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Contractual Discretion and the Endangered Species Act: Can the Bureau of Reclamation Reallocate Federal Project Water for Endangered Species in the Middle Rio Grande

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Water Conservation Incentives for New Mexico: Policy and Legislative Alternatives

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ABSTRACT

A broad range of options for encouraging municipal, industrial and agricultural water conservation are proposed for water-short New Mexico. Of particular interest are feasible options within the existing institutional and legal framework, focusing on measures that could be implemented without statutory changes by the Office of the State Engineer and the Interstate Stream Commission. Definitions of water conservation and beneficial use should be adopted, with emphasis on efficiency and economic feasibility. A "water conservation policy handbook" should be developed, with guidelines for preparing conservation plans and information on available conservation grants and water banking opportunities. Additional funding for water conservation activities should be pursued through the establishment of a "water conservation grants" program, following examples in Colorado, Texas, and Arizona. Projects currently funded by the Interstate Stream Commission should document the amount of water conserved. Return flow policies should encourage groundwater reuse and recharge, should account for lower quality water in assigning credits, and should recognize that a water right includes a diversion amount, farm delivery amount, a consumptive irrigation requirement, a return flow amount, conveyance losses, and on-farm incidental depletions. A policy statement should be prepared stating that conserved or banked water depletions can be sold or leased by acequia associations, conservation districts or municipalities. Policy statements need to be prepared and publicized that recognize the conservation advantages of protecting water from quality degradation and the potential for using and reusing poor quality water for appropriate uses. In cooperation with the Environment Department, a system of water credits for using poor quality water and other reuse procedures should be

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established. A system of withdrawal fees should be adopted to pay for administering the water conservation program, which would include water conservation grants. Methodologies for calculating the economic benefits of water conservation should be included in a "water conservation handbook," and an economist should be hired to analyze potential projects. All water right applicants should be required to prepare a conservation plan, with guidelines for preparation published in a "water conservation handbook." Metering should be mandatory. The Office of the State Engineer should recognize in a policy statement that integrated resource management plans for watersheds provide rational bases for statewide water planning.

INTRODUCTION

New Mexico's water law has neither a definition of water conservation nor a set of coherent policies for the conservation of water. This analysis reviews a range of options for encouraging municipal, industrial, and agricultural water conservation, particularly those feasible within the existing institutional and legal framework; and chooses the most promising for detailed evaluation. The work focuses on measures that could be implemented through the Office of the State Engineer (OSE) and Interstate Stream Commission (ISC), but are not limited to these agencies, especially where cooperation with other entities would be beneficial. Practical approaches are suggested for new conservation statutes, regulations, and policies.

WATER CONSERVATION STATUTES IN NEW MEXICO

Prior Appropriation Doctrine and Beneficial Use

New Mexico follows the "Colorado doctrine"[1] of prior appropriation, in which the "first in time equals first in right."[2] Under this system, the law requires that in times of shortage the first appropriator receive as much water as is available up to a full supply before junior right holders.[3] Article XVI of the New Mexico Constitution provides that

1. *See* IRA G. CLARK, WATER IN NEW MEXICO: A HISTORY OF ITS MANAGEMENT AND USE 39-43 (1987).
2. *See id.* at 42-43.
3. *See id.*

> All existing rights to the use of any waters in this state for any useful or beneficial purposes are hereby recognized and confirmed.[4]
>
> The unappropriated water of every natural stream, perennial or torrential, within the state of New Mexico, is hereby declared to belong to the public subject to appropriation for beneficial use, in accordance with the laws of the state. Priority of appropriation shall be given the better right.[5]
>
> Beneficial use shall be the basis, the measure and the limit of the right to the use of the water.[6]

The prior appropriation doctrine has not always encouraged water to be used in ways that would promote conservation and efficient use. Wilkinson describes western states, including New Mexico, as "motivated by the 'use it or lose it' mentality that has always driven western water developers to extract as much water as possible as quickly as possible lest it be appropriated by someone else."[7] However, he sees opportunities to work within the structure of the doctrine, opining that "[s]etting water policy right in a relatively short time is a realistic objective, and it can be done without taking draconian measures."[8] In terms of water policy reform in the West, Wilkinson recommends that "[f]irst and foremost, states should adopt phased-in conservation programs to require reduced consumption and diversion of water. Over time, the current high level of waste can be significantly reduced through installing affordable and available technology that would permit more efficient use of the water resources."[9]

The concept of "beneficial use," although undefined in the New Mexico constitution, is an evolving concept.[10] Agreeing that water is a property right, but limited to beneficial use, Wilkinson states that "[w]ater users do plainly possess vested property rights, but they are limited to beneficial use—that is, efficient use without unreasonable waste. This means that states can squeeze current usage to reduce inefficient practices."[11] Other authors, including Clyde, agree that the prior appropria-

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4. N.M. CONST. art. XVI, § 1.
5. N.M. CONST. art. XVI, § 2.
6. N.M. CONST. art. XVI, § 3.
7. CHARLES F. WILKINSON, CROSSING THE NEXT MERIDIAN: LAND, WATER AND THE FUTURE OF THE WEST 223 (1992).
8. *Id.* at 286.
9. *Id.* at 288.
10. *See id.* at 290.
11. *Id.* at 289.

tion doctrine is adaptable to change and can be used to provide incentives for water conservation.[12]

Nonetheless, there are several aspects of New Mexico's law that could create impediments in adapting to modern concepts of beneficial use and conservation. The first possible impediment is that the vast majority of rights confirmed in Section 1 of the state constitution were pre-1907 rights, which constituted most of the surface water rights in New Mexico.[13] Many of these rights have never been formally defined in adjudication suits and are therefore not subject to the jurisdiction of the State Engineer. As a result, these pre-1907 surface water rights may lie beyond the power of the State Engineer to promote conservation by defining beneficial use.

The second issue is that "[p]riority of application shall be given the better right" only describes the strength of the right relative to other holders.[14] Senior appropriators, who normally control the largest allocations, have little incentive to conserve.[15] Prior appropriation legally protects their rights so long as they are putting their duty to full use. Prior appropriation does not mandate *efficient* beneficial use, only *full* beneficial use.[16] A conservation approach, using Wilkinson's interpretation of beneficial use, would encourage all users, especially senior users, to conserve water.[17] Once a water right has been confirmed or permitted, the OSE normally does not have the authority to lower a duty unless there is an application for a transfer.[18] The office could take a forfeiture action, but that would only determine whether the person was using the full right, not whether the right was being efficiently used.

Thirdly, New Mexico law states that "[b]eneficial use shall be the basis, the measure and the limit of the right to the use of water."[19] Under New Mexico's prior appropriation law, beneficial use as the basis of a water right has not been defined. One way to incorporate the concept of conservation into a system that doesn't account for efficiency would be to define the measure and limit of beneficial use with a conservation addendum. For example, an administrative definition (e.g., OSE regulation)

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12. *See* Steven E. Clyde, *Adapting to the Changing Demand for Water Use Through Continued Refinement of the Prior Appropriation Doctrine: An Alternative Approach to Wholesale Reallocation*, 29 NAT. RESOURCES J. 435, 454 (1989).

13. N.M. CONST. art. XVI, § 1.

14. *See* WILKINSON, *supra* note 7, at 234.

15. *See id.*

16. *See id.*

17. *See id.*

18. *See* Bill Fleming & Emlen Hall, Analysis of Potential Water Conservation Incentives for New Mexico 5 (May 1995) (unpublished manuscript, on file with the New Mexico Office of the State Engineer).

19. N.M. CONST. art. XVI, § 3.

could say that "beneficial use shall be the basis, the measure and the limit of the right to the use of water, subject to the appropriator making reasonably efficient use of his water as defined by the state engineer." This type of regulation could be adopted by the OSE without requiring amendment to the constitution.

New Mexico Return Flow Policies

Water right policies in New Mexico are designed to protect downstream and other water right holders.[20] When water is returned to a river or aquifer after certain uses, the amount of return flow is given credit to the water right holder under New Mexico's water administration system.[21] The policy is based on the principle of "keeping the river whole," or not allowing any additional depletions in the river system.[22] While this is hydrologically rational and legally equitable, the policy may not encourage water reuse.

An example of how the policy functions is the disposition of Santa Fe's sewage outflow after treatment by the municipal waste treatment facility.[23] Engineers estimate that municipal use consumes only about 36 percent of the water that is diverted from the several supply sources.[24] The remaining 64 percent of the water is returned to the Santa Fe River,[25] potentially reducing the amount of diversion rights needed to be acquired (calculation of the potential reduction is complex because of the different hydrologic sources of the supply). Because of the high cost of water rights in the Santa Fe area, there is an incentive to return as much sewage effluent as possible to the river, rather than to reuse effluent for watering parks and golf courses.[26]

The city has not yet applied to the OSE to take advantage of return flow credits for San Juan-Chama river water.[27] To fully develop credits for water diverted from the Rio Grande, the OSE would need to be convinced that the effluent actually reaches the Rio Grande (it currently is returned to the Santa Fe River, about ten miles upstream from the Rio Grande).[28]

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20. *See* LINDA G. HARRIS, NEW MEXICO WATER RIGHTS 25-26, 41 (1984).
21. *See id.* at 24.
22. *See id.* at 39.
23. *See* Harza Eng'g Co. et al., Long-Range Water Planning Study for the Santa Fe Area (System Expansion Alternatives) III-13 (Sept. 14, 1988) (unpublished manuscript, on file with Santa Fe County, New Mexico).
24. *See id.* at III-13, III-35 fig.III-1.
25. *See id.* at IV-20.
26. *See id.* at III-13.
27. *See id.* at III-13 to 14.
28. *See id.* at III-13, IV-20.

According to Harza, "the state engineer has suggested that a pipeline from the Santa Fe wastewater plant to the Rio Grande might be considered."[29] From a water rights point of view, there is little incentive for the city to reuse its effluent. Other factors, such as maintaining a constant flow in the river downstream from the treatment plant, are important considerations.

Agricultural return flows are often assumed to be a fixed percentage for a wide variety of field conditions, although documentation to ensure that the percentage is technically accurate and maintained over time may be lacking. There are no written technical or administrative guidelines for calculating return flow in the OSE Water Rights Division or Hydrology Section.[30] Municipal and industrial applicants are required to demonstrate, either with measurements or technically acceptable calculations, the amount of water that returns to the hydrologic system.[31]

An example cited by Chavez is a septic tank application for return flow credits.[32] The present policy is not to allow return flow credits for septic systems unless the water is demonstrated to return to an aquifer through metering data or with convincing hydrologic calculations.[33] In this case, water conservation through on-site reuse of septic tank effluent for outdoor watering is encouraged by this return flow credit policy.[34]

The city of Albuquerque receives credit for return flows to the Rio Grande, which are metered outflows from the sewage treatment plant.[35] In this case, the city may purchase fewer water rights in exchange for the amount that is returned to the river, thereby reducing the cost of expensive transfers from other uses.[36] However, the practice is a disincentive for the reuse of effluent as groundwater recharge or on parks and golf courses.[37] The economic benefits of effluent reuse (e.g. water supply treatment and other associated savings) have not yet been compared with the costs of additional water rights purchase.[38]

A new U.S. Geological Survey groundwater model reports potentially less connection between the deep aquifer underlying Albuquer-

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29. *Id.* at IV-20.

30. Telephone Interview with Calvin Chavez, Water Resources Engineer, Water Rights Division, *New Mexico Office of the State Engineer* (Jan. 10, 1996).

31. *See id.*

32. *See id.*

33. *See id.*

34. *See id.*

35. Telephone Interview with Jean Witherspoon, Deputy Director for Water Conservation, *City of Albuquerque* (Jan. 20, 1996).

36. *See id.*

37. *See id.*

38. *See id.*

que and the Rio Grande than previously considered.[39] If this model were used instead of the more conservative approaches now used, results would show that in 1994 more nonrenewable water came from aquifer storage (55 percent) and less (44 percent) from the river when the city's wells were pumped.[40] The implications of this new information are that the largely nonrenewable deeper aquifer is being rapidly depleted and that it may be prudent to encourage recharge, at least for the portion coming from largely nonrenewable groundwater storage.[41]

A policy change that would encourage conservation is one in which the city has the option to "bank" water without the threat of losing it through forfeiture.[42] The "use it or lose it" criterion of the appropriation doctrine does not encourage appropriators to use less than a full right, because after four years they could be vulnerable to forfeiture.[43] However, the forfeiture statute exempts municipalities and counties from this requirement.[44] Therefore, Albuquerque has the opportunity to implement conservation measures to protect its water sources without fear of losing water rights.[45]

Water Banking in New Mexico

The prior appropriation doctrine doesn't encourage conservation by water right holders because water saved usually returns to public ownership. One of the principles of the prior appropriation doctrine is that a water right cannot be enlarged by a change in use.[46] An irrigator cannot use water saved by more efficient practices to irrigate additional land. The reasoning is that there may be additional consumptive use if the area of irrigated land is increased. Therefore, water saved through conservation usually cannot be used by the conserver and returns to the public domain. However, New Mexico recently adopted a statute which allows water to be "banked" by a conservancy district or an *acequia* or community ditch organization without the threat of forfeiture.[47]

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39. *See* JOHN MICHAEL KERNODLE ET AL., STIMULATION OF GROUND-WATER FLOW IN THE ALBUQUERQUE BASIN, CENTRAL NEW MEXICO, 1901-1994, WITH PROJECTIONS TO 2020 1 (U.S. Geological Survey Water-Resources Investigations Report No. 94-4251, 1995).
40. *See id.*
41. *See* Fleming & Hall, *supra* note 18, at 39.
42. Telephone Interview with Jean Witherspoon, *supra* note 35.
43. *See* N.M. STAT. ANN. § 72-5-28(A) (Michie Repl. Pamp. 1997).
44. *See* § 72-5-28(C).
45. Telephone Interview with Jean Witherspoon, *supra* note 35.
46. *See* Clyde, *supra* note 12, at 438.
47. *See* § 72-5-28(G).

> Periods of nonuse when water rights are acquired and placed in a state engineer-approved water conservation program, by a conservancy district...[or] an *acequia* or community ditch association...shall not be computed as part of the four-year forfeiture period.[48]

The Interstate Stream Commission currently banks water to meet commitments in U.S. compacts.[49]

Pecos Basin Water Rights Lease/Purchase Program

An initiative began in 1988 to alleviate shortages in the Pecos Basin and to ensure compliance with interstate compact obligations to Texas.[50] The state passed legislation in 1991 to create a water conservation program, including projects proposed by the Interstate Stream Commission,[51] under which the Commission proposed to lease and purchase water rights in the Pecos Basin.[52] The Interstate Stream Commission's long-term goal is to increase flows at the boundary with Texas by acquiring water rights, thereby conserving water and protecting water rights in the Pecos Basin.[53]

The legislation provides a water banking option within the general forfeiture statute.[54] The provision exempts water rights owned by *acequias*, community ditch associations, or conservancy districts from forfeiture if these rights are placed in a water conservation program approved by the state engineer.[55] It is important for conservation programs, because it circumvents one of the primary impediments to conservation in the state's water code.

To guarantee the actual use of water and thereby avoid speculation, the territorial legislature mandated that an appropriator use as much water as necessary to fulfill a water right, or duty.[56] If a user didn't use a full duty for extended periods of time, there was a risk of losing part of the duty.[57] The general forfeiture statute did not differentiate between non-use attributable to waste or attributable to conservation by the user. Under this

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48. *Id.*
49. *See* Fleming & Hall, *supra* note 18, at 44.
50. *See id.* at 44.
51. *See* § 72-5-28(G).
52. *See* Memorandum from William J. Miller, Interstate Stream Engineer, *Interstate Stream Commission*, to Eluid L. Martinez, State Engineer, *New Mexico Office of the State Engineer* 1 (Oct. 31, 1991) (on file with the New Mexico Office of the State Engineer).
53. *See id.*
54. *See* § 72-5-28(G).
55. *See id.*
56. *See* § 72-5-28.
57. *See id.*

scheme there was a lack of incentive to conserve if the extra saved water would go back to the state. This new provision gives *acequias* and conservation districts the incentive to conserve by ensuring that any saved water will not be subject to forfeiture and can be used for other purposes.

Water Banking Options in Conservancy Districts

One of the major impediments to conservation is the lack of incentive contained within New Mexico's prior appropriation scheme. Generally, individual water right holders are always subject to abandonment and forfeiture water statutes.[58] These statutes do not distinguish waste from conservation.[59] If an appropriator fails to use a full duty for the required time period, the right may be subject to forfeiture for the portion that wasn't used, regardless of the intent of the appropriator.[60] Thus, the problem confronted by a conscientious appropriator is the fear that, if he begins to make more efficient use of his duty, there may be a loss of that saved water. Confronted with this anomaly in New Mexico's statutory scheme, it is not unreasonable that an appropriator would not invest the time, effort, and financial resources to enact conservation measures without receiving some pecuniary benefit. While general water law seems to lack functional tools to promote conservation goals, the legislature has given conservancy districts an incentive to conserve.[61]

As the name indicates, one of the primary purposes for the creation of conservancy districts was expressly for the conservation and reclamation of water.[62] To protect and reward the conservancy districts' conservation of water, the Legislature has specifically exempted conservancy districts from forfeiture.

> Where the district acquires...water or water rights, or where it conserves, develops or reclaims water, it shall have the rights which go with the appropriation and beneficial use thereof...conservation or reclamation of water by the district is hereby declared to be an appropriation thereof by the district, and the disposition thereof under the terms of this act is hereby declared to be a beneficial use thereof by said districts and by the lands included therein.[63]

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58. *See id.*
59. *See id.*
60. *See id.*
61. *See* § 72-5-28(G).
62. *See* N.M. STAT. ANN. §§ 73-1-1; 73-1-2 (Michie 1978).
63. § 73-14-47(F).

Irrigation districts do not have the statutory authority to bank water, leaving them in the position of being potentially vulnerable to water rights forfeiture after four years of non-use.[64]

Acequia Water Banking

Historically, *acequias* have long been the guardian of water rights for villages throughout New Mexico. Although *acequias* are similar in nature to conservancy districts, legally they are different with respect to forfeiture.[65] A similarity is that both *acequias* and conservancy districts have the power to acquire and hold property and water rights.[66] This important similarity would give *acequias* the power to hold excess water that they conserved, but, as a practical matter, *acequias* could conserve water and re-apply, or transfer, that water to other parcels of land. The term "conservation" is used in this analysis to mean water use efficiency, rather than the older meaning of water storage in a reservoir.

Yet, *acequias* do differ from conservancy districts because they are not subject to the same rules of forfeiture.[67] As discussed above, conservancy districts' water rights are not subject to forfeiture for non-use.[68] *Acequias*, on the other hand, are subject to the same forfeiture requirements as private appropriators: "[t]he rights of an *acequia* or community ditch association to the waters of the *acequia* or their use on the lands and property owned by the *acequia* or association shall not be lost by the *acequia* or community ditch association by prescription or adverse possession or for nonuse of waters except as provided in Section 72-5-28 NMSA 1978."[69]

Although the language of the statute purports to exempt *acequias* from the loss of water rights due to non-use, it is not an exemption at all. Section 72-5-28, the general forfeiture statute, applies to *acequias*.[70] Therefore, just as with private appropriators, there is little incentive to implement a conservation plan if the water remains at risk. The system of water rights for acequias would hold some promise for conservation. There may be an incentive to conserve so long as the conserved water is placed into use. This would result in higher efficiency, but as a practical matter wouldn't affect overall use of water. Perhaps more crops would be grown

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64. Telephone Interview with Patrick Simpson, Assistant Attorney General, Legal Division, *New Mexico Office of the State Engineer* (Dec. 2, 1995).

65. *See* § 73-2-22.1(B).

66. *See* §§ 73-14-47(B) & (F).

67. *See* N.M. STAT. ANN. § 72-5-28 (Michie Repl. Pamp. 1997).

68. City of Raton v. Vermejo Conservancy Dist., 678 P.2d 1170, 1175 (N.M. Ct. App. 1984).

69. N.M. STAT. ANN. § 73-2-22.1(B) (Michie 1978).

70. § 72-5-28.

and less water wasted, but just as much or more water would be used or it would be lost due to forfeiture.

The most promising avenue for *acequias* is the water banking statute, which allows water banking of conserved water for future growth.[71] Adopted for the Pecos River Water Conservation Program, the provision allows for water banking in any part of the state.[72] Presumably, the water would have to be used within the specific conservancy district or *acequia* association where the conservation takes place.[73] While conserved water in a bank does not have to return to the public domain, it is Simpson's opinion that "it does not allow for sale of banked water and leaves open the question of whether the water is wasted."[74] If the water comes under the classification of "wasted water," it returns to the public domain for use by subsequent appropriators.[75]

Another view is expressed by Richardson, who suggests that water conserved under Section 72-5-28(G) could be leased or sold to other water users.[76] Similar to the ISC's Pecos River Water Conservation Program, Richardson suggests a conservation program with both a forfeiture protection and a water bank function.[77] For the OSE to allow the lease or sale of conserved water, there would have to be convincing evidence presented by the applicant that the action would not result in an increase in depletions exceeding the conserved amount.[78]

Assurance that banked water rights could be sold would be a positive incentive for water conservation. Two options for resolving the issue are proposed by Simpson, who suggests that there is justification for either interpretation of the statute.[79] One option encouraging conservation would be for the OSE to issue an interpretive policy statement indicating that the office agrees that, under the present legislation, banked water could be sold.[80] A second and more complicated option would be to draft additional statutory language making it clear that banked water could be sold, and to submit this to the Legislature for consideration.[81] A reasonable interpretation could be made by the OSE that banked water is saleable

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71. *See* § 72-5-28 (G); Telephone Interview with Patrick Simpson, *supra* note 64.

72. Telephone Interview with Patrick Simpson, *supra* note 64.

73. *See id.*

74. *See id.*

75. *See id.*

76. Telephone Interview with Bruce Richardson, Water Resources Specialist, Hydrographic Survey Division, *New Mexico Office of the State Engineer* (Jan. 14, 2000).

77. *See id.*

78. *See id.*

79. Telephone Interview with Patrick Simpson, Assistant Attorney General, Legal Division, *New Mexico Office of the State Engineer* (Nov. 2, 1995).

80. *See id.*

81. *See id.*

under existing legislation, and a policy statement to this effect would clarify the issue and serve as an incentive for water conservation.[82]

Implementing the Promising Approaches

The following incentives are identified as promising and are discussed in terms of potential changes in statutes, regulations and policies, as well as strategies for implementation:

definitions of conservation, beneficial use and public welfare;
grants and loans;
return flow policies;
water banking and forfeiture issues;
coordination of water quality and quantity;
user charges;
economic analysis;
integrated resource management and conservation plans; and
disposition of conserved water.

DEFINITIONS OF CONSERVATION, BENEFICIAL USE AND PUBLIC WELFARE

Beneficial Use as Related to Conservation

"Beneficial use shall be the basis, the measure and the limit of the right to the use of water."[83] Under New Mexico's prior appropriation law, "beneficial use" remains undefined. Beneficial use, in its usual meaning, is a very broad standard and there are many types of uses that are beneficial. An effective way to incorporate the concept of conservation into a system that doesn't explicitly account for efficiency would be to define beneficial use with a conservation addendum.

Analysis of the term "beneficial use" may be helpful. There are three distinct concepts defined by the phrase "beneficial use." The first is that "beneficial use shall be the basis...of the right to the use of water."[84] As discussed above, with the diverse water uses in New Mexico, it would not only be politically, but also economically unwise to change this part of the definition. For almost a century, New Mexico has been well served by an expansive definition of beneficial use as the basis for a water right.[85] There

82. *See id.*
83. N.M. CONST. art. XVI, § 3.
84. *Id.*
85. *See id.*

are many "beneficial uses" that serve to diversify our culture and economy. Of course, the initial determination of what "beneficial use" is has always remained within the discretion of the OSE, [86] and because it is such a factual matter determined by hydrologic, engineering, and legal considerations, the OSE is perhaps the proper entity for this determination.

Second, "beneficial use" as the "measure" of a water right should also remain as a basic element of the essential water code.[87] Without having some general measure of a water use, the legislature or the OSE would have to somehow delineate specific measures of each possible proposed water use. This alone would be a tremendous task.

The third concept in the definition of "beneficial use" is the limitation aspect ("[b]eneficial use shall be the basis, the measure and the limit of the right").[88] A change in this part of the definition could help to clarify the concept of conservation. The first two aspects of the definition deal with a determination of *why* and in *what quantity* a person could use water. But, the third part deals with *how* the appropriator would use a water right. Although it includes much more, the principal aspect of conservation is a mandate to existing appropriators to use the resource more efficiently. Conservation goals can be achieved by precluding uses that are inefficient.

The OSE could promulgate a regulation defining beneficial use: "Beneficial use shall be the basis, the measure and the limit of the right to the use of water, subject to reduction if the appropriator does not make reasonably efficient use of the right." Efficient use of water should be defined, in general, as a water use which minimizes the diversion and consumption of water without adversely affecting the beneficial use thereof, and is consistent with present technologies which are economically feasible. In the interim period before a regulation is adopted, the OSE should issue a policy statement with the same information.

Definition of Water Conservation

It appears that a definition of conservation could be adopted based on existing constitutional definitions, statutes relating to the subject, and case law. Statutory guidance comes from requirements that the state engineer determine that new applications and transfers are not "contrary to the conservation of water."[89] For new applications and adjudications, the OSE has the authority to determine an amount of surface water "consistent

86. *See* N.M. STAT. ANN. §§ 72-2-8; 72-4-15 (Michie Repl. Pamp. 1997).
87. *See* § 72-12-2.
88. N.M. CONST. art. XVI, § 3.
89. §§ 72-5-6; 72-5-7; 72-12-3(D) & (E). *See also* § 72-5-5.1.

with good agricultural practices and which will result in the most effective use of available water in order to prevent waste."[90] Other statutes recognize the relationship between "conservation" and the "prevention of waste."[91] The ISC has a mandate to "protect" and "conserve" the waters of the state.[92]

New Mexico administrative law supports the concept of "efficient" water use, particularly in municipal use. The city of Roswell was denied a request for additional water because it had a "high" per capita rate of water use and had no conservation plan specifying measures to make consumption more efficient.[93] The Intel Corporation was required to reduce its water demand by 40 percent through conservation in a recent OSE decision.[94] The city of El Paso, Texas, was denied a request for additional water, partly because the state engineer decided that the city could meet 40-year needs through conservation and more efficient use.[95]

With these precedents, it is likely that the OSE could successfully adopt a definition of water conservation with the concepts of efficient use without unreasonable waste. Because, in general, there is no existing legal impediment to such a definition, the state engineer could implement a conservation policy either by practice, as has been the custom in the office, or by formal regulation, which has rarely been resorted to. In light of the need to raise public consciousness about conservation, a formal well-publicized regulation would be preferable to the current case-by-case approach.

Such a new regulation should clearly apply to new applications to appropriate water. It should also apply to changes in the purpose and place of use of existing rights. Finally, because the definition of beneficial use could limit existing rights to the most efficient means of exercising them, a conservation regulation could apply as well to existing rights to water so long as those rights either had been adjudicated or were based on an OSE license.[96]

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90. § 72-5-18.

91. *See* § 72-8-4.

92. *See* § 72-14-3.

93. *See In re* Application of Leo Edward Bergschneider for Permit to Change Point of Diversion and Place and Purpose of Use from Surface to Ground Water in the Roswell-Artesian Basin, New Mexico, New Mexico State Engineer Nos. 01734 & RA-4533-Enlgd. A&B into RA-4253 & RA-4255, Findings of Fact & Recommendation 3-5 (1992).

94. *See In re* Application of INTEL Corp. to Appropriate the Underground Waters of the State of New Mexico in the Rio Grande Underground Water Basin, New Mexico State Engineer Nos. RG-57125; RG- 57125-S; RG-57125-S-2, Findings and Order 14-17 (1994).

95. *See In re* Applications of the City of El Paso, Texas, Public Service Board Nos. HU-12 through HU-71 & LRG-92 through LRG-357, New Mexico State Engineer Findings and Order 6-8 (1987).

96. *See* N.M. STAT. ANN. § 72-2-9 (Michie Repl. Pamp. 1997).

The OSE should adopt a regulation defining water conservation, containing at least the following elements: (1) efficient use of water to prevent or reduce waste without causing reductions in economic benefits, without causing impairment to existing users, and without being detrimental to public welfare; (2) use which prevents or reduces water pollution; (3) use with presently available and economically feasible technologies; (4) reduced water uses, including diversions, conveyance losses, incidental depletions and return flows.

As a program implementation measure, it is recommended that a "conservation policy handbook" be prepared by the OSE, including the following:

conservation definitions, including beneficial use;
guidelines for a conservation plan, including required contents of an acceptable plan;
a review of OSE administrative decisions on conservation, including El Paso, Roswell, Alamogordo and Intel;
information on available conservation grants and loans for municipal, agricultural and industrial users;
return flow policies encouraging conservation;
water banking opportunities for conservation;
integrated resource planning, including water quality and watershed management;
economic incentives for water conservation (including examples);
incentives and methods for selling conserved water;
methods for using a water right for instream flow; and
examples of variations in "consumptive irrigation requirement" (CIR) from basin to basin, including the reasons for variations and example calculations.

Grants and Loans

Some grant and loan options are presently available for agricultural water conservation through programs such as the Irrigation Works Construction Fund and related state and federal programs.[97] A description of these opportunities should be published as a "guide to water conservation project funding" or included in a handbook, along with application. Evaluation of the amounts funded each year in New Mexico should be summarized and published.

Additional funding options through the Conservation Program of the OSE should be actively pursued, and a "water conservation grants" program should be established. Areas funded would include municipal,

97. *See* Fleming & Hall, *supra* note 18, at 27.

agricultural, and industrial water conservation projects. Funding for such a program could come from fees charged for water withdrawals. Although the Irrigation Works Construction Fund has the option to fund more agricultural water conservation projects, the opportunities need to be better described and publicized.[98] The ISC should require each funded project to document the amount of water conserved. Additional agricultural projects should be funded under an OSE "water conservation grants program."

Return Flow Policies

Return flow policies allowing credits against diversion requirements are a disincentive to water reuse. Revisions in water rights return flow policies would encourage reuse of effluent for groundwater recharge and irrigation of lower quality water on parks and other outdoor facilities.

Return flow policies should (1) encourage reuse and groundwater recharge, particularly in nonrenewable aquifers; (2) account for lower quality water in return flows; (3) recognize that a water right includes a diversion amount, farm delivery amount, a consumptive irrigation requirement (CIR), a return flow amount and conveyance losses.

These initiatives should be effected through internal policy development, rather than statutory or regulatory changes. Steps for implementation include (1) establishment of a joint Water Rights Division/Special Projects/Hydrology Section task force to formulate preliminary technical recommendations, (2) request for public input on proposed changes in water rights policies, (3) formulation of recommended policy changes and submission to the state engineer, (4) revision and adoption of policy changes by the state engineer, and (5) publication of return flow policies in the "water conservation handbook."

Water Banking and Forfeiture Issues

Several recent provisions in the law, particularly the Pecos Basin Water Conservation Program, provide mechanisms for conservation districts and *acequia* associations to save water through conservation practices and not lose the conserved water by forfeiture.[99] Municipalities already have these privileges under current law.[100] Water banking vests these administrative entities with the power to enact conservation programs and retain the conserved water rights. It also vests the state engineer with oversight power in approving conservation programs. With

98. *See id.*
99. *See* § 72-5-28(G).
100. *See* § 72-5-28(C).

the broad powers to hold water rights and transfer them, conditions for water banking approaches are greatly improved.

While this provision alleviates the concern about forfeiture, circumventing the beneficial use and the four-year forfeiture requirements, it only benefits the listed entities. It does not expressly authorize the state engineer to enact conservation programs, although the ISC is empowered to initiate banking.[101] *Acequia* associations have not yet used this provision, and a manual describing the steps in setting up a water bank for conserved water would be a useful step in encouraging implementation of conservation opportunities.

The OSE should prepare a policy statement stating that, under existing legislation,[102] banked or conserved depletions can be sold or leased by *acequia* associations, conservation districts or municipalities. The statement should also clarify that conserved or banked water could also be allowed to become instream flow without fear of forfeiture. If the conservation practice is discontinued, the OSE can protect the integrity of the stream system by requiring that the seller retain at least as large a water right (in acre-feet) as the one sold or leased. The OSE would retain jurisdiction over the seller's remaining water right, and would reduce it by the amount of the conservation practice that was discontinued.

Coordination of Water Quality and Quantity

Several opportunities exist for conjunctive management of water quality and quantity without statutory or regulatory changes. Policy statements need to be prepared and publicized that recognize the conservation advantages of protecting water from quality degradation and the potential for using and reusing poor quality water for various appropriate uses.

An interagency task force should be established with representatives from the OSE; the ISC; the Energy, Minerals and Natural Resources Department; and the Environment Department so that common conservation goals can be accomplished. Cooperative arrangements between the OSE and the NM Environment Department should be encouraged so that critical water quality issues, particularly in the areas of water reuse and the allocation of lower quality water for certain uses, can be integrated into a comprehensive conservation program. Within the Environment Department, the Water Quality Standards Program, the Nonpoint Source Control Program, and the Surface Water Bureau are key elements.[103]

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101. *See* § 72-5-28(G).
102. *See id.*
103. *See* Fleming & Hall, *supra* note 18, at 63.

A system of water credits for using poor quality water and other reuse procedures needs to be established as part of OSE water rights policy. An OSE task force comprised of representatives from the Water Rights Division, the Hydrology Section, the Water Conservation Program, and the Environmental Division should be established to formulate policies on this issue. The task force should draft proposed policies to be reviewed and approved by the state engineer as OSE policy. The task force could begin with the goal of Arizona's Water Quality Assessment and Management Program, which is "to manage the quality of...groundwater in order to maximize the quantity of water available for beneficial use."[104]

For example, Arizona accounts for effluent at a reduced rate for the purposes of determining compliance with an annual pumping allotment.[105] If the amount of effluent used by a golf course is between 50 percent and 89 percent of its annual diversion allotment or actual use (whichever is less), each acre-foot of effluent is counted as only 0.85 acre-foot of water for diversion right accounting.[106] If effluent use is 90 percent or more of use, each acre-foot is counted as 0.80 acre-foot.[107]

Information on integrated water quality and quantity management for conservation enhancement should be presented in an OSE "conservation handbook." The Environment Department should have a representative on the Interstate Stream Commission. While the OSE/ISC has a representative on the Water Quality Control Commission, the Environment Department is not represented on the Interstate Stream Commission.[108]

User Charges and Metering

Other states, such as Arizona, charge water users a fee for withdrawals based on the quantity withdrawn (an incentive to conserve water).[109] The Arizona fees, ranging up to $5 per acre-foot of water withdrawn, are used to pay part of the costs of administering water and to fund a grant program of conservation projects.[110]

Through regulation, a system of withdrawal fees should be adopted for New Mexico to pay for administering the water conservation program, as well as for funding a program of water conservation grants. The fee schedule should be established on a "per acre-foot" of withdrawal

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104. *See* ARIZONA DEP'T OF WATER RESOURCES, MANAGEMENT PLAN FOR THE SECOND MANAGEMENT PERIOD: PHOENIX ACTIVE MANAGEMENT AREA 43 (1991).

105. *See id.* at 184.

106. *See id.*

107. *See id.*

108. *See* N.M. STAT. ANN. § 72-5-28(G) (Michie Repl. Pamp. 1997).

109. *See* ARIZONA DEP'T OF WATER RESOURCES, *supra* 104, at 274.

110. *See id.*

basis, in itself an incentive for water conservation. It is recommended that a task force within the OSE/ISC be established to develop a program of withdrawal fees, based upon the amount of water used, and recommend a program to the state engineer for approval.

It is clear that metering is an incentive to conserve water, especially when rate structures are of the increasing block-rate type.[111] Just as important is the information that comes from metering of water use in various basins. Senior personnel in the OSE and ISC consider the information critical for making rational water administration decisions.[112]

Mandatory metering of all water use is recommended policy for the OSE because the information is considered essential for rational administration and evaluation of all programs related to water use, including water conservation. This policy should be adopted as soon as administratively possible and implemented on a basin-by-basin priority, beginning with the basins having the highest water use and most serious supply/demand problems.

Economic Analysis

The use of benefit-cost analysis is an effective way of demonstrating economic incentives for conservation.[113] Some benefits are "hidden" and need to be clearly quantified and shown to decision makers who may be uncertain about the economic viability of water conservation. The OSE should consider establishing a position in economic analysis or contracting for the studies. Examples of the economic benefits of water conservation should be illustrated in an OSE "water conservation handbook."

The importance of evaluating economic tradeoffs has been mentioned several times in this analysis: return flow policies, water banking, water quality issues, user charges, and public welfare evaluations (particularly with regard to the entitlement to conserved water). Several states, particularly California, use benefit-cost analysis as a method to determine the economic efficiency of various water conservation programs.[114]

Comparing the benefits and costs of a particular conservation measure is a useful exercise because it can be an important way to convince decision makers to adopt a program. A recent water conservation

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111. *See* Fleming & Hall, *supra* note 18, at 65.

112. *See id.*

113. *See* William M. Fleming, *Phewa Tal Catchment Management Program: Benefits and Costs of Watershed Conservation in Nepal, in* FOREST AND WATERSHED DEVELOPMENT AND CONSERVATION IN ASIA AND THE PACIFIC 217, 265 (Lawrence S. Hamilton ed., 1983).

114. *See* GARY S. FISK & RENNIE ANN WEINER, A GUIDE TO CUSTOMER INCENTIVES FOR WATER CONSERVATION 16 (U.S. Envtl. Protection Agency Handbook No. 230-R-94-001, 1994).

conference illustrated the method with an example from Austin, Texas, where the benefits and costs of installing ultra low flush toilets were analyzed from the perspective of the customer.[115] Results showed that the customers would save $1.06 million by lowering water consumption during the first year, compared with installation costs of $0.9 million.[116]

Economic analysis of the costs and benefits of, for example, effluent reuse could be done for the city of Albuquerque. Costs would include the purchase of additional rights for effluent water not returned to the river and distribution costs of transporting effluent to parks, golf courses, and other irrigation opportunities. Benefits would include savings from lower water supply treatment costs, possible groundwater recharge, and more available water for other uses. The benefits of using lower quality water for certain uses could be evaluated in a similar way.

Examples of the economic benefits of water conservation, such as those summarized here, should be presented in a "water conservation handbook." Case studies from other communities should be described, illustrating the benefits of using lower quality water for a variety of uses, benefits of instream flow for fish and recreation uses, and the benefits and costs of a program to install ultra low flush toilets.

Integrated Resource Management for Water Conservation

Integrating key elements of the planning process will help to ensure that a community water conservation plan has a good chance for successful implementation. The first step of the process involves a careful and insightful definition of plan objectives, such as the use of the most technically efficient and/or cost-effective measures to reduce water use. Continuous monitoring and evaluation are needed so the success of the plan can be documented and demonstrated. Both supply-side and demand-side options for efficient water use should be evaluated and rated in terms of the carefully outlined objectives.

Local public input is essential from the beginning of the planning process because it is the people who live in the region who are the implementers of the plan. Locals must feel they have helped to identify problems and solutions, and will be involved in continuous evaluation of project success. Public meetings may have to be professionally facilitated for maximum effectiveness. Financial and economic analyses are essential to ensure that benefits are expected to exceed costs, with inclusion of non-

115. *See* Ximena Poch, *Austin's Free Toilet Program: Cheaper than Rebates!*, *in* PROCEEDINGS OF CONSERV 96: RESPONSIBLE WATER STEWARDSHIP 649, 652 (1996).

116. *See id.* at 652-53.

monetary values in the equation. The benefits of education and demonstration components should not be underestimated.

All water right applicants should be required to prepare a conservation plan and the OSE should prepare and publish a "New Mexico Conservation Plan Handbook." The OSE needs to develop a methodology to ensure that applicants plan and implement conservation measures. A conservation plan needs to include a detailed evaluation of supply and demand, evaluation of methods to reduce demand through increased efficiency, evaluation of alternative sources of supply, economic analysis of the costs of alternative sources, consideration of the most technically efficient water conservation methods to reduce demand, impacts on other users, whether the source is renewable or nonrenewable, how long a nonrenewable source will last, water quality issues of reuse and the use of lower quality water, and the disposition of conserved water. Guidelines should be developed for staff review of conservation plans.

The OSE should recognize in a policy statement that integrated resource management plans for watersheds are a rational basis for statewide water planning. Watershed management involves the analysis, protection, development, and maintenance of the land, vegetation, and water resources of a drainage basin for the conservation of all its resources and for the benefit of its residents.[117] Watershed management is directly related to water conservation because it reduces flood peaks, prolongs streamflow during dry seasons, and reduces the sedimentation rate in reservoirs.[118] Watershed management incorporates all aspects of water supply management, habitat protection, flood control, and water quality protection efforts.[119] The watershed approach provides a framework and a new focus for effectively integrating ongoing programs and developing innovative solutions to water management problems.

Disposition of Conserved Water

At present New Mexico captures (and thereby "conserves") incidental depletions required by beneficial use only when an existing right is transferred to a new place for a new use.[120] For more than twenty-five years, the OSE has administratively limited transfers to specific consumptions for particular uses. At the time of the transfer, the balance of a New Mexico water right included in a diversion—incidental off-farm and

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117. *See generally* Bill Fleming, Watershed Health: An Evaluation Index for New Mexico (1998) (unpublished manuscript, on file with the author).

118. *See id.* at 8.

119. *See id.*

120. *See* Fleming & Hall, *supra* note 18, at 68.

on-farm depletions not recaptured as part of the historic supply of existing users—is returned to the public stock to satisfy other existing users with histories of a short supply, and then new appropriations. New Mexico could impose or encourage the same "conservation" methods, prior to transfer, by requiring the holders of existing rights to reduce those incidental depletions currently needed to serve the underlying beneficial use essential to the right, if economically feasible.

New Mexico could achieve those conservation savings with respect to existing rights in one of two ways. First, the OSE, by regulation, could require the holders of existing rights either to reduce their incidental depletions or to reduce their corresponding consumptive right ("direct depletion"). In this way, existing holders would have to elect either to conserve water by correcting for their own incidental depletions or by cutting back on their direct depletion. If an existing water rights holder chose not to reduce his incidental depletions, he would be required to reduce his direct depletion. One way or the other, the same amount of public water would be conserved.

An example clarifies this alternative: a farmer has a diversion right of eight acre-feet per acre (afpa). One acre-foot of that diversion is depleted by the farmer's delivery system before the water reaches the point of direct depletion for beneficial use. The consumptive irrigation requirement by the crop amounts to three acre-feet. Another acre-foot is depleted after the water passes the point of direct consumption. The last three acre-feet of the diversion are neither directly consumed nor indirectly depleted. This amount is incidentally lost and recovered by other existing users as part of their historic water supply.

In the above scenario, the OSE could require the existing water right holder to bring his diversion closer to his direct consumption by requiring him to reduce the two acre-feet part of his eight acre-feet diversion attributable to incidental depletions. The OSE probably could not require the water right holder to reduce the three acre-feet part of his diversion right attributable to direct consumption for beneficial use since these three acre-feet are the essential part of his protected property right. But the OSE could require the appropriator to reduce his diversion by a reasonable fraction of the two acre-feet of his eight acre-feet diversion which represents incidental depletions not strictly necessary to his consumptive right and not part of a neighbor's historic supply.

A second alternative could be used if the water rights holder refused to invest in the technologies necessary to reduce incidental depletions. The OSE could reduce a water right owner's direct consumption for beneficial use to offset the unnecessary incidental depletions. In the scenario above, the OSE would require the water rights holder to reduce his direct consumptive depletion by two acre-feet, the amount of the user's incidental depletions, thus requiring the inefficient user to account for his

incidental depletions as if they were part of his consumptive right. Either by reduction in diversion or reduction in direct depletion, the OSE would make additional unappropriated water available for public purposes.

The OSE might also consider splitting water saved by reduction of incidental depletions between the water right conservator and the state. Referring to the example above, if the irrigator eliminated the two acre-feet of his own incidental depletions, the OSE could allow him to increase his direct consumption by one acre-foot. The other acre-foot would revert to the public supply.

The first, a regulatory alternative, may seem harsh, especially in light of the long-standing practice in New Mexico of not scrutinizing too critically the ancient and on-going inefficient methods of delivering water to the land. Nevertheless, such regulation is clearly allowed by New Mexico law.[121] For New Mexico, it is a question of political will rather than legal right.

The second, a private investment alternative, has the advantage of appearing less Draconian, although it offers less in savings to the public. Oregon, with its much less rigorous analysis of the elements of a water right, has attracted very few takers for its water conservation scheme.[122] The experience there suggests that the offer of a private/public conservation plan may not hold much promise.

In any case, no one knows how much water is now incidentally depleted from New Mexico's public supply. The two alternatives discussed here—regulation and reduction—would require complex criteria to administer and implement. A prudent first step would be to analyze the potential amount of water that might be saved to determine whether either is worthwhile.

The OSE should analyze the potential amount of water that might be saved through the alternatives of regulation or reduction of existing agricultural water rights. If one of the alternatives appears worthwhile and administratively feasible, criteria for implementation should be developed with public input.

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121. *See* N.M CONST. art. XVI, § 3. *See, e.g.*, New Mexico *ex rel.* Reynolds v. Lewis, 508 P.2d 577 (1973); New Mexico *ex rel.* Reynolds v. Niccum, 695 P.2d 489 (1985).

122. Telephone Interview with Douglas Parrow, Water Resources Specialist, *Oregon Dep't of Water Resources* (Nov. 29, 1995).