to-date information on IPPs will be gathered so that there is better understanding of where providers are in the process of completing their IPPs. In addition, CWCB is developing an IPPs database that will be used to track projects and processes into the future.

#### Identify Conservation Opportunities

The M&I Water Conservation TRT set out to "develop a deeper understanding and greater consensus on conservation and efficiency for municipal, industrial, and agricultural water uses." In the category of urban water demand, the TRT made significant advances that forward understanding of the important role of water conservation and efficiency in municipal water planning. Successes include:

- Consensus was reached on how conservation may affect system reliability under various scenarios
- Quantified potential long-term savings available from conservation measures
- Developed a range of potential water conservation savings from select measures that were in a comparable range to potential water conservation savings identified in the SWSI report
- Common understanding was reached on some issues

The conclusions and recommendations made by the CWCB and the TRT will serve as a starting point for the Consumptive Work Group to further quantify the role water conservation can play in meeting the demands of Colorado's water supply future.

### **Addressing Agricultural Needs**

Agricultural irrigated acreage, diversions, consumptive use, and shortages were identified in the SWSI Report. There have been changes in irrigated acreage due to urbanization, water transfers, and impacts of well augmentation requirements. Irrigated acreage and updated estimates of consumptive use based on high altitude coefficients will be made.

Limited progress was made on agricultural water efficiency by the SWSI Phase 2 Conservation and Efficiency TRT and this remains a significant challenge. Based on initial work, there appears to be some opportunities to achieve additional efficiencies in agricultural water use. However, since agricultural return flows are used by downstream water users, at a watershed level there are significant limitations in the overall net potential savings that can be realized. Nevertheless, since agricultural water use accounts for over 85 percent of total water use in the state, follow-up efforts should include this group of water users. CWCB and Colorado State University are working with the agricultural community to further examine these issues and opportunities.

### **Alternative Agricultural Water Transfer Methods for Water Supply**

SWSI Phase 2 provided an extensive look at all alternatives to a traditional transfer and concluded that fallowing has the most potential statewide, and may require state assistance. Interruptible supply strategies will also be assessed. There may be a role for the state, through the CWCB for example, to "level the playing field" through the use of incentives to encourage M&I providers and users to use alternatives to traditional agricultural transfers in order to foster the maximum utilization of the state's waters and to ensure that other non-market values (open space, wildlife habitat) are retained. Several roundtables have requested that this move forward.

### **Assessing the Effects of Climate Variability on Colorado's Consumptive Use Needs**

Global warming is expected to alter the pattern of water supply and use in Colorado and should be factored into any long-range planning. Global warming-based changes to supply availability can be examined by comparing projected changes in streamflow to current hydrographs at locations throughout the State, and estimating evaporative loss to reservoirs. The change in consumptive water demands in Colorado will be evaluated using the

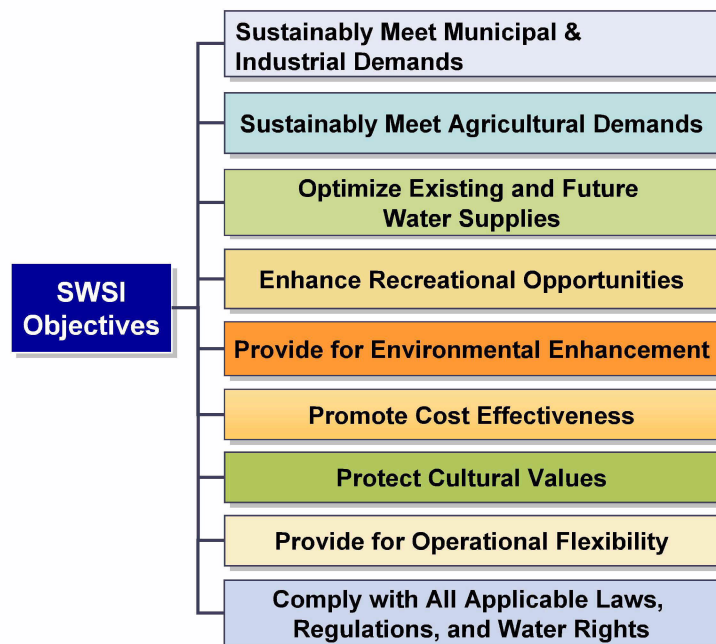
CWCB's consumptive use model StateCU. This will be looked at on both the demand side by this Consumptive Group and on the supply side in the Supply Availability Study.

### **Non-tributary Groundwater and Water Use Sustainability**

Several roundtables have identified that the increasing demand for Colorado's limited water supplies suggests the need to examine how our water resources can be used more efficiently. One method to maximize beneficial use is to use surface and groundwater resources in a more fully integrated manner through conjunctive use management. This is a proven strategy that recharges aquifers during wet periods and relies on them during dry periods. Studies conducted by the CWCB and Colorado Geological Survey have shown that considerable storage exists in both alluvial and bedrock aquifers throughout the State.

### **Recalculate the Gap**

The current Gap identified in SWSI is 118,200 AF based on the ability of the IPPs to address new demands. An update to the IPPs and the new demand projections out to 2050 will be used to recalculate for each basin. Additional considerations of climate variability and groundwater sustainability will also be considered in recalculating the Gap. Climate variability will play a role in determining the revised Gap and is described in detail below. In the South Metro area it is also anticipated that aquifer production will decline by 40 to 80 percent by the year 2050, and that municipal well production will decline. Conjunctive use of available surface water supplies can reduce these costs and decrease the annual demand on the aquifers by 50 percent.





**Delineate a Process for Decisionmaking**

Through the SWSI process, a set of nine major "water management objectives" were developed, refined, and then used to evaluate options for addressing Colorado's future water needs. These objectives represent the overarching interests in water management - they define major goals of water users in clear, understandable terms. These objectives should be used in decisionmaking to move stakeholders towards common ground for developing future water supply alternatives.

**Strategy for Non-consumptive Needs Assessment**

Each Basin Roundtable will develop a non-consumptive needs assessment (NCNA) under the Interbasin Compact Process. Participants of this statewide work group will assist the roundtables and IBCC as this process moves forward. Following is the strategy proposed for moving forward.

**Goals**

The goals of this process with the Basin Roundtables and NCNA Work Group are to:

- Identify priority areas and reaches for environmental and recreational attributes based on existing data
- Identify the quantities of seasonal flows necessary to maintain priority areas and reaches, to the extent possible with existing data, based on agreed-upon methodologies
- Outreach to interested parties about the existence of the products of this effort so that parties can use the information developed in other water planning efforts

**Methodology**

The methodology for completing the NCNA focuses on a two step process for evaluating non-consumptive needs – prioritization and quantification (illustrated in the figure below). Following provides information on the steps and their components.

**Prioritization**

**Build Upon Attributes:** Over the next several months, the NCNA Work Group will ask each Basin Roundtable to review and comment on the GIS coverages of environmental and recreational attributes compiled during SWSI Phase 2, as well as to suggest development of additional, important GIS coverages and data layers specifically for their basin.

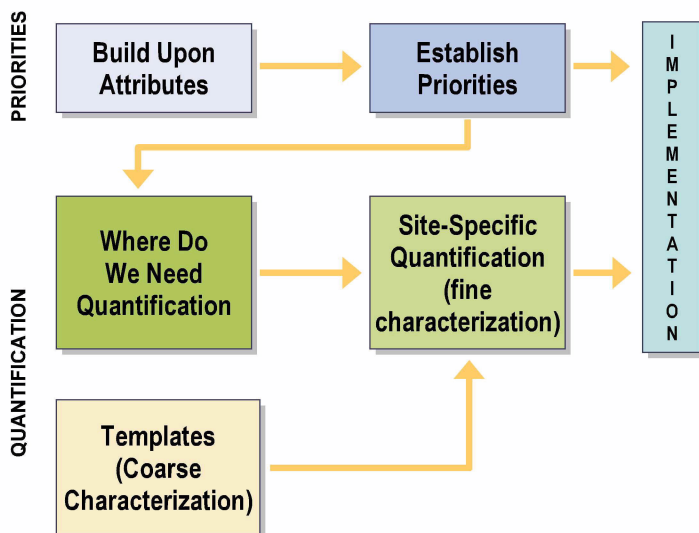
**Establishing Priorities:** Once Basin Roundtables have identified the data layers that contain important non-consumptive attributes for their basins, they will establish priorities. A basin's priorities will be based on both local and state information. In addition, basin roundtable members will be able to consider whether and how to prioritize a reach or area.

**Quantification**

**Where do we need quantification?:** The work group will develop criteria to help evaluate the need for quantification in priority reaches. The "triage" process will begin with the prioritized reaches and areas. Roundtables will consider the condition of the reach or area as well as its existing status or land use protection. Based on this evaluation, the roundtable will decide if it would be appropriate to perform a quantification.

**Templates (Coarse Characterization):** The CDM Technical Team will develop approximately 10 templates for Colorado stream and river types (e.g., high mountain headwaters, ephemeral desert washes, etc.) based on gross differences in hydrology and function. The template would provide a model hydrograph as well as specify which components of the hydrograph are important for specific ecological and recreational attributes.

**Site-Specific Quantification (Fine Characterization):** Based on the "triage" or where priority reaches warrant site-specific quantification, the CDM Technical Team will use the appropriate general template from the coarse characterization and apply it to the specific river reach (mainstem and significant tributaries) using existing data regarding flow and function.



## Implementation

The Basin Roundtables will be critical to implementing recommendations produced by their non-consumptive needs assessments. The implementation objectives are summarized in the figure here.

### Water Supply Reserve Account and Technical Assistance Task Orders Requested by Basin Roundtables

The tables on the following pages summarize Water Supply Reserve Account funding requests and the status of the 1400 Task Orders.

#### Implementation Objectives

Encourage water suppliers to consider this information when planning their projects and processes

Identify projects and processes to meet these needs

Identify additions to other processes or projects developed to meet other needs that might also meet the nonconsumptive needs

Identify and assist in securing funding for such projects and processes

Ensure development and implementation of sufficient projects and processes to meet these nonconsumptive needs

## Water Availability Study of Colorado River and Tributaries

### Study Purpose

Over the last decade Colorado has seen rapidly increasing demands placed on our water supply by both traditional consumptive and more recent non-consumptive (recreational and environmental) uses. By the year 2030 Colorado's population is expected to grow to about 7.1 million people (current estimates are approximately 4.5 million people). This population growth coupled with concerns over both the recent severe drought and projections of greater climate variability raises significant concerns over the water supplies Colorado has available to meet the needs of our citizens and the environment.

The water availability study is intended to help Colorado make wise resource management decisions while acknowledging that there is a degree of uncertainty as Colorado moves into the future. The study is intended to answer what on the face seems an easy question:

*"How much water from the Colorado River Basin System is available to meet Colorado's current and future water needs?"*

The answer to that question will take into consideration the following factors.

- **Hydrology** - varies in time, location and amount. Agreement on how to consider these factors in a water availability study will be important to gain greater understanding and acceptance of the study conclusion. As described later in this scope the initial study phase will focus on issues in a period of known hydrology and a period extended from known hydrology.
- **Water Availability** - will include both legal and physical supply considerations. Initially legal availability will consider current demands.
- **Water Use** - water use consideration (also referred to as demands) should include existing absolute water rights. Water use can be measured in terms of consumptive use, gross diversions or total deliveries. Categories of water use include municipal (domestic and commercial), industrial, agricultural, water rights for instream environmental flows and water rights for recreational in-channel diversions. The Study should examine: 1) how non-consumptive uses within the priority system may affect Colorado's ability to fully develop its consumptive use apportionment; and, 2) how much water would remain for non-consumptive uses if Colorado fully developed its apportionment.

At various locations within the state initial water availability will be evaluated using the following formula:

$$\text{Water Availability} = \text{Physical Supply} - \text{Current Water Use (includes downstream demands)}$$



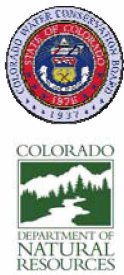
## Approved Water Supply Reserve Account Applications by the CWCB Board

Name of Water Activity	Basin Account	Statewide Account	Total Request
<b>Arkansas Basin Total Request</b>	<b>\$265,000</b>	<b>\$250,000</b>	<b>\$515,000</b>
Arkansas Valley Conduit		\$200,000	
Tamarisk		\$50,000	
Upper Black Squirrel Creek Aquifer Recharge Investigation	\$70,000		
Round Mountain Water and Sanitation District Water Systems Improvements Project	\$120,000		
Fountain Creek Vision Task Force	\$75,000		
<b>Colorado Basin Total Request</b>	<b>\$70,000</b>	<b>\$2,100,000</b>	<b>\$2,170,000</b>
Acquisition of Vail Ditch by Grand County Interests		\$1,500,000	
Energy Development Water Needs Assessment		\$150,000	\$300,000 Joint App. (See Yampa)
Enlargement of Eagle Park Reservoir		\$250,000	
Upper Colorado Endangered Fish Recovery Alternatives Analysis		\$200,000 Joint App. With Colorado, S. Platte and Metro	
Grand County Streamflow Management Plan	\$30,000		
Roaring Fork Watershed Assessment	\$40,000		
<b>Gunnison Basin Total Request</b>	<b>\$155,000</b>	<b>\$480,000</b>	<b>\$635,000</b>
Lake San Cristobal Controlled Outlet Structure	\$35,000		
Safety and Serviceability Needs Inventory for Reservoirs in the Lerou Creek Drainage Basin	\$60,000		
Orchard City Water Reservoir Project	\$60,000	\$480,000	
<b>Metro Basin Total Request</b>	<b>\$103,000</b>		<b>\$103,000</b>
Chatfield Reallocation EIS/FR	\$103,000		
<b>North Platte Basin – None Requested</b>			
<b>Rio Grande Basin Total Request</b>	<b>\$101,250</b>	<b>\$288,000</b>	<b>\$389,250</b>
Alamosa River Instream Flow Project	\$64,500		
Preliminary Design Multi-use Rio Grande Reservoir Rehabilitation and Enlargement		\$288,000	
Rio Grande Conservation Reserve Enhancement Project	\$36,750		
<b>South Platte Basin Total Request</b>	<b>\$79,000</b>		<b>\$79,000</b>
Chatfield Reallocation EIS/FR	\$27,000		
Clear Creek Water Bank/High Altitude Storage	\$52,000		
<b>Southwest Basin Total Request</b>	<b>\$87,700</b>	<b>\$1,000,000</b>	<b>\$1,087,700</b>
Dry Gulch Reservoir/San Juan Reservoir Land Acquisition		\$1,000,000	
Goodman Point Water Association Pipeline Environmental Assessment	\$7,700		
Jackson Gulch Reservoir Expansion	\$80,000		
<b>Yampa/White/Green Basin Total Request</b>	<b>\$49,500</b>	<b>\$150,000</b>	<b>\$199,500</b>
Energy Development Water Needs Assessment		\$150,000	\$300,000 Joint App. (See Colorado)
Morrison Creek Reservoir Feasibility Study	\$49,500		

## Status of Technical Assistance Task Orders



Name of Water Activity	Status
<b>Arkansas Basin</b>	
<ul style="list-style-type: none"> <li>Update the status of identified projects and processes (IP&amp;Ps) from SWSI</li> <li>Articulate implementation status of conservation and reuse programs</li> <li>Evaluate potential opportunities for rotational fallowing and/or leasing agreements</li> <li>Evaluate groundwater sources that were not included in SWSI Phase I, especially designated basins.</li> <li>Examine the relationship between Colorado River Compact supplies, imports from the Colorado River Basin and exports of native water supplies from the basin.</li> </ul>	Consumptive tasks, as outlined, will begin summer 2007.
Non-consumptive Needs	<p>Roundtable will utilize non-consumptive strategy as outlined above and are building on attributes.</p> <p>The Non-consumptive Needs Assessment Work Group Kick-off meeting was attended by Arkansas BRT representatives.</p>
<b>Colorado Basin</b>	
Consumptive Use Needs Assessment	A task order for this work is slated for development during the summer 2007.
Energy Development Water Needs Assessment Scoping (Joint with Yampa Basin Roundtable)	A workplan is scheduled to be completed in the summer 2007.
Non-consumptive Needs Assessment	<p>Roundtable will utilize non-consumptive strategy as outlined above and are building on attributes.</p> <p>The Non-consumptive Needs Assessment Work Group Kick-off meeting was attended by Colorado BRT representatives.</p>
<b>Gunnison Basin</b>	
<ul style="list-style-type: none"> <li>Basinwide - Review, refine, and/or confirm the estimate of current and future water demands and supply for the smaller water providers</li> <li>Basinwide - Review and refine the estimate of current and future rural domestic demands and supply</li> <li>Basinwide - Identify vulnerabilities to water supply shortages for Gunnison Basin municipalities</li> <li>Sub-basin Specific: Upper Gunnison - Review, refine, and/or confirm the estimate of future snowmaking demands in the Upper Gunnison</li> </ul>	Technical work for this first task order will be completed in the summer 2007.
Non-consumptive Needs Assessment	<p>Roundtable will utilize non-consumptive strategy as outlined above and are building on attributes.</p> <p>The Non-consumptive Needs Assessment Work Group Kick-off meeting was attended by Gunnison BRT representatives.</p>
<b>Metro Basin</b>	
<ul style="list-style-type: none"> <li>Analysis of where providers are looking at the same water as a future supply</li> <li>Update of unappropriated water in the South Platte Basin</li> <li>Impact of water administration changes on the availability of water</li> <li>Impact of reusable water not being available to downstream users</li> <li>Status of Conservation</li> <li>Status of IPP's</li> </ul>	Technical work for this first task order will be completed in the summer 2007.
Non-consumptive Needs Assessment	<p>Roundtable will utilize non-consumptive strategy as outlined above and are building on attributes.</p> <p>The Non-consumptive Needs Assessment Work Group Kick-off meeting was attended by Metro BRT representatives.</p>
<b>North Platte Basin</b>	
Town of Walden Water Supply Evaluation	A task order for this work is slated for development during the summer 2007.
Water Supply Availability	The requested water supply availability task will be completed through Decision Support System modeling updates by CWCB.
Non-consumptive Needs Assessment	<p>Roundtable will utilize non-consumptive strategy as outlined above and are building on attributes.</p> <p>The Non-consumptive Needs Assessment Work Group Kick-off meeting was attended by North Platte BRT representatives.</p>



## Status of Technical Assistance Task Orders

Name of Water Activity	Status
<b>Rio Grande Basin</b>	
Implementation of well monitoring program south of the Rio Grande River and evaluation of the status of the hydraulic divide	Technical work for this first task order will be completed in the near term.
Non-consumptive Needs Assessment	Roundtable will utilize non-consumptive strategy as outlined above and are building on attributes. The Non-consumptive Needs Assessment Work Group Kick-off meeting was attended by Rio Grande BRT representatives.
<b>South Platte Basin</b>	
<ul style="list-style-type: none"> <li>• Analysis of where providers are looking at the same water as a future supply</li> <li>• Update of unappropriated water in the South Platte Basin</li> <li>• Impact of water administration changes on the availability of water</li> <li>• Impact of reusable water not being available to downstream users</li> <li>• Status of Conservation</li> <li>• Status of IPPs</li> </ul>	Technical work for this first task order will be completed in the summer 2007.
Non-consumptive Needs Assessment	Roundtable will utilize non-consumptive strategy as outlined above and are building on attributes. The Non-consumptive Needs Assessment Work Group Kick-off meeting was attended by South Platte BRT representatives.
<b>Southwest Basin</b>	
<ul style="list-style-type: none"> <li>• Consumptive Use Needs Assessment</li> <li>• Alternatives to permanent Ag dry-up</li> <li>• Analysis and options for Water Conservation and Efficiency</li> </ul>	The Southwest Basin's Consumptive Use Needs Assessment update and associated task order is under consideration by a subcommittee.
Non-consumptive Needs Assessment	Roundtable will utilize non-consumptive strategy as outlined above and are building on attributes.
<b>Yampa Basin</b>	
Energy Development Water Needs Assessment Scoping (Joint with Colorado Basin Roundtable)	A workplan is scheduled to be completed in the summer 2007.
Evaluation of Agricultural Needs	A workplan for this evaluation has been drafted.
Non-consumptive Needs Assessment	Roundtable will utilize non-consumptive strategy as outlined above and are building on attributes. The Non-consumptive Needs Assessment Work Group Kick-off meeting was attended by Yampa BRT representatives.

Further information regarding the Interbasin Compact Process accomplishments and support provided to the basin roundtables to further their basinwide needs assessments can be found at:

<http://dnr.state.co.us/Home/ColoradoWaterforthe21stCentury/lbccHome.htm>.

Information on the Water Supply Reserve Account and continuing SWSI activities is located on CWCB's webpage:

<http://cwcb.state.co.us/IWMD/>.

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