

*Middle Rio Grande Regional
Water Plan
Alternative Feasibility —
Draft 60 Percent Status Presentation*

Dominique Cartron

John Shomaker, John Shomaker and
Associates, Inc.

December 10, 2002



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Scope of Work

- Technical, economic, legal, & social/cultural feasibility analysis (25 alternatives)
- Not all alternatives receive each type of analysis
- Lead analysis for 6 alternatives was legal or economic



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Scope of Work (2)

- Technical, Economic, Legal & Social Cultural Feasibility Rating (19)
- Level of Effort: 2 -5 working days of time per alternative to conduct lead evaluation and draft fact sheet.



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Alternative Categories

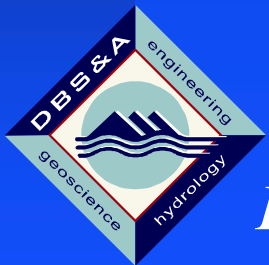
- Increase water supply
- Decrease or regulate water demand
- Water rights regulation
- Water quality protection
- Implementation of plan & management of water resources



Funding

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Alternatives to Increase Water Supply



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Alternative 66

Implement local and regional watershed management plans through all land and water agencies in the planning area

Technical Lead: Joanne Hilton



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A-66: Technical Feasibility

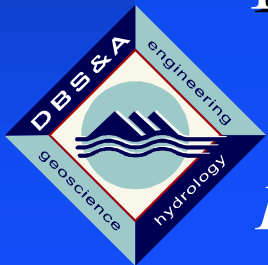
- Published research indicates the best potential for measurable increases in streamflow due to watershed thinning activities at higher elevations, where precipitation is greater than 18-20 inches



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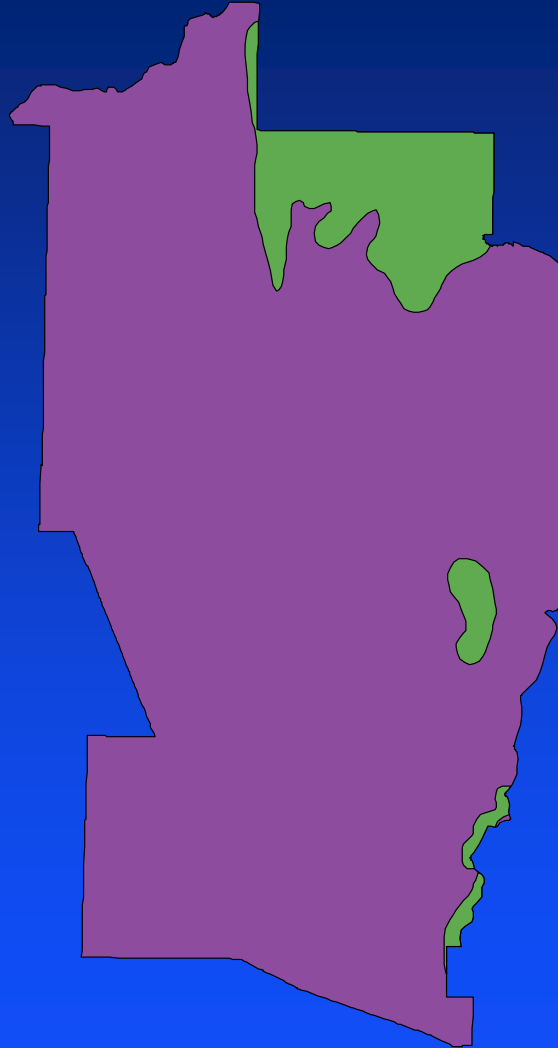
A-66: Technical Feasibility (2)

- About 9% of the MRG region has an average precipitation equal to or greater than 18 inches
- Greater snowpack and higher probability of successfully increasing streamflow occurs at elevations greater than 9000 ft, or about 1.5% of the region



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Acres where precipitation is above 18"	308397.609
Total Acres	3401658.381
Percent of total area above 18"	9.07%

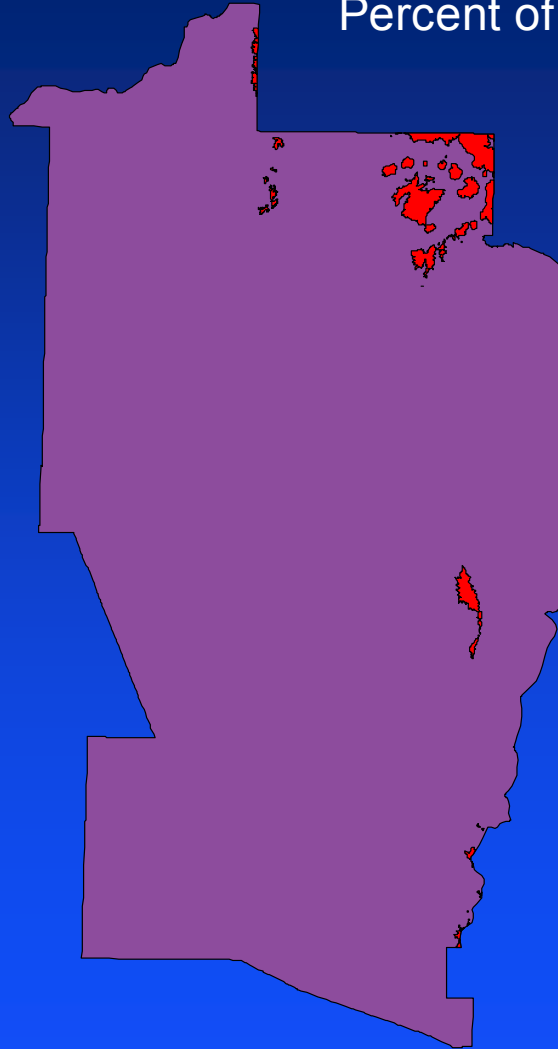


Average Annual
Precipitation
Above 18 inches



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Acres above 9000 ft	46292.8092
Total Acres	3401658.381
Percent of area above 9000 ft	1.36%



Elevation above 9000ft



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A-66: Technical Feasibility (3)

- Even where watershed management activities may produce little measurable increase in yield, they can help prevent negative impacts such as catastrophic fires
- To minimize environmental impacts, best management practices such as buffer strips and road placement need to be incorporated in watershed planning



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A-66: Legal Feasibility

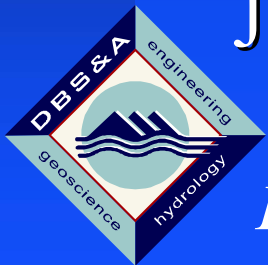
- Federal land and environmental laws: National Forest Management Act, NEPA, Clean Water Act, Endangered Species Act, National Historic Preservation Act, American Indian Religious Freedom Act
- Access and rights of way: MRGCD, Pueblos, private



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A-66: Legal Feasibility (2)

- Who owns surplus water created by water savings?
- Should law create incentives to salvage water?
- Plus, local ordinances/state laws likely will have be amended or adopted allowing inter-jurisdictional authority



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Alternative 1

Restore Bosque habitat and manage vegetation in the Bosque to reduce evapotranspiration by selectively removing vegetation and promoting native plants

Technical Lead: James Cleverly



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A-1: Technical Feasibility

Remove salt cedar, Russian olive, willow & herbaceous ground cover

Mechanized or chemical methods of removal

Maintenance to prevent recurrence of invasive plants

Decreased fire danger

Decreased water demand (approximately 1 acre-foot reduction per acre restored)



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A-1: Technical Feasibility

Approximately \$600 an acre for mechanical removal

\$100-200 per acre for chemical removal - less feasible and raises environmental and permitting questions

Corp of Engineers project near Las Lunas (\$20,000 an acre restored includes river channel restoration and creation of flood channels in the Bosque)



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A-1: Legal Feasibility

- Federal land and environmental laws: National Forest Management Act, NEPA, Clean Water Act, Endangered Species Act, National Historic Preservation Act, American Indian Religious Freedom Act.
- Access and rights of way: MRGCD, Pueblos, private



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A-1: Legal Feasibility (2)

- Who owns surplus water created by water savings?
- Should law create incentives to salvage water?



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Alternative 45

Reduce open water evaporation in storage reservoirs by retaining water at higher elevations or latitudes, or by reducing surface areas.

Technical Lead: Rob Leutheuser



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A-45: Technical Feasibility

- Move storage to higher reservoirs (saving depends on assumed contents)
- 50,000 af from EB to Cochiti—save 1,750+ af
- 50,000 af from EB to El Vado—save 3,850+ af



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A-45: Technical Feasibility (2)

- 100,000 af EB to Abiquiu—save 3,400 to 6,200 af
- 100,000 af EB to new WWG—save 11,500 af
- 5,000 af EB to new Indian Camp—save 155 af



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A-45: Technical Feasibility (3)

- Dredge sediment to reduce evaporation loss
 - ◆ 50,000 af sediment from Abiquiu—1,600 af
 - ◆ 50,000 af sediment from Cochiti—4,500 af
- Surfactants to reduce evaporation loss
 - ◆ 50 to 80 % reduction?



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A-45: Technical Feasibility (4)

- Store in Albuquerque ASR instead of EB (saving depends on assumed contents of EB: range 1 to 2 million af)
- 50,000 af from EB—save 5,350 to 6,360 af
- 100,000 af from EB—10,700 to 12,700 af



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A-45: Economic Feasibility

- Change existing management—no capital cost
- New reservoirs
 - ◆ Wagon Wheel Gap—\$150 million
 - ◆ Indian Camp—\$35 million



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A-45: Economic Feasibility (2)

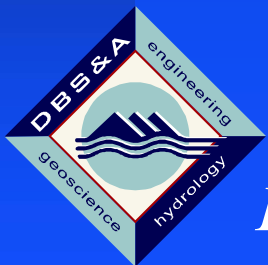
- Dredging at \$7,500/af of sediment saves—
 - ◆ 1 afy at Cochiti: \$83,000 once plus \$1,600 per yr
 - ◆ 1 afy at Abiquiu: \$234,000 plus \$4,600 per yr
- Economic benefits to MRG of expanded supply



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A-45: Economic Feasibility (3)

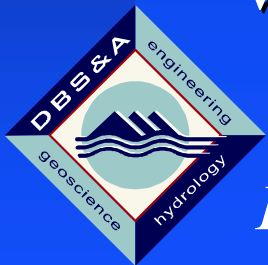
- Economic benefit to construction sector likely outside MRG
- Negative impact on existing recreation business
- Economic benefit to recreation business at new reservoirs is outside MRG



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A-45: Legal Feasibility

- Requires new reservoir management, and authorization by owner/operator: El Vado - MRGCD; Abiquiu - Albuquerque (200,000 af authorized); Cochiti - COE and Federal legislation
- State Engineer permit: Impairment? Public welfare? Conservation?



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A-45: Legal Feasibility (2)

- Rio Grande Compact: Texas and Colorado approval and adjustments to compact accounting. Article VII restricts upstream storage when Elephant Butte below 400,000 af
- New or expanded reservoirs: subject to federal laws listed in A-1



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Alternative 38

Increase monitoring and modeling of surface water system to improve water management at the watershed level, and retain excess water flow from Elephant Butte Reservoir during wet cycles.

Technical Lead: Rob Leutheuser



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A-38: Technical Feasibility

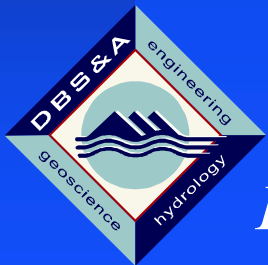
- RiverWare model—routing
- NRCS runoff forecasts—supply prediction
- Modular Modeling System—runoff distribution
- ET Toolbox—demand prediction



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A-38: Legal Feasibility

- Regional water management: same issues as A-67
- Credits for water savings: same issues as A-1 and A-66
- Retain excess flows? must satisfy OSE permit requirements



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A-38: Legal Feasibility (2)

- Rio Grande Compact: 405,000 af cap on MRG consumption of Otowi flows except spill years
- City of Albuquerque applied to appropriate flood flows in Abiquiu Reservoir



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Alternative 46

Inject water treated to drinking water standards for aquifer storage in appropriate locations throughout the water planning region.

Technical Lead: Mark Miller



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A-46: Technical Feasibility

- Injection wells
- Infiltration basins
- Potential sources of water
 - ◆ Seasonal excess surface water, storm flows
 - ◆ San Juan Chama Project water
 - ◆ Water in lieu of storage at Elephant Butte
 - ◆ Treated M&I wastewater



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A-46: Technical Feasibility (2)

- Small-scale enhanced recharge project: 10,000 afy
- Large-scale ASR: 100,000 to 200,000 afy



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A-46: Economic Feasibility

- Infrastructure capital cost
 - ◆ Central Avra Valley: \$94 per afy capacity
 - ◆ Sweetwater: \$143 per afy capacity
- O&M costs
 - ◆ Granite Reef USP (infiltration basins): \$2.50 per af



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A-46: Legal Feasibility

- Ground Water Storage and Recovery Act provides legal mechanism for ASR (state issue)
- Must comply with Underground Injection Control regulations (state issue)



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A-46: Legal Feasibility (2)

- ASR may have Rio Grande Compact implications (federal/compact issue)
- Current analysis does not identify any Indian or local government issues



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Alternative 24

Promote, through incentives, on-site residential and commercial greywater reuse and recycling.

Technical Lead: Beth Salvas



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A-24: Technical Feasibility

Implemented in California, Arizona & Texas

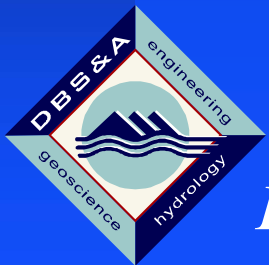
Reduces fresh water demand by amount of
greywater recycled-(20-25%)

Reduces return flows

Retrofit cost: \$135 - \$1,250

New construction cost: \$65 - \$650

Casa del Aqua cost - \$1,500



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A-24: Economic Feasibility

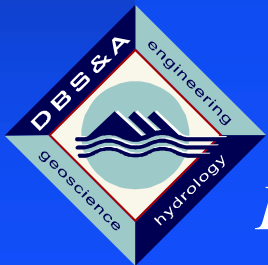
- The cost of residential and non-residential building will increase
- Financial incentives would have to be sufficient to offset these greater building costs
- Local construction industry might benefit



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A-24: Legal Feasibility

- Must comply with all applicable NMED regulations (state issue)
- NMED must approve greywater reuse (state issue)



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A-24: Legal Feasibility (2)

- Local governments provide incentives for reuse and recycling (local issue)
- Current analysis does not identify any federal, Indian or compact issues



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Alternative 27

Reuse treated wastewater for non-potable uses.

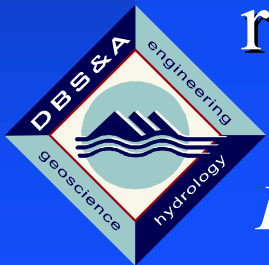
Technical Lead: Sue Umshler



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A-27: Technical Feasibility

- No new technologies required
- New or expanded treatment plant(s) and pump stations—and winter storage
- Extend supply by offsetting some current consumptive uses
- Reduces return flows—now available to river and riparian uses



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A-27: Legal Feasibility

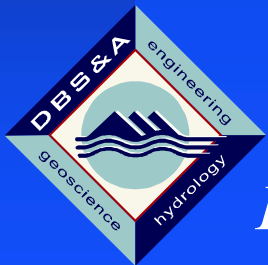
- Must comply with all applicable NMED regulations (state issue)
- If municipalities return treated wastewater to river for return-flow credit, such water cannot be used for non-potable uses such as watering golf courses, etc. (state, local, compact issues)



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A-27: Legal Feasibility (2)

- Current analysis does not identify any federal (non-compact) or Indian issues



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Alternative 39

Utilize technological advances for treating deep saline and brackish water for potable or non-potable use in the region.

Technical Lead: Mark Miller



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A-39: Technical Feasibility

- Established and improving technologies
 - ◆ 13,600 units—7.7 million afy—worldwide
- Water in parts of valley-fill aquifer, Glorieta Sandstone, San Andres Limestone
- Brine-disposal: deep wells, evaporation ponds, treat and discharge



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A-39: Economic Feasibility

- Costs rise with increasing salinity
- Economy of scale in capital cost, not O&M
- Energy cost is 50 to 75% of O&M
- Fresh water: \$500 to \$830 per af, plus cost of brine disposal
- Brine disposal: \$16 to \$600 per af fresh water



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A-39: Economic Feasibility (2)

- Economic benefit to MRG from expanded supply
- Energy intensive: power (and construction) industry benefit
- Federal and/or state financing would have greater impact in MRG than local financing



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A-39: Legal Feasibility

- No OSE jurisdiction over aquifers with top at 2,500 ft or deeper, and water more than 10,000 ppm, but must file notice of intent (state issue)
- If within jurisdiction of OSE, must file application to appropriate (state issue)



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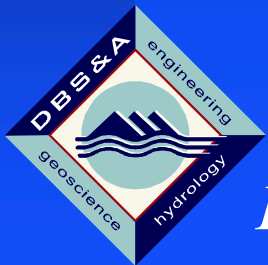
A-39: Legal Feasibility (2)

- If disposing brine, may need a groundwater discharge or NPDES permit (state issue)
- Review application by OSE to appropriate brackish water to meet state line delivery obligations (compact issue)
- Current analysis does not identify any federal (non-compact) or Indian issues



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Alternatives to Decrease or Regulate Water Demand



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Alternative 18

Adopt and implement local water conservation plans and programs in all municipal and county jurisdictions, including drought contingency plans.

Technical Lead: Myra Segal Friedmann



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A-18: Technical Feasibility

- Residential outdoor: OSE “low” guidelines
- Residential indoor: “conserving house” (Vickers)
- Analysis assumes full compliance with guidelines
- Effective conservation may reduce savings under drought mitigation plan



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A-18: Technical Feasibility (2)

- Accumulated water savings compared with year 2000, and total water use in gpcd:
 - ◆ 2010 low pop., 149,000 af saved , 157 gpcd
 - ◆ 2010 high pop., 195,000 af saved, 157 gpcd
 - ◆ 2020 low pop., 109,000 af saved , 132 gpcd
 - ◆ 2020 high pop., 120,000 af saved, 139 gpcd
 - ◆ 2050 low pop., 238,000 af saved, 120 gpcd
 - ◆ 2050 high pop., 292,000 af saved, 119 gpcd



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A-18: Economic Feasibility

- Outdoor residential, golf courses and parks: reduce area, change plantings and irrigation systems @ \$2/ft²—\$520 million
- Indoor: \$1,925 per household



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A-18: Legal Feasibility

- OSE may claim preemption if local ordinances have effect of regulating water under OSE jurisdiction (state issue)
- Local governments must adopt conservation plans (local issue)
- Current analysis does not identify any federal, compact, or Indian issues



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Alternative 21

Examine a variety of water pricing mechanisms and adopt those that are most effective at conserving water. The mechanisms to be examined include: a) price water to reflect the true value; b) institute a moderately increasing block price schedule; c) institute a steeply increasing block price schedule; and d) other feasible incentives and subsidies for conserving water.

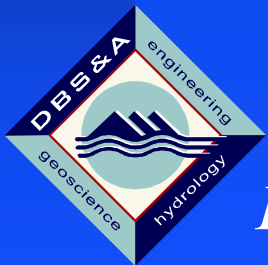


Technical Lead: Brian McDonald

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A-21: Economic Feasibility

- Urban water demand is inelastic: For every 100% increase in the price of water, the urban demand for water decreases only 20% (in summer)



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A-21: Economic Feasibility (2)

- Since demand is inelastic, increases in the marginal price of water alone will not achieve reductions in residential water use
 - ◆ Higher prices for water could result in revenue enhancements for the water utility
 - ◆ However, regulatory practice does not allow utilities to benefit from revenue enhancements from higher water prices



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A-21: Legal Feasibility

- Strongest scenario: municipal system with customers subject to conservation measures
- General police powers will allow some regulation of use even if not served by public water system, but may not go so far as to be regulatory taking

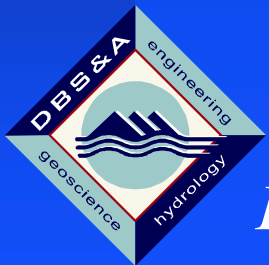


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Alternative 22

Provide local government programs that offer subsidies for adoption of water efficient technologies and utilization of water saving devices.

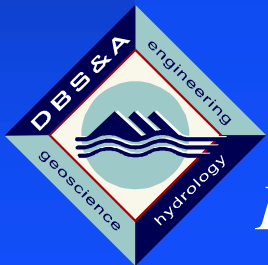
Technical Lead: Myra Segal Friedmann



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A-22: Technical Feasibility

- Existing technologies (may be improved upon)
- No physical infrastructure
- Incentives demonstrate commitment by supplier



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A-22: Economic Feasibility

- Cost per af saved—Albuquerque's experience over 7 years:
 - ◆ Toilets - \$1,136
 - ◆ Xeriscape - \$3, 484
 - ◆ Clothes washer - \$5,013
- Reduce expenditure for water rights



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A-22: Economic Feasibility (2)

- Local businesses benefit
- Less pumping, reduced demand for electricity



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Alternative 56

Establish region-wide educational programs, including public and private school curricula, to encourage voluntary conservation of water.

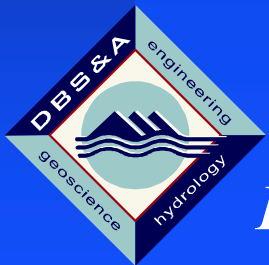
Technical Lead: Myra Segal Friedmann



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A-56: Technical Feasibility

- Albuquerque's outreach now visits 180 classrooms per year, about 4,500 students
- Water fairs reach more students
- Programs may yield 3 to 15% water savings, which would be part of the savings described in A-18
- Cost: \$50,000 per year plus \$5 to \$10 per student



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Alternative 10

Develop and employ alternatives to maximize irrigation efficiency on all irrigated land in the region.

Technical Lead: Mike McGovern



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A-10: Technical Feasibility

- Measures evaluated will include:
 - ◆ On farm irrigation (flood to furrow, sprinklers and micro-irrigation)
 - ◆ On farm canal lining and piping
 - ◆ Land preparation (leveling, canal repair, drainage system improvements)
 - ◆ On farm water management (scheduling, application)



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A-10: Economic Feasibility

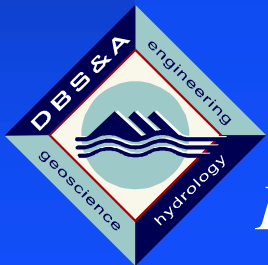
- Saved water could economically sustain local agriculture (water remains in agriculture)
- Real-time deliveries may allow farmers to grow different, more profitable crops
- Local construction sector would benefit from the installation of meters



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A-10: Economic Feasibility

- If farmers pay for meters, could adversely affect agricultural sector
- Funds from banking saved water could cover costs for metering



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Alternative 7

Meter and manage surface water distribution flows through all irrigation systems to conserve water.

Technical Lead: Mike McGovern



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A-7: Technical Feasibility

■ Assumptions

- ◆ MRGCD (50,541 acres)
- ◆ 21 other smaller systems (4,638 acres)
- ◆ Include additional remotely operated gates tied to “real-time” telemetered water stage recorders
- ◆ Stage monitors and automatic gates at the lateral level



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A-7: Technical Feasibility (2)

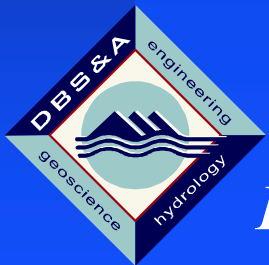
- Spot checking farm turnout flows throughout the system
- Systems under 100 acres mechanical stage recorders at headworks and at farm turnouts
- Systems over 100 acres add stage recorder at drains, and major main canal branches



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A-7: Technical Feasibility (3)

- Time frame for both MRGCD and other systems — 40 years
- Costs developed for typical equipment installations
- Total program cost for divided over a reasonable period



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A-7: Economic Feasibility

- Saved water could economically sustain local agriculture (water remains in agriculture)
- Real-time deliveries may allow farmers to grow different, more profitable crops
- Local construction sector would benefit from the installation of meters



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A-7: Economic Feasibility (2)

- If farmers pay for meters, could adversely effect agricultural sector
- Funds from banking saved water could cover costs for metering



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A-7: Legal Feasibility

- OSE may claim preemption if local/conservancy district ordinances have the effect of regulating water under OSE jurisdiction (state issue)
- Authority of MRGCD to impose metering requirements (local government issue)



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A-7: Legal Feasibility (2)

- No authority to impose metering requirements on Indian land (Indian issue)
- Current analysis does not identify any federal or Compact issues

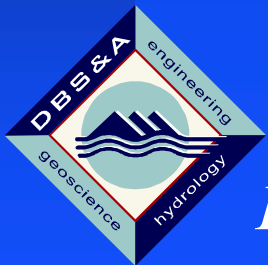


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Alternative 9

Develop conveyance alternatives for water transportation in agricultural irrigation systems.

Technical Lead: Mike McGovern



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A-9: Technical Feasibility

- Assumptions:
- Canal lengths estimated based on existing MRGCD program and data
- Canal seepage in certain locations necessary to support riparian vegetation
- Costs: To be determined - will include operation and maintenance



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A-9: Economic Feasibility

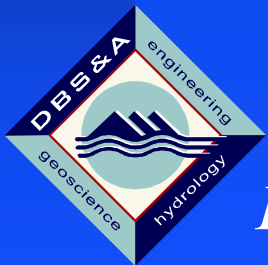
- Saved water could economically sustain local agriculture (water remains in agriculture)
- Real-time deliveries may allow farmers to grow different, more profitable crops
- Local construction sector would benefit from the installation of meters



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A-9: Economic Feasibility (2)

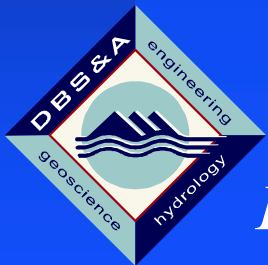
- If farmers pay for meters, could adversely effect agricultural sector
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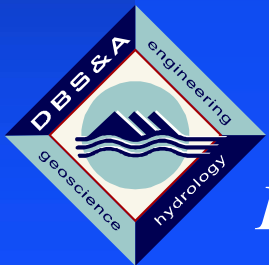
A-9: Legal Feasibility

- No legal issues with developing new conveyance systems
- Legal issue of “ownership” of saved water



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Alternatives to Change Water Uses to Increase Supply / Decrease Demand



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Alternative 11

Develop markets for locally-grown produce,
and low-water alternative crops.

Technical Lead: Brian McDonald



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A-11: Technical/Economic Feasibility

- 75 percent of irrigated crop acres in 2000 were alfalfa and pasture
- Alfalfa is a high water use crop (28.20 inches annual consumptive use)
- Other varieties of alfalfa may have lower consumptive use



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A-11: Technical/Economic Feasibility (2)

- New Mexico dairy industry growth increased the demand for alfalfa and raised the price of alfalfa by 50% since 1985
- Alfalfa production is amenable to part-time farming on small plots and is low risk



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A-11: Technical/Economic Feasibility (3)

- Change in crops requires different business infrastructure: farm labor, crop storage and processing facilities, and marketing and distribution networks and cooperatives
- Other crops have higher risks and require more labor



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A-11: Technical/Economic Feasibility (4)

- In 2000 there were 41,494 irrigated acres in the Middle Rio Grande region, with 21,200 acres in alfalfa and 10,020 acres in pasture
- Switching 5,000 acres from alfalfa to sorghum in the Belen area would reduce consumptive water use by an estimated 4,275 acre-feet of water



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Alternative 30

Adopt policies to integrate land use and transportation planning and water resource management in all government jurisdictions in the Middle Rio Grande water planning region.

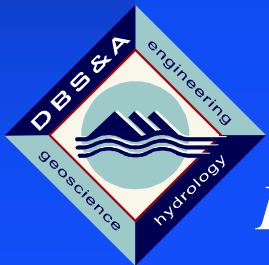
Technical Lead: Phyllis Taylor



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A-30: Technical Feasibility

- Proof of water availability for new subdivisions
- Development fees can include cost of water rights
- Use land use policy as an incentive for other related alternatives, such as water conservation
- Location of growth to protect water quality and aquifer recharge areas



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A-30: Technical Feasibility (2)

- Impact on water demand - seen over time
- Linking land use policy and water use can provide an incentive for reduced water demand through higher densities, xeriscaping, stormwater management, and other conservation techniques

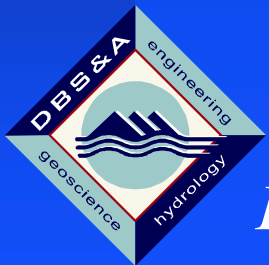


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A-30: Technical Feasibility (3)

■ California

- ◆ Land use approval linked to water supply since 1995
- ◆ Large developments must verify water availability
- ◆ Local government must confirm with water utility



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A-30: Economic Feasibility

- Reduced demand diminishes need for acquiring current and future water rights
- Reduced land subsidence from additional groundwater pumping
- Reduced cost from lack of drought reserve
- Increased residential and commercial building prices



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A-30: Legal Feasibility

- Raises many of same issues discussed in A-67
- Will face many of same limitations discussed in A-21
- Land use authority will provide additional basis for regulation, especially subdivision laws



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Alternative 28

Increase building densities (as compared to typical suburban density) and infill development through adoption of local government land use policies and regulations.

Technical Lead: Phyllis Taylor



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A-28: Technical Feasibility

- Local governments have the authority to implement
- Infrastructure can be designed or upgraded to accommodate higher densities
- Reduction in water demand will occur as new development takes place



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A-28: Technical Feasibility

- Increase in density from 5.7 to 7.4 units per acre could reduce residential outdoor water use by up to 46% over planning period
- Cost to implement: to be determined
- Potential funding sources: utility rates, general obligation bonds, and state and federal grants



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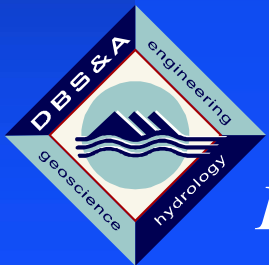
A-28: Economic Feasibility

- Reduced demand diminishes need for acquiring current and future water rights
- Reduced land subsidence from additional groundwater pumping
- Reduced cost from lack of drought reserve
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Alternatives for Water Rights Regulation



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Alternative 63

Change state water law to include in-stream flow as a beneficial use.

Technical Lead: Susan Kery



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A-63: Legal Feasibility

- Requires a change in state law
- Current federal law arguably already allows for recognition of instream flow as beneficial use
- Evaluate ways to strengthen existing laws
- Provide examples of efforts by other Western states
- Recognizing instream flow as beneficial use will not guarantee water remains in the river



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Alternative 144

Address groundwater/surface water interactions in the statutes for administering water rights.

Technical Lead: Susan Kery



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A-144: Legal Feasibility

- Administration of water rights to account for well-recognized hydrological connection between ground- and surface water.
 - ◆ Allow conjunctive use of water through permitting process
- Issues include possible limitations under Rio Grande Compact and protection of water right priorities through conjunctive use



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A-144: Economic Feasibility

- Reduced uncertainty about water availability during times of water shortage
- Senior water right holders will have more reliable water availability.
- Increased certainty has positive impact on business climate
- Could facilitate water transfers



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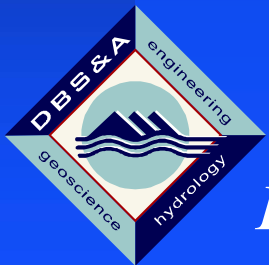
A-144: Technical Feasibility

- Improved conjunctive administration would:
 - ◆ Require better technical tools/models at OSE
 - ◆ Improve certainty with respect to water rights
 - ◆ Not increase water supply, but would improve management of existing supply



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Alternatives for Water Quality Protection

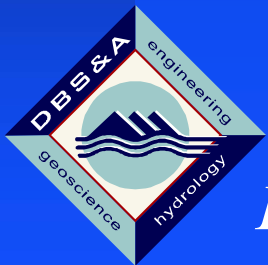


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Alternative 47

Identify, protect and monitor areas vulnerable to contamination (quality issue) and restrict groundwater supply wells in sensitive areas.

Technical Lead: Bob Gray



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A-47: Technical Feasibility

- Identification of highly vulnerable areas for Bernalillo County complete
- Vulnerability studies in Valencia and Sandoval County should be updated
- NMED program for local communities
- High costs to inventory additional vulnerable areas (including new monitor wells)



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A-47: Technical Feasibility

- Restricting supply wells in sensitive areas
 - ◆ Public health issue (reducing exposure of public to contaminants does not eliminate contamination/ will not increase water supply)
- Initiatives to reduce contamination from septic tanks
 - ◆ Bernalillo County new ordinance in place
 - ◆ Sandoval and Valencia County - no new ordinance



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A-47: Technical Feasibility (2)

- Quantification of increase (if any) to water supply- difficult to estimate without further complex studies

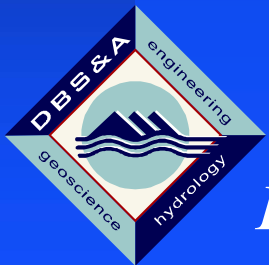


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Alternative 26

Expand use of centralized wastewater collection and treatment systems into all areas of urban and suburban development within the water planning region.

Technical Lead: Sue Umshler



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A-26: Technical Feasibility

- Current technologies
- Pipelines, pump stations, and new or expanded treatment plant(s) required
- Could increase supply if treated water is discharged to surface-water source or aquifer



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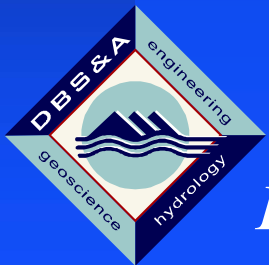
A-26: Economic Feasibility

- Construction industry impacts in MRG
- O&M would create jobs in MRG
- Federal or state financing would create greater positive impact on MRG economy than local financing
- MRG septic tank owners would pay more, but offset by no annual maintenance



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Alternatives for Implementation of Plan & Management of Water Resources

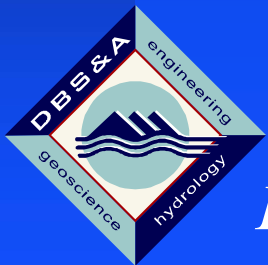


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Alternative 67

Establish a regional water management authority to provide professional water resource management and to administer or assist in a water banking program.

Lead: John Utton



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A-67: Legal Feasibility

Regional Water Management Authority

Planning and coordination powers in place in
Mid-Region Council of Governments

Management or regulatory functions would
require change in state law.

Regional utility could function under Joint
Powers Agreement Act

Water usage under OSE jurisdiction



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A-67: Legal Feasibility (2)

No water banking law exists for regional water banks in Middle Valley

Limited water banking allowed in Lower Pecos

Water reallocation would occur under existing state law (OSE must permit changes to point of diversion and place and purpose of use)

MRGCD can re-allocate water within its boundaries consistent with Conservancy Act



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A-67: Economic Feasibility

- Could provide the financial incentive to local farmers to implement many of the other alternatives such as A-7 and A-10
- Could reduce the adverse economic impact of short-term water crises, such as droughts, on the agricultural sector



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A-67: Economic Feasibility

- Transfer of water from low-income, rural areas to high-income, urban areas could adversely impact economic sustainability of agriculture in MRG region
- Combination of alternatives (e.g., A-7 & A-10) could accommodate agricultural sector water needs and growth in other sectors (possible win-win situation)



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Alternative 52

Develop a sustainable and coordinated growth management plan for adoption and implementation by local governments in the middle Rio Grande region in order to: 1) reduce water consumption; 2) minimize impact on water resources; 3) encourage conservation-oriented economic development and 4) ensure adequate water supplies for any proposed development.



Technical Lead: Phyllis Taylor

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A-52: Technical Feasibility

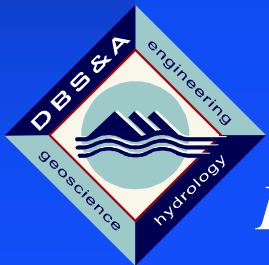
- Urban service areas – tie growth to capacity and extent of public water systems
- Rural water supply – tie growth to proof of adequate water supply
- Location of growth – protect water quality and aquifer recharge areas
- Growth boundaries - (“leapfrog” over boundaries - must be regional)



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A-52: Technical Feasibility (2)

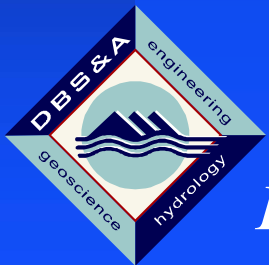
- Conservation-oriented economic development
 - ◆ Increase incentives for industries that use less water, use water efficiently, and/or have high value added relative to water use
 - ◆ Decrease incentives for industries that do not meet these criteria
- Applies to “new” growth



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A-52: Technical Feasibility (3)

- Restrictions on housing - shifts growth to other areas, socio-economic impacts
- Commercial development restrictions
- Job mix approach – incentives for high value added jobs could increase prosperity with less job growth and provide jobs for underemployed locals. High cost of training, long term implementation



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A-52: Economic Feasibility

Reduction in demand reduces cost of
acquiring water rights for future

Higher land costs will increase housing costs

Groundwater retained for drought reserve
increases certainty of water availability

Decreased price and demand for land on
fringe of urban development



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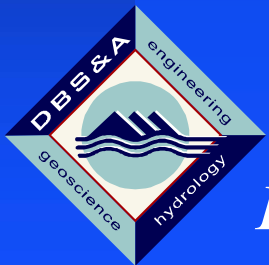
A-52: Legal Feasibility

- Local governments have planning authority in local jurisdictions
- If plan is mandatory or implemented by a regional land-use planning entity, considerable legal issues arise
- Regionalization of land-use management could require wholesale changes in both state law and local ordinances
- Regulation of water use limited by existing



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Funding Alternatives



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Alternative 59

Establish a State-based water severance tax for water projects, planning and conservation.

Technical Lead: Brian McDonald



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A-59: Economic Feasibility

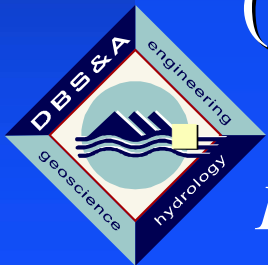
- Broad-based tax on water consumption would raise \$20.4 million per year
 - ◆ Tax rate at \$100 per acre-foot = \$0.000307 per gallon of water
 - ◆ Based on total consumptive use of 204,701 afy
 - ◆ 41.5% - public water supply, primarily municipal and industrial use
 - ◆ 47.1% - agriculture



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A-59: Economic Feasibility (2)

- Tax rate higher on mined groundwater to account for associated social costs
- Metering recommended to determine actual consumptive use
- Water tax rates for different users based on income to reduce regressivity of the tax, (e.g., \$100 municipal use, \$50 agriculture)



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A-59: Legal Feasibility

- Change in state law required
- Regional assessment could occur through local government authorities
- Formation of regional authority to assess & collect raises several legal issues (see A-67)



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