Colorado Water Plan
Basin Implementation Plan

Colorado Mesa University
2014 Water Course Agenda
February 3, 2014
Louis Meyer PE
THE TIME IS RIGHT...

Critical to our *interstate* positions that our *intra*state house is in order.

**Explanation**
- **State water plan**
- **Planning program but no comprehensive state plan**
Governor Hickenlooper’s Executive Order
What?

• May of 2013….start
• Colorado Water Conservation Board (CWCB) will coordinate the plan
• Plan will be prepared by the 9 Roundtables
• Draft on CWCB’s desk by July 2014
• Our team were given notice to proceed on December 11th, 2013
• Plan has to show how we meet the Gap
• Planning horizon is 2050
Governor Hickenlooper’s Executive Order

Why?

1. The Gap between water supply and demand is real….500,000 AFY
2. Drought conditions will hasten impact of Gap
3. Current rate of transfer of water rights from Ag is unacceptable
4. Can not separate Water Quantity and Water Quality….need to address conjunctively
5. Interstate Issues pressing
6. Front Range would like to see a new supply project
WHY?

• The CWP is an opportunity to allow the statewide thinking to transition from an individual perspective to a regional perspective.
Colorado River Water – Supporting Diverse Land Use

- Agriculture
- Environment and Game
- Industry and Energy
- Recreation and Tourism
- Municipalities

Grand Junction looking towards Grand Mesa
<table>
<thead>
<tr>
<th>County</th>
<th>2000 Population</th>
<th>2030 Population</th>
<th>Increase in Population 2000 to 2030</th>
<th>Percent Change 2000 to 2030</th>
<th>Percent Annual Growth Rate</th>
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<td>76,100</td>
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<td>28,800</td>
<td>15,900</td>
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<td>50,400</td>
<td>24,700</td>
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<td>492,600</td>
<td>244,600</td>
<td>99</td>
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Fastest growing basin in Colorado
Ref: SWSI and *AGNC

Population doubling

Colorado Basin Population Projections
Colorado’s 9 Roundtables

1. Arkansas
2. Colorado
3. Gunnison
4. Metro
5. North Platte
6. Rio Grande
7. South Platte
8. Southwest
9. Yampa/White
Colorado Basin Roundtable tasks:

- Assess internal needs & identify projects to meet them
- Negotiate how to meet state needs.
Our population is increasing but there’s no new water.

Many uses compete for a scarce and limited water supply.

Agriculture 86%
Municipal & Industrial 9%
Environment
Recreation

Graphics provided by the Colorado Foundation for Water Education
Colorado is facing a “Gap”
How can we fill the gap?
Already planned projects (Windy Gap firming, Moffat Collection System) +

Conservation
Ag to Urban Transfers
New Projects (Colorado Basin development)

The Governor wants a draft plan by the end of 2014 & a final plan by the end of 2015.

Graphics provided by the Colorado Foundation for Water Education
Consumptive PLT Themes

- Need for Multi-Purpose Reservoirs
- Need modeling capabilities
- Water Court concerns
- Better clarity of Hierarchy of Water Use
- Land Use Connection with Water Use
- Aging Infrastructure and true cost of water
- Protect Main-stem Water Right Operations
Policy PLT Themes

- Would like other PLT’s to guide efforts
- Eliminate inconsistency in Water Right administration between Divisions
- How to allow donation for in-stream flow without running the gauntlet
- Set the rules of the game for compact curtailment now
- Establish rainy day fund for compact curtailment
- Make connection between land/water use but not at expense of local control
- Find balance between local control and State control
- How do you share risk in case of compact curtailment
Non Consumptive Themes

• Would like to see better models to understand impact to stream flow from future consumptive and non consumptive projects
• Need more work on identifying critical reaches
• Protect trout, warm water fish, aquatic environment, recreational reaches
• Improve Adaptive management process
• Restore native species along Colorado River
• Improve point source and non point source water quality
Agriculture PLT Themes

- Agricultural Water Shortages (Reservoirs?)
- Agriculture Water to Urban Transfers/Land Use
- Agricultural Production Incentives
- Trans-mountain Diversions
- Agricultural Education and involvement
- Efficiency/Preservation/Conservation
Water Provider Interviews?

- Most Water Providers have very complex physical and legal water right plans!
- Plans are very reliant upon Augmentation Storage and exchanges!
- Physical Water Supply Planning based upon firm yield in dry year...based upon historical hydrology.
- Future storage is required and needs to be above supply...not just augmentation storage. Why?
  - Reliant upon stream flows
  - Uncertainty
  - Land Use changes
  - Climate changes
  - Extended droughts beyond historical averages
  - Customers are very engaged with in-stream flows
- Under current regulatory climate future reservoirs very expensive and can not be done by any one entity.
- No discussion of regional projects
- Not focused on Compact Call implications!
<table>
<thead>
<tr>
<th>Growth Projection</th>
<th>Total Population</th>
<th>Landscape Area (acres)</th>
<th>Δ from Existing (acres)</th>
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<tr>
<td>Existing</td>
<td>2,513,000</td>
<td>62,000</td>
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<td>Low</td>
<td>4,018,000</td>
<td>99,000</td>
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<tr>
<td>Medium</td>
<td>4,144,000</td>
<td>102,000</td>
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<tr>
<td>High</td>
<td>4,534,000</td>
<td>112,000</td>
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</table>
Metro BRT Landscape Area Comparison

Denver, CO

Existing: 62,000 acres, 97 sq.mi.
High Growth Projection: 112,000 acres, 175 sq.mi.

15 Miles
FIGURE 4-42
Schematic Diagram of Grand Valley Water Rights

Water Rights By Priority

<table>
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<tr>
<th>Year</th>
<th>AGENCY</th>
<th>Amt.</th>
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<td>1882</td>
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<td>520.81</td>
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<tr>
<td>1883</td>
<td>Palisade</td>
<td>80</td>
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<td>1898</td>
<td>OMD</td>
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<tr>
<td>1903</td>
<td>Mesa Co.</td>
<td>40</td>
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<tr>
<td>1907</td>
<td>OMD</td>
<td>450</td>
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<tr>
<td>1908</td>
<td>GVWUA</td>
<td>730</td>
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<td>1914</td>
<td>GVICO</td>
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<tr>
<td>1918</td>
<td>Palisade</td>
<td>23.5</td>
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</table>

TOTAL IN USE: 2260.28 cfs

WATER REQUIRED FOR PUMPING:
- Canal 41
  - 965 cfs Pumped x 1.1 = 1061.5 cfs
  - 78 cfs Pumped x 2 = 156 cfs
  - 111.2 cfs Pumped x 2 = 222.4 cfs

WATER REQUIRED FOR IRRIGATION:
- 272 cfs OIMD Pumping
- 309.80 cfs OIMD Power

NOTE: River should be placed on call when river flow falls below 2260.28 cfs.

OMID JULY 87
Colorado River Compact

- Senate Bill-122 study underway to determine risk of continued water development

*includes other basins feeding greater Colorado basin*

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**Faltering flows**

The 1922 Colorado Compact allocated water to seven states and Mexico assuming 16.5 million acre-feet flowed in the river on average, with the upper and lower basins getting 7.5 million acre-feet each and Mexico 1.5 million acre-feet. But tree-ring studies have shown 1922 was an unusually wet year. Here are the river flows recorded this decade in million acre-feet:

<table>
<thead>
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<th>Year</th>
<th>Average 11.7 million acre-feet</th>
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<tr>
<td>2000</td>
<td>11.03</td>
</tr>
<tr>
<td>2001</td>
<td>11.02</td>
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<tr>
<td>2002</td>
<td>10.47</td>
</tr>
<tr>
<td>2003</td>
<td>9.41</td>
</tr>
<tr>
<td>2004</td>
<td>12.45</td>
</tr>
<tr>
<td>2005*</td>
<td>11.73</td>
</tr>
<tr>
<td>2006*</td>
<td>16.78</td>
</tr>
<tr>
<td>2007*</td>
<td>16.15</td>
</tr>
<tr>
<td>2008**</td>
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</table>

*Preliminary measurements that need to be verified
**Incomplete water year, provisional estimate

Note: An acre-foot of water is the amount it takes to cover an acre with one foot of water, or about 326,000 gallons, enough to supply one to two households for a year.

Source: U.S. Bureau of Reclamation, "The Salt Lake Tribune"

Lake Powell has been our savings account for the compact
Lake Powell Elevations
The Colorado River Basin is still in a drought
Public Outreach

• Facebook
  – Go to your Facebook page; type in Colorado Basin Implementation Plan in Search.
  – In two days we are up to 273 followers
  – Once you are on BIP page go to friends and invite your friends to like this page.

• Web Page
  http://www.coloradobip.sgm-inc.com

• Twitter Feed @ColoBIP
Roundtable Meeting BIP Schedule

- **December 11**
  - Notice to proceed from CWCB

- **December 30th**
  - Goals and measurable outcomes
  - Explain the GAP
  - Constraints and opportunities

- **January 27**
  - Evaluate current Basin Operation and hydrology

- **February 24**
  - Projects and Methods

- **March 24**
  - Projects and Methods

- **April 28**
  - Implementation Strategies

- **May 26**
  - How does plan meet our Goals/White Paper

- **June 23**
  - Check in with CBRT

- **July 15**
  - Draft BIP due to CWCB by July 15
Questions??

• Thanks for the opportunity to have a conversation!
Colorado Basin Planning Cycle

Section 1: Vision of what CBRT can and should accomplish

Section 2: Inventory & conclusions of existing reports

Section 3: Constraints & opportunities
- Water administration
- Current & future shortages

Section 4: Projects & methods to meet objectives

Section 5: Implementation strategies

Section 6: Has BIP met objectives & measurable outcomes?

Public Involvement
Why?

- Statewide Municipal demands are estimated to increase from 975,000 AFY to 1,360,000 AFY by year 2035. This is an addl 383,000 AFY
- With passive water conservation 2050 statewide M & I water demands will range from 1.5 to 1.8 AFY
- By 2050 Colorado will need between 538,000 and 812,000 AFY additional water to meet M&I demands.
- Passive conservation savings will result in 154,000 AFY reduction Statewide or just over 8% decrease in M&I water demands for 2050 for the medium demand scenario.
- For the Colorado Basin the 2008 AFY water demand was 130,000 AFY
  - In 2050 low 270,000 med 290,000 high 330,000 no passive conservation
  - In 2050 low 200,000 med 260,000 high 300,000 with passive conservation
- M&I and SSI demands for the Colorado Basin in 2008 is 68,480 AFY
  - In 2035 111,240
  - In 2050 low 129,000 med 149,000 high 179,440
Conveyance System Improvements

• Canal Lining
• Intake improvements
• New Technology   Rubicon
Transfers

- Rotational Fallowing
- Super Ditch
Irrigation Efficiency Programs

- Conversion to sprinklers in lieu of Flood Irrigation
- What happens with water rights?
- Return flows
- Is this really more efficient.....CU versus Diversions
- Can’t harm downstream juniors
- How do you shepherd this water downstream
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<tr>
<td>Colorado Basin</td>
<td>64,447</td>
<td>81,470</td>
<td>111,175</td>
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<tr>
<td>Eagle County</td>
<td>10,102</td>
<td>14,036</td>
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<td>Grand County</td>
<td>4,068</td>
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<td>6,732</td>
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<td>Gunnison Basin</td>
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<td>1,825</td>
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<td>Ouray County</td>
<td>281</td>
<td>520</td>
<td>807</td>
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Governor Hickenlooper’s Executive Order
What?
Water Provider Interviews Themes?

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<table>
<thead>
<tr>
<th>State</th>
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