Supporting Document G-1

Economic Feasibility Fact Sheets

Prepared by Daniel B. Stephens and Associates

Economic Feasibility Fact Sheet
Alternative 1: Bosque Management

Acknowledgements: This economic feasibility fact sheet was written by Brian McDonald, Ph.D., a private economic consultant, as part of the "Evaluation of Alternative Actions for Technical, Physical, Hydrological, Environmental, Economic, Social, Cultural, and Legal Feasibility and Water Quality Issues and Legal Overview" contracted to Daniel B. Stephens & Associates, Inc. The format and organization of the fact sheet and the definition of the alternative were developed by the Water Assembly.

1. Definition of Alternative

A-1: Restore Bosque habitat and manage vegetation in the Bosque to reduce evapotranspiration by selectively removing vegetation and promoting native plants.

2. Assumptions

- Much of the bosque along the Rio Grande in the Middle Rio Grande (MRG) planning region is invaded by high water using, non-native plants such as salt cedars and Russian olives. Removal of these non-native plants and the promotion of native plants such as cottonwoods could reduce evapotranspiration and the demand for water in the region by up to an estimated 13,900 acre-feet per year.

- Mechanical removal of non-native plants is the preferred approach. This approach would cost up to $600 per acre and would take from 10 to 25 years to complete.

- The financing of the bosque restoration would come from the federal government as well as from local sources such as the City of Albuquerque and the Middle Rio Grande Conservancy District (MRGCD).

3. Economic Feasibility

3.1 Effect on Local Business

- Mechanical removal of non-native species and other activities to promote native plants would have an impact on the construction industry in the MRG planning region. The

construction itself would create one-time employment, payroll, and purchases of local goods and services in the local economy. For each $1.0 million of construction expenditures, approximately 20 jobs would be created in the local economy during the life of the construction project.[1]

- Federal funding of bosque restoration would have the greatest economic impact, since these monies would come from outside the region. Funding from the City of Albuquerque and MRGCD would come ultimately from local residents via higher taxes or fees, which would reduce household disposal income. Local funding would come at the expense of retail trade and service business, as these are dependent upon local consumer spending.

- Restoration of the bosque would provide additional recreational opportunities for local residents, such as hiking trails and bicycle paths.

- Bosque restoration would complement the City of Albuquerque's existing Biopark cluster, which includes the Rio Grande Zoo, the Aquarium, the Botanical Gardens and the planned restoration of Tingley Beach. Tourism and the quality of life in the region would be enhanced.

3.2 Changes to Local/Regional Businesses

- The economic impact on the regional economy would depend upon the amount of water savings that occurs with this alternative and how they are used. Water savings could be used to support various sectors or beneficial uses in the region, some of which would have tangible economic benefits.

- Federal funding of bosque restoration has already occurred. Additional federal funding would provide an economic boost to the local economy, providing new jobs primarily in the construction industry over a 10- to 25-year time period.

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[1] Based on 2001 input/output economic model of New Mexico designed using IMPLAN Professional Version 2.0 software (from Minnesota IMPLAN Group, Inc., Stillwater Minnesota).

3.3 Special or Unique Aspects and Considerations

Surface water supplies would be enhanced, which could improve the habitat for endangered species such as the silvery minnow.

References/Bibliography

Fruth, W.H. Undated. *The flow of money and its impact on local economies*. POLICOM Corporation, National Association of Industrial and Office Properties.

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Economic Feasibility Fact Sheet
Alternative 45: Reservoir Management

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1. Definition of Alternative

A-45: Reduce open water evaporation in storage reservoirs by retaining water at higher elevations or latitudes, or by reducing surface areas.

2. Assumptions

- Water savings or maximization of existing supply could benefit the regional economy by supporting various activities or beneficial uses in the region. Specific economic benefits would depend on how the water is used.

- This alternative would require the construction, expansion, or modification of new or existing reservoirs, involving one-time capital expenditures.

- The regional economic impact would ultimately be determined by who pays for the construction costs and by the location of these capital expenditures. However, it is likely that the federal government would pay for a significant portion of the cost to implement this alternative and the location of the expenditures would be outside the region.

3. Economic Feasibility

3.1 Effect on Local Business

- Since this alternative expands the water supply in the region, the economic impact may be measured by comparing the economic benefit to the economic cost to implement the alternative. Benefits would include the avoidance of costs associated with obtaining

future water rights (currently, a one-time purchase price of $5,000 per acre-foot) and future pumping of groundwater. The reduction of groundwater pumping would prevent consolidation of the aquifer, thereby preventing land subsidence. Water left in the aquifer could supply the region in times of drought.

- The economic impact from the construction of new or expanded reservoirs would depend upon the location of the reservoir. Many of the best sites are outside of the Middle Rio Grande (MRG) planning region, which indicates that this economic impact would be exported to other regions. If local taxes or fees were increased to pay for this alternative, retail trade and services industries in the region would be adversely affected.

- Businesses that depend on recreation at Elephant Butte would experience a negative impact if the surface area of this reservoir were reduced. Landowners currently located at the reservoir's edge would see a decline in property value, as they would no longer own "lakefront" property. New recreational opportunities would be created with new reservoirs in other regions. In both instances, the economic impact would be felt outside the MRG planning region. For example, Truth or Consequences in Sierra County would be adversely affected, while communities in northern New Mexico or southern Colorado would be positively impacted by a new reservoir in their area.

- A rising groundwater table resulting from new reservoir construction or from increasing storage in existing reservoirs could inundate lands near the reservoir. This could adversely affect landowners near the new or enlarged reservoir.

3.2 Changes to Local/Regional Business

- Water savings or maximization of existing supply could benefit the regional economy by supporting various activities or beneficial uses in the region. Specific economic benefits would depend on how the water is used.

- Competing uses of limited water supply may be more easily accommodated with the expansion of the regional water supply. This would ease social and political strains and allow agricultural, non-agricultural, recreational, and instream users within the region to co-exist with less conflict.

3.3 Special or Unique Aspects and Considerations

Additional upstream reservoir storage would provide the possibility of timed releases of water throughout the summer irrigation season, which could minimize the adverse consequences of inadequate water flow on endangered species and would improve riparian habitat. Overall, this would improve the quality of life in the MRG planning region and have a positive economic benefit.

References/Bibliography

Brown, F. L. Ph.D. 2001. *The value to the City of Albuquerque of storing its San Juan-Chama water in Abiquiu Reservoir or Elephant Butte Reservoir*. Prepared for the City of Albuquerque, Water Resources Division. February 26, 2001.

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Economic Feasibility Fact Sheet
Alternative 24: Reuse Greywater

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1. Definition of Alternative

A-24: Promote, through incentives, on-site residential and commercial greywater reuse and recycling.

2. Assumptions

- On-site greywater reuse systems in residential and commercial properties can be an effective way to extend existing urban water supplies.

- No new water supplies are achieved, however, through such reuse systems.

3. Economic Feasibility

3.1 Effect on Local Business

- The cost of residential and non-residential building would increase to include the cost to install separate on-site plumbing for the collection and reuse of greywater. Homeowners would have to pay for construction costs to retrofit existing systems. To eliminate this adverse impact on homebuyers and businesses, financial incentives would have to be sufficient to offset these increased retrofit construction and new building costs.

- Higher construction costs for new residential and non-residential building would mean additional employment and wages in the local construction sector.

- Economic benefits would accrue to the city water utility in the form of reduced operating expenses from the need to pump less groundwater and/or divert and treat less surface water. With less pumping there would be a reduced demand for electricity.

- The retrofitting of existing residential and non-residential structures would also have a positive economic impact on the local construction industry, but could increase cost of homeownership.

- Education would be required for households and businesses in the proper use and application of greywater. This may provide an opportunity for private and public educators.

3.2 Changes to Local/Regional Businesses

Since this alternative achieves no aggregate water savings for the region, there are no significant economic impacts within the region. Because there would be fewer diversions to meet demand, more water supply management options would be available (e.g., more water left in the reservoir, less water pumped from the aquifer). Water suppliers may be able to delay the purchase of more water rights or reduce the purchase amount, which would be an economic benefit for them. However, the river and downstream users would receive less water from the region, which could have consequences in the southern part of the region.

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Fruth, W.H. Undated. *The flow of money and its impact on local economies*. POLICOM Corporation, National Association of Industrial and Office Properties.

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Economic Feasibility Fact Sheet
Alternative 39: Desalination

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1. Definition of Alternative

A-39: Utilize technological advances for treating deep saline and brackish water for potable or nonpotable use in the region.

2. Assumptions

- Saline and brackish water, both of which exist within the Middle Rio Grande (MRG) planning region, can be effectively treated to expand water supplies within the region.

- The financing of capital expenditures for desalination would ultimately determine the economic impact on the regional economy and on regional users.

- Only urban water users are likely to be able to afford the cost of this alternative.

3. Economic Feasibility

3.1 Effect on Local Business

- Since this alternative expands the water supply in the region, the economic impact may be measured by comparing the economic benefit to the economic cost to implement the alternative. Benefits would include the avoidance of costs associated with obtaining future water rights (currently, a one-time purchase price of $5,000 per acre-foot) and future pumping of groundwater. The reduction of groundwater pumping would prevent consolidation of the aquifer, thereby preventing land subsidence. Water left in the aquifer could supply the region in times of drought.

- . A benefit/cost analysis would determine the overall economic impact on the region.

- Desalination is highly energy intensive. The power industry would benefit from the need for new conventional and non-conventional sources of energy.

- The need for new power plants to supply energy for desalination would also benefit the construction industry.

- The source of the financing of this alternative would determine the economic impact on local businesses. If federal or state sources were used, the economic impact on the regional economy would be greater. Local financing through property taxes or water fees would adversely impact local urban water users.

3.2 Changes to Local/Regional Businesses

Assuming that this alternative is cost-effective, the increased supply of water would allow the benefit the regional economy by making water available to support the various beneficial uses in the region. The specific economic benefit would depend on how the water is used.

3.3 Special or Unique Aspects and Considerations

- Because saline and brackish water would be mined, this alternative would have a finite useful life.

- Other economic costs such as those related to land subsidence near the desalination plant (above the source aquifer) should also be considered in the feasibility of this alternative.

References/Bibliography

Brown, F. L. Ph.D. 2001. *The value to the City of Albuquerque of storing its San Juan-Chama water in Abiquiu Reservoir or Elephant Butte Reservoir*. Prepared for the City of Albuquerque, Water Resources Division. February 26, 2001.

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See the Technical and Physical Feasibility Fact Sheet for

Alternative 21: Urban Water Pricing

in

Evaluation of Alternative Actions for

Technical, Physical, Hydrological, and Environmental Feasibility

Economic Feasibility Fact Sheet
Alternative 22: Conservation Incentives

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1. Definition of Alternative

A-22: Provide local government programs that offer subsidies for adoption of water efficient technologies and utilization of water saving devices.

2. Assumptions

- Urban water use can be reduced by encouraging the use of water efficient technologies and water saving devices.

- Financial incentives must be offered to encourage urban water uses to adopt these technologies and water saving devices, which represent increased costs to residential and commercial/industrial water users.

3. Economic Feasibility

3.1 Effect on Local Business

- Water savings would reduce the need for cities to acquire additional water rights as well the amount of groundwater pumped. Benefits would include the avoidance of costs associated with obtaining future water rights (currently, a one-time purchase price of $5,000 per acre-foot) and future pumping of groundwater. The reduction of groundwater pumping would prevent consolidation of the aquifer, thereby preventing land subsidence. Water left in the aquifer could supply the region in times of drought.

- This economic benefit would accrue to present and future city residents and water ratepayers.

- The economic benefit should be compared to the cost to implement this alternative to ensure a positive benefit/cost outcome.

- Local businesses that would benefit directly include plumbers, landscape architects, rock and gravel operations, and distributors of water-saving appliances.

- Water savings would reduce the amount of water pumped from groundwater and would result in cost savings to the water utility. The reduced cost of operating the water utility, including the lower costs for pumping and the acquisition of water rights, could free up financial resources and enable cities to offer financial subsidies.

- With less pumping of groundwater, there would be a reduced demand for electricity from the Public Service Company of New Mexico.

- At current water rate levels, reduced water use would cause total water revenues to public and private water utilities to decline. A water rate increase may be required to offset this decline water revenue.

3.2 Changes to Local/Regional Businesses

Water savings from the reduced demand for urban water would likely be significant and could benefit the regional economy by supporting various activities or beneficial uses in the region. Specific economic benefits would depend on how the water is used.

3.3 Special or Unique Aspects and Considerations

None.

References/Bibliography

Brown, F. L. Ph.D. 2001. *The value to the City of Albuquerque of storing its San Juan-Chama water in Abiquiu Reservoir or Elephant Butte Reservoir*. Prepared for the City of Albuquerque, Water Resources Division. February 26, 2001.

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Economic Feasibility Fact Sheet
Alternative 10: Irrigation Efficiency

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1. Definition of Alternative

A-10: Develop and employ alternatives to maximize irrigation efficiency on all irrigated lands in the region.

2. Assumptions

- Water savings can be achieved by improving irrigation efficiency.
- Diversions of water from surface sources would decrease, thereby leaving more water in the river.
- Diversions from groundwater for agricultural use would decrease slightly, thus prolonging the life of the aquifer. However, groundwater accounts for a much smaller percentage of water used for agriculture.
- Implementation of this alternative would require capital expenditures such as the concrete lining of irrigation ditches, the laser leveling of fields, and installation of water meters.
- The financing of such capital expenditures would ultimately determine the economic impact on the regional economy and on regional users.
- The long-term economic impact on the regional economy would depend on who receives the benefit from water savings.

3. Economic Feasibility

3.1 Effect on Local Business

- Water savings from this alternative that remain within the agricultural sector would improve the long-term economic sustainability of the Middle Rio Grande agricultural sector. Water could still be available to transfer to nonagricultural uses, while the same or a greater level of agricultural activity is maintained within the region.

- Water could be delivered more efficiently and reliably to improve crop yields and agricultural productivity. Tail-end irrigation water users would benefit from a more reliable flow of water. With the ability to deliver real-time water, farmers may be able to grow different, more profitable crops.

- The local construction sector would benefit from the implementation of this alternative by engaging in activities such as laser leveling of fields, installation of drip irrigation, and other on-farm management activities. For each $1.0 million of construction expenditures, approximately 20 jobs would be created in the local economy during the life of the construction project.[1]

- The source of the financing for this alternative would determine the economic impact on local businesses. Federal or state sources would provide greater economic benefits to the regional economy. Local financing through agricultural property taxes or fees on farmers would adversely impact the agricultural sector.

- If water savings from this alternative could be transferred to the non-agricultural sector via water banking, revenues raised by means of water banking could also be used to finance the implementation of this alternative.

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[1] Based on 2001 input/output economic model of New Mexico designed using IMPLAN Professional Version 2.0 software (from Minnesota IMPLAN Group, Inc., Stillwater Minnesota).

3.2 Changes to Local/Regional Businesses

- The local economy would benefit overall from the movement of water from agriculture, which generates less revenue per acre-foot, to nonagricultural economic activities, which generate more revenue per acre-foot. To the extent that agricultural production can still be maintained, this alternative represents a win-win situation for all sectors of the local economy.

- This alternative would result in reduced diversions for water in the agricultural sector and reduced evaporation and seepage from flooded fields. Water savings or maximization of existing supply could benefit the regional economy by supporting various activities or beneficial uses in the region. Specific economic benefits would depend on how the water is used.

3.3 Special or Unique Aspects and Considerations

Water law may have to be changed to provide economic/financial incentive for irrigation organizations and farmers to implement this alternative. The legal right to water saved, by those organizations/individuals that implement this alternative, would have to be established.

References/Bibliography

Fruth, W.H. Undated. *The flow of money and its impact on local economies*. POLICOM Corporation, National Association of Industrial and Office Properties.

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Economic Feasibility Fact Sheet
Alternative 7: Agricultural Metering

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1. Definition of Alternative

A-7: Meter and manage surface water distributions flows through all irrigation systems to conserve water.

2. Assumptions

- Implementation of this alternative would require capital expenditures for the installation of water meters.

- The financing of such capital expenditures would ultimately determine the economic impact on the regional economy and on regional users.

- The long-term economic impact on the regional economy would be determined by who receives the ultimate benefit of the water savings.

3. Economic Feasibility

3.1 Effect on Local Business

- The local construction sector would benefit from the installation of meters within irrigation systems. The Middle Rio Grande Conservancy District (MRGCD) would be required to add staff and educate existing staff to manage metered water use.

- If the water savings from this alternative were to remain within the agricultural sector, it would improve the long-term economic sustainability of agriculture in the Middle Rio

Grande region. Water management within the district is improved. Water could still be available to transfer to nonagricultural uses, while maintaining the same or a greater level of agricultural activity within the region.

- Metering allows for fixed water deliveries and scheduling.

- Water could be delivered more efficiently and reliably to improve crop yields and agricultural productivity. Tail-end irrigation water users would benefit from a more reliable flow of water. With the ability to deliver real-time water, farmers may be able to grow different, more profitable crops.

- Different sources of financing for meters and meter installation would have different economic consequences for the regional economy. If federal or state sources of finance were used, there would be few adverse consequences on local farmers. If, however, local farmers are required to finance the meters and their installation, higher costs may drive some farmers out of business.

- If water savings from this alternative could be transferred to the non-agricultural sector via water banking, revenues raised through water banking could be used to finance the implementation of this alternative.

3.2 Changes to Local/Regional Businesses

- The local economy would benefit overall from the movement of water from agriculture, which generates less revenue per acre-foot, to nonagricultural economic activities, which generate more revenue per acre-foot. To the extent that agricultural production could still be maintained, this alternative represents a win-win situation for all sectors of the local economy.

- The economic impact on the regional economy would depend upon the amount of water savings that occurs. Water savings or maximization of existing supply could benefit the regional economy by supporting various regional activities or beneficial uses

3.3 Special or Unique Aspects and Considerations

- The presence of meters may encourage water conservation by fostering a greater awareness of actual water use.

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Fruth, W.H. Undated. *The flow of money and its impact on local economies*. POLICOM Corporation, National Association of Industrial and Office Properties.

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Economic Feasibility Fact Sheet
Alternative 9: Agricultural Conveyance

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1. Definition of Alternative

A-9: Develop conveyance alternatives for water transportation in agricultural irrigation systems.

2. Assumptions

- Water savings would be possible by improving the efficiency of water delivery to the irrigated agricultural sector.

- Implementation of this alternative would require capital expenditures such as the concrete lining/piping of irrigation ditches and installation of water meters.

- The financing of such capital expenditures would ultimately determine the economic impact on the regional economy and on regional users.

- The long-term economic impact on the regional economy would be determined by who receives the ultimate benefit of the water savings.

3. Economic Feasibility

3.1 Effect on Local Business

- If water savings from this alternative were to remain within the agricultural sector, the long-term economic sustainability of the Middle Rio Grande agricultural sector would improve. Water could still be available to transfer to nonagricultural uses, while the same or a greater level of agricultural activity is maintained within the region.

- Water could be delivered more efficiently and reliably to improve crop yields, agricultural productivity, and reduce evaporative losses. Tail-end irrigation water users would benefit from a more reliable flow of water. With the ability to deliver real-time water, farmers may be able to grow different, more profitable crops.

- The local construction sector would benefit from the implementation of this alternative by engaging using concrete or other materials to line ditches and installing a covered piping system of water canals, where appropriate. For each $1.0 million of construction expenditures, approximately 20 jobs would be created in the local economy during the life of the construction project.[1]

- The source of the financing of this alternative would determine the economic impact on local businesses. If federal or state sources were used, the economic impact on the regional economy would be greater. Local financing through agricultural property taxes or fees on farmers would adversely impact the agricultural sector.

- If water savings from this alternative could be transferred to the non-agricultural sector via water banking, revenues raised through water banking could be used to finance the implementation of this alternative.

3.2 Changes to Local/Regional Businesses

- The local economy would benefit overall from the movement of water from agriculture, which generates less revenue per acre-foot to nonagricultural economic activities, which generate more revenue per acre-foot. To the extent that agricultural production could still be maintained, this alternative represents a win-win situation for all sectors of the local economy.

- Water savings could benefit the regional economy by making water available to support various activities or beneficial uses in the region. Not all beneficial uses of water have a

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tangible economic benefit. The specific economic benefit, if any, would depend on how the water is used.

3.3 Special or Unique Aspects and Considerations

- Water law may have to be changed to provide economic/financial incentive for irrigation organizations and farmers to implement this alternative. The legal right to water saved by the organizations/individuals who implement this alternative would have to be established.

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Fruth, W.H. Undated. *The flow of money and its impact on local economies*. POLICOM Corporation, National Association of Industrial and Office Properties.

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See the Technical and Physical Feasibility Fact Sheet for

Alternative 11: Low-Water Crops

in

Evaluation of Alternative Actions for

Technical, Physical, Hydrological, and Environmental Feasibility

Economic Feasibility Fact Sheet

Alternative 30: Land Use

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1. Definition of Alternative

A-30: Adopt policies to integrate land use and transportation planning and water resource management in all government jurisdictions in the Middle Rio Grande planning region.

2. Assumptions

Local governments can implement land use policies and regulations that support water saving programs such as water conservation, infill development, and xeriscaping.

3. Economic Feasibility

3.1 Effect on Local Business

- To the extent that this alternative would reduce the demand for water in urban areas, the benefits would include the avoidance of costs associated with obtaining future water rights (currently, a one-time purchase price of $5,000 per acre-foot) and future pumping of groundwater. The reduction of groundwater pumping would prevent consolidation of the aquifer, thereby preventing land subsidence. Without reduced demand, future costs associated with such impacts would have been borne by city residents and water ratepayers. Water left in the aquifer could supply the region in times of drought.

- To the extent that infill development would result in higher residential prices and higher commercial building prices, there would be an adverse impact on homeownership rates and a higher cost of doing business in the city. Land prices within the urban core may rise if land use policies restrict the overall supply of developable land.

- Owners of land on the fringe of urban development would see a decrease in demand for land and lower land prices.

- New construction activity associated with economic growth and development generates significant gross receipts taxes for New Mexico cities. If growth management policies reduce construction revenues and subsequently gross receipts, these policies may also restrict local government's ability to provide general fund services

- The ultimate impact of growth management measures would depend upon how the local implementation these measures affects both the supply and demand for land, housing, and commercial space.

3.2 Changes to Local/Regional Businesses

None.

3.3 Special or Unique Aspects and Considerations

To be effective, any growth management regulations must be adopted region-wide. The benefits of these regulations could be lessened if local residents move to nearby communities that do not implement such regulations.

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Brown, F. L. Ph.D. 2001. *The value to the City of Albuquerque of storing its San Juan-Chama water in Abiquiu Reservoir or Elephant Butte Reservoir*. Prepared for the City of Albuquerque, Water Resources Division. February 26, 2001.

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Economic Feasibility Fact Sheet
Alternative 28: Infill/Density

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1. Definition of Alternative

A-28: Increase building densities (as compared to typical suburban density) and infill development through adoption of local government land use policies and regulations.

2. Assumptions

Local governments can reduce exterior landscape use of water via land use policies and regulations that increase building densities and infill development in the existing urban core.

3. Economic Feasibility

3.1 Effect on Local Business

- To the extent that this alternative would reduce the demand for water in urban areas, the benefits would include the avoidance of costs associated with obtaining future water rights (currently, a one-time purchase price of $5,000 per acre-foot) and future pumping of groundwater. The reduction of groundwater pumping would prevent consolidation of the aquifer, thereby preventing land subsidence. Without reduced demand, future costs associated with such impacts would have been borne by city residents and water ratepayers. Water left in the aquifer could supply the region in times of drought.

- To the extent that high density development or, in particular, infill development results in higher residential prices and higher commercial building prices, there would be an adverse impact on homeownership rates and a higher cost of doing business in the city. Land prices within the urban core may rise, if land use policies restrict the overall supply

of developable land. New development may be discouraged by a higher cost of business, including higher land prices.

- Greenhouses, landscaping businesses, and lawn service businesses would experience a decrease in demand for their goods and services.

- Owners of land on the fringe of urban development would experience a decrease in demand for land and lower land prices.

- New construction activity associated with economic growth and development generates significant gross receipts taxes for New Mexico cities. If growth management policies reduce construction revenues and subsequently gross receipts, these policies may also restrict local government's ability to provide general fund services

- The ultimate impact of growth management measures depends upon how the local implementation of these measures affects both the supply and demand for land, housing, and commercial space.

3.2 Changes to Local/Regional Businesses

- The economic impact on the regional economy would depend upon the amount, if any, of water savings that would occur as a result of this alternative. Water savings or maximization of existing supply could benefit the regional economy by supporting various regional activities or beneficial uses.

3.3 Special or Unique Aspects and Considerations

To be effective, any growth management regulations must be adopted region-wide. The benefits of these regulations would be lessened if local residents move to nearby communities that do not implement such regulations.

References/Bibliography

Brown, F. L. Ph.D. 2001. *The value to the City of Albuquerque of storing its San Juan-Chama water in Abiquiu Reservoir or Elephant Butte Reservoir*. Prepared for the City of Albuquerque, Water Resources Division. February 26, 2001.

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Economic Feasibility Fact Sheet
Alternative 144: Conjunctive Management

Acknowledgements: This economic feasibility fact sheet was written by Brian McDonald, Ph.D., a private economic consultant, as part of the "Evaluation of Alternative Actions for Technical, Physical, Hydrological, Environmental, Economic, Social, Cultural, and Legal Feasibility and Water Quality Issues and Legal Overview" contracted to Daniel B. Stephens & Associates, Inc. The format and organization of the fact sheet and the definition of the alternative were developed by the Water Assembly.

1. Definition of Alternative

A-144: Address groundwater/surface water interactions in the statutes for administering water rights.

2. Assumptions

- Water rights in the planning region should be conjunctively managed to account for the hydrological connection between ground and surface water.

- Surface and ground water should be managed under a priority call to maximize the beneficial use for all the waters of the state. Junior groundwater users should be allowed to pump in drought years, even though senior surface water users cannot divert from surface sources.

- To maintain the equity of the prior appropriation doctrine, junior groundwater users should pay compensation to senior surface water users during drought periods and/or should be required to augment surface waters depleted by groundwater pumping.

3. Economic Feasibility

3.1 Effect on Local Business

- During periods of drought, economic productivity within the region would be maximized, given the limited water resources available. Agriculture, which is dependent upon junior

groundwater rights, could be sustained. Nonagricultural water users, who are dependent upon junior groundwater rights, would also suffer less impact during drought.

- Junior water users would face higher costs for water during a priority call, either in the form of lease payments to senior users in order to keep pumping or in the form of surface water right purchases to augment surface waters depleted by groundwater pumping.

- Senior surface water users who cannot divert water during a priority call would receive monetary compensation from junior groundwater users, which would offset their economic losses from an inability to farm during the drought.

3.2 Changes to Local/Regional Businesses

Improving the legal and institutional framework for water management would stabilize the local economy during periods of drought.

3.3 Special or Unique Aspects and Considerations

None.

References/Bibliography

Brown, F. L. Ph.D. 2001. *The value to the City of Albuquerque of storing its San Juan-Chama water in Abiquiu Reservoir or Elephant Butte Reservoir*. Prepared for the City of Albuquerque, Water Resources Division. February 26, 2001.

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Economic Feasibility Fact Sheet
Alternative 26: Domestic Wastewater

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1. Definition of Alternative

A-26: Expand use of centralized waste water collection and treatment systems into all areas of urban and suburban development within the water planning region.

2. Assumptions

- A centralized wastewater collection and treatment system would require planning, siting, and construction of a wastewater system in the Middle Rio Grande (MRG) planning region.

- The financing of this centralized wastewater collection and treatment system would ultimately determine the economic impact on the regional economy and on regional users. If financing external to the region were obtained, the economic impact would be more significant than financing totally from local fees or property taxes.

3. Alternative Evaluation

3.1 Effect on Local Business

- Construction of a wastewater collection and treatment system would have a major impact on the construction industry in the MRG region. The construction itself would create one-time employment, payroll, and purchases of local goods and services in the

local economy. For each $1.0 million of construction expenditures, approximately 20 jobs would be created in the local economy during the life of the construction project.[1]

- Annual operations of the wastewater collection and treatment system would create new jobs in the local government sector (assuming it was operated by a public utility) for operation, maintenance, metering, and billing.

- Financing of a wastewater collection and treatment system could come from a variety of sources including federal, state, and local sources. If the financing were from federal and state sources, the MRG region would benefit from the inflow of state and federal resources to fund construction. If financing were local (i.e., from users within the MRG region through hook-up charges, annual wastewater fees, and/or property taxes), the positive economic impact of construction would be offset by negative economic impacts on sectors such as retail trade and services due to reduced after-tax disposable income.

- Local residents who now use septic systems would see an increase in monthly charges for the operation of the wastewater collection and treatment system. However, these residents would no longer have to pay for annual maintenance of the septic system.

- Suppliers and installers of residential septic systems would suffer a decline in business.

3.2 Changes to Local/Regional Businesses

Water savings or maximization of existing supply could benefit the regional economy by supporting various activities or beneficial uses in the region, some of which would have tangible economic benefits. For example, sectors that can more efficiently use existing supplies could delay the immediate need to acquire additional water rights.

[1] Based on 2001 input/output economic model of New Mexico designed using IMPLAN Professional Version 2.0 software (from Minnesota IMPLAN Group, Inc., Stillwater Minnesota).

3.3 Special or Unique Aspects and Considerations

Water quality in the valley areas would improve due to a decrease in septic-system related contamination. Domestic water well users may also realize costs savings if they do not have to drill as deep to reach potable water.

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Fruth, W.H. Undated. *The flow of money and its impact on local economies*. POLICOM Corporation, National Association of Industrial and Office Properties.

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Economic Feasibility Fact Sheet

Alternative 67: *Water Authority/Banking*

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1. Definition of Alternative

A-67: Establish a regional water management authority to provide professional water resource management and to administer or assist in a water banking program.

2. Assumptions

- A new regional water management authority would be established to implement feasible alternatives identified by the Middle Rio Grande water plan.

- Among the duties of this new regional water management authority would be the implementation of a water banking program for the benefit of both the agricultural and nonagricultural sectors of the local economy.

3. Economic Feasibility

3.1 Effect on Local Business

- A regional water management authority would facilitate the implementation of policies to increase water supply, reduce water demand, and encourage water conservation. Such facilitation would result in economic benefits from access and use of additional water supplies, and improved water supply management.

- A water banking program would provide the financial incentive to local farmers to implement water-saving alternatives such as A-7 and A-10. The economic benefits of

these alternatives would be more achievable if saved water were used to sustain the existing agricultural sector and/or transferred to the non-agricultural sector.

- Water banking would reduce the adverse economic impact of short-term water crises, such as droughts, on the agricultural sector. During periods of shortage, water banking would provide a mechanism to move water to locations where it would provide the greatest economic yield within the agricultural sector.

3.2 Changes to Local/Regional Businesses

- By facilitating the transfer of water from low-income rural areas to high-income urban areas, water banking may adversely impact the economic sustainability of agriculture in the MRG planning region. However, the overall economic productivity of the region would be enhanced by moving water from agriculture to non-agricultural uses.

- If true water savings can be achieved by implementing alternatives such as A-7 and A-10, a win-win situation can be established in which agriculture has sufficient water to maintain its sustainability and water resources can be freed up to other sectors and beneficial uses within the region.

3.3 Special or Unique Aspects and Considerations

None.

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Fruth, W.H. Undated. *The flow of money and its impact on local economies*. POLICOM Corporation, National Association of Industrial and Office Properties.

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Economic Feasibility Fact Sheet
Alternative 52: Growth Management

Acknowledgements: This economic feasibility fact sheet was written by Brian McDonald, Ph.D., a private economic consultant, as part of the "Evaluation of Alternative Actions for Technical, Physical, Hydrological, Environmental, Economic, Social, Cultural, and Legal Feasibility and Water Quality Issues and Legal Overview" contracted to Daniel B. Stephens & Associates, Inc. The format and organization of the fact sheet and the definition of the alternative were developed by the Water Assembly.

1. Definition of Alternative

A-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.

2. Assumptions

- Local governments can reduce use of water via land use policies and regulations, which increase building densities and infill development in the existing urban core and encourage water conservation by both residents and business

- Any proposed development should be required to provide water rights sufficient to meet the new demand for water associated with that development.

3. Economic Feasibility

3.1 Effect on Local Business

- To the extent that this alternative would reduce the demand for water in urban areas, the benefits would include the avoidance of costs associated with obtaining future water rights (currently, a one-time purchase price of $5,000 per acre-foot) and future pumping of groundwater. The reduction of groundwater pumping would prevent consolidation of

the aquifer, thereby preventing land subsidence. Water left in the aquifer could supply the region in times of drought.

- To the extent that infill development results in higher residential prices and higher commercial building prices, there would be adverse impact on homeownership rates and a higher cost of doing business in the city. Land prices within the urban core may rise if land use policies restrict the overall supply of developable land.

- Owners of land on the fringe of urban development would experience a decrease in demand for land and lower land prices.

- A water management authority would be required to develop and implement a growth management plan within the region. This water management authority would require a source of funding, such as the water tax proposed in the fact sheet for A-59, *Severance Tax*. (See A-59 fact sheet in *Evaluation of Alternative Actions for Technical, Physical, Hydrological, and Environmental Feasibility* for further discussion of economic feasibility.)

- The economic burden of the cost of new water rights would be borne by new development rather than the existing community at large.

- New construction activity associated with economic growth and development generates significant gross receipts taxes for New Mexico cities. If growth management policies reduce construction revenues and subsequently gross receipts, these policies may also restrict local government's ability to provide general fund services

- However, the ultimate impact of growth management measures depends upon how the local implementation of these measures affects both the supply and demand for land, housing, and commercial space.

3.2 Changes to Local/Regional Businesses

None.

3.3 Special or Unique Aspects and Considerations

To be effective, any growth management regulations must be adopted region-wide. The benefits of these regulations would be lessened if local residents move to nearby communities that do not implement such regulations.

References/Bibliography

Brown, F. L. Ph.D. 2001. *The value to the City of Albuquerque of storing its San Juan-Chama water in Abiquiu Reservoir or Elephant Butte Reservoir*. Prepared for the City of Albuquerque, Water Resources Division. February 26, 2001.

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See the Technical and Physical Feasibility Fact Sheet for

Alternative 59: Severance Tax

in

Evaluation of Alternative Actions for

Technical, Physical, Hydrological, and Environmental Feasibility