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# A Case Study of Water Sharing in the San Juan Basin

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# **A Case Study of Water Sharing in the San Juan Basin**

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## Abstract

In times of shortage, how should New Mexico's scarce water supply be allocated? New Mexico's prior appropriations doctrine gives a temporal preference of "first in time, first in right," as the rule for allocation. Unfortunately, in most basins, we do not know with certainty who that "first" is, because rights have not been adjudicated. In 2004, the New Mexico Legislature passed Active Water Resource Management (AWRM) legislation which codified the Office of the State Engineer's (OSE's) authority to administer water rights in advance of adjudication if needed. The OSE promulgated general regulations in 2004 implementing the legislation and district specific regulations for seven priority basins are forthcoming. Both the general and proposed district specific regulations allow for alternative administration, which consists of water sharing agreements, which include shortage sharing. Shortage sharing basically allows all water rights users in a particular basin to share the pain of low water years, ensuring that everyone gets a little water. This contrasts with traditional priority date based administration in which senior water rights holders get their full allocation of water before junior holders get any.

While the AWRM as a whole has been controversial and further implementation bogged down in litigation a series of water sharing agreements have been successfully negotiated in the San Juan Basin. The San Juan agreement covers how to allocate water in the basin in advance of the adjudication process, and also includes provisions for water sharing during drought years. Factors leading to the agreement's success include the nature of its administrative structure, its comprehensiveness, its flexibility, and the nature of its water allocation procedures. This is consistent with other research into interstate water sharing agreements.

In my paper I will first discuss the background of traditional priority administration and water adjudications in the state of New Mexico, as well as delve into the nature of the AWRM alternative, which serves as the basis for the formation of shortage sharing agreements. I will next discuss some of the literature on large interstate agreements. I will then derive principles from them that can be applied to smaller local water sharing agreements. Finally, I will apply these to the San Juan Basin agreement,

and discuss whether the agreement has been successful or not, and whether it could be used as a model for other local water sharing agreements.

I conclude that although adjudications are absolutely necessary and traditional priority date based administration will likely continue to be the most common method of water allocation in New Mexico, water sharing agreements in advance of adjudications can be useful tools for dealing with the Western United States' water "crisis."

## **Introduction**

New Mexico, like many other states in the West, has a water shortage. Demand is increasing as population increases, while supply is decreasing due to both climate change and the nature of New Mexico's water supply. One suggestion for dealing with the water shortage has been that we use the traditional prior appropriations system. New Mexico's constitution makes temporal priority the basis for water administration, but in New Mexico most water basins have not been adjudicated due to the costly and lengthy nature of the adjudication process.

The New Mexico Legislature recognized all of this in January of 2003 when it authorized the Office of the State Engineer (OSE) to promulgate Active Water Resource Management (AWRM) regulations. The legislation gives the OSE explicit permission to administer water rights in advance of adjudication in order to deal with the state's water shortage. Necessary tools for administration include a list of administrable rights and metering to determine how much water is being used by each appropriator. General regulations were finalized in December of 2004 and district specific regulations for seven priority basins are currently in the process of being drafted (Hoffman, 2008).

One particularly interesting aspect of the AWRM regulations is the provision allowing for alternative administration. Alternative administration contrasts with traditional priority of right administration and is based on negotiated water sharing agreements that can include shortage sharing agreements (New Mexico Statutes Annotated (NMSA) §19.25.13.6.4). Historically, shortage sharing agreements have been used by acequias in the state (O'Leary, 2004). Although implementation of the AWRM regulations is on hold due to litigation, water sharing agreements have been worked out and approved by the OSE in many priority basins, including the San Juan. A shortage sharing agreement was also negotiated among some users in the Gallinas, but was not approved by the OSE because it did not include all affected water users (Hoffman, 2008).

This paper answers three questions. First, what principles do successful water sharing agreements share? Most research into water sharing agreements looks at agreements between countries or U.S. interstate compacts. This is the starting point.

Second, do the same principles apply when looking at agreements among a small number of water users under a single jurisdiction as apply when looking at agreements among large state and federal actors? Finally, are local water sharing agreements<sup>1</sup> a useful overall addition to the system of water allocation in the West?

In order to address these questions, I specifically consider the example of one local water sharing agreement in the San Juan River Basin in New Mexico. I chose the San Juan Basin because it is the only agreement of its kind where users negotiated prior to any litigation or action by a state agency. The other alternative administration agreement in place is on the Pecos River, but that is based on the “Pecos Settlement Agreement,” which was a result of litigation (OSE, 2006). Also useful for comparison purposes would be the proposed agreement in Gallinas River Basin, where approval was not granted by the OSE. This was left out because of a lack of time and information.

My paper first considers the background of traditional priority administration and water adjudications in the state of New Mexico, as well as the AWRM alternative, in order to place the San Juan agreement in context. Second, it considers the large body of research on what makes international and interstate agreements succeed or fail. Third, it then distills the essential principles that can be applied to local water sharing agreements. Finally, using these principles as a framework for analysis, it considers the San Juan agreement.

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<sup>1</sup> For the purpose of this paper a local agreement will be defined as one among a limited number of water rights holders all using a single water source and all located within a single state



## **Chapter 1: New Mexico Context**

### **Traditional Water Law in the State of New Mexico**

It has been suggested that one strategy for dealing with New Mexico's water shortage is to start administering on the basis of the traditional prior appropriations system. In order to consider why this may or may not work, it is useful to have a basic knowledge of the traditional New Mexico water law. Water law in the state of New Mexico, like other western states, is based on the doctrine of prior appropriation, or "first in time first in right" (New Mexico Constitution, Article XVI, §2). This contrasts with eastern states where water law is based on riparian rights which award water rights to the owner or owners of the land adjacent to a water body.

Water rights in New Mexico are complicated by New Mexico's long history of European settlement. On January 6<sup>th</sup>, 1912, New Mexico adopted its constitution. It states "All existing rights to the use of any waters in this state for any useful or beneficial purpose are hereby recognized and confirmed" (New Mexico Constitution, Article XVI, §1). This included rights granted to Pueblos and to Spanish settlers under Spanish law starting in 1540, rights derived under Mexican law starting in 1824 and confirmed by the Treaty of Guadalupe, Hidalgo in 1848, and rights granted between 1848 and 1912 when New Mexico was a territory of the U.S (Hall, 2007). Article 16 §3 of the New Mexico Constitution goes on to state that "beneficial use shall be the basis, the measure, and the limit of the right to use of water" (New Mexico Constitution, Article XVI, §3).

The water rights Article 16 considers are mostly surface water rights. Prior to the adoption of the 1907 water code, a new water right was obtained by taking water and applying it to beneficial use. The priority date of a surface water right relates back to the time in which an appropriator took the first concrete steps to appropriate water. Since the adoption of the 1907 water code, a permit has to be obtained from the OSE, then necessary works constructed, and proof filed that the water is being put to beneficial use. Finally applicants are supposed to file for a license, but few applicants actually take this step. During this process the OSE determines if un-appropriated water exists, if the new water right would prove detrimental to senior water rights holders, and if the new right is

against the public interest (NMSA, § 72.5.1, §72.5.7). In New Mexico, surface water is over appropriated and there are no new surface water rights being approved (Hall, 2007).

New Mexico water law also covers rights to groundwater. Groundwater rights in the state have always been governed by the law of prior appropriation (Yeo v. Tweedy, 1929). There exist two processes for acquiring a new groundwater right depending on whether the basin is declared or undeclared. Most of the groundwater basins in New Mexico are declared basins (NRCS, 2002). Inside a declared basin, an applicant must apply to the OSE and must give notice. Prior to drilling the appropriator must prove that there exists un-appropriated water and that his or her well will not impair existing wells. The OSE also has a duty to protect existing rights. In an undeclared basin, an appropriator is free to drill and get a right to water without the permission of the OSE. The new appropriator can be sued by an existing water rights holder, but the burden of proof is on the one suing to prove impairment (NMSA §72.4). Given all of the different types of water rights claims on any given system, it is easy to see why water adjudications are costly and lengthy. The purpose of adjudication is to establish validity of a right and its elements such as priority date, volume, and uses allowed. An adjudication must define the legal and hydrological interrelationship of: (1) Pre-1907 rights, (2) Post 1907 rights, (3) Pre-declared basin rights (in the case of groundwater), (4) Post declared basin rights (in the case of groundwater), (5) Federal reserved rights, and (6) Native American rights. In an adjudication, the plaintiff is the State of New Mexico and the defendants are all of the water rights holders. Water rights are investigated using aerial photographs, Geographic Information Systems (GIS), and other means. Next, a hydrographic survey determines the elements of each right: quantity, type of use, purpose of use, and location of use. Then an offer of judgment with these elements listed is given to each plaintiff. If the owner disagrees with his or her offer of judgment, then the case goes to trial. If the owner agrees with his or her offer of judgment or after the trial, an order is entered. After all the orders are entered, the court enters a partial final decree confirming all prior orders. Next, during the inter-se portion of adjudication process, individual water right holder can challenge each other over the elements of their water rights (NMSA §72.4 / Hoffman, 2008). Adjudications have been completed for less than 25 percent of the water rights in the State of New Mexico. As of 2007 there were

twelve ongoing adjudications in the state, some of which had been going on for decades (Associated Press, November, 2007). In 2007, “State Engineer John D’Antonio...estimated it would cost \$300 million over 55 years to settle all the claims on New Mexico’s rivers and streams” (Ibid).

### **Active Water Rights Management in the State of New Mexico**

In the many basins of the state that are not completely adjudicated, the State Engineer does not have a list of administrable water rights to use as the basis for administration. Therefore, administering on the basis of the traditional prior appropriations system is currently not a very useful tool to get a handle on New Mexico’s water “crisis.” An alternative is needed. Active Water Resource Management (AWRM) is an effort to administer water rights in the state of New Mexico in advance of completion of the numerous costly and lengthy legal adjudications that are underway throughout the state. When AWRM was authorized in 2003, the state legislature stated,

The legislature recognizes that the adjudication process is slow, the need for water administration is urgent, compliance with the interstate compacts is imperative and the state engineer has the authority to administer water allocations in accordance with water right priorities recorded or declared or otherwise available to the state engineer (NMSA§72.2.9.1A).

It charged the Office of the State Engineer (OSE) with adopting rules for priority administration that would, “Ensure that authority is exercised: (1) so as not to interfere with future or pending adjudications; (2) so as to create no impairment of water rights, other than what is required to enforce priorities; and (3) so as to create no increased depletions” (NMSA§72.2.9.1A). Additionally, the OSE was directed to adopt rules based on appropriate hydrologic models and that allowed for expedited marketing and leasing (NMSA§72.2.9.1A).

The 2003 legislation led to the promulgation of general regulations in December of 2004 by the OSE. The OSE’s regulations state that the scope of the regulations is to undertake the supervision of the physical distribution of water, to prevent waste, and to administer the available supply of water by priority date or by alternative administration as appropriate. These rules apply to all water rights within the state from all sources of water, surface water and hydrologically connected groundwater (N.M. OSE 19.25.13

(2004)).

The regulations define an administrable water right as “A water right or right to impound, store or release water, the elements of which had been determined by a court of competent jurisdiction or determined on an interim basis by the state engineer under these rules and regulations” ((N.M. OSE 19.25.13.2 (2004))). AWRM also includes efforts to meter water rights. The general framework allows for four forms of administration which can be combined based upon the unique circumstances of the district. The four forms are (1) direct flow administration, (2) storage water administration; (3) depletion limited administration, and (4) alternative administration. The first three of these are based on temporal priority (N.M. OSE, 19.25.13.7 C (1-3) (2004)). The last, alternative administration, is defined by the general regulations as,

administration that is based on a water sharing agreement among affected water rights owners, and that is acceptable to the state engineer. Such administration may include voluntary shortage sharing such as, but not limited to, percentage division or pro rata allocation, rotation of water use, and reduced diversions (N.M. OSE, 19.25.13.7 C (4) (2004)).

Existing agreements in place by acequias or community ditch associations are also approved (Ibid).

AWRM has been controversial, with some water rights holders strongly objecting to the legislation and subsequent regulations (Hoffman, 2008). The basic argument of those that oppose the AWRM regulations is that it is unconstitutional for the State Engineer to administer in advance of adjudications being completed in a court of law (Hoffman, 2008). AWRM was challenged in court in 2005 by Tri-State Generation and Transmission Association and the New Mexico Mining Association (OSE, 2007). In May of 2007, “Judge Matthew Reynolds of the Seventh Judicial District issued a ruling...that affirms the State Engineer’s Active Water Resource Management Rules and Regulations” (OSE, 2007). Some of the specific regulations adopted were found to be invalid.

The two parts invalidated were the list of documents that the State Engineer would use to determine the elements of a water right for the purpose of administration , and the procedure for hearing objections to the State Engineer’s determinations (Utton Center, 2009, pg. 37).

However, the general principle that administration need not wait until adjudications had

been completed by the court system was upheld. The case was appealed to the Court of Appeals by the OSE, who objected to the courts invalidating the certain procedures listed above. Briefs have been submitted in the case (Utton Center, 2009, pg. 38).

While litigation is ongoing, the implementation of AWRM is proceeding. The general framework is the basis for the promulgation of specific water master district rules and regulations. The Office of the State Engineer (OSE) has selected seven priority districts which are: (1) the Rio Chama Basin, (2) the Rio Gallinas Basin, (3) the Lower Pecos Basin, (4) the Lower Rio Grande Basin, (5) the Rio Mimbres, (6) the Nambé-Pojoaque-Tesuque Stream System, and (7) the San Juan Basin. The promulgation of district specific regulations, the creation of a list of administrable water rights, and metering are proceeding at different rates in each district (Hoffman, 2008). Overall AWRM is 80 percent completed in the seven priority basins (OSE, 2009).

The San Juan agreement is the only whose district specific regulations include a negotiated water sharing agreement. The San Juan agreement has a relatively long history, being created prior even to the finalizing of the general regulations. It can serve as a good case study on how local water sharing agreements work, and whether they can be a model for other similar agreements in New Mexico or elsewhere.

## **Chapter 2: Interstate Agreements**

To examine how an agreement like the one on the San Juan for success or failure a set of criteria is needed. Although little research has been done on the process of working out local area water sharing agreements, there is a rich body of literature on sharing between countries and sharing between states. This literature includes analysis of the existing interstate compacts, theoretical literature, and model water sharing codes (McCormick, 1994, Draper, 2002, Muys, 2007, etc.). This paper will draw important principles about how to share water from this body of literature and then apply them to the San Juan River Basin agreement.

### **Interstate Compacts**

The traditional model for water sharing across boundaries in the U.S. is the interstate compact. Zachary McCormick (1994) reviewed the twenty-two Western interstate compacts to see what had made them successful or unsuccessful. He also examined what problems might arise in the future because of changing political and physical environments. His analysis is useful in evaluating water sharing agreements that cover all different area sizes. His definition of success is also instructive. He stated, “For the purposes of this paper, a compact will be judged to be successful if the system of allocation created by the compact has been maintained and operated without intervention by the federal government or successful resort to federal power by one of the compacting parties” (McCormick, 1994, pg. 3). Later in this paper I draw an analogy that is appropriate for considering the success or failure of a small local water sharing agreement. McCormick considered two main questions; “How is the water divided and is that division still working between the states?” (McCormick, 1994, pg. 9)

Before launching into his review of interstate compacts, McCormick briefly considers the strengths and weaknesses of the three methods used to allocate water between states. The first method is Congressional legislation, which is allowed under Congress’s power over navigation and commerce (McCormick, 1994). This method has only been used twice due to the reluctance by Congress to address situations that are both highly technical and sticky politically (McCormick, 1994)). More frequently, disputes

over interstate water issues result in litigation. “In fact litigation before the Supreme Court has been referred to as a substitute for war. If states were independent and could not agree on a treaty, they might go to war. That course of action being blocked, they litigate instead” (McCormick, 1994, pg. 18). These cases are decided under the principles of equitable apportionment making it difficult to predict how they will turn out. “The outcome of the suit in equity may turn on who can make the most persuasive case to the particular court. That in turn often involves a balancing of perceived benefit to one party against the perceived harm to another” (McCormick, 1994). The litigation process is highly uncertain, lengthy, and costly, making litigation a less than ideal method of solving water conflicts.

The compact process is the third option for solving water conflicts, and it is allowed under the Compact Clause of the U.S. Constitution. “No State shall without the consent of Congress...enter into any agreement or compact with another State or with a foreign power.” (U.S. Constitution: Article I, §3). After reviewing the 22 Western interstate compacts, McCormick concludes his thesis with several recommendations, most of which are relevant to small local water sharing agreements. The first of these is that because compacts vary in their historical and geographic contexts, the administration of the compact must vary accordingly (McCormick, 1994). This principle of flexibility is important when it comes to creating local agreements tailored to the unique needs of an individual water basin. The second recommendation McCormick makes is that the degree of monitoring and active administration needed depends to a large extent on how much water and how many states are involved. More formal administration is needed where more water and/or a greater number of states are involved. If the compact or agreement involves more than just the diversion of water (for instance, if issues of water quality are involved), a more formal administrative structure may also be an advantage. McCormick’s second recommendation suggests that a local water sharing agreement may not need a large formal administrative structure. McCormick’s third recommendation concerns how disputes are resolved under compact agreements (McCormick, 1994). Mechanisms for dispute resolution are critical to the success of any agreement, whether the agreement covers a large or small area. McCormick lays out four different mechanisms for dispute resolution. These are; (1) majority vote, (2) casting vote, (3)

arbitration, and (4) litigation (McCormick, 1994):

The first three require a surrender of state power to some compact authority or third person. In matters affecting so vital a resource as water, states may be loathe to cede control and the scarcer the water, the more difficult it may be to obtain such a concession. Water users who lose water as a result of such third party decisions are likely to feel sold out by state government (McCormick, 1994, pg. 292).

Majority vote only works when more than two states are involved. A “casting vote” involves a federal representative who votes as a tie breaker if need be. This option transfers more power to the federal government and may have political fallout for the federal representative or agency involved. The third option, arbitration, involves a neutral arbitrator who makes a decision based upon law and evidence. This option is quicker and less costly than litigation, but may be less politically acceptable. Its results must also be enforced. McCormick recommends using either arbitration or litigation as the method of dispute resolution. His third recommendation is that compacts include groundwater due to the problems that arise if they do not. He discusses how initially most interstate compacts were negotiated when the relationship between surface water and groundwater was not as well understood as it is today. As a result most compacts cover surface water only and this has created problems with groundwater pumping contributing to a decrease in surface water flows. McCormick’s recommendation may or may not have relevance for local agreements depending on the hydrological circumstances of the basin. His fourth recommendation is that compacts are more successful when negotiated in advance of a water crisis. This principle is also likely true on a local level but given current “crisis” level conditions in Western water, negotiations truly in advance may not be possible for the type of local agreements this paper considers. His fifth recommendation is that compacts allow for periodic modification (McCormick, 1994). In the case of local agreements, periodic modification may be easier. Finally, McCormick discusses methods of water allocation, and concludes that “there is no right or wrong way to allocate water” (McCormick, 1994, pg. 300). Again flexibility is important, and this principle applies to agreements covering both large and small areas.

Work such as McCormick’s on what has made past water sharing agreements



successful or unsuccessful led to more theoretical work on what should be in water sharing agreements. The next section discusses the details of two model agreements, one by American Society of Civil Engineers (ASCE) and one by the Utton Center for Transboundary Resources, and the general principles that can be derived from these agreements.

### **Model Agreements: Utton Center Model**

The first model agreement considered was put together by the Utton Center for Transboundary Resources at the University of New Mexico.<sup>2</sup> The Center began drafting the Model Compact in 2004 (Muys, et. al., 2007). The Center first conducted a literature review in order (1) “to identify and evaluate the asserted strengths and weaknesses of the use of compacts to resolve interstate water conflicts” (Muys, et. al., 2007, pg. 22), and (2) to review the language of all the existing compacts to see how they addressed critical issues. The practical administration of the compact was looked at by surveying the interstate water compact commissions. An advisory committee of professionals in different fields met in March of 2005 to make recommendations for inclusion in the Model Compact. A working draft of the Model Compact was completed by Utton Center staff and went through several revisions based on suggestions by the advisory committee. The final version of the Model Compact was completed in 2006 (Muys, et. al., 2007).

The Utton Center Model Compact starts out with a preamble stating the strong foundation on which the compact is based. The section is important to an agreement because it provides common understanding for the different parties. The stronger the common understanding, the more likely the agreement is to succeed. The preamble also lays out the need for parties to negotiate in good faith, and acknowledges the need for the compact to be consistent with the existing federal and state legal framework (Muys, et. al., 2007). Both the need for a common ground and the need for a consistent legal framework are also important for local water sharing agreements.

Article I of the Model Compact covers the compact purposes, water subject to the compact and signatory parties. According to Muys, et. al. 2007, the purpose of this

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<sup>2</sup> Referred to in the rest of this paper as either the Utton Center or the Center.

### Model Compact:

is to respond to the Supreme Court's repeated admonishment to contesting states that the negotiation of their respective "equitable shares" of interstate regional water resources and resolution of other disputes regarding such resources is a far better approach than a judicially imposed "equitable apportionment" or other judicial decree (Muys, et. al., 2007, pg. 27).

This purpose is very broad but also very clear. The commentary by Muys, et. al., 2007 acknowledges that compacts can also be used for more limited purposes like flood control, water quality protection, or just water allocation. The purpose of a local agreement is likely to be more limited; however, clarity about the agreement's purposes is important for all different sizes of agreements. The water subject to the compact is that of "surface water flows and hydrologically connected subsurface waters of the Utton River and its tributary water bodies within the states of A, B, and C" (Muys, et. al., 2007, pg. 27). This reflects the belief among the advisory committee and other water professionals that related groundwater must be included in compact allocations of surface water flows. Finally the signatory parties to the compact include all of those affected by the compact, including the states, the U.S. government, and Native American tribes in those states (Muys, et al., 2007). Both the inclusion of any related groundwater and the inclusion of all parties affected by an agreement in the negotiating process are points that are important to local agreements.

Article II of the compact covers its more procedural aspects. There is a waiver of U.S. sovereign immunity if the U.S. is a signatory party. This is likely irrelevant to local area agreements. Unlike many existing compacts, the Model Compact has a sunset provision in which the agreement is set to expire in twenty five years if not renewed by the parties in some fashion. The compact can not be terminated unless existing financial obligations of the Commission are satisfied, water rights are preserved, and environmental protection obligations are also met. This sunset provision allows for flexibility, but also increases uncertainty. Individual signatory parties are also allowed to withdraw if they give two years notice to the other parties, and the financial, water rights, and environmental protection obligations are all met (Muys, et. al., 2007). The exact duration of an agreement should be an element covered by small local water sharing agreements.

Article III of the Model Compacts is a definition section. This is a very common element in interstate water compacts. The use of clear and common definitions and terminology help the signatory parties to be on the same page, which in turn helps the compact succeed. There are two common approaches to providing the needed definitions (Muys, et. al., 2007). According to Muys, et. al., 2007,

One approach is to include a long list of compact terms and definitions of these terms. The alternative approach is to include relatively few definitions and to authorize whatever administrative entity is created by the compact to define additional terms as needed (Muys, et. al., 2007, pg. 39).

The Utton Center Model Compact (in contrast to the ASCE model code that will be discussed in the next section of this paper) takes the second of these two approaches. It includes only sixteen definitions, which are related both to the governance structure, and scientific and technical terminology related to the compacts application (Muys, et. al. 2007). If a definitions section is included in a smaller local agreement, then a more succinct approach with fewer definitions is probably all that is needed. The important principle is that all parties share a common language to communicate.

Article IV of the Model Compact establishes the administrative structure for the compact. Because this compact covers both a large area and a broad set of purposes, its administrative structure is relatively complex. This is more extensive than something that would be needed for a local agreement whose purpose is more limited. Article IV sets up a three part system in which an Utton River Basin Commission is supported by a Council and a Division of Scientific Analysis to which “certain authorities and responsibilities are delegated” (Muys, et. al., 2007, pg. 41). The Members of the Commission are the governors of states A, B, and C, a single tribal representative representing all the tribes in the basin, and a federal representative. These members represent the key players in the basin and at least in the case of the governors are of a sufficiently high level to have decision making authority. The Utton Center’s literature review indicated that many existing compacts did not grant sufficient authority to the compact commissions. In response the Advisory Committee helping to draft the Model Compact “made it clear that the Commission needed powers broad enough to accomplish the purposes of the Compact” (Muys, et. al., 2007, pg. 50) and “sufficient discretion, authority and flexibility to respond to changing conditions” (Muys, et. al. 2007, pg. 50),

like drought and climate change (Muys, et. al., 2007). The Council, the second structure set up by Article IV, consists of high ranking administrators from the signatory states, tribes, and a federal representative, all from agencies managing water allocation and water quality. The Council implements the Water Quality Protection Program and the Water Resource Programs, performs other day to day duties, and carries out the decisions of the Commission (Muys, et. al., 2007). This structure allows for the Commission to concentrate on the large overarching issues and not get bogged down in the smaller program details. It also elevates the role of administrators by giving them some policy making responsibility. The Division, the third administrative piece set up by Article IV, is responsible for providing multidisciplinary scientific and technical support to the Commission and the Council. The inclusion of the Division elevates the importance of science in the operation of the compact (Muys, et. al., 2007).

Article V of the Model Compact is its most important article, and discusses how water is to be allocated annually amongst the different states. According to Muys, et. al, 2007,

Article V rests on several important basic premises. First is that adequate stream flows should be maintained in each state in the Basin to provide a healthy ecosystem, without which any long-term allocation and management agreement could be doomed to recurrent conflict or failure. Second is that existing rights in each state at the time of compact execution should be protected to the extent that they have been perfected under state or federal law (Muys, et. al. 2007, pg. 64).

The amount of water needed to satisfy both the healthy ecosystem requirements and perfected water rights is determined during the compact negotiations and comprises the “base apportionment” level. Any excess additional water would be considered a “supplemental apportionment” (Muys, et. al., 2007). “The water supply premise of the Model Compact is that ‘safe annual yield’ of the Basin is more than adequate to satisfy the two components” (Muys, et. al., 2007). This is likely an unrealistic assumption in many situations in the Western United States. When future supply is less, Article V authorizes the Commission to “to make appropriate equitable reductions of the perfected use rights of the base apportionment” (Muys, et. al., 2007). The shortage is shared under a model compact agreement. This is analogous to the kind of water sharing and shortage sharing that might occur under a small local agreement. Article V also clearly states

that intra-state allocation among water users is left up to the individual states, which fits with other provisions in the Model Compact that state the compact must fit within an existing legal framework. Finally, Article V discusses reasonable beneficial use. Members of the advisory committee argued that a beneficial use standard should be clearly defined and more aggressively enforced in order for there to be “new water” for environmental uses and an expanding population. The states would be responsible for enforcing the recommended standard within their own state, but the Commission could act if there was a complaint against one signatory party by another (Muys, et. al., 2007). After a notice and hearing the Commission could:

be authorized to gradually reduce the wasting state’s apportionment by the amount of water that could reasonably have been conserved by enforcement of the recommended guidelines and reapportion it to the complaining party and other states or parties (Muys, et. al., 2007, pg. 75).

While this part of the Model Compact would be controversial, parties may prefer it to having an equitable apportionment action brought in the Supreme Court.

The next article of the Model Compact, Article VI, covers the creation of a Water Quality Protection Program, which would be implemented by the Council. Water quality, like water quantity, is also a transboundary issue, and thus it makes sense that it would also be covered by a very broad compact. Depending on the purposes of a small local agreement, a provision about water quality may or may not be needed. Inclusion of water quality issues helps makes the Model Compact truly comprehensive.

Article VII covers the creation of a Water Resource Management Program. It requires that within two years of the Compact becoming effective, the parties submit to the Commission estimates for water demands, different projects, and categories of uses for a five year period as well as estimating water supply, both existing and supplemental (Muys, et. al., 2007). Then,

Based upon such submittals, the Commission shall develop a basin wide water resource management program establishing construction or implementation priorities for the components of the state’s proposed programs and possible alternatives to certain components (Muys, et. al., 2007, pg. 83).

The Model Compact also gives the Commission the responsibility of approving or rejecting all new major projects, surface diversions, subsurface water extractions, and

water transfers to make sure they are accordance with the water management program. Additionally there are provisions for the construction and operation of projects designed to reduce or prevent flood damage. The main goal of this part of the Model Compact is to engage in coordination of regional supply and demand planning in order to more optimally utilize existing and new water supplies in the basin to meet existing and future water demands (Muys, et. al., 2007). This would be done via exercising a “review and approval authority” (Muys, et. al., 2007, pg. 86) over new projects rather than the Commission taking the lead in developing a binding comprehensive plan (Muys, et. al., 2007). While this kind of water planning is useful over a larger area, it is not necessary when it comes to a local water sharing agreements.

Articles IX, Interagency Coordination and Public Participation, and Article X, Budgeting and Financing, are other aspects of the broad Utton Center Model Compact which would not be applicable to a local water sharing agreement. Article IX, dealing with interagency coordination and public participation, provides additional guidance as to what form the administrative structure surrounding the agreement should be. The three divisions, Commission, Council, and Division, are all responsible for maintaining contact with their respective constituencies. Article IX also sets up a multi-interest, multi-disciplinary Advisory Committee to give advice to both the Commission and the Council, and sets out the method by which the Commission should report its activities to the general public (Muys, et. al., 2007). As stated in the discussion of Article IV above, the administrative needs of a local water sharing agreement are likely to be less extensive than that of larger area water sharing agreements, and therefore the provisions of Article IX would likely be irrelevant. Article X sets up a process for financing and cost sharing for infrastructure development, and thus would be irrelevant for a local water sharing agreement that is not completing any infrastructure development projects (Muys, et. al., 2007).

Article VIII sets out an extensive multi-step process by which the compact will be enforced and disputes resolved (Muys, et. al., 2007). Dispute resolution principles are relevant to any type of agreement where conflict may arise. The resolution procedures are designed to give the Commission “adequate authority to enforce the Compact obligations against the signatory parties and to resolve disputes under the Compact”

(Muys, et. al., 2007, pp. 92-93). This is done so that the principal purpose of the Compacts, “to avoid interstate litigation in the Supreme Court (Muys, et. al., 2007, pg. 92),” can be achieved (Muys, et. al., 2007). One of the problems with many western water compacts is that they “require unanimity of the signatory parties for official action....thus conferring a veto power in a single state” (Muys, et. al., 2007), and allowing a single party to block enforcement of the compact. This also gives upstream states a clear advantage over downstream states, because they can theoretically use water before it reaches downstream states while blocking enforcement of the compact against them. The downstream states are forced to resort to costly interstate litigation in the Supreme Court, which is exactly what the Model Compact seeks to avoid. Additionally the second part of Article VIII makes seeking resolution before the Commission mandatory before initiating litigation. The penalty for not doing so is that the party would have to pay all the litigation cost of any parties involved in future litigation on the subject of the dispute (Muys, et. al., 2007). While the process for a local water sharing agreement would likely involve fewer steps and take less time, the same general principle of negotiation before litigation should still apply.

The last article of the Utton Center Model Compact that I will discuss is Article XI which covers the relationship of the Utton Center Model Compact to existing state, federal, and treaty law. Article XI, Section 1, states that

except as expressly preserved herein or in the congressional legislation consenting to this Compact, any present or future state or tribal laws or regulations that are irreconcilably inconsistent with any provision of this Compact are superseded by such Compact provisions (Muys, et. al., 2007, pg. 107).

This is consistent with compacts being laws of the United States once they have been ratified by Congress, and thus under the Supremacy Clause of the Constitution superseding inconsistent states laws unless otherwise stated. The provision relating to existing federal laws is similarly stated. All applicable federal laws must be followed by the Commission, Council, and Division of Scientific Analysis. Applicable federal laws include the National Environmental Policy Act, the Federal Advisory Committee Act, and the Administrative Procedures Act, as well as other laws relating to financial disclosure, open meetings, advisory committees, judicial review, etc. The Model Compact also states that any interstate water allocations by the Supreme Court the Model

Compact expressly states otherwise or the Commission votes unanimously to change the water allocation(s) (Muys, et. al., 2007). The relationship of a local water sharing agreements to existing laws is obviously going to be different. Local water sharing agreements must fit within the existing legal framework or risk being challenged on the basis of state or federal laws that supersede them.

The Model Compact by the Utton Center covers a wide range of purposes and a large geographic area and so contains many provisions that are inapplicable or would need to be tweaked in order to apply to a local water sharing agreement. The provisions that are irrelevant in whole include Article VI (unless a small local water sharing agreement wants to deal with water quality), Article VII (the creation of an extensive Water Resource Management Program), Article IX (Interagency Coordination and Public Participation), and Article X (Budgeting and Financing). The extensive administration of the Utton Center as laid out by some of the procedural elements of Article II and Article IV, is more complex than what is needed for a small local water sharing agreement. The next model I will consider is narrower in its scope.

### **Model Agreements: ASCE Model**

The second model water code considered was put together by the American Society of Civil Engineers (ASCE). In 1995, the ASCE initiated the Shared Use of Water Resources (SUTWR) project.

The purpose of the project was to review trans-boundary agreements and develop a model agreement for utilization of water by sovereign governments or sub units within sovereign nations. The model agreement was focused on the allocation and use of shared waters and the resolution of conflicts involving such waters (Draper, 2002, pg. iii).

The ASCE's process for drafting its Model Code was similar to that used by Utton Center for its 2006 Model Compact Model Agreement. Stephen E. Draper chaired the working group drafting the Model Code and later edited a book outlining the three model codes the working group developed (Draper, 2002). There were three model codes, because early on "the committee recognized that the degree to which Parties were willing to



relinquish sovereign control of water resources depended on the hydrologic, geographical, and political situation” (Draper, 2002, pg. v). The models developed were; Model A (Coordination and Cooperation), Model B (Limited Purpose), and Model C (Comprehensive Management) (Draper 2002).

Model B (Limited Purpose) is concerned with water management needs that are limited in scope. It is a model wherein the Parties enter into an agreement to achieve certain limited purposes. The willingness to concede authority of management of internal water resources is limited to what is necessary to achieve a specific goal. The limited purpose goals may vary from simple allocation of water released from a single reservoir, to prioritization of needs during droughts, to other issues such as water quality (Draper, 2002, pg. vi).

Of the three model agreements, Model B most closely resembles the circumstances of a local water sharing agreement and will be examined in more detail.

Article I of the ACSE’s Model B agreement declares the purposes and policies of the agreement. It covers similar ground to the Preamble and Article I of Utton Center Model Compact. The scope of the agreement is limited to certain specified purpose or purposes and to a particular water basin. The agreement also makes clear whether groundwater is covered (Draper, 2002). From this part of the model agreement we can draw the principle that water sharing agreements should be very clear about what they cover (both purpose wise and geographically) If an agreements is not clear on these points, interpretation of the agreement in the future will be muddled, and implementation will falter. Article I also covers the duty of the parties to the agreement to coordinate and cooperate in good faith, despite the fact that all parties enter into agreements with their own self interest in mind. Successful agreements are ones in which all parties operate with good faith intentions and agree to follow certain principles in the management of water (Draper, 2002). Finally, Article I contains two provisions that are optional depending on the circumstances of a particular agreement. One provision covers the need to preserve federal rights, and a national security provision for use in international agreements (Draper, 2002). Obviously neither of these will apply in a local water sharing agreement.

Article II of the ASCE Model B Agreement covers some of its procedural

provisions. First, Article II covers how long the agreement is going to be in effect. When selecting a duration for an agreement, there are two important principles to be considered. The first of these is that a longer time period gives greater predictability for resource development. On the other hand, a longer time period makes the agreement less flexible, which may hurt the agreement when there are significant changes in climate, hydrology, water demand, or water technology in the future. Article II also outlines specific procedures for amending and/or supplementing the agreement. Amending or supplementing an agreement may be needed if an agreement fails to operate as well as initially intended. Amending or supplementing (in the case of an interstate compact) may also trigger the need for congressional re-approval of the agreement. Next, Article II contains a limited applicability provision. This provision says that if one provision of the agreement is found to be null in a court, then the entire agreement doesn't become void. Finally, Article II says that annexes to the agreement that contain procedural information are part of the agreement, and gives definitions for the various terms found in the agreement. The definition section contains mostly physical and not administrative definitions (Draper, 2002). Of these procedural elements, the only ones with direct applicability to a local water sharing agreement are those that deal with selecting a duration for the agreement and procedures for amending the agreement.

Article III of the ASCE's Model Code B concerns the administrative provisions of the code. The first part of Article III covers administrative officials. Administration relies on the use of the existing water officials of the two parties. Since Model Code B is limited in its purposes and scope, there is no need for a complicated and extensive administrative structure, such as that used in the Utton Center Model Compact. The first part of Article III provides a minimal means of administering. The two parties are obligated to provide administrative and technical support as needed to implement the agreement. Funding mechanisms are also covered and depend on the complexity of the agreement (Draper, 2002). "In the case of simple allocation agreements in which no commission is established, funding provisions are not normally included" (Draper, 2002). This kind of diffused and limited administrative structure is similar to what would be needed by a local limited purpose agreement. Part II of Article III contains some provisions which are not applicable to local water sharing agreements. For example, "To

achieve efficient use of allocated water it may be desirable to construct reservoirs or other works within the boundaries of the other Party” (Draper, 2002, pg. 58). This could lead to conflicts with the sovereignty of the other party within its own territory. Part II of Article III attempts to smooth over conflicts in advance. In the case of international agreements, navigation is also covered (Draper, 2002).

Like in the Utton Center Model, the most important provision, Article IV, covers how best to allocate water. Is the allocation to be based on the relative geographic areas of the two parties, on the relative contributions of their water ways, on existing uses, or to be divided in half, etc.? In his discussion of Article IV, Draper agrees with McCormick that how water is best allocated depends in part on the unique circumstances of the particular agreement. This again has applicability to local water sharing agreements. Also related is the first part of the ASCE's Model Code B Article IV, covering exclusive jurisdiction and control. “This provision establishes the principle of the sovereign right of each Party to allocate or otherwise utilize and control the waters within its borders, constrained only by the requirement that such use be reasonable and equitable” (Draper, 2002, pg. 62). Article IV also looks at water level protection, flood protection works, information sharing, how hydraulically connected groundwater is to be dealt with, and the importance of water quality in addition to water quantity (Draper, 2002).

The last article of the ASCE’s Model Code B, Article V, specifically deals with the question of dispute resolution.

Disputes will inevitably arise as the Agreement is implemented. These disputes may involve differences in interpretation of the Agreement’s provisions or noncompliance with the Agreement itself. The disputes may also arise because of the changing conditions that alter the effectiveness of the Agreement for one or more of the Parties. While a speedy and equitable process of Dispute Resolution serves all parties well, some sovereign entities do not wish to enter into an obligatory process. In such a case, Article 5B must be omitted. In other instances Parties may recognize the need to institutionalize a dispute resolution process (Draper, 2002, pp. 69-70).

Article V first encourages peaceful informal negotiations and consultation between the two parties. It then outlines that the parties have a clear right to litigation (if there is an appropriate judicial body) if peaceful negotiations and consultations fail (Draper, 2002). The same principles of peaceful negotiations, followed by resort to litigation, apply in the

case of local water sharing agreements, although the first venue of resort may be a state administrative agency and not the court system.

### General Principles for Water Sharing Agreements

As shown by the discussion of the literature on existing interstate compacts and on the two model agreements, there are many general principles that can be derived from the literature on interstate compacts and model water sharing agreements that cover a large area. These can then be applied to local water sharing agreements. They are listed in Table 1 below, and then explained in more detail.

<b>Table 1: Water Sharing Principles for Large Area and Small Local Agreements</b>		
<b>Category/Sub-category (if applicable)</b>	<b>Principles over a Large Area</b>	<b>Analogy to a Local Area Agreement</b>
<b>Administrative Structure: Clarity</b>	Must be clear with delineated responsibilities	Must be clear with delineated responsibilities. Parties must share a common language in order to be able to communicate
<b>Administrative Structure: Size</b>	Appropriate size to accomplish the job	Local agreements may not need a formal administrative structure in place
<b>Administrative Structure: Legality</b>	Agreements must fit with an applicable legal framework	Local agreements should have the backing of a larger legal structure
<b>Comprehensiveness: Included Parties</b>	All affected parties must have a voice at the table	All affected parties must have a voice at the table
<b>Comprehensiveness: Included Water</b>	Groundwater and Surface water	Groundwater and surface water as applicable
<b>Comprehensiveness: Science</b>	Agreements must be based on a good understanding of hydrology, etc.	Agreements must be based on a good understanding of hydrology, etc.
<b>Management Purposes</b>	Varies but needs to be clearly stated	Varies but needs to be clearly stated
<b>Management Purposes: Water Allocation</b>	Several different methods can be used based upon the unique circumstances of the situation	Several different methods can be used based upon the unique circumstances of the basin
<b>Dispute Resolution: Resolution Procedure</b>	Negotiation First, Followed by Option for Resort to Litigation	Negotiation First, Followed by Option to Resort to State Agency, Then Resort to Litigation
<b>Definition of Success</b>	Maintained and Operated without intervention by the federal government	Maintained and Operated without Resort to a Traditional Priority Administration System that would leave junior appropriators without water

The first category of principles that are relevant for larger area agreements is principles related to administrative structure include in the agreement. The same principles apply to local area agreements. The first of these is clarity, which is stressed in numerous places throughout McCormick, 1994, the Utton Center Model Compact, and the ASCE's Model Code B. The second administrative principle has to do with the size of the organization. The literature suggests that the appropriate size depends on how much water is being managed, the purpose for which the water is being managed, and how large a geographic area is included. This is illustrated in McCormick's recommendations, and in Article II of the ASCE's Model Code B. Smaller local agreements likely will not need an extensive administrative structure. Additionally parties must share a common vocabulary for communication. For water sharing agreements that cover a large area, this might take the form of a formal definitions section, but for a local area agreement this may happen more informally. Definitions are covered in the appendix to the ASCE's Model Code B, and in Article III of the Utton Center's Model Compact. The final administrative principle is legality. Agreements must fit within an applicable legal framework. Smaller agreements must have the backing of a larger legal structure. The importance of this is illustrated most clearly in Article XI of the Utton Center Model Compact.

The second category of principles that applies to larger area water sharing agreements relates to the need for the agreement to be comprehensive. The first of these is that all affected parties must have a voice at the negotiating table. The second is that both surface and groundwater must be included. The connection between groundwater and surface water is recognized in McCormick's recommendation, as well as in the first article of both model agreements/compacts. Third, all agreements must be based on sound science. The importance of science is related to the need to include hydrologically related groundwater, but is also illustrated by the Utton Center Model Compact's setting up a science division as part of the administrative structure laid out in Article IV.

The third category of principles is the management purpose or purposes of an agreement. According to the literature the management purposes can vary depending on the particular circumstances, but need to be clearly stated. Management purposes also

cover how water is to be allocated by the agreement. In a larger area agreement this may be outlined in very broad strokes only, with details regulated to an appendix. For a local area agreement this may form the bulk of the agreement document. Management purposes, chiefly water allocation procedures, are covered in Article V of the Utton Center Model Compact, and Article IV of the ASCE's Model Code B. McCormick's recommendations also stress the importance of tailoring the water allocation procedures in a basin to the needs and physical realities of that particular basin.

The fourth category of principles deals with the amount of flexibility present in any given agreement. The first of these principles has to do with the duration of the agreement. The literature discusses a tension between agreements that are flexible enough to respond to changing climatic and hydrologic realities, but stable enough to provide some consistency so water users know what to expect especially where large investments are being made in water infrastructure (Muys, et. al., 2007 / Draper, 2002). In the case of a local area agreement, the need for large investments in water infrastructure development is arguably less of an issue. Given a smaller number of water users over a smaller area, it is also easier for the parties to renegotiate their agreement on a more frequent basis. Finally it is also important for parties to be able to think "outside the box" to ensure that everyone gets the water they need. More novel solutions may be more easily employed at the local level.

The next to last category of principles is dispute resolution. The type of resolution procedure used will vary from agreement to agreement, but some general rules apply. Both the ASCE Model Code B and the Utton Center Model Compact, try to put in place mechanisms by which parties can negotiate first before they resort to litigation. Article VIII of the Utton Center Model Compact and Article V of ASCE's Model Code B both reflect this emphasis. Similarly local area agreements can have mechanisms by which parties can negotiate before resorting to intervention by a state agency or to litigation. The last category is how we define success. When he looked at interstate compacts, McCormick, 1994 defined success as when the compact had been maintained and operated without intervention by the federal court system (McCormick, 1994). An analogous definition for success for local water sharing agreements in the Western United States is: The agreement allows the parties to not have to resort to a traditional priority

administration that would leave junior appropriators without a significant portion of their water under drought conditions.

## **Chapter 4: Case Study of Shortage Sharing in the San Juan Basin**

### **Basin Setting**

The San Juan River “is located in the northwest corner of New Mexico and extends into Colorado, Utah, and Arizona” (ISC, 2003, Section 1: Executive Summary, pg. 1). In New Mexico it flows through San Juan County and Rio Arriba County. It is also a tributary to the Colorado River. The San Juan River Basin is somewhat unique in New Mexico, in that it is one of the few basins where only a small percentage of the water used in the basin is groundwater (ISC, 2003).

Water rights in the basin are held by agricultural users, industrial users (mostly power plants), municipal users, as well as by the Navajo Nation and the Jicarilla Apache Nation. Like in the rest of New Mexico, the most senior rights are likely held by Native American tribes, followed by agricultural users, followed by industrial and municipal users. The water rights adjudication process, however, is still ongoing (ISC, 2003). The area was partially adjudicated in 1948 in the Echo Ditch Decree. This partial adjudication, however, was inadequate. The adjudication did not include Native American Water Rights, Federal Reserved Rights for federal projects that developed later, and private water rights after 1938 (ISC, 2003). In 1975, the Echo Ditch Decree began to be “re-evaluated in a pending action, which ultimately will involve an estimated 8,000 water users” (ISC, 2003, Section 6: Legal Issues, pg. 5). ). As of 2003 all of the Jicarilla Apache rights had been quantified and the State was negotiating with the Navajo Nation; however little had been done in the way of quantifying non-Native American water rights (ISC, 2003). This is the status of water rights in the basin that existed around the time the first San Juan River Operations and Administration agreement was negotiated. There are also several interstate compacts, including the Colorado River Compact that affect water administration in the basin (ISC, 2003).

### **History/Background**

In 2003 there was a water “crisis” brewing among users of the San Juan River in New Mexico. During 2002 and the winter of 2003 there had been extreme drought



conditions. Water levels in Navajo Reservoir were low and there were many competing needs for water. Priority administration was likely imminent. Most likely to be cut off due to their junior priority status were power plants and the City of Farmington, New Mexico. This sense of crisis drove the initial development of a water sharing agreement (OSE, 2003). In June of 2003 major water users on the San Juan River in New Mexico developed recommendations and principles for how the waters of the San Juan were to be divided (Recommendations for San Juan River Operations and Administration 2007 and 2008, 2006). Nine water users, including Bloomfield Irrigation District, Hammond Conservancy District, Farmer's Mutual Ditch, Jewett Valley Ditch, Public Service Company of New Mexico, Arizona Public Service Company, BHP Billiton, Jicarilla Apache Nation, and the Navajo Nation, endorsed the recommendations. The Navajo Nation was speaking for its three irrigation projects (Navajo Indian Irrigation Project, the Fruitland Irrigation Project, and the Hogback Irrigation Project) (OSE, 2003). "The City of Farmington also endorsed the agreement" (OSE, 2003). Similar agreements have been made on a year by year basis since, with the exception of the most recent agreement which was a two year agreement covering both 2007 and 2008. The latest agreement is entitled "Recommendations for San Juan River Operations and Administration for 2007 and 2008" (Recommendations for San Juan River Operations and Administration 2007 and 2008, 2006).

The provisions of the San Juan agreement will first be summarized and then discussed in more detail below as they pertain to the principles for success listed in Chapter 3. Sections I, III, and V in particular will be covered in more detail. Section I of the agreement covers the water demand for specific project or uses. Section I also states "the diversion demand amounts and rates in Table 1 are negotiated values that take into consideration differing opinions of the parties as to the demands and rights to divert water under existing conditions" (Recommendations for San Juan River Operations and Administration 2007 and 2008, 2006, pg. 2). Those amounts are to be recognized only for implementation during 2007 and 2008, and are not considered quantifications of water rights (Recommendations for San Juan River Operations and Administration 2007 and 2008, 2006). Section II of the agreement covers the procedure by which the Bureau of Reclamation (BOR) will determine the quantity of water to be released from Navajo

Dam, taking into account the diversion demands of Section I, and a target minimum flow for environmental purposes. Section III covers shortage determination and sharing. Section IV covers agreements to transfer or broker water between parties. Section V covers dispute resolution. Section VI covers cooperative activities with the BOR. Section VIII is a waiver of liability. Lastly section VII is statement of endorsement and gives additional terms of the agreement, while Section IX lists endorsing parties to the recommendations (Recommendations for San Juan River Operations and Administration 2007 and 2008, 2006). Available as an addendum to the agreement are documents of endorsement by all nine parties, as well as letters from the New Mexico State Engineer and the BOR.

### **Principles for Successes in the San Juan Agreement: Administrative Structure**

The administrative structure involved in the San Juan agreement is minimal and diffused. There is nobody whose sole job it is to work on the agreement. The major users come together every year to negotiate the agreement with the assistance of basin manager John Whipple (Hoffman, 2008, Whipple, January 23<sup>rd</sup>, 2008). Necessary dam releases are computed by the BOR in accordance with what is needed by the agreement. The BOR, OSE, and Bureau of Indian Affairs (BIA) also assist with their technical and administrative resources, including completing tasks such as calculating whether there is a shortage or not and assisting in the resolution of disputes. The assistance of these outside technical and administrative resources from federal and state agencies is likely critical to the smooth functioning of the agreement. State and federal agencies can be seen as fairly neutral arbitrators, able to make technical calculations (like probable shortage calculations in the case of the BOR) about key issues. This kind of minimal and diffused structure is appropriate given that the agreement only covers nine water users on one body of water within one state (Recommendations for San Juan River Operations and Administration 2007 and 2008, 2006). The San Juan water sharing agreement is also backed up by a larger legal structure. Under the 2003 AWRM Management statute, discussed in Chapter 1, these kind of negotiated water agreements are allowed as an alternative to priority administration. The agreement also makes clear that the negotiated amounts hold only for the years covered by the agreement and are not binding on any

future legal proceedings over water rights (Recommendations for San Juan River Operations and Administration 2007 and 2008, 2006).

### **Principles for Success in the San Juan Agreement: Comprehensiveness**

The San Juan agreement includes the nine major water users on the river, including power companies, ditch users, the City of Farmington, and two tribal nations. Additionally, “the endorsing parties waive no rights with regards to non-endorsing water users in 2007 or thereafter” (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006). This means that those minor users who were not at the table are not held to an agreement they did not help develop and endorse. This fulfills the principle that all those affected by an agreement should have a voice at the table (OSE, 2003)

The agreement also, however, affects the solutions to a broader range of issues that involve additional users who are not at the table. The first of these is that because the San Juan is a tributary to the Colorado, occasionally use on the river may need to be curtailed to meet conditions set by the Upper Colorado River Basin Commission. This is taken care of by ensuring that there are provisions related to this in the agreement. Specifically the San Juan agreement states that, if the Upper Colorado River Basin Commission makes a determination that uses needed to be curtailed, “the parties to these Recommendations agree to meet within thirty days...of the determination to make any necessary adjustment to the Recommendations” (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006, pg. 1). The agreement also interacts with the San Juan Chama Project (SJCP). The manner in which it does so is governed by Section 11a of Public Law 87-483, which “provides a formula for a sharing of the water supply among the SJCP and the Navajo Reservoir water supply contractors in years when the supply is inadequate to meet the demands of the contractors” (Whipple, January, 12<sup>th</sup>, 2008). Although, the parties to the San Juan agreement can recommend that “In the event of a shortage...that Reclamation limit its annual San Juan-Chama Project diversions for 2007 and 2008 to an annual amount equal to 107,500 AF less the percentage shortage calculated by Reclamation” (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006, pg. 6), this recommendation is

not binding on SJCP contractors (Whipple, January 12<sup>th</sup>, 2008). In the event that a shortage condition occurs and Reclamation can not fulfill this recommendation, they would need to consult with the parties to the San Juan agreement. Upon first glance the fact that the agreement leaves out the SJCP contractors, may appear to be a significant weakness to the comprehensiveness of agreement, but it is likely that it is only a minor weakness, due to its lack of actual physical effect on the amount of water available to both the San Juan agreement parties and to the SJCP contractors. According to John Whipple, basin manager, in times of shortage the SJCP is more likely to be limited by physical water shortages on the particular streams it diverts from than from the administrative recommendations of the San Juan River Operations and Administration agreement. Although the San Juan River Operations and Administration agreement relates in a broad sense to both the San Juan Chama Project and to the Colorado River Compact, it is not necessary to bring in all of those parties in order for the agreement to be successful. Adding these parties to the negotiation would likely add unnecessary complications to a simple agreement to share the waters of the San Juan River. Relationships with these larger structures can be taken care of by ensuring that there are provisions in the agreement that relate back to the larger structure and by using external water institutions like the BOR as intermediaries.

Comprehensiveness principles also indicate that hydrologically related groundwater should be included in surface water agreements. The San Juan Basin, unique to New Mexico, however, uses very little groundwater. This means that the fact that groundwater is not covered by the agreement is for now inconsequential. If, at a later date, groundwater in the basin starts to be utilized, its inclusion in the San Juan Rivers Operations and Administration agreement would then be warranted. The agreement also supports the principle that sound science back agreements by relying heavily on water professionals like the BOR and OSE for importance calculations and decisions.

### **Principles for Success in the San Juan Agreement: Management Purposes**

In the case of the San Juan agreement the preamble/introduction to the agreement clearly states that it was made “for the purpose of establishing a cooperative distribution of water supplies during 2007 and 2008 among users of water from the San Juan River in

New Mexico” (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006, pg. 1). The bulk of the San Juan agreement is a fairly detailed description about how to allocate water under both normal and shortage conditions. The negotiated limits for diversion are given in either total amount in acre-feet (AF), diversion rate in cubic feet per second (cfs) (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006).

I will illustrate how the agreement divides water under normal conditions, using the amounts for 2008. The diversion amount for the Navajo Indian Irrigation Project (NIIP) is 224,000 AF, but it can be increased to as much as 229,000 AF (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006). “This allowed increase is in recognition of the continuing development of NIIP whereby acreage is increased each year as construction progresses” (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006, pg. 3). The diversion amounts for the Hammond Irrigation Project, San Juan Generating Station, the Four Corners Power Plant, and the City of Farmington are 26,700 AF, 27,985 AF, 31,000 AF, and 16,000 AF respectively (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006). These

may include amounts to be diverted under contract with the Secretary of the Interior, direct flow rights, and/or subcontracts or agreements with other parties. Also, the diversion amounts listed for the San Juan Generating Station and the Four Corners Power Plant include diversions by BHP Billiton made at the power plants’ diversion works for uses at the San Juan/La Plata Mines and Navajo Mines, respectively (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006, pp. 1-2).

The diversion amount for the minor Jicarilla Apache Nation subcontracts is 1,055 AF (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006). While the diversion amounts listed above are for total AF, the diversion amounts for Citizen’s Ditch, Farmer’s Mutual Ditch, Fruitland Irrigation Project, Jewett Valley Ditch, and Hogback Irrigation Project are given as rates, and are 160 cfs, 110 cfs, 100 cfs, 32 cfs, and 170 cfs respectively. The rates for irrigation projects are seasonal rates with diversion allowed during the spring through fall growing season, while the rates for the power plants and the City of Farmington are for year round. The agreement goes on to state that there are certain amounts diverted by Farmington that will not be

charged to its diversion amount, including “amounts: (1) diverted for delivery to local water users associations or to the Navajo Tribal Utility Authority-Shiprock, or (2) diverted for non-consumptive use at the Farmington hydro-electric power plant” (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006, pg. 3). The Hammond Irrigation Project gets credit for return flows, and the San Juan Generating Station, Four Corners Power Plant, City of Farmington, and the minor Jicarilla Apache subcontracts can exceed their diversion limits during November and December if conditions are sufficiently wet to allow them to do so without causing harm to other users or to the environmental requirements (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006).

### **Principles for Success in the San Juan Agreement: Flexibility**

The San Juan agreement has been renegotiated every year since 2003, except for the most recent agreement which was for the years 2007 and 2008. The agreement has varied slightly from year to year mostly in the area of small changes in how much water each user gets from year to year (Whipple, January 23<sup>rd</sup>, 2008). This renegotiation on a yearly basis is a major sign of flexibility in the agreement, and this is likely made possible in part given that the agreement only covers a small number of water users in a limited area.

The major flexibility to the agreement comes from the use of two relatively novel strategies. The first of these is shortage sharing. Section III of the Agreement first goes into the procedure by which the BOR calculates any water supply shortage. This is done twice a month “using operations studies for the Navajo Reservoir that evaluate monthly dam and reservoir operations throughout the calendar year 2007 and 2008” (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006, pg. 5). The BOR uses data such as the amount of water in the Navajo Reservoir above elevation 5990 feet, monthly evaporation estimates, monthly inflow to the reservoir, anticipated releases based on section II of the agreement, and monthly diversion amounts. Inflow data is based upon precipitation data from the National Weather Service with adjustments for “operation of the Vallecito Dam and the San Juan Chama Project under minimum probable runoff conditions” (Recommendations for San

Juan River Operations and Administration for 2007 and 2008, 2006).

If the operational studies indicate that reservoir water surface level will fall below elevation 5990 feet at any time during 2007 or 2008 should the diversion demands at and below Navajo Dam and Reservoir be fully satisfied, then Reclamation shall calculate the amount of shortage to the diversion demands that must occur to prevent the projected water surface level in the reservoir from following below elevation 5990 feet (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006, pg. 5).

If a shortage is determined to exist, shortage sharing procedures go into effect. The percentage by which the diversion will be reduced will be the same for the Navajo Irrigation Project, the San Juan Generating Station, the Four Corners Power Plant, the minor Jicarilla Nation subcontracts, and the City of Farmington. The City of Farmington, however, shall not have its diversions reduced below 13,000 AF in 2008 (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006). Although the reason is not explicitly stated in the agreement, this is likely because much of the City of Farmington's water is for domestic purposes, and to reduce its amount further would pose too great a burden. "The water users will determine the time schedules for bearing their share of any shortage during 2007 and 2008" (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006). If a shortage sharing percentage is calculated that has already been exceeded by a particular user, then the user must cease to divert water for the remainder of the year, unless the user acquires transfer water from another user (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006). The diversions for the irrigation projects and ditch associations will be shorted by the same amount. In order to do this,

each ditch or project shall shorten its irrigation season in order to meet its commitment to reduce irrigation depletions during 2007 and 2008. The end date shall be moved forward in time from October 31<sup>st</sup> until the percentage reduction in irrigation depletion matches the same percentage shortage as calculated by Reclamation (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006, pg. 6).

The revised end can be adjusted to give irrigators credit for "delaying the start of their irrigation season past April 1<sup>st</sup> or as a result of ceasing diversions during the irrigation season" (Recommendations for San Juan River Operations and Administration for 2007

and 2008, 2006). Diversions by the ditch associations for delivery to domestic water users can continue even if the irrigation season is shortened (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006).

The second relatively novel strategy is based on the transfer of water rights as discussed by Section IV of the agreement, “Agreements to Transfer or Broker Water between Parties. “ This agreement allows the power plants to continue to divert water up to their full allotment of water via the approval of “subcontracts for delivery of water from the Navajo Reservoir supply entered between the Jicarilla Apache Nation and the Public Service Company of New Mexico, the Arizona Public Service and BHP Billiton” (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006, pg. 8). The total amount of water delivered under subcontracts is limited to 8,500 AF. Since this will result in a reduction in water supply, there will be an additional shortening of the irrigation seasons for all of the irrigation projects/ditch associations. The power companies in compensation “agree to provide funds to mitigate the effects to the water supply of any added increment of shortage that is caused by actual diversion of water under subcontracts” (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006, pg. 9). The funds are distributed by the power companies to the bodies in charge of each irrigation project or community ditch who “may utilize or dispose of said funds in a manner or manners of their choosing to the benefit of the water users under the project” (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006, pg. 9). The exact distribution of funds is given by the agreement, and there is also the possibility of transfers between other parties to the agreement (Recommendations for San Juan River Operations and Administration for 2007 and 2008, 2006).

### **Principles for Success in the San Juan Agreement: Dispute Resolution**

The San Juan River agreement has a provision, Section 5, specifically pertaining to dispute resolution. The section, in part, states that

In the event that a dispute should arise regarding the implementation of the recommendations or the performance of an endorsing party under the recommendations, the endorsing parties commit to resolve such a dispute in a cooperative, timely, and effective manner (Recommendations for San Juan River



Operations and Administration for 2007 and 2008, 2006, pg. 9).

If the parties can not work out the issue amongst themselves, the venue of next resort is to ask for the assistance of the BOR and/or the OSE in resolving the dispute. The parties do not waive their right to litigate if the dispute can not be worked out amongst themselves or with the aid of the BOR and/or the OSE.

### **Principles for Success in the San Juan Agreement: Definition of Success**

The San Juan Rivers agreement(s) appears to be working as intended. According to John Whipple, basin manager, “The agreements have worked from the standpoint of ditches self-regulating their diversions within limits that they agreed to” (Whipple, January 23<sup>rd</sup>, 2008). Some of the provisions of the agreement have been tested to a limited extent and found to work as planned. For example, one year a small percentage shortage was predicted early in the year, and so all the irrigation ditches delayed irrigating by a few days at the start of the growing season. However, the shortage sharing provisions have not been tested beyond this limited extent, and the provisions allowing for the leasing of water rights have not been tested. These provisions of the agreement have not been fully utilized due to hydrological circumstances having been generally fairly wet. It will be interesting to see how the agreement(s) fair under more stressful environmental conditions. For now, however, the parties to the agreement appear to be happy with how it is working. John Whipple, states that, “I believe that the parties to date generally have been satisfied with the agreements and the cooperation shown by all involved” (Ibid). Lastly, the agreement appears to meet the definition of success for a small local water sharing agreement laid out previously in this paper. There has not been a priority call on the San Juan River. This is again due to the fact that hydrologic conditions have been favorable. There has been enough water for all the parties to the agreement to satisfy their water requirements without having to resort to either shortage sharing or the undesirable alternative of cutting someone off based upon the traditional prior appropriations system. While the agreement has thus far worked as planned, it is impossible to call it truly successful or unsuccessful until there has been a year where water is insufficient to satisfy all the water requirements of the parties. Under

these circumstances the shortage sharing provisions and the water sharing agreement as a whole could truly be tested.

## Conclusion

What can we learn about water sharing agreements in general and how are the three questions I posed in my introduction answered? Both research into existing water compacts (McCormick, 1994) and more theoretical research (the Utton Center Model Compact, and the ASCE Model agreements) indicate several common areas of consideration and agreement on what constitutes successful water sharing agreements over a large areas (between states or between countries). Some common areas to be considered are summarized below.

<b>Table 2: Summary of Factors to be Considered When Negotiating A Successful Local Water Sharing Agreement</b>
<b>Category (Sub-category if Necessary)</b>
<b>Administrative Structure:</b> Clarity
<b>Administrative Structure:</b> Size
<b>Administrative Structure:</b> Legality
<b>Comprehensiveness:</b> Included Parties
<b>Comprehensiveness:</b> Included Water
<b>Comprehensiveness:</b> Science
<b>Management Purposes:</b>
<b>Management Purpose:</b> Water Allocation
<b>Dispute Resolution:</b>
<b>Definition of Success:</b>

All the factors help the parties successfully negotiate and maintain a method of water allocation without having to resort to litigation.

Setting up an administrative system that follows the three administrative principles laid out here (clarity, legality; and size) sets up the structure necessary to manage the chosen method of water allocation. If there is too little administration, certain aspects of managing the agreement are likely to fall through the cracks. If there is too much administration, on the other hand, procedures for doing things may become overly burdensome. An administrative structure that is unclear as to who has what responsibilities or what terminology in the agreement means may be the cause of disagreements among the parties. The use of principles of comprehensiveness--included

parties, included water, and the use of science--contribute foresight to the agreement. If all the relevant parties are included at the negotiating table at the start, the agreement's water allocation procedures are less likely to be derailed in the future by a lawsuit or complaint from a user who was not included. Additionally, if a large water user is left out, that means that all of the basin's water is not included, partially defeating the purpose of using water sharing agreements. The second comprehensiveness principle relates to this and to the need to include any related groundwater in any given agreement. Given how much better our scientific understanding of the relationship between ground and surface water is, related groundwater should be include in water agreements. The third comprehensiveness principle, the use of science, makes the procedures for allocating water sounder and makes sure that (1) everyone gets their share, (2) shortages are properly determined, and (3) the procedures put in place to deal with shortages are the proper ones. The flexibility principles--duration of agreement and novel solutions--allow the water allocation procedures to change over time in order to respond to changing environmental and political realities. Lastly dispute resolution procedures that actively encourage extensive negotiation before litigation are critical to water allocation agreements not ending up in ligation. Any water allocation procedure that is backed by strong science and a larger support structure (as outlined here) can succeed. This can include traditional temporal priority or alternative administration.

The analysis I've done here of the San Juan agreement also indicates how this framework can be a useful tool for analysis of local water sharing agreements. While the exact *procedures* and *structures* are not the same at the local level as at the state level, the same *principles* are relevant to both. An excellent example of this is illustrated by the area of dispute resolution. The Utton Center Model Compact in Article VIII lays out a long detailed multi-step process for dispute resolution. The process in the San Juan San Juan River Operations and Administration agreement is much simpler. Both, however, follow the principle of negotiation first then resolution by an outside body (either in the courts or by a state agency). Similar principles are at work in both large and small area water sharing agreements.

Finally, are local water sharing agreements a useful overall addition to water allocation procedures? If they work they are. A local water sharing agreement that

works would prevent conflict amongst water rights holders and decrease depletions on stream systems. The San Juan agreement has not been tested enough to determine its success conclusively, but I predict that it will be successful when tested further. My prediction is based on how well the provisions of this local water sharing agreement track those of larger interstate compacts that have been better studied.

Alternative administration may be particularly useful as a stop-gap measure in areas where water rights have not been settled. The shortage sharing procedures part of alternative administration could also be applied in areas where temporal priority might threaten junior water users (including municipalities and power companies like in the San Juan Basin example) with being left without some of the water they need. While adjudications are absolutely necessary and traditional temporal based administration will likely continue to be the most common method of water allocation in New Mexico, water sharing agreements in advance of adjudication can be useful tools to deal with the water “crisis” in New Mexico and other western states.

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