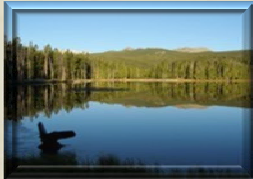


Progress Report Wind-Bighorn Basin Plan Update

Wind-Bighorn Basin Advisory Group March 3, 2009



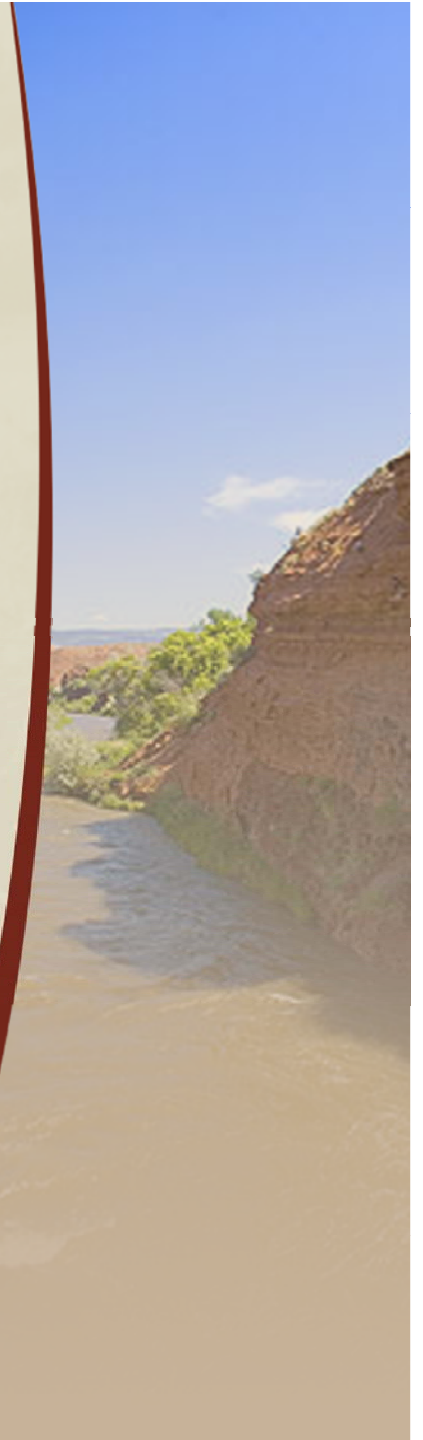
Wyoming Water Development Commission
Michael K. Purcell, Director
6920 Yellowtail Rd, Cheyenne, WY 82002
Phone: 307-777-7626



MWH

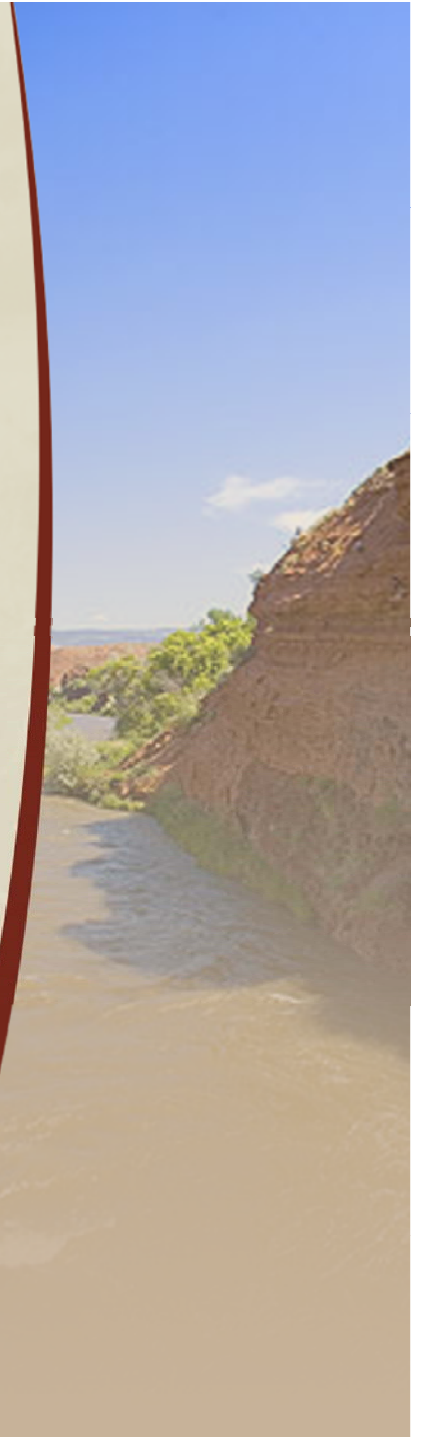
Presentation Outline

- Introductions
- Consultant Scope-of-Work
- Discussion

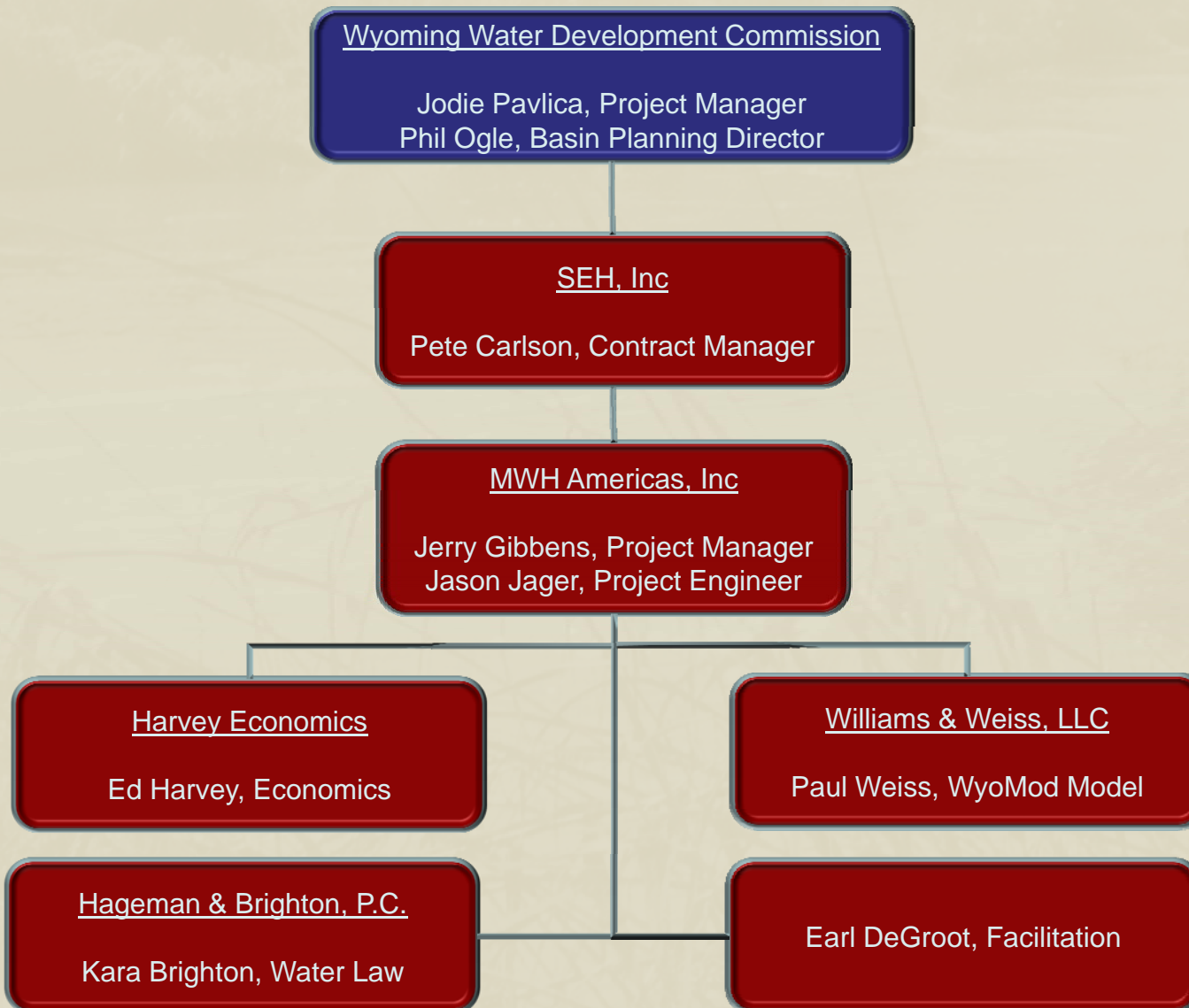


Introductions

- **Pete Carlson (SEH, Denver)**
 - Contract Manager
- **Jerry Gibbens (MWH, Fort Collins)**
 - Technical Manager
 - Surface Water



Organization Chart



Goals of Basin Plan Update

- ***Update Planning Tools*** to Include Most Recent 5 Years (Extended Drought)
- ***Develop Strategies*** to Help Meet the Needs of the Basin as they are Identified by the Planning Process
- ***Promote and Enhance Stakeholder Dialog*** Through Basin Advisory Group Meetings



Scope-of-Work

- **Tasks**

- Task 1. Meetings
- Task 2. Literature Review
- Task 3. Surface Water Profile Update
- Task 4. Available Surface Water Determination
- Task 5. Demand Projections
- Task 6. Future Water Use Issues and Topics
- Task 7. Strategies
- Task 8. Presentation Tool
- Task 9. Discretionary Task
- Task 10. Basin Planning Report

- **Deliverables**

- Technical Memoranda
- Technical Analysis Products and Models
- Basin Planning Report



Task 1. Meetings

- Progress Meetings with WWDO
- Basin Advisory Group Meetings
 - Provide Progress Reports
 - Solicit Input on Analysis
 - Identify and Discuss Issues
 - Discuss Strategies for Resolution of Issues
 - Meetings Currently Planned Quarterly During Basin Plan Update
- Present Final Basin Plan Update (1Q 2010)



Task 2. Literature Review

- Review Reports Since Last Basin Plan (Completed 2003)
- Update Basin Plan With Information from Project Reports
 - Approximately 67 WWDC Reports Available
 - Includes Review of Tribal Water Plan



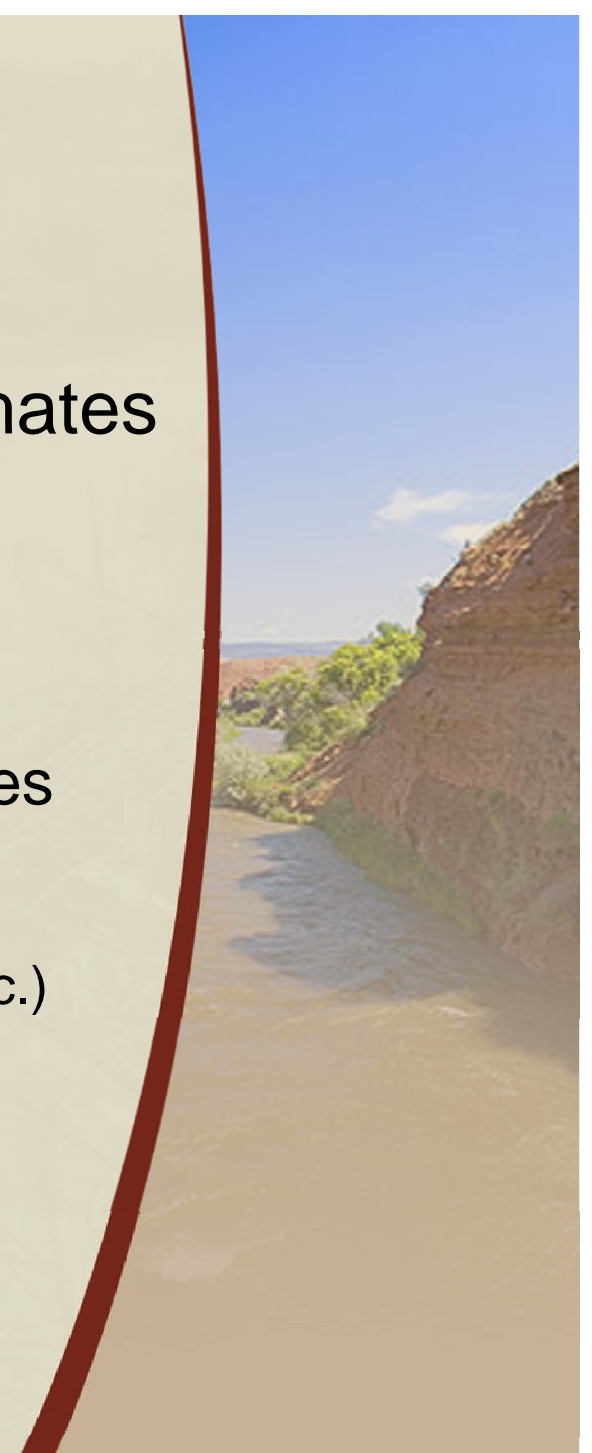
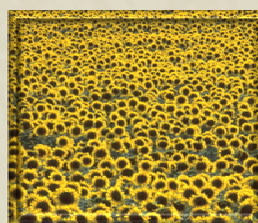
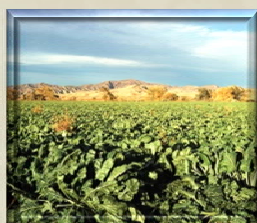
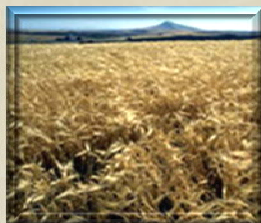
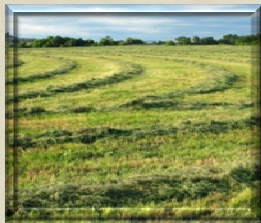
Task 3. Surface Water Profile Update

- **Update Information in Previous Plan**
 - Agricultural Water Use
 - Municipal and Domestic Water Use
 - Industrial Water Use
 - Recreational Water Use
 - Environmental Water Use
 - Water Use From Storage
 - Basin Advisory Group Concerns
 - Water Law/Administration
- **Focus on Differences**
 - CBM/Produced Water
 - Drought



Agricultural Water Use

- Update Agricultural Water Use Estimates
 - Update Historical Diversions
 - Update CIR Precipitation (PRISM Data)
 - Update Cropping Patterns
 - Develop Variable Dry-Avg-Wet Estimates
- Update Irrigation Lands Mapping
 - Contact Entities (Div. 3, NRCS, TWE, ID, etc.)
 - Review Basin Studies
 - Basin Advisory Group Meetings



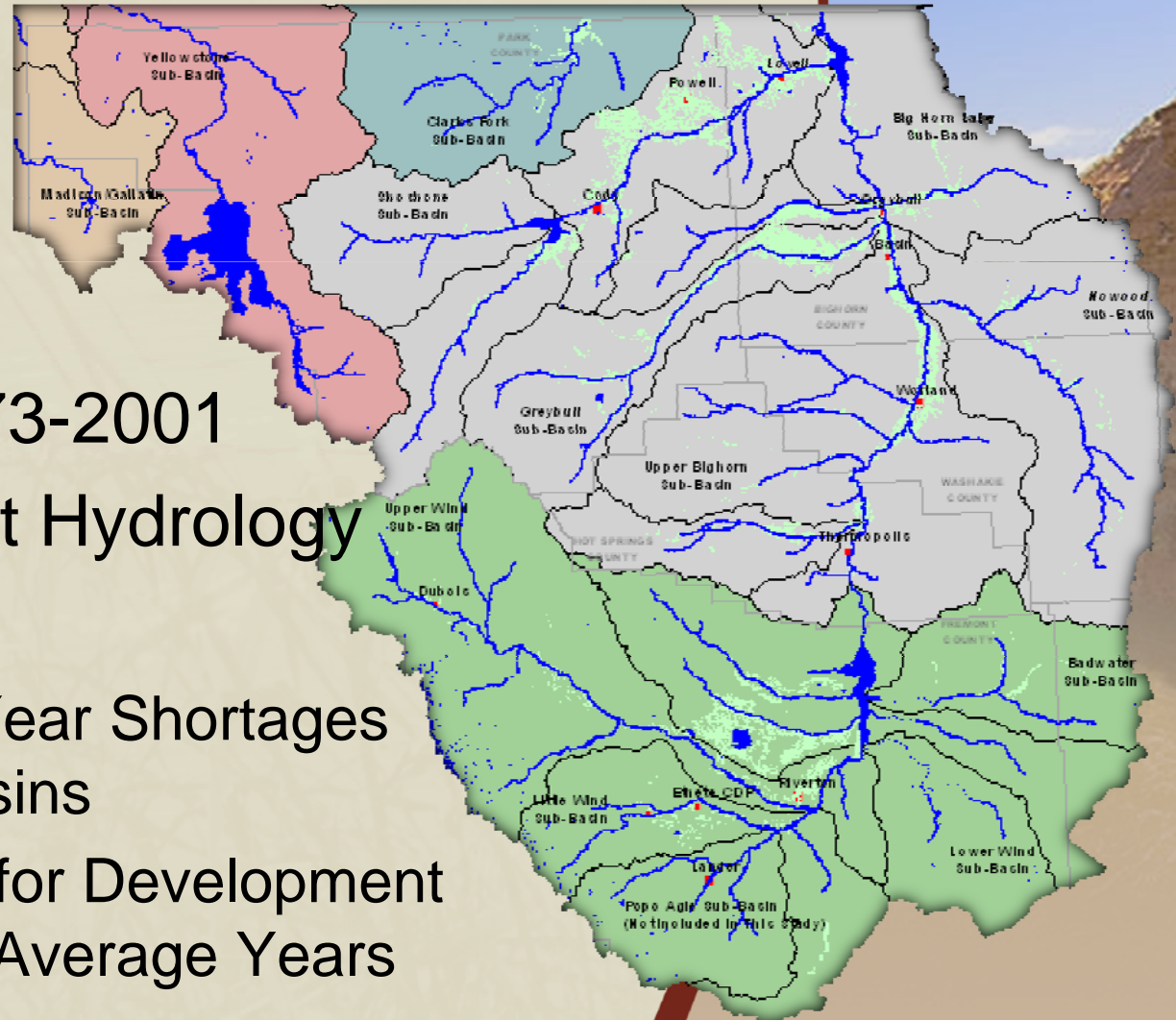
Task 4. Available Surface Water Determination

- Update Basin Plan Spreadsheet Models
 - Extend Study Period through 2008
 - Verify Previous Model Construction
 - Update Available Surface Water Determination
- Produce Preliminary WyoMod Model Information



Existing Spreadsheet Model

- Wind/Bighorn Basin Plan
- 5 major basins, 18 sub-basins
- Study period 1973-2001
- Dry-Average-Wet Hydrology
- General Results
 - Significant Dry-Year Shortages in Many Sub-Basins
 - Water Available for Development During Wet and Average Years



Strengths and Weaknesses – Spreadsheet Model

- Strengths

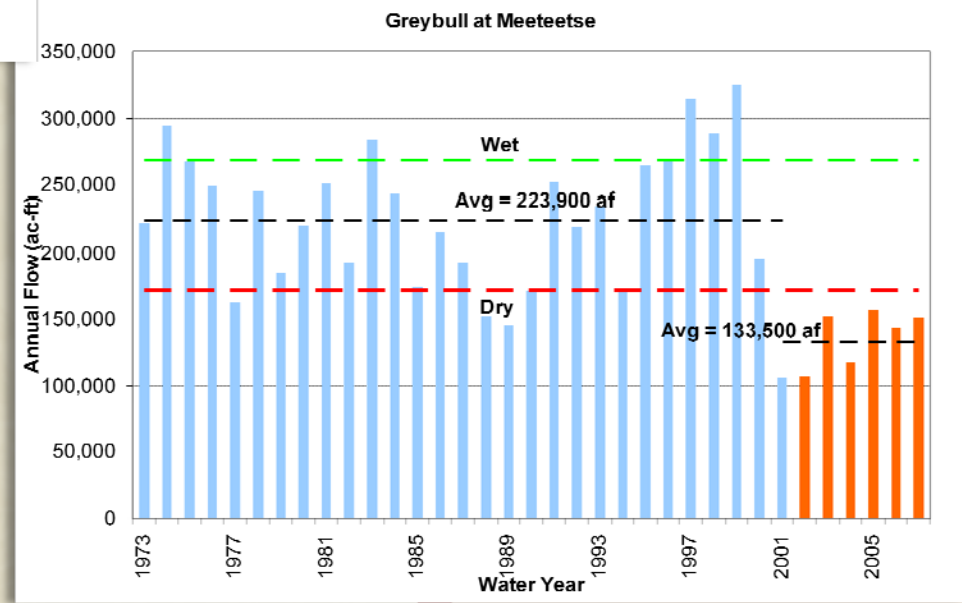
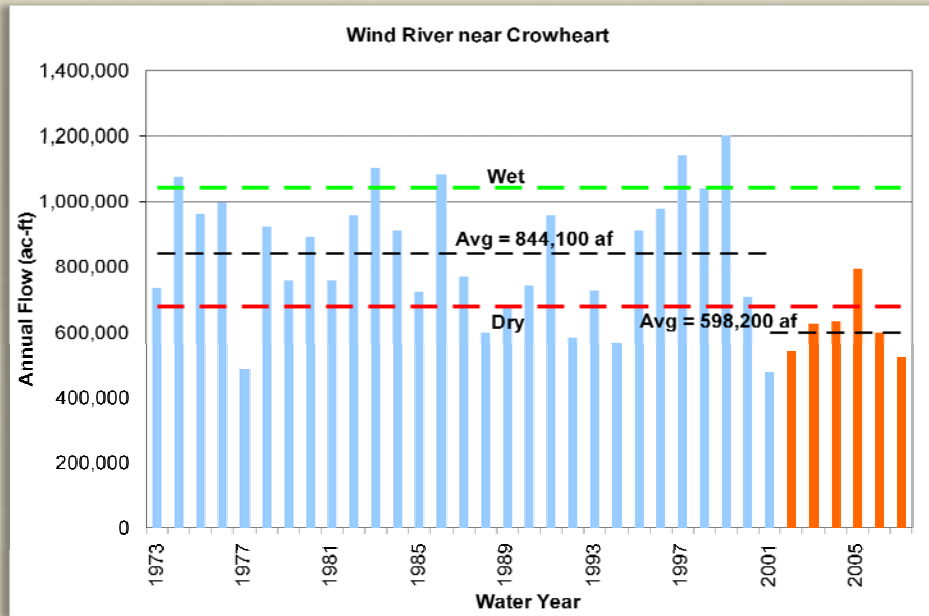
- Consistent between plans
- Picture of historical use
- Simple and useful summaries
- Clearly identify basin-wide needs and opportunities

- Weaknesses

- Inaccurate at smaller scales
- Difficulties in simulating future projects
- Lack of “continuous run” hydrology
- Not water rights based



Spreadsheet Model Update



Task 5. Demand Projections

- Preliminary Tasks
 - Refine Planning Scenarios
 - Review Socio-Economic Data Sources
 - Define Methodology and Update Project Demands
- Issues
 - How to apply the Tribal Water Plan in Scenarios?
 - Should the methodology in the original Basin Plan be replicated?



Inputs and Outputs for the Water Demand Projections

Water Use Sector	Driving Variables	Water Use Patterns/ Intensity	50-Year Water Demand Projections		
			High	Medium	Low
Agricultural Irrigation Livestock	Irrigated acreage Number of head	Water use by crop type, head Conservation assumptions	What can conceivably occur based on sector prospects?		
Industrial/Water Intensive Oil and gas	Number of wells drilled Barrels/BCF produced; transported	Water use per unit of output	What can conceivably occur based on sector prospects?		
Power generation Other	MWh generation by type Units of output	Water use per unit of output Water use per unit of output	What can conceivably occur based on sector prospects?		
Municipal and Domestic Residents	Population, housing units	Gallons per capita or per dwelling unit per day	What can conceivably occur based on sector prospects?		
Visitors Support Businesses and Services	Visitor-days by season Employment	Combined with population	What can conceivably occur based on sector prospects?		
Instream Recreational Environment	Visitor-days by activity Instream flow filings	Volume required by season	What can conceivably occur based on sector prospects?		
Wind River Indian Reservation (WRIR)	Included above or separate?	Consistency with non-Indian?	What can conceivably occur based on sector prospects?		

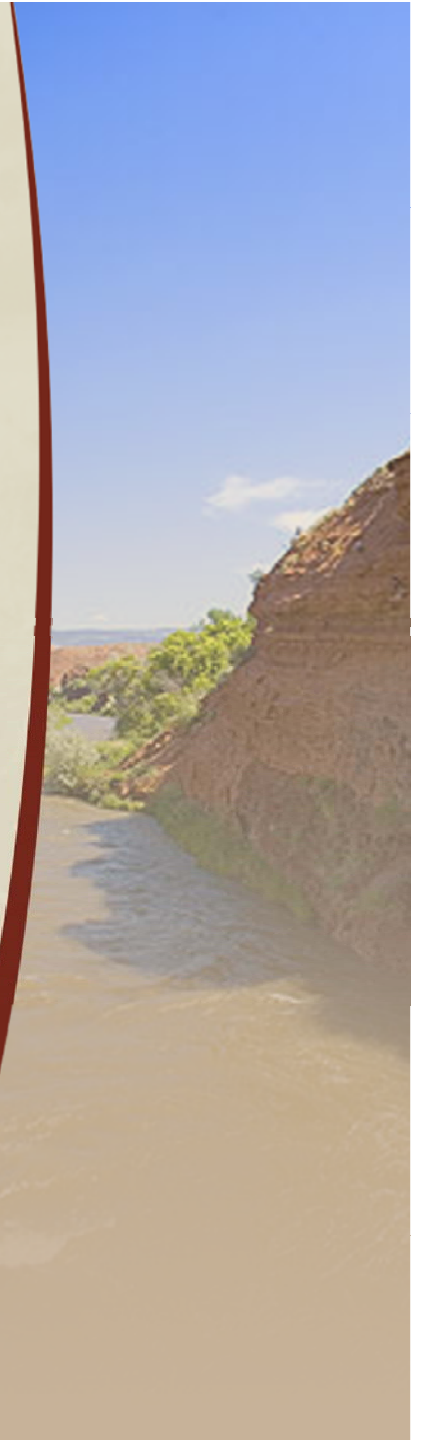
Task 6. Future Water Use Issues and Topics

- Use Task 2-5 Information and BAG Information to Discuss *Issues* and *Opportunities*
 - Describe Issues Affecting Future Water Use Opportunities
 - Water Quality Issues
 - Climate
 - Conservation
 - Watershed Planning
- Text and Map Based Products



Task 7. Strategies

- Work with WWDO Staff and BAG to Develop, Asses and Recommend Strategies
 - Water Conservation
 - Drought Planning and Management
 - Develop New Water Supplies
 - Improve Management of Existing Supplies

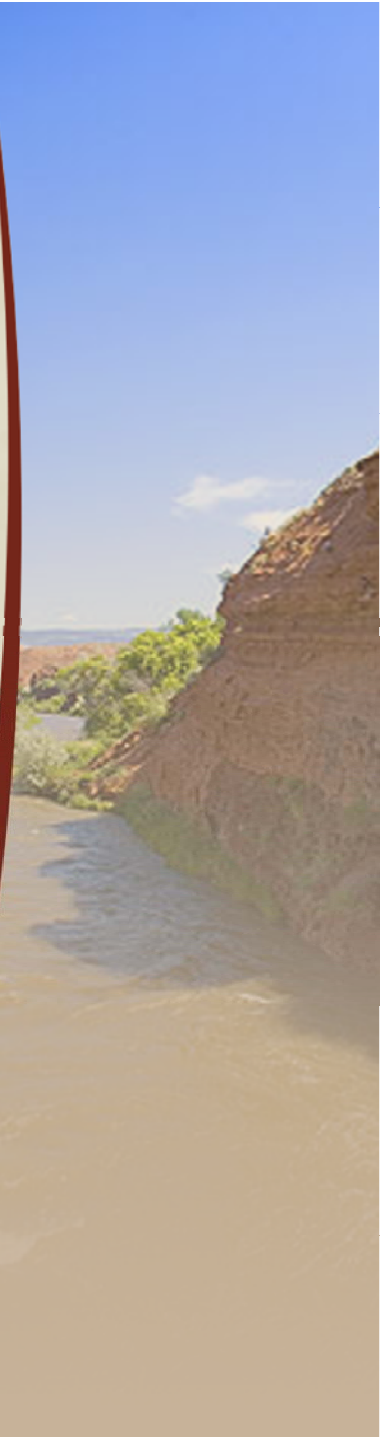


Task 8. Presentation Tool

- Provide Data to WRDS for Updating State Framework Plan Tool

Task 9. Discretionary Task

- Set Aside to Allow Changes in Scope
- Portion Used to Expand Economic Analysis Task



Task 10. Basin Planning Report

- **Preliminary Outline**

- Executive Summary
- Section 1 – Introduction
- Section 2 – Presentation Tool
- Section 3 – Setting
- Section 4 – Resources
- Section 5 – Current Use
- Section 6 – Future Needs
- Section 7 – Availability
- Section 8 – Opportunities
- Section 9 – Strategies
- Section 10 - Conclusions



THANK YOU!

