



Colorado's Water Supply Future



IBCC Meeting

Lakewood, Colorado

December 2, 2009

Agenda

- Context for Meeting
- Discuss Evaluation Criteria
- Panel Discussion
- Breakout Session
- Colorado River Water Availability Study

Context for Meeting

Development of Portfolios and Evaluation of Water Supply Strategies

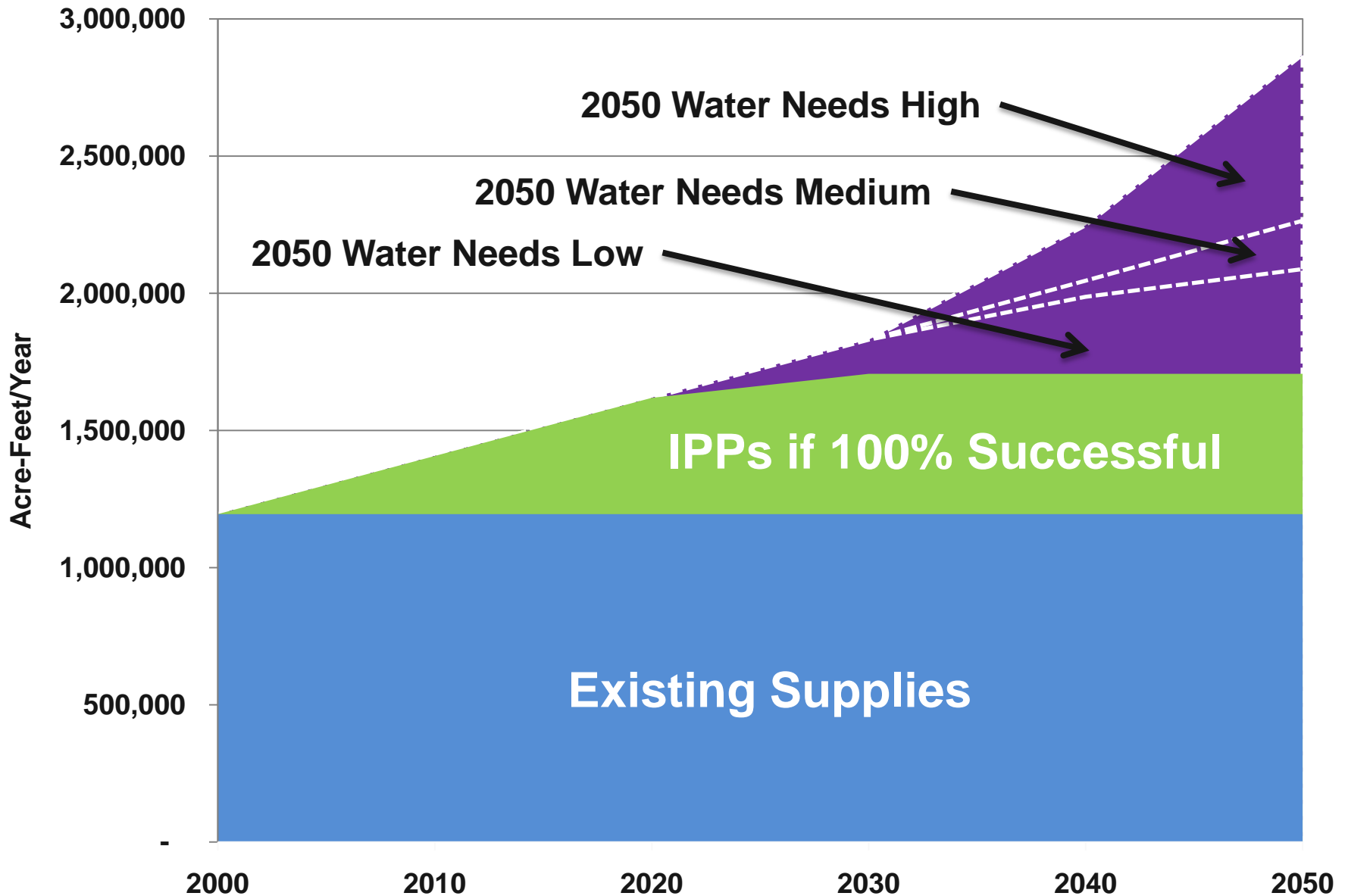
- During 2008, Colorado's water community embarked on a visioning process to address the following questions:
 - If we let Colorado's water supply continue to evolve the way it is now, what will our state look like in 50 years?
 - Is that what we want it to look like?
 - If not, what can and should we do about it?

IBCC/CWCB Visioning Process

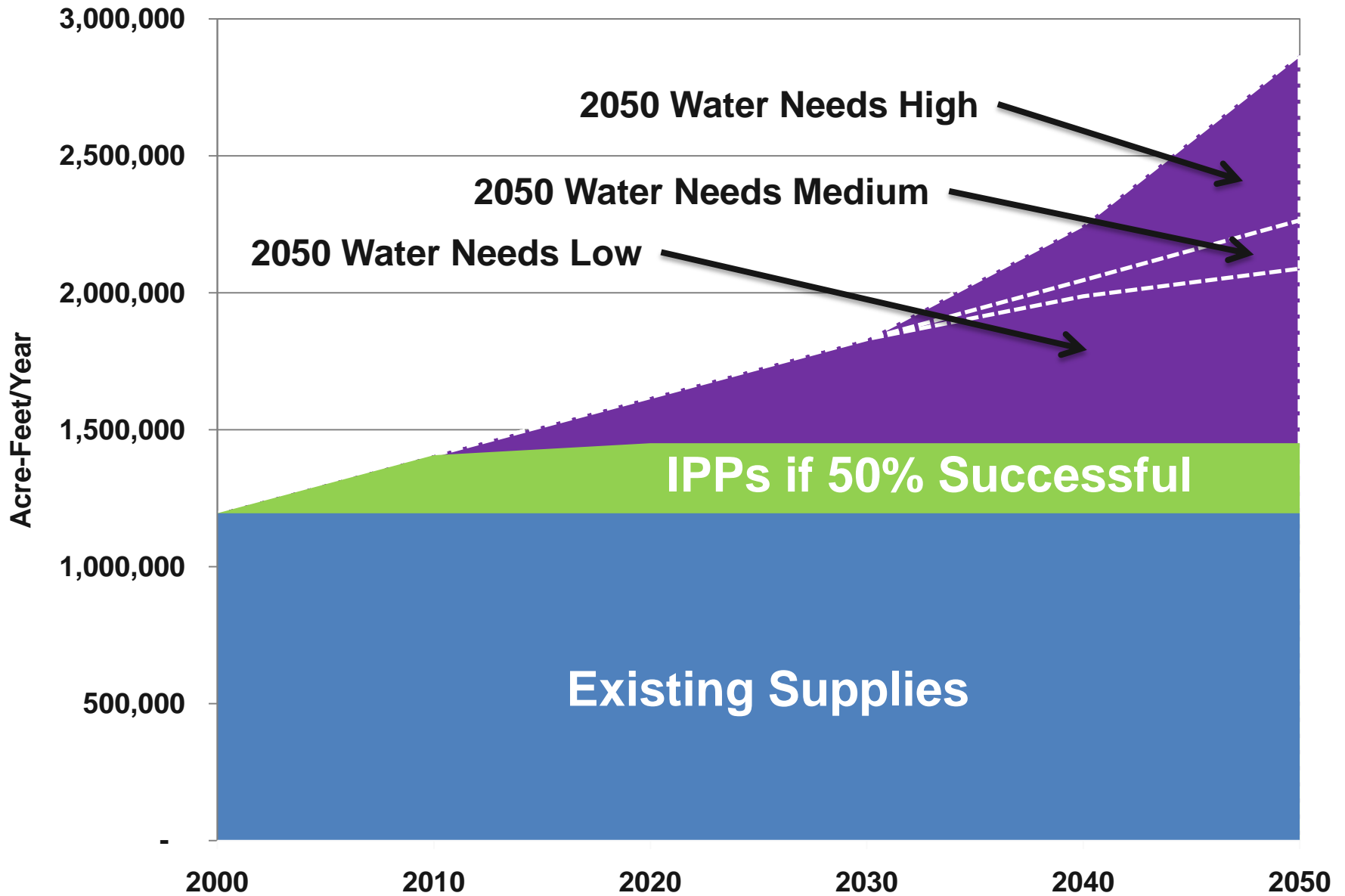
Basic Conclusions

- The status quo approach to water supply will not lead to a desirable future for Colorado.
 - Status Quo = Significant loss of irrigated acres
 - If not the Status Quo then what?
- Colorado will need of range of demand side and supply side strategies.
- We need to work together to examine the trade-offs, risks, and uncertainties associated with different strategies and combination of strategies.

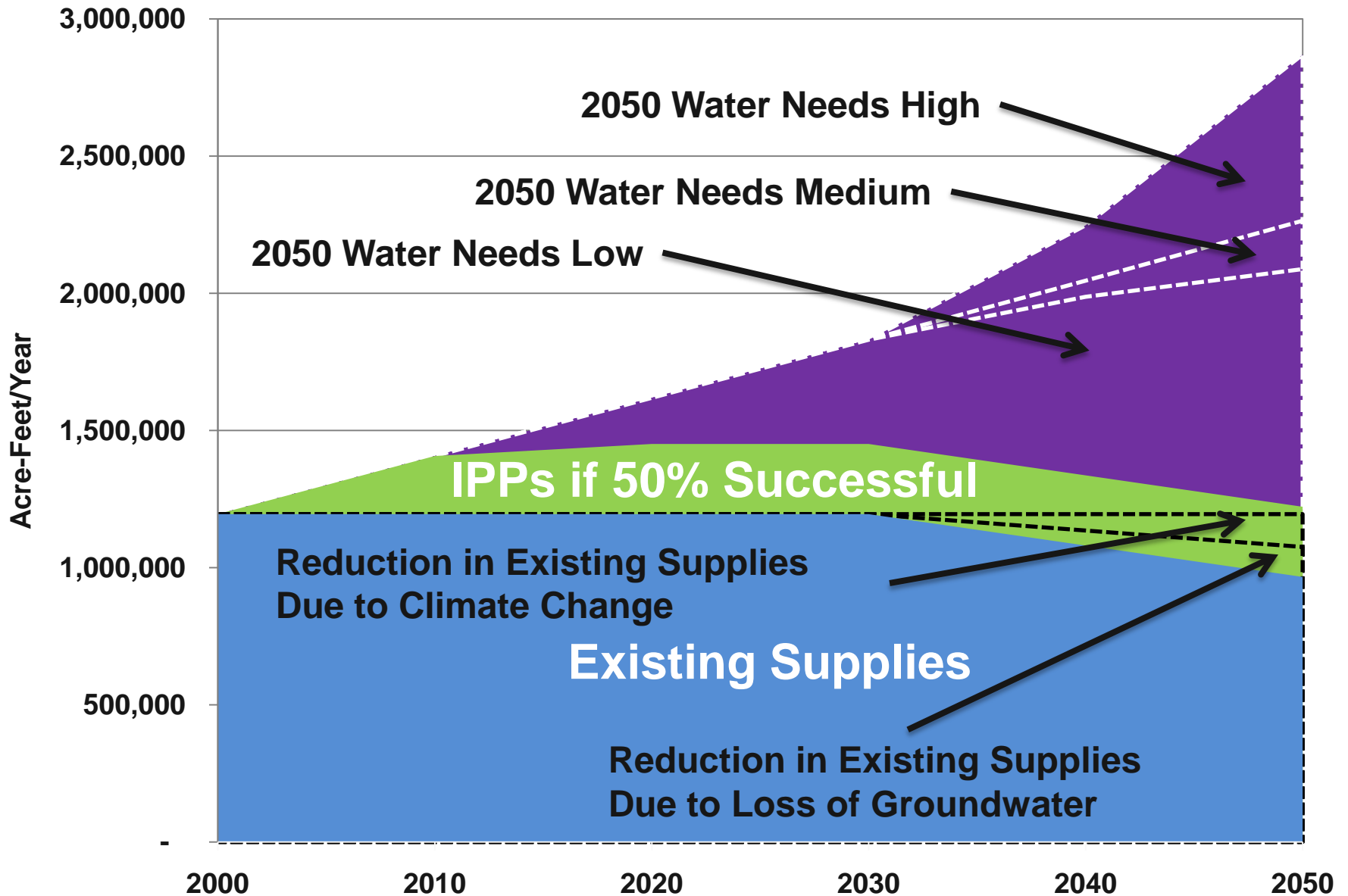
Colorado's Future M&I Water Needs



Colorado's Future M&I Water Needs

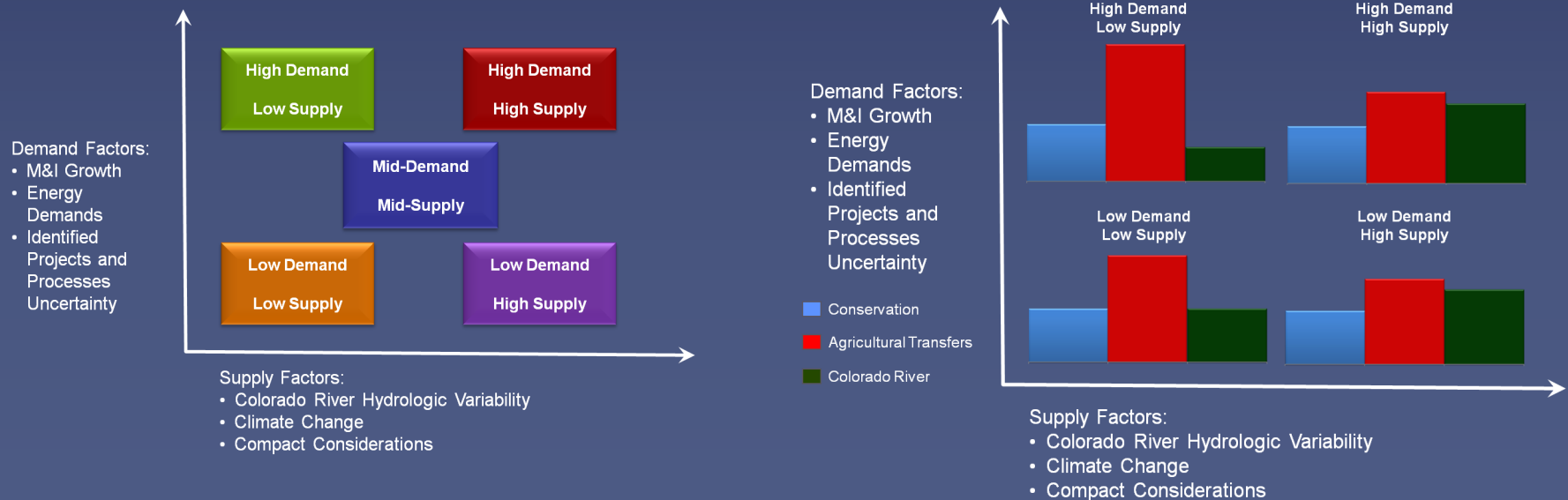


Colorado's Future M&I Water Needs

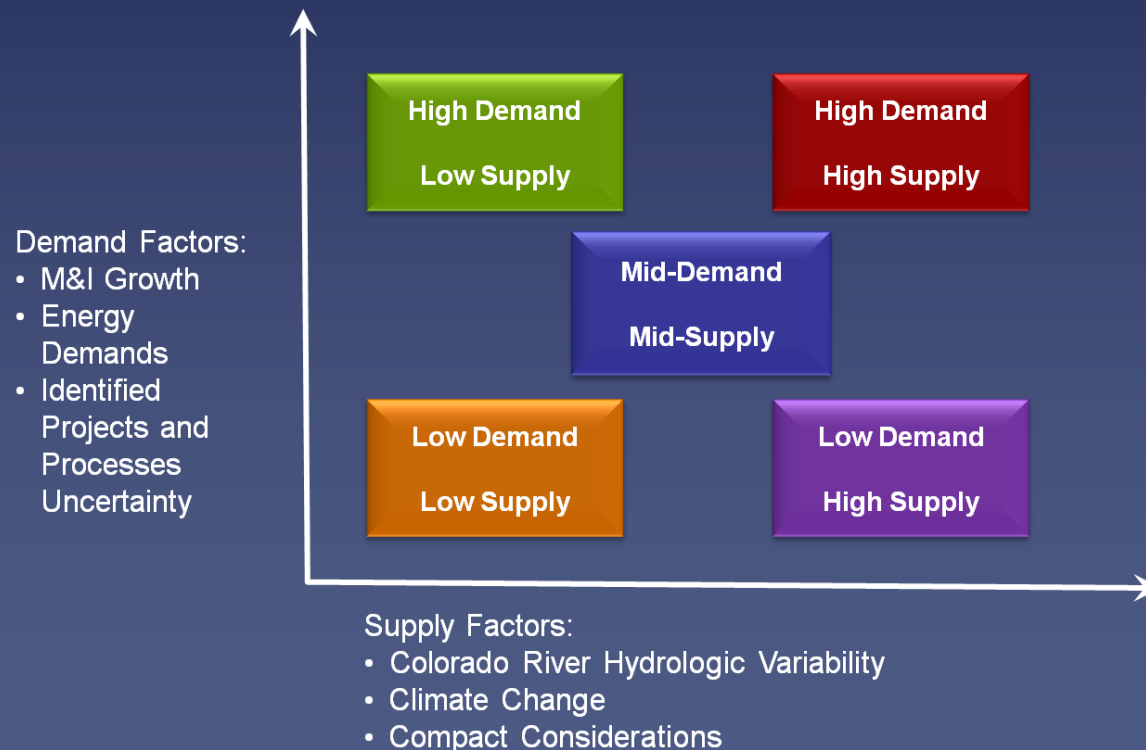


September IBCC Meeting:

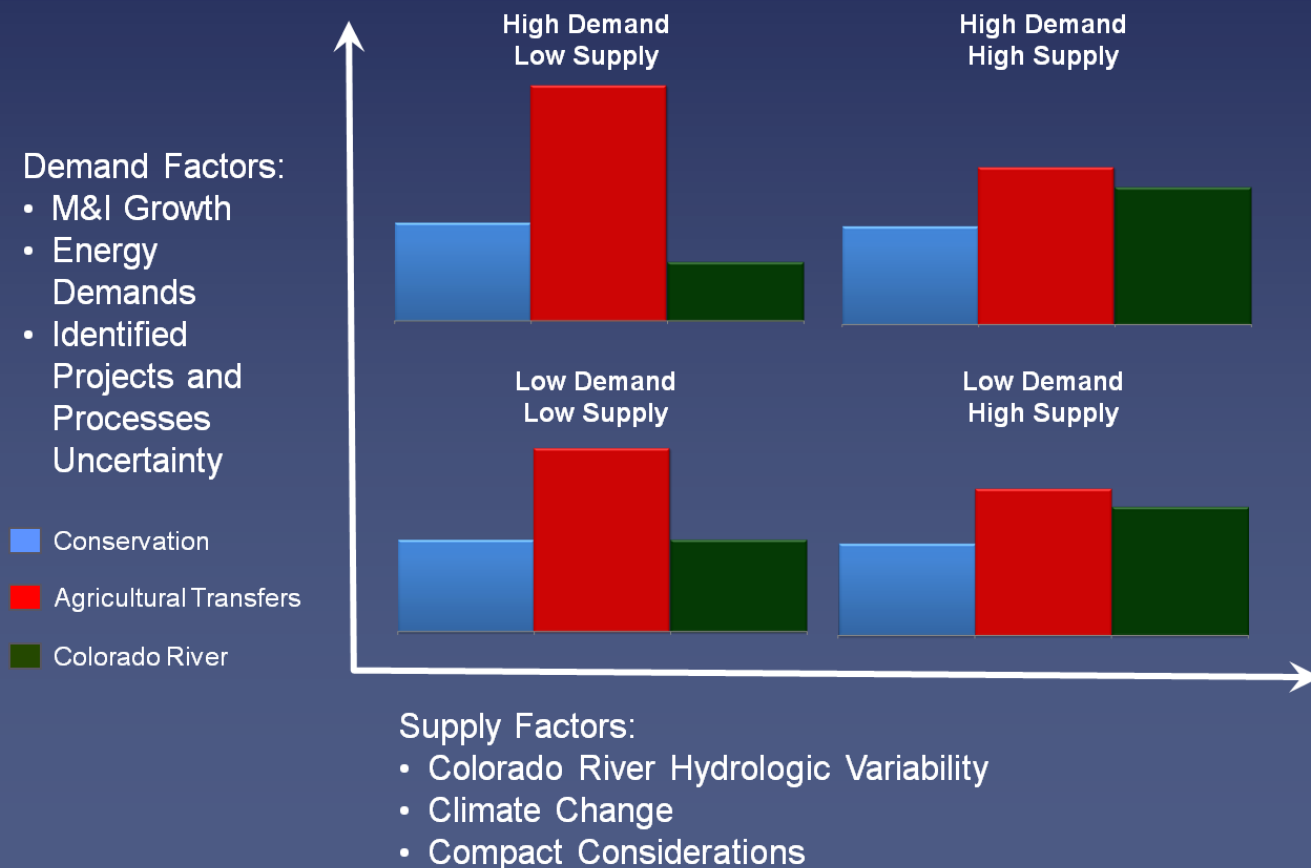
- Began building “portfolios” for meeting Colorado’s future water needs.
- Reviewed the concepts of: Scenarios, Portfolios, Strategies, and Projects/Methods.
- Discussed Refinements to the Portfolio Tool.



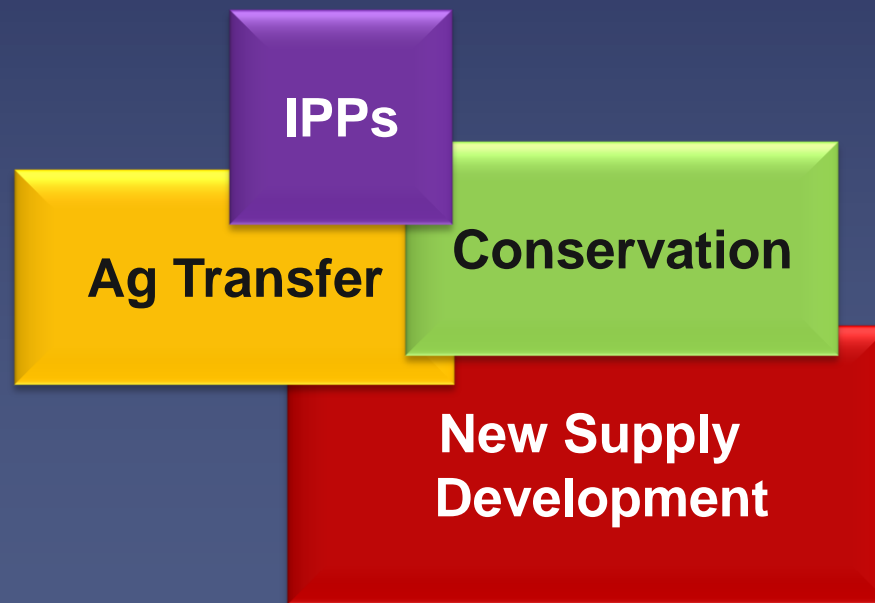
Scenarios – Different future conditions. Each scenario represents a different, but plausible, representation of circumstances that would result in differing statewide consumptive and nonconsumptive water demand and water supply. The IBCC is considering 5 different scenarios.



Portfolios – Combinations of strategies which collectively meet statewide water demands. Portfolios can be developed for each future scenario.



Strategies – Broad categories of solutions for meeting Colorado's consumptive and nonconsumptive water supply needs. Through its Visioning Process the IBCC identified a set of Demand Side Strategies and Supply Side Strategies and began developing conservation, agricultural transfers, and new water supply development strategies.



Projects and Methods – Specific actions that help implement each strategy. For example, a water project helps implement a new water supply development strategy, a rotational fallowing program helps implement an agricultural transfer strategy, and a block rate pricing program helps implement a conservation strategy. Each Basin Roundtable is responsible for proposing projects and methods to meet their consumptive and nonconsumptive needs.

Strategies

Projects and Methods

Agricultural Transfer

- Agricultural Transfers (Traditional and Alternative)
- South Platte Basins
- Arkansas Basin

Colorado River System

- Yampa
- Flaming Gorge
- Green Mountain

Conservation

- 15% to 40% savings off 2000 water usage

IPPs

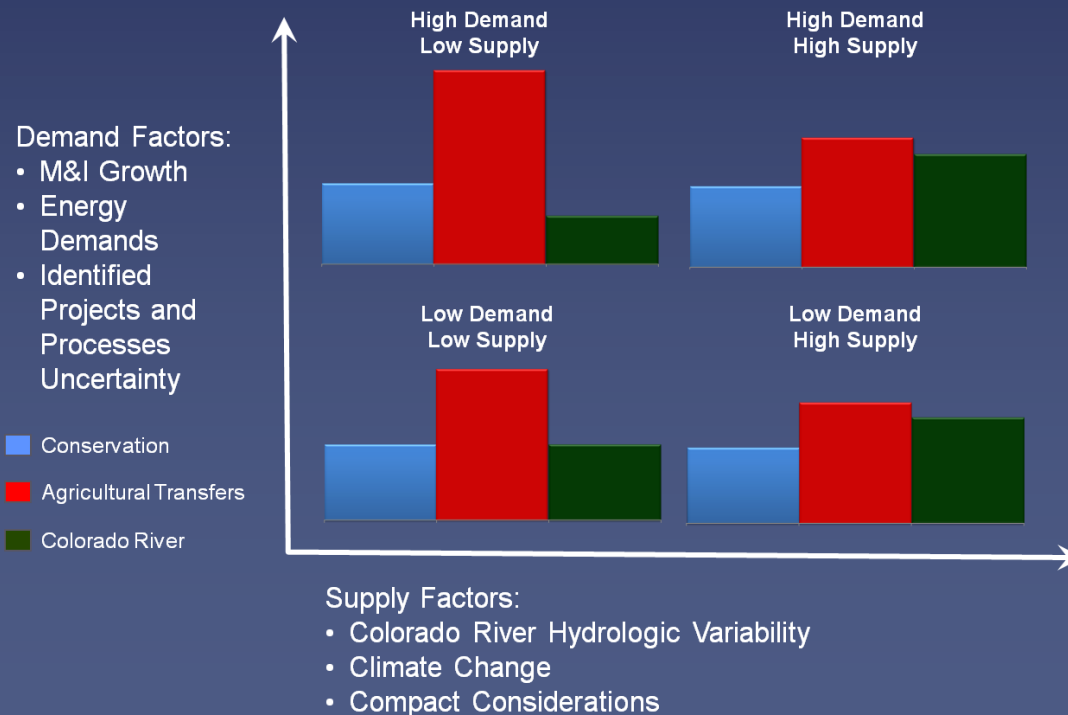
- Providers current conservation plans and optimization of existing infrastructure
- Southern Delivery System, Arkansas Valley Conduit, Wolcott Reservoir, Elkhead Enlargement, Moffat Collection System, Rueter Hess Enlargement, Thornton Northern Project, Prairie Waters, Chatfield Reallocation, Northern Integrated Supply Plan (NISP), Windy Gap Firming, Halligan Enlargement, Seaman Enlargement

Portfolio Tool Updates

- Vary IPP yield success rate by basin
- Vary conservation savings by basin
- Change conservation savings baseline to 2000 water usage rates
- Break out Oil Shale from SSI
- Include option to fully use available Colorado River water
- Others in the works:
 - Land Use
 - Incorporate monetary impacts of reduced ag production
 - On/Off switch for loss yield of groundwater
 - Revisions to energy based on Phase II Energy Study
 - Validation with CRWAS
 - Integrate new information from BNDSS

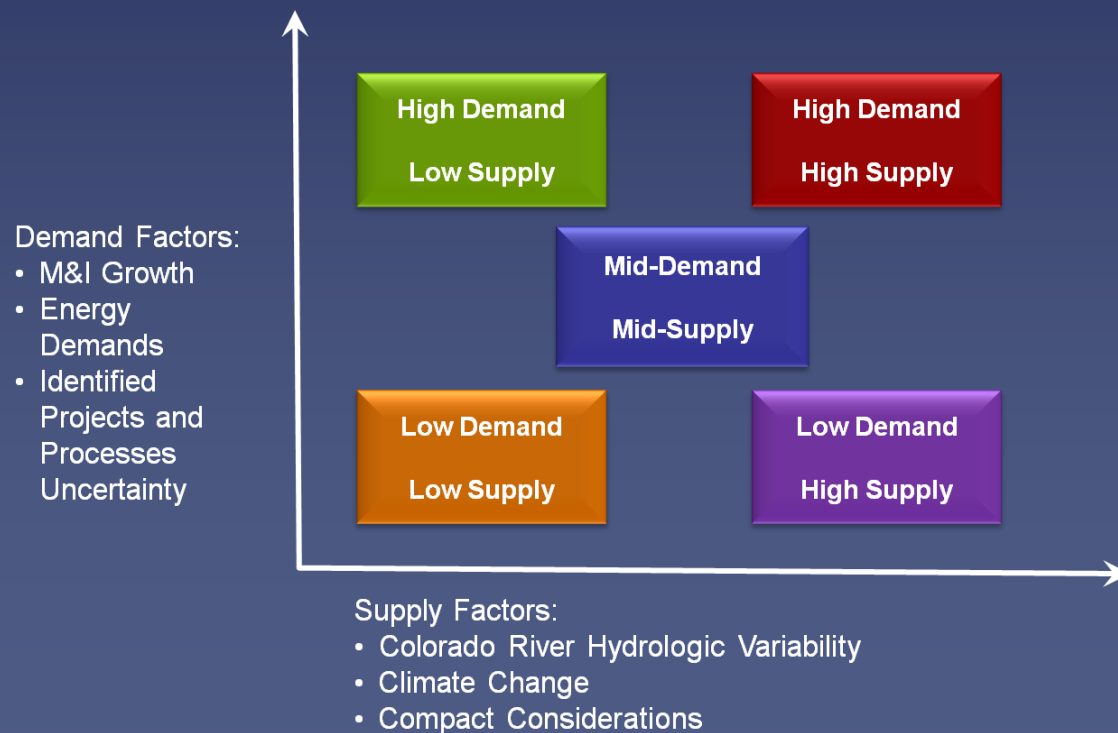
IBCC Meeting Objective:

- Use the updated Portfolio Tool to refine water supply portfolios for the mid-demand/mid-supply scenario
- Use the IBCC Vision Goals to help evaluate portfolios



Next Meeting

1. Examine other scenarios
2. Develop Performance Measures for Portfolios
3. Discuss Projects and Methods for the mid-demand/mid-supply scenario

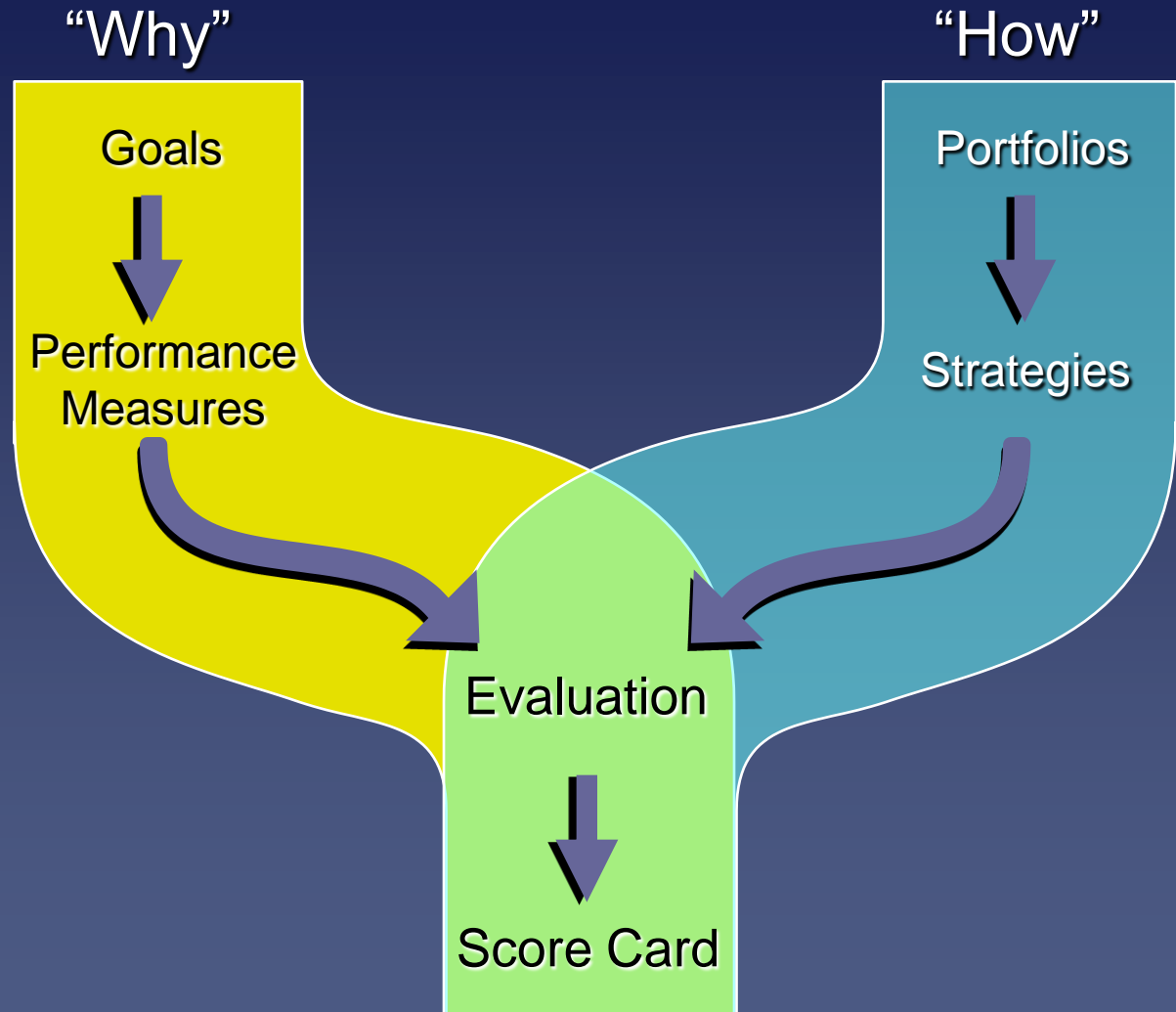


Discuss Evaluation Criteria

Revisit Intent of Process

- What it is:
 - Helps to facilitate discussion and illustrate tradeoffs
 - A tool to help find common ground between diverse interests
 - Provides information to decision-makers about stakeholders' preferences
- What it is not:
 - Majority rules or a “vote” for a preferred portfolio or strategy

Evaluation “Road Map”



Two parallel tracks of process. One road represents the “why are we doing this” aspect. The other represents the “how will we accomplish this aspect”.

Overview of Terms

Vision Goals

The goals that define the essential purposes of the process – Why?

Preferences

The relative importance that stakeholders give to the objectives

Portfolios/ Strategies

The means of accomplishing the objectives (which include projects, management options, etc.) – How?

Performance Measures

The quantifiable indicators of how well an alternative meets the objectives – How well?

Elements of the Visioning Process



**Colorado's
Water Supply
Future Vision
Goals**

Meet M&I Demands

Meet Agricultural Demands

**Meet Colorado's Environment and
Recreation Demands**

**Promote Cooperation Between Water Supply
Planners and Land Use Planners**

**Promote More Cooperation Among All
Colorado Water Users**

Optimize Existing and Future Water Supplies

Promote Cost-Effectiveness

Minimize the Net Energy Used to Supply Water

**Protect Cultural Values Linked to
Water Resources**

**Provide Operational Flexibility
and Coordinated Infrastructure**

**Promote Increased Fairness When
Water is Moved Between Areas**

**Comply With all Applicable
Laws and Regulations**

**Educate all Coloradoans on the
Importance of Water**

Performance Measures Indicate How Well Goals are Being Achieved

Goals

Sustainably Meet
M&I Industrial
Demands

- Meet M&I demands during drought

Performance Measures

Amount of additional supply provided during 1950s drought on a basin-wide level as aggregated from County demands

Percent of major water providers that have shortages during 1950s drought

Goals

Sustainably Meet Agricultural Demands

- Meet agricultural demands when and where needed

Performance Measures

Amount of additional supply provided during 1950s drought on a basin-wide level

Amount of identified agriculture shortage reduced by alternative

Goals

Provide for
Environmental
Enhancement

- Avoid/mitigate environmental impacts of new projects

Performance Measures


On a scale of 1 to 5 in areas with Programmatic Biological Opinions (PBO), 1 reduces flow in PBO area and 5 meets current flow in PBO area.


IBCC Meeting on Portfolio Development


Instructions:

- List the amount of supply for each broad strategy included in your portfolio:

Conservation	_____ K AFY
Ag Transfers	_____ K AFY (Reuse _____ K AFY)
New Supply	_____ K AFY (Reuse _____ K AFY)
IPPs	_____ K AFY
- For each Vision Goal, assign a qualitative score for your portfolio, relative to the thematic portfolios as a guide, and provide a brief reason for the score:

 = Good performance

 = Medium performance

 = Poor performance

Example Thematic Portfolios

Vision Goals	Conservation Portfolio	Colorado River/ New Supply Portfolio	Ag Transfer Portfolio	IPPs Portfolio	Your Portfolio	Reasons for Score
Meet M&I Demands						
Meet Ag Demands						
Meet Environmental & Recreation Demands						
Promote Cost-Effectiveness						
Protect Cultural Values						
Optimize Existing Water Supply						

Panel Discussion

Status Quo Portfolio (Ag Transfer)

- IPP - Success rate varied by basin
- Conservation - 20% reduction from 2000 water usage rates by basin
- New Supply – Future development of CO River water beyond IPPs will occur for uses on the West Slope
- Ag Transfer – Remaining East Slope M&I Demands will be met through ag transfers

Colorado's Water Supply Future Trade-Off Tool Portfolio Builder IPPs

IPP Success Rate (% Yield)

Arkansas	75%
Colorado	90%
Gunnison	90%
Metro	30%
North Platte	90%
Rio Grande	90%
South Platte	45%
Southwest	75%
Yampa/White	90%

Scenario Builder

Review Portfolio
Chart

Portfolio
Conservation

Review Portfolio
Table

Portfolio Land
Use (Under
Construction)

Reuse Options

Portfolio Ag
Transfer and
New Supply

Ag Transfer
Options

Specify Individual IPPs



Yes



No

Colorado's Water Supply Future Trade-Off Tool Portfolio Builder Conservation Savings

Arkansas 20% (171 gpcd) ▼

Gunnison 20% (181 gpcd) ▼

Metro 20% (153 gpcd) ▼

South Platte 20% (197 gpcd) ▼

Yampa/White 20% (184 gpcd) ▼

Colorado 20% (195 gpcd) ▼

North Platte 20% (214 gpcd) ▼

Rio Grande 20% (282 gpcd) ▼

Southwest 20% (176 gpcd) ▼

Reuse Options

Review Portfolio Chart

Scenario Builder

Portfolio
Builder

Ag Transfer
Options

Review Portfolio Table

Portfolio Land Use
(Under Construction)

Portfolio Ag
Transfer and
New Supply

Colorado's Water Supply Future Trade-Off Tool

Portfolio Builder Ag Transfer and New Supply

Remaining M&I need met first through:

- ☒ Agricultural Transfer
☐ Colorado River

Specify Ag Acres

If remaining Colorado River System Allocate to East Slope:

- ☐ Yes ☒ No

Reuse Options

Review Portfolio Chart

Scenario Builder

Portfolio Builder

Ag Transfer Options

Review Portfolio Table

Portfolio Land Use
(Under Construction)

Portfolio Conservation

M&I Needs	Statewide	West Slope	East Slope	North Platte/ Rio Grande
M&I Water Needs (AFY)	922,800	203,100	708,500	11,200
SSI Water Needs (AFY)	84,400	45,300	39,100	0
Oil Shale Water Needs (AFY)	43,700	43,700	0	0
Total M&I Needs (AFY)	1,050,900	292,100	747,600	11,200
Strategies				
IPPs (AFY)	281,000	94,800	182,300	3,900
Conservation (AFY)	85,400	34,100	49,000	2,300
New Supply Development (AFY)	163,200	163,200	0	0
Reuse (AFY)	0	0	0	0
<i>New Supply Development Sub-Total (AFY)</i>	<i>163,200</i>	<i>163,200</i>	<i>0</i>	<i>0</i>
Ag Transfer (AFY)	349,300	0	344,200	5,100
Reuse (AFY)	172,100	0	172,100	0
<i>Ag Transfer Sub-Total (AFY)</i>	<i>521,400</i>	<i>0</i>	<i>516,300</i>	<i>5,100</i>
Reduction in Irrigated Acres (percent)	19%	4%	39%	1%
			28% Arkansas 44% South Platte	
Reduction in Irrigated Acres (acres)	501,100	38,667	455,600	6,800
			88,200 Arkansas 367,400 South Platte	

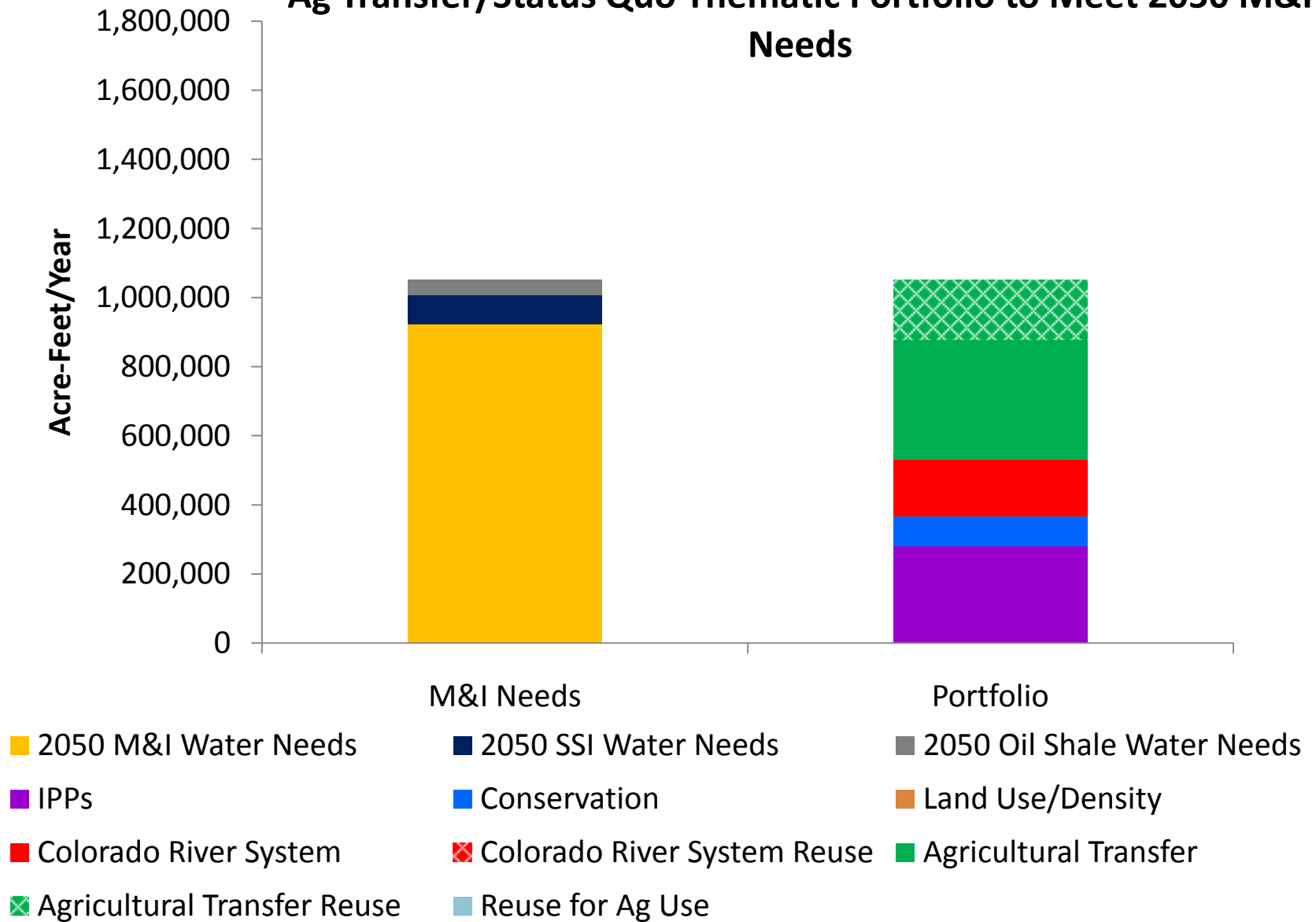
Thematic Portfolios

- One Strategy is changes
- The other 3 Strategies are held constant

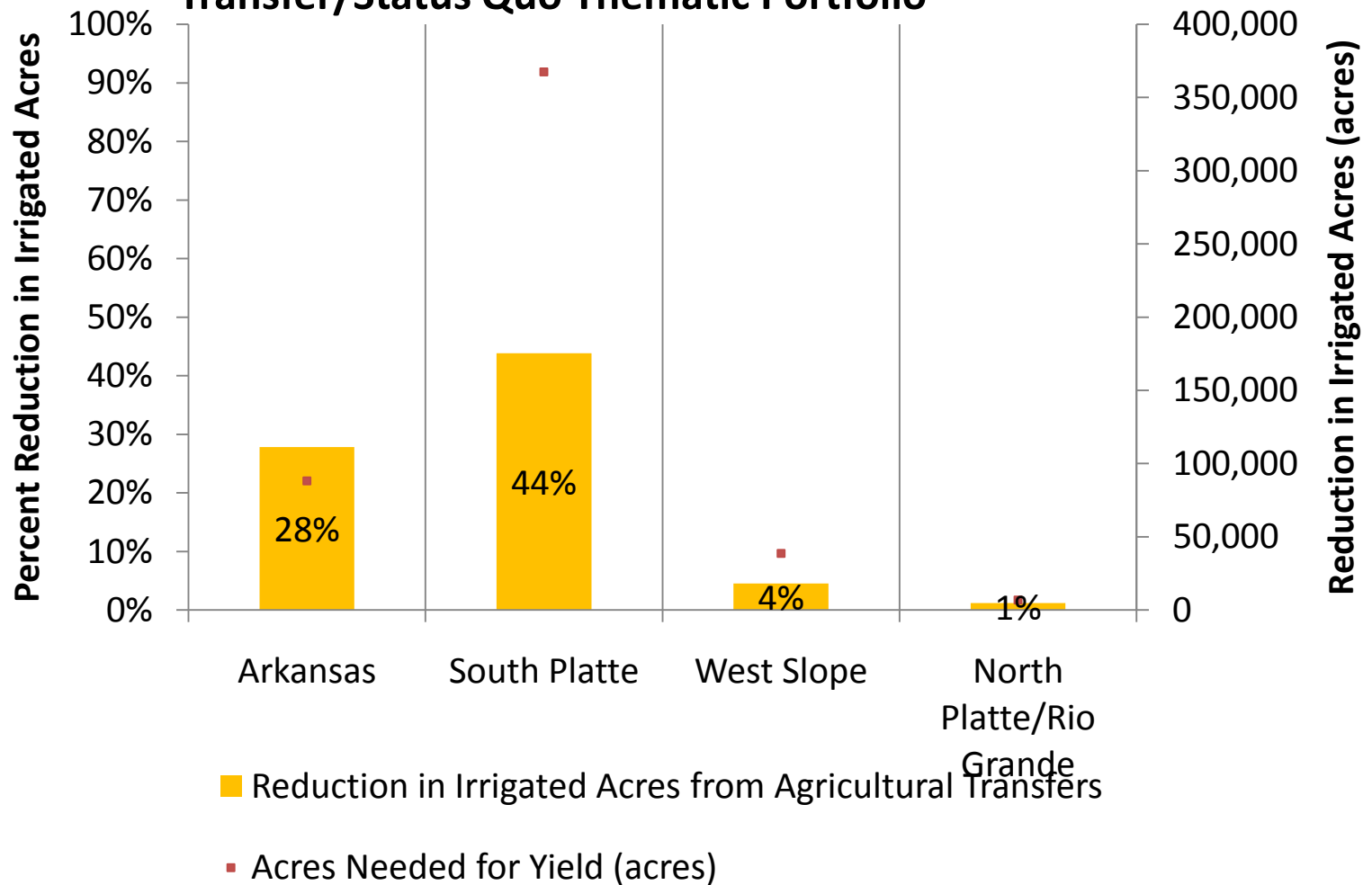
Agricultural Transfer Thematic Portfolio (Status Quo)

- **For the South Platte, Arkansas, Rio Grande, and North Platte, all of the water comes out of agricultural transfer**
- IPPs are at status quo levels described above
- Conservation is at 20% from the year 2000 levels
- The west slope meets its municipal needs using Colorado River water

Ag Transfer/Status Quo Thematic Portfolio to Meet 2050 M&I Needs



Reduction in Irrigated Acres in 2050 Based on Ag Transfer/Status Quo Thematic Portfolio





IBCC Meeting on Portfolio Development


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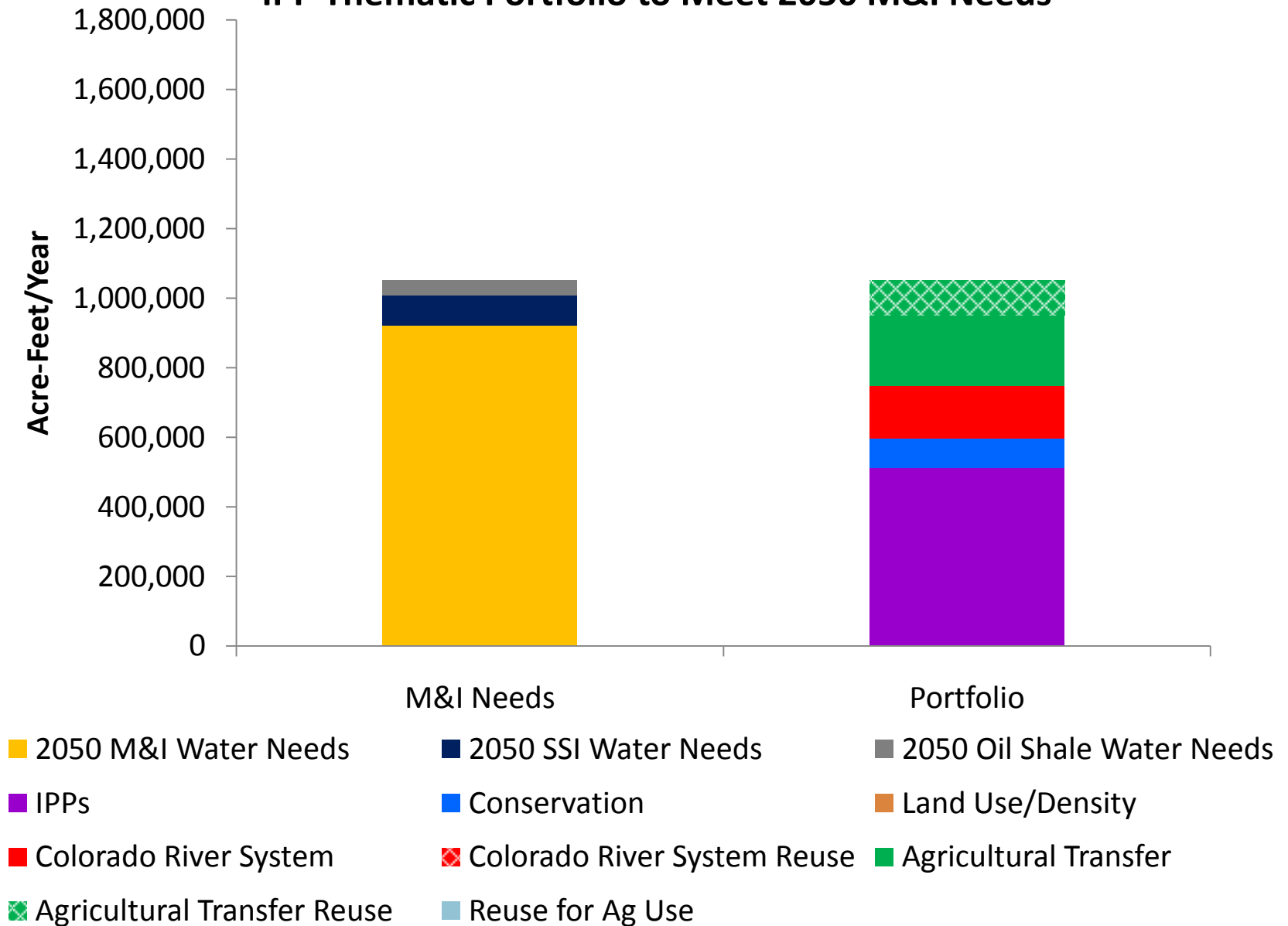
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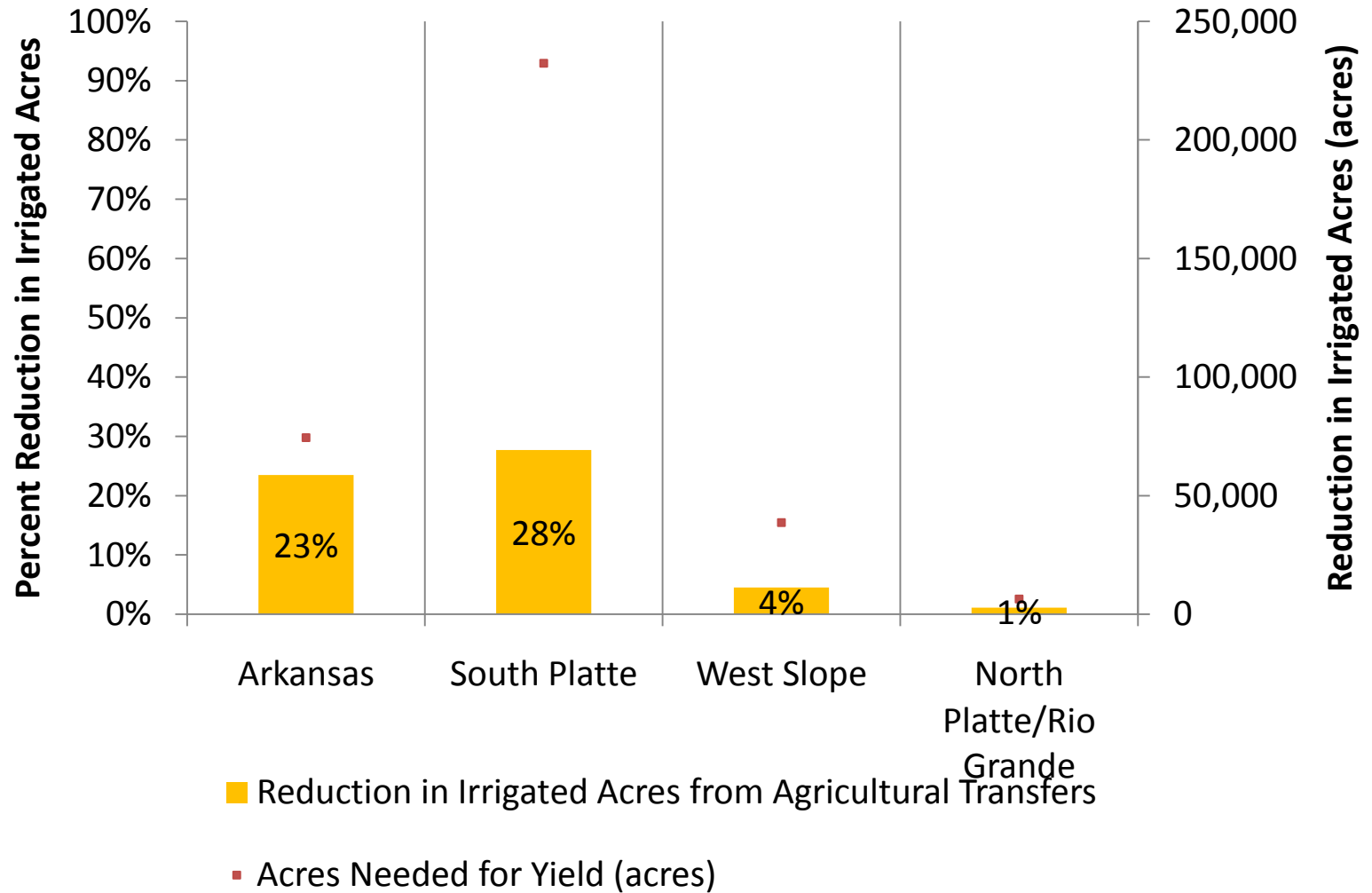
Identified Projects and Process Thematic Portfolio

- **IPPs are at 100% success rate in all basins**
- Conservation is at 20% from the year 2000 levels
- For the South Platte, Arkansas, Rio Grande, and North Platte, additional water comes out of agricultural transfer
- The west slope meets its municipal needs using Colorado River water

IPP Thematic Portfolio to Meet 2050 M&I Needs



Reduction in Irrigated Acres in 2050 Based on IPP Thematic Portfolio





IBCC Meeting on Portfolio Development


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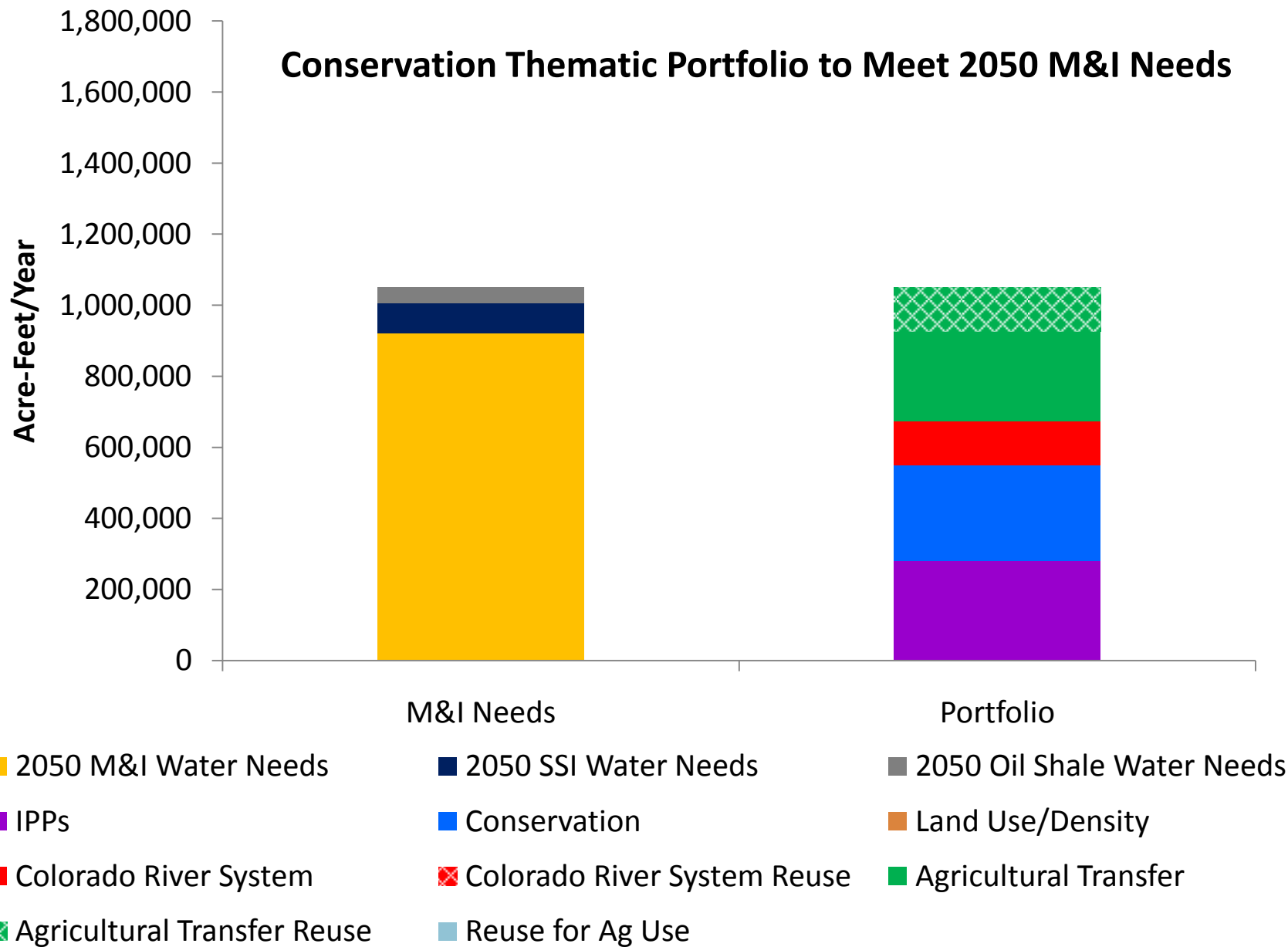
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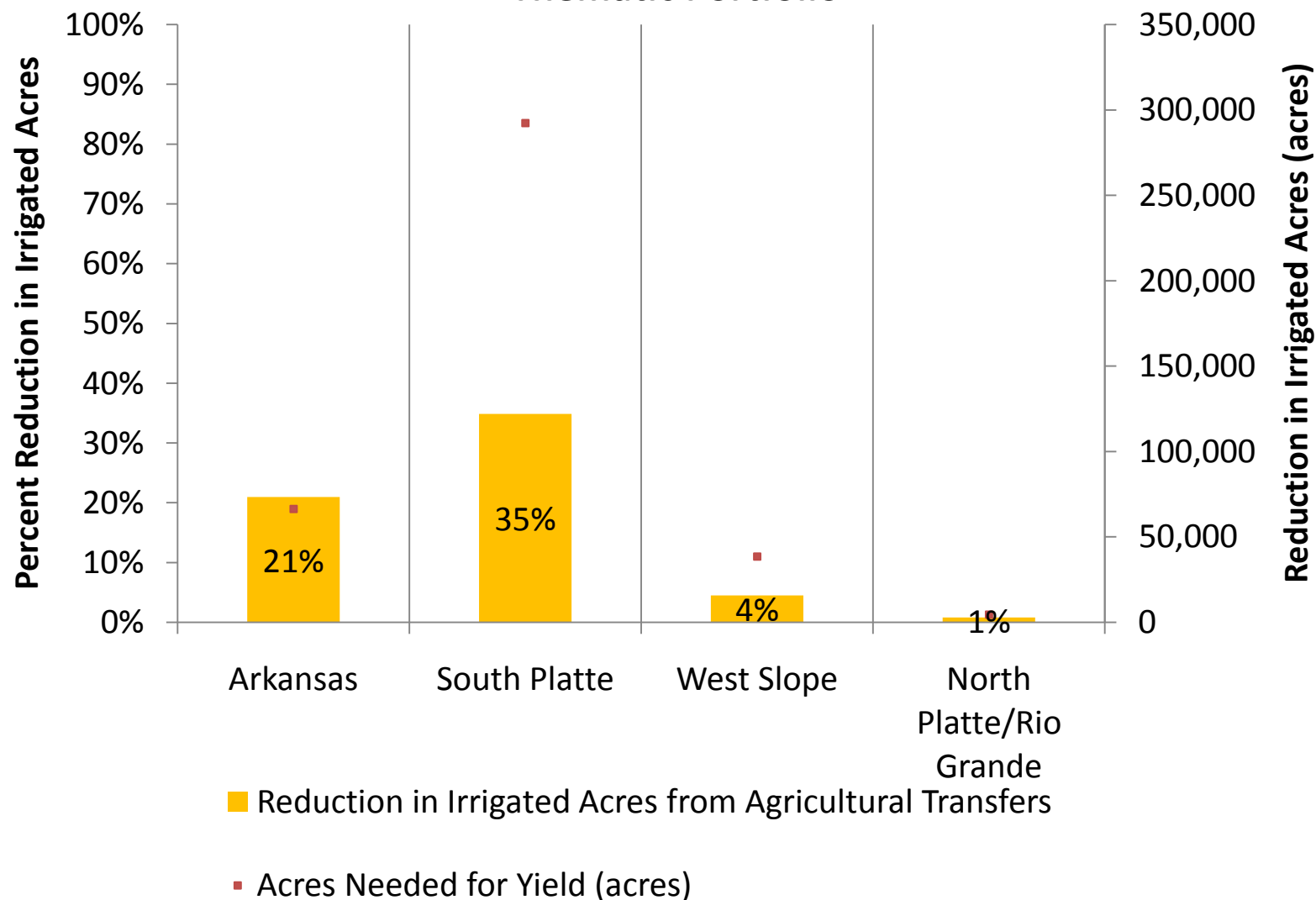
Conservation Thematic Portfolio

- **Conservation is at 40% from the year 2000 levels**
- IPPs are at status quo levels described above.
- Next increment of water to meet demands on the South Platte, Arkansas, Rio Grande, and North Platte are from agricultural transfer
- To meet demands on the west slope an increment of supply is used from the Colorado River

Conservation Thematic Portfolio to Meet 2050 M&I Needs



Reduction in Irrigated Acres in 2050 Based on Conservation Thematic Portfolio





IBCC Meeting on Portfolio Development


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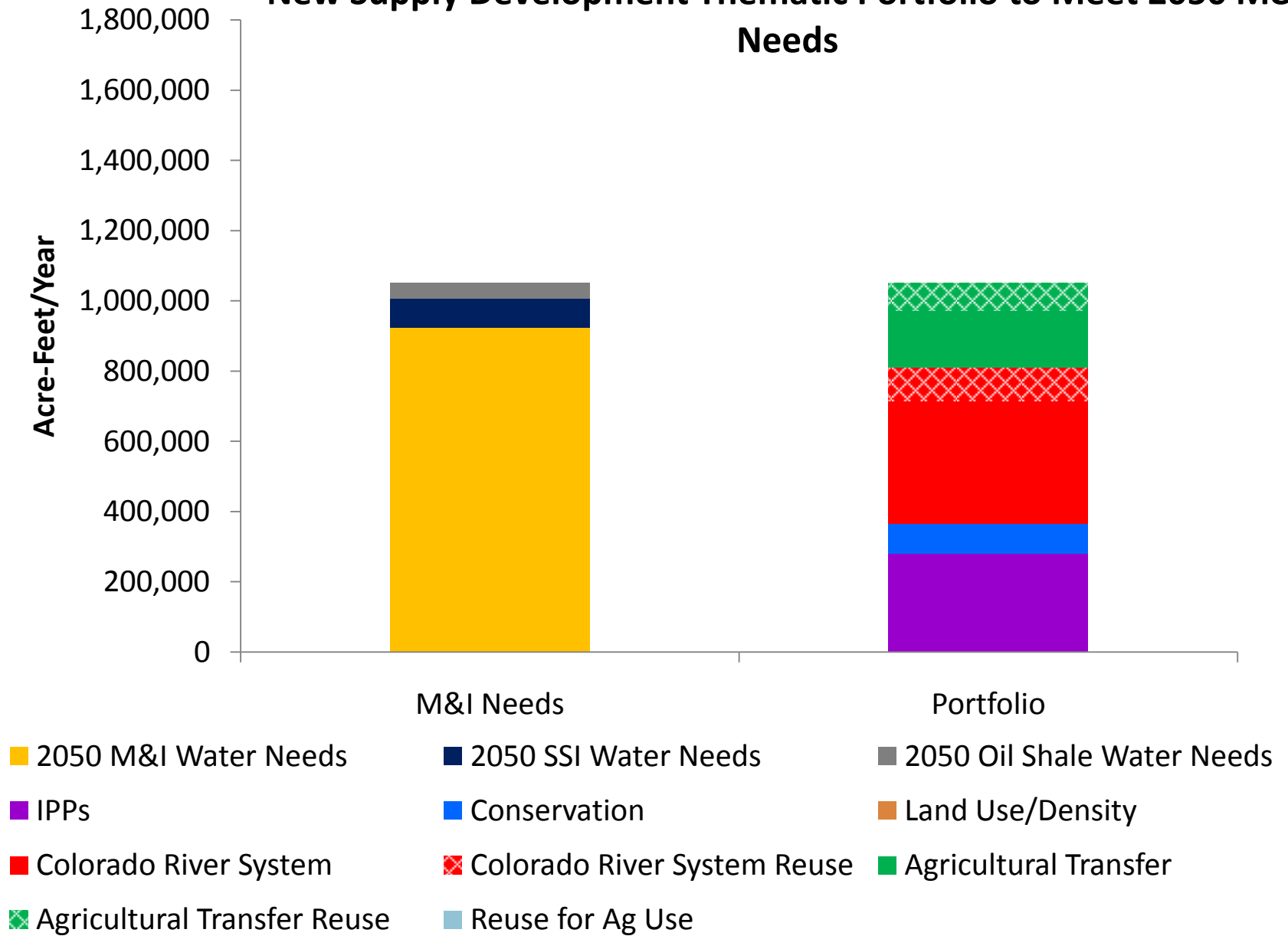
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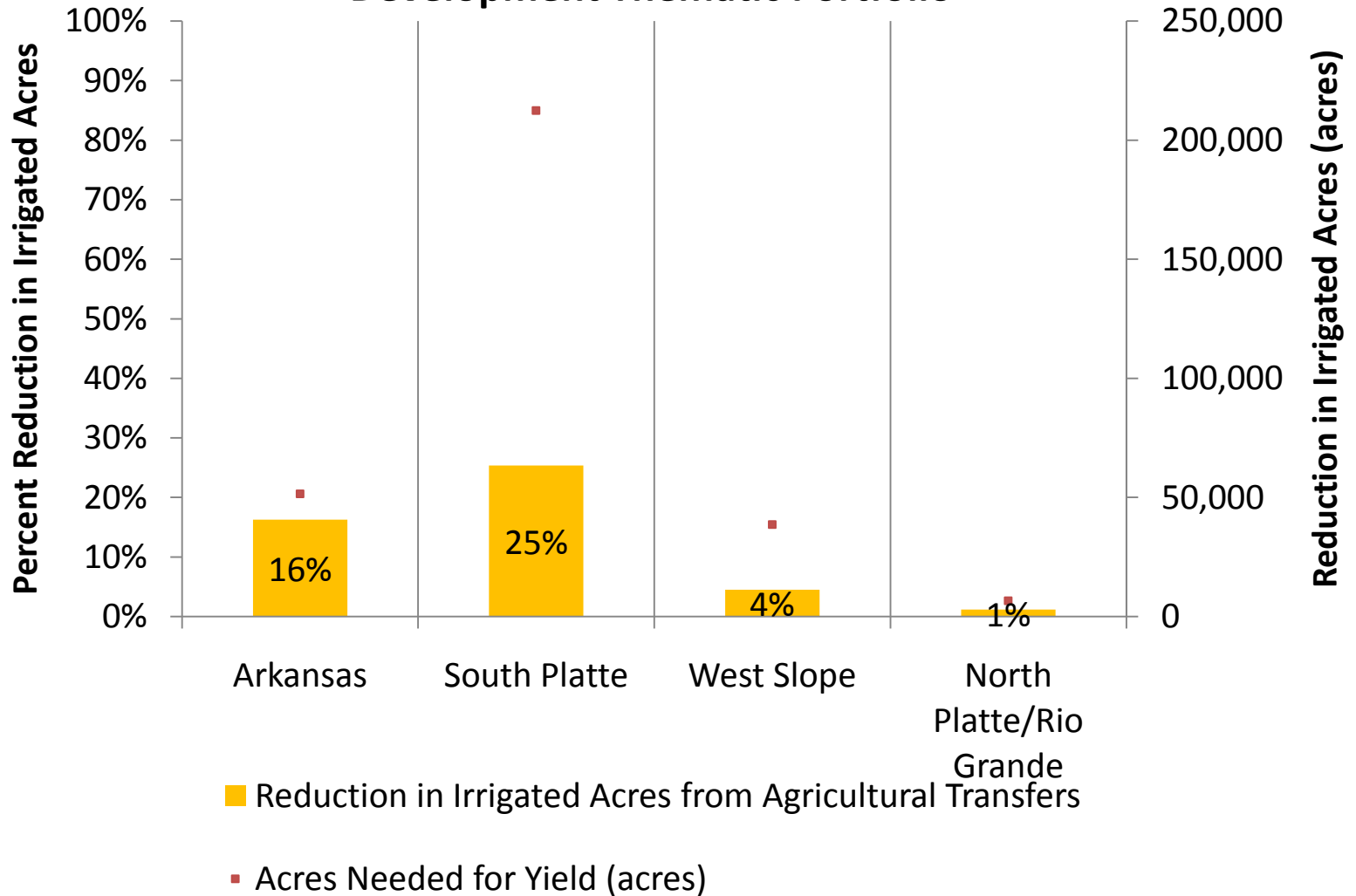
Colorado River System/New Supply Development Thematic Portfolio

- **The Colorado River water available under the mid-supply scenario (350,000 a.f.) is fully used by both the east and west slope**
- IPPs are at status quo levels described above.
- Conservation is at 20% from the year 2000 levels
- Remaining supply needed is filled from agricultural transfer for all basins

New Supply Development Thematic Portfolio to Meet 2050 M&I Needs



Reduction in Irrigated Acres in 2050 Based on New Supply Development Thematic Portfolio





IBCC Meeting on Portfolio Development


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

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Protect Cultural Values						
Optimize Existing Water Supply						

Breakout Groups

Breakout Group Instructions

- Purpose of exercise is to construct a portfolio to meet the 2050 new demand – 1,050,850 AFY
- Use portfolio tool to determine the amounts future demands from IPPs, conservation, ag transfers and new supply development
- Assign qualitative score to each vision goal for the developed portfolio
- Provide reasons for score for each vision goal

*Technical Support for the
Interbasin Compact Process,
Basin Roundtable Needs
Assessments, and Schedule*

Technical Support for the Interbasin Compact Process, Basin Roundtable Needs Assessments, and Schedule

- Draft reports
- Key findings
- Next steps
- Schedule

The Following Draft Reports are Available

- State of Colorado 2050 Municipal and Industrial Water Use Projections
- Nonconsumptive Needs Assessment Priorities Mapping
- Watershed Flow Evaluation Tool Pilot Study for Roaring Fork and Fountain Creek Watersheds and Site-Specific Quantification Pilot Study for Roaring Fork Watershed
- Evaluation of Water Supply Strategies

To access the reports visit:

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

M&I Demands

- CWCB Staff have gathered comments on M&I Demands to 2050 report
- CWCB will respond to comments and revise report 2nd quarter of next year
- Report will be included as an appendix to statewide update of consumptive and nonconsumptive needs – October 2010

Nonconsumptive Focus Areas Mapping

- CWCB Staff have gathered feedback on report
- CWCB will respond to comments and revise report
- Report will be included as a section in the statewide update of consumptive and nonconsumptive needs – October 2010

Nonconsumptive Projects and Methods

- CWCB will examine past studies:
 - Existing studies and plans by "ISF recommending entities"
 - Watershed restoration plans and flood DSS for identified restoration projects
 - Other relevant restoration and quantification studies, plans and processes
 - Other WSRA funded studies or Basin Roundtable Studies
- Information will be summarized by focus area
- Results will be included in statewide update of consumptive and nonconsumptive needs – October 2010

Agricultural shortages

- CWCB will update the agricultural shortages from SWSI 1
- CWCB will summarize results of Yampa and Gunnison Agricultural WSRA studies
- CWCB will review information with roundtables 1st and 2nd quarter 2010
- Information will be included in statewide update – October 2010
- CWCB will also review the Alternative Agricultural Transfer Methods Grant Projects

Consumptive Gap Analysis

- CWCB will update M&I gap analysis from SWSI 1 using updated IPP database
- CWCB will update agricultural shortages statewide
- CWCB will review information with roundtables 1st and 2nd quarter 2010
- Information will be included in report updating consumptive and nonconsumptive needs statewide – October 2010

Report summarizing needs assessments (October, 2010)

- CWCB will provide update of statewide consumptive and nonconsumptive needs based on recent reports and Basin Roundtable Needs Assessment efforts
- Target completion date of report is October 2010

CRWAS