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Groundwater in New Mexico

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INTRODUCTION

Since the late 19th century, New Mexicans have been developing the state's groundwater resources. From hand-dug wells to proposed wells penetrating to 12,000 feet, residents have sought sources in lieu of or to supplement or replace surface water. Today the state relies upon groundwater to supply almost 50% of its needs. Technology allows scientists and legislators to better understand the physical characteristics of the resource so that future generations also may be served.

The 1885-1904 drought led to early groundwater development in the Roswell Artesian Basin area in eastern New Mexico and in the southwestern part of the state. Residents of the Roswell Artesia area drilled their first wells in 1891 and constructed the first large municipal well in 1903. A few years later, development for agricultural purposes took off, creating a successful economy based on groundwater. Extensive shallow groundwater development took place in the 1930s. By the 1950s, withdrawals on average exceeded the projected average natural recharge by 80%.

Other areas in New Mexico also experienced growing groundwater use as development increased. In the Gila River and Mimbres River areas, settlers concluded that available surface water and rainfall were not sufficiently reliable for their agricultural pursuits. They too turned to wells and groundwater to make up the difference and support irrigation and livestock production.

With the introduction of new technologies and population growth, New Mexico groundwater development exploded following World War II. In 1931, the New Mexico Legislature passed the state's Groundwater Code. The Code gave the State Engineer control over groundwater administration, although such control was not conferred until the Engineer "declared" a groundwater basin; that is, identified a groundwater source of supply with "reasonably ascertainable boundaries." In the eighty years since the passage of the Groundwater Code, the State Engineer has declared basins when in his judgment the declaration was necessary to allow for the protection of senior water rights in the area of the declaration. At present, all groundwater basins have been declared in the state.

The drought of the 1940s and 1950s intensified interest in groundwater pumping as surface water supplies and precipitation dwindled. Pumping has continued and as a result many New Mexico water tables have continued to drop. For instance:

- In the Albuquerque area, some groundwater levels tracked by the USGS in production wells have declined more than 120 feet in the past forty years.

- In the Animas Basin located in the southwest corner of New Mexico, groundwater pumping for agricultural uses caused the water table to drop more than 80 feet between 1948 and 1981.
- In the Roswell Artesian Basin, from 1950 to 1975, the declines in the alluvial aquifer ranged between 40 and 80 feet.
- In the Gallup area, the water table dropped about 200 feet between 1999 and 2009 and is not expected to meet the demands of the population by 2019.

A central concern about groundwater from a legal point of view is the connection between groundwater and surface water. To the extent that groundwater pumping affects surface supply, the increase in groundwater use in New Mexico may reduce the amount of water available for surface water rights, which are often senior to groundwater rights. In *City of Albuquerque v. Reynolds*, the New Mexico Supreme Court established a principle that has deeply affected water law and administration throughout the West; that is, a state's water official, such as the New Mexico State Engineer, has the authority to recognize the connection between surface and groundwater in his administration of water. This principle means that ground and surface water must be considered together in any analysis of water rights.

As of 2009, New Mexico uses about 1.9 million acre-feet of groundwater each year for agricultural, municipal and other purposes. According to the National Groundwater Association, groundwater supplies 47% of the water used in New Mexico. The Association reported the annual usage in 2011 as follows:

Purpose	MGD	% total GW	% total supply for Purpose
Public Supply	249	15%	87%
Household (self supplied)	32	02%	100%
Irrigation	1,270	76%	45%
Livestock/Aquaculture	49	03%	70%
Industrial (self supplied)	12	01%	87%
Mining	57	03%	98%
Thermoelectric	10	01%	19%

In 1964, Charles Theis warned:

> …[R]eserves of groundwater accumulated over millennia are being depleted at a rate that will exhaust some of them in decades and will demand changes in the economy or the development of new concepts in water supply in the not-distant future.…
>
> …In their pristine state, water bodies are in approximate dynamic equilibrium, with recharge over a period of years balancing the natural discharge through springs, invisible seepage into surface streams or lakes, and evaporation and transpiration where the water table stands near the surface. Wells represent a new

discharge superimposed on this previously stable system, and the discharge from wells has to be balanced by increasing the recharge, or decreasing the natural discharge, or by some combinations of these processes.

As the population grows and drought intensifies, groundwater sources are tapped with increasing urgency, even as precipitation decreases. Limited steps are being taken to preserve groundwater through limiting withdrawals when surface water is available, conservation, and groundwater recharge.

References 1

GROUNDWATER BASINS OF NEW MEXICO

There are 39 underground water basins in New Mexico. Some of these are isolated or closed basins and some are hydrologically connected to surface water. An isolated or closed basin, encased by surrounding geology, does not receive significant recharge from surface water or precipitation. These basins do not recover appreciably from withdrawals. Groundwater withdrawal which exceeds a basin's recharge is regarded as mining or overdrafting. Examples of mined aquifers in New Mexico include the Ogallala Aquifer of the Great Plains where it extends into eastern New Mexico; the Jornada del Muerto and Hueco Basins of the southern New Mexico; and the Estancia Basin located east of Albuquerque and the Sandia Mountains. Some basins are not well connected to surface water sources and thus recharge and recover from pumping slowly. Other basins, such as the Albuquerque Basin are hydraulically well connected to surface water and receive recharge from stream flows.

Declared Groundwater Basins in N.M.

Underlying the declared groundwater basins are undefined deep water basins or aquifers. Toward the end of the 20th century, attention turned to this groundwater as a possible source to meet New Mexico's increasing demand. The nature of deep groundwater is not well understood, but it is less dependent upon surface water than shallow groundwater basins for recharge. It is not accessed frequently because of the expense of deep drilling and uncertainty about its quality.

To be classified as deep groundwater, the top of an aquifer must be at least 2,500 feet below the land surface and contain nonpotable water. Nonpotable groundwater contains not less than 1000 mg/l of total dissolved solids. If an overlying shallow groundwater basin contains nonpotable water, it is likely that the underlying deep groundwater will also be nonpotable. Information about these aquifers is derived largely from oil and gas wells and is fairly sparse. To ascertain the boundaries of these basins, hydrogeologists apply existing knowledge, information about geology and structure, and the principle that the major regional divides between surface and shallow groundwater generally reflect the deeper underlying structures. The OSE Hydrology Bureau continues to examine potential deep groundwater basin boundaries and their hydrologic connections to shallow groundwater and surface water.

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INSTITUTIONAL STRUCTURES FOR REGULATION

State, federal and tribal governments manage some aspects of groundwater. The federal government has long deferred to state law in this arena; however, there are exceptions where the federal government has a management or regulatory role. Some tribes have developed and adopted tribal water codes which include provisions regarding groundwater management.

State Institutions: The public owns all water, including groundwater, in New Mexico, with the right to use water established by state law. The New Mexico Office of the State Engineer (OSE) administers the state's water resources through the supervision, measurement, appropriation and distribution of all surface and groundwater in the state. Under the 1931 Groundwater Code, the State Engineer gained jurisdiction over groundwater by delineating or 'declaring' groundwater basins. The Engineer develops rules, regulations and guidelines to carry out the purposes of the Code. The Engineer creates water districts and appoints water masters to help actively manage both ground and surface water, to assist with compliance issues and to administer water distribution on a daily basis.

To declare a basin, the State Engineer conducts studies to determine the basin's hydrologically distinct or "reasonably ascertainable" boundaries. The Engineer declares basins in response to increased well development, aquifer draw downs and impacts on surface water which put existing interstate and intrastate obligations and uses at risk. In 2006, the State Engineer declared all remaining undeclared basins in the state. The legal description of each basin is found in Article 7 of the Rules and Regulations. These declared basins do not involve deep, nonpotable groundwater in aquifers with tops more than 2500 feet below the land surface.

Rules, Regulations and Guidelines: The statutes provide the Engineer with the authority to:

> …adopt regulations and codes to implement and enforce any provision of any law administered by him and may issue orders necessary to implement his decisions and to aid him in the accomplishment of his duties. In order to accomplish its purpose, this provision is to be liberally construed. (N.M.S.A 1978 § 72-2-8)

The State Engineer develops rules and regulations to carry out the purposes of the New Mexico water codes. The Engineer has adopted general groundwater regulations that address:

- Rights that were developed prior to the declaration of a basin;
- Well permitting process;
- Licensing of uses;
- Construction of wells;
- Changes to location, place or purpose of use;
- Changes of ownership;
- Supplemental, deepened and repaired wells;
- Plugging of wells;
- Termination of water use;
- Metering and reporting requirements; and

- Transport and storage of water.

Appropriations, Declarations, Permits & Licenses: State Engineer documents that describe appropriations include declarations, permits, licenses or some combination of the three. Prior to the State Engineer's declaration of a groundwater basin, regulation of groundwater appropriation occurred under the common law. A future appropriator had only to dig or drill a well and put the water to beneficial use to create a vested or perfected right. This water right owner could file a declaration with the OSE, but it was not required. A declaration gives the public notice of an intent, or of previous actions taken, to use groundwater. Declarations serve as *prima facie* proof of the facts stated, but do not actually create a water right. That is accomplished through beneficial use. Under the *Mendenhall* doctrine, if drilling a well is initiated but not completed prior to the declaration of a basin, no permit is required.

Once a basin is declared, all new groundwater appropriations, alterations to existing uses, and drilling of supplemental or replacement wells require a permit from the State Engineer. When an application is filed, the Engineer publishes a notice once a week, for three weeks in a newspaper located in the county where the well will be located and in each county where the water will be used or other water rights will be affected. Anyone who objects to the proposed water right or well may file an objection with the OSE. The basis for objections must include substantial and specific impairment of the objector's existing rights. In addition, an objector may assert that granting the permit would be contrary to the public welfare and/or the conservation of water within, or detrimental to the public welfare of the state. If there is unappropriated groundwater water and the other tests are met, the permit will likely be issued.

Today, most applications are challenged. The OSE's Administrative Hearing Unit hears challenges, takes evidence and renders decisions. The hearing examiner submits a report and recommendations to the State Engineer for disposition. Any decision of the Engineer may be appealed to the district court in the county where the diversion will take place. Following the issuance of a permit, a licensed driller constructs the well and files the appropriate paperwork with the Engineer. Cities such as Santa Fe may further limit wells drilling within their boundaries.

Once a well is drilled and water is put to beneficial use, the regulations provide that an applicant shall prepare and file a final inspection and report prepared by a registered survey professional. When that step is completed, the State Engineer will issue a "Certificate and License to Appropriate." Very few licenses have been issued in recent years.

Mined Groundwater Basins: The process, law, and regulations for permitting or licensing new and changed uses are the same for all groundwater appropriations. The State Engineer, however, may develop administrative guidelines for issuing permits for new appropriations and changes to uses in mined groundwater basins. Groundwater mining occurs when groundwater is pumped faster than it is replenished in a basin. The Engineer's objective is to administer groundwater basins to extend their productive life by regulating the rate of dewatering. The guidelines often follow the Engineer's determination that the groundwater in a basin has been fully appropriated. This determination is captured in an order which closes the basin for an indefinite period to new water use permits issued under the general groundwater appropriation statute, N.M.SA 1978 § 72-12-3. Among those closed to new development are the underground water basins of Estancia (2001), Curry County and Portales

(2009), and the Lea County - High Plains Aquifer area (2009), and portions of the Roswell Underground Water Basin (2005).

The State Engineer considers developing guidelines when a groundwater basin shows signs of significant stress. Thus, problems which have lead to guidelines include:

- domestic wells going dry and irrigation wells experiencing reduced production in the Curry County-Portales Basin;
- declining water levels and deteriorating water quality in the Estancia and Tularosa Basins; and
- concerns about groundwater depletion effects on the Rio Grande from Albuquerque's municipal pumping and the subsequent effects on senior users, Compact obligations, and land subsidence.

These conditions signaled a need for more careful and restrictive administration.

The goal of the guidelines is to guide OSE staff in the administration of the groundwater to 1) assure the orderly development of the water resources within the basin; 2) meet the statutory obligations regarding protection of the senior users; and, 3) extend the life of these basins so that they have a minimum of forty years of productivity. These guidelines may include provisions such as, but are not limited to:

- closing a basin to new appropriations except for those obtained under N.M.SA 1978 § 72-12-1;
- using block computer models and local assessment methods to evaluate the effects of a proposed well and to appropriately limit drawdowns in areas;
- limiting drawdowns over a set period of time such as 40 years;
- limiting permits to consumptive beneficial use for different purposes as determined by the OSE;
- limiting the per-acre amount to be transferred for an irrigation use where there is to be a change of use;
- limiting transfer amounts in the case of stacking or spreading of water rights; and,
- requiring meters and usage reports in certain instances.

Guidelines have been issued for the underground water basins of Estancia (2002), Lea County (2009), Curry County and Portales (2010), and Roswell (2005) as well as the administrative areas in the Mesilla Valley (1999), the Alamogordo-Tularosa area in the Tularosa Underground Water Basin (1997), and the Middle Rio Grande (2000).

The State Engineer can also declare a Critical Management Area (CMA) within a mined basin. A CMA defines an area where excessive water level decline rates require additional protection. It generally includes any area where there is insufficient groundwater to sustain existing appropriations for a forty year period. In a CMA, drawdown restrictions are more stringent to maximize the useful life of the designated area. Basins which include CMAs include the Estancia, the Lea County, the Curry County-Portales, the Roswell, the Tularosa, and the Middle Rio Grande.

Pumping Depletions on Surface Water: Where groundwater pumping is or will cause unacceptable depletions on fully appropriated surface water resources, the State Engineer can condition any new permit by requiring 'offsets'. To effect an offset requirement, a proposed appropriator must acquire a senior surface water right and obtain a OSE permit to transfer it, that is, change the place of use, to the

proposed groundwater diversion. The land on which the surface water was used, no longer has an appurtenant water right and the water right is said to be 'retired'.

Offsets are a part of the Mesilla Valley Administrative Criteria and are described as being

> "…achieved by acquiring a volume of water through a water right or other contractual obligation in the affected water source and releasing that water to replenish the affected volume in the source that results from exercise of the permitted groundwater appropriation. Offsets must be made before groundwater withdrawals commence tantamount to surface water effects associated with the full exercise of the permit."

Mesilla Guidelines at page 5. Requiring offsets protects the surface flows of the related stream by reducing surface water diversions from a river to accommodate depletion or reduction by pumping. This strategy is a critical part of conjunctive management of surface and groundwater resources. Offsets are also required in the guidelines of the Middle Rio Grande Basin, and the Roswell Basin.

Domestic and Other Small Uses: The State Engineer's authority over relatively small groundwater withdrawals for domestic, livestock and temporary purposes is somewhat limited. N.M.SA 1978 § 72-12-1 and its subparts require applicants to apply for permits and require the Engineer to issue them. The Engineer does so without evaluation, public notice or hearing because issuance is mandatory.

In the exercise of his authority, however, the State Engineer has developed domestic well regulations. The current regulations were issued in 2006 and amended in 2011, and do not affect pre-existing appropriations. The regulations are similar to those issued for other groundwater uses. The State Engineer may also declare a Domestic Well Management Area or CMA to protect valid, existing water rights and mined aquifers from the effects of domestic wells. The subsequent guidelines may include more restrictive limits on the amount allowed per domestic right. The limits are based on the hydrologic conditions and the number of existing water rights within the declared area. In 2003, the Engineer declared a CMA in the Tularosa Underground Water Basin for the La Luz, Fresnal and Laborcita watersheds in the Sacramento Mountains and limited new domestic well diversions to no more than .5 acre-feet per year.

Metering: To further the mission of protecting and administering New Mexico's groundwater diversions, the State Engineer now requires metering, monitoring and reporting water usage in certain areas. Previously, metering was not required unless by a court order. In the Roswell Artesian Basin, the *Lewis* court entered a January 19, 1966 Partial Final Judgment and Decree which provided for the metering of all irrigation, industrial and municipal wells. In the *Aamodt* water rights adjudication of the Rio Pojoaque Valley, the federal court ordered that all subsequent domestic wells developed be metered and limited to indoor use only. Metering and reporting allows the State Engineer water masters to monitor for over-diversion and to manage the condition of the aquifer.

The State Engineer also requires metering in the critical underground water areas in the Roswell Underground Water Basin, Carlsbad Underground Water Basin and Capitan Underground Water Basin. The Engineer ordered metering of all groundwater diversions in the Lower Rio Grande Water Master District, except for domestic or livestock purposes. He retained authority to order metering of these

exceptions at a later date. The Engineer requires affected well owners to obtain, install, maintain, and repair any meter and to report meter readings to the OSE quarterly or more frequently if necessary.

Deep Groundwater Basins: The State Engineer's authority over deep groundwater basins is also limited. In 1967 the legislature passed the original deep groundwater statutes. This action was taken to protect oil and gas interests from involvement in Pecos Compact administration. Between then and 2009 when the legislature amended N.M.SA § 72-12-25, the State Engineer did not have authority to administer water from deep groundwater basins. The law only required simple notice for the drilling of a legal well. In 1997, Midway Ranch Ltd Partnership filed the first notice of intent, completing the well that same year. By April 2009, a total of 607 notices had been filed for appropriations for about 1.6 million acre-feet per year from depths between 2,500 to 12,000 feet. At that time, only five wells had actually been constructed. Most of the notices were filed in 2008-2009 and were related to drilling in the Middle Rio Grande area.

Under the current statute, the Engineer may obtain regulatory authority over nonpotable deep groundwater for any use except oil and gas exploration, and production, prospecting, mining, road construction, agriculture, generation of electricity, use in industrial processes or geothermal use. Effectively, the Engineer's authority is limited to uses for municipal purposes. To obtain authority to regulate this water in the same manner as other groundwater, the State Engineer must declare a deep groundwater basin.

In a presentation in 2009, then State Engineer, John D'Antonio, stated if a deep aquifer was hydrologically connected to a shallow aquifer, there was no need to declare the deep basin. He outlined the next steps for the OSE to pursue:

1. Declaring nonpotable deep water aquifers if technically defensible;
2. Determining the legal significance of the Notices of Intent filed and published prior to 2009;
3. Formalizing procedures for filing applications to appropriate water from deep aquifers;
4. Formalizing procedures to manage drilling of and reporting of usage from deep wells;
5. Setting a well-defined process to facilitate development of deep nonpotable resources while protecting water rights and compacts; and
6. Recognizing that the economics of development will limit the use deep aquifer water in the near term.

Today, OSE administrative procedures require interested parties to submit a notice of intent and to file an exploratory well permit application and proof of publication in the newspaper. After drilling the well owner must submit well records, proof of compliance with drilling standards, and water quality results. Then meter readings are submitted on a quarterly basis. In order to avoid the OSE permitting requirements, the owner must show the two conditions set out in the statute are met: the depth to water and the nonpotable nature of the water.

The Interstate Stream Commission (ISC) protects New Mexico's right to water under eight (8) interstate compacts, ensures the state meets its obligations to its sister states and makes certain that endangered species are afforded necessary water. The ISC becomes involved in groundwater management where pumping affects surface water deliveries required under compacts and by endangered species such as in the Lower Rio Grande and Pecos River regions. The ISC develops

groundwater models to assist in the prediction of groundwater impacts on the rivers in its management of compact obligations. The legislature authorized the ISC to purchase water rights or appropriate water on behalf of any region. Under this authority, the ISC purchases and leases groundwater to supplement Pecos River flows so New Mexico can meet its obligations to Texas under the Pecos Compact.

Federal Management of Water: The federal government generally defers to state law for the management of water. In *California Oregon Power Co. v. Beaver Portland Cement Company*, the United States Supreme Court addressed the question of federal involvement in water regulation in the western states. It recognized that water use "generally was fixed and regulated by local rules and customs." This approach included the doctrine of prior appropriation and was formalized in the Mining Act of 1866, the Desert Lands Act of 1877 and their subsequent amendments. The Supreme Court held that:

> …[F]ollowing the act of 1877, if not before, all nonnavigable waters then a part of the public domain became *publici juris,* subject to the plenary control of the designated states, including those since created out of the territories named, with the right in each to determine for itself to what extent the rule of appropriation or the common law rule in respect of riparian rights should obtain.

The Court went on to observe in a footnote that "Congress, since the passage of the Desert Land Act, has repeatedly recognized the supremacy of state law in respect of the acquisition of water," citing to the Reclamation Act of 1902.

However, the federal government is not without constitutional authority to regulate or influence groundwater management. In the *Sporhase v. Nebraska* case, the United States Supreme Court found that the Commerce Clause clearly gives Congress the "affirmative power… to implement its own policies concerning [groundwater] regulation… Groundwater overdraft is a national problem and Congress has the power to deal with it on that scale."

The effects of groundwater pumping on the federal claims to state law surface water rights is playing out in New Mexico's Lower Rio Grande water rights state court adjudication. The United States recently sought to protect its surface water rights for the federal Rio Grande Project from depletions caused by groundwater pumping in the area. As a matter of both state and federal law, the United States asserted that the source of the water for the Project is "(1) all the surface water in the lower Rio Grande and (2) water in the ground hydrologically connected to surface waters in the lower Rio Grande." The state and other responding parties countered that the United States' claim is unsupported by New Mexico state law. On August 16, 2012, the state adjudication court found that the Project right being adjudicated is limited to a surface right and ruled that the federal claim is beyond the scope of the adjudication.

Tribal Institutions: The water rights of Native American are generally identified and defined under federal law. In *Winters v. United States*, the United States Supreme Court held that when the federal government created reservations, it sets aside both lands and water. These rights are known as federal reserved rights or *Winters* rights. This holding could be interpreted to mean that reservation tribes have a right to the water itself, and certainly means that they have the right to the use of the water. While

this issue has not been address head on by court or by commentator, it certainly underlies questions of administration.

Most state and federal adjudication courts have held that tribes have *Winters* rights to groundwater as well as to surface water. In New Mexico, many of the Native Americans are Pueblo peoples who have held their lands and waters long before the arrival of other Americans. In its 1985 opinion, the *Aamodt* federal district court concluded that the Pueblos' water rights under Spain and Mexico law still exist and could be satisfied from either surface water or hydrologically connected groundwater. Later in 2001, the *Aamodt* court examined the question of whether the Pueblos own groundwater. It held that that under every sovereign, the Pueblos did not own groundwater but rather developed rights to use it.

Groundwater Regulation by Tribes: Whether tribes can regulate their groundwater water or must comply with state law is a matter of debate. Some commentators argue that administration of water within reservation boundaries is a matter of sovereignty. Others assert that since the reservations are located within state boundaries, rational management of the ground and surface water resource demands that the tribal portion be administered under the rules and regulations of the local state engineer.

Development of a tribal water code is one avenue to administration within tribal boundaries. The Navajo Nation, for instance, asserts ownership of full equitable title to groundwater through the Navajo Nation Water Code. The Nation's situation is not representative. Only a few tribes regulate the allocation of their surface and groundwater. Under the Indian Reorganization Act of 1934, tribes must obtain approval of the secretary of the Department of Interior when enacting laws. Under pressure from western states, the U.S. Department of Interior stopped approving tribal water codes in 1975 until such time as it could promulgate appropriate rules for the use of water on tribal lands. To date, these rules have not been written.

Native American water settlements, however, have addressed administration in a variety of ways. Tribes may agree to submit to local state engineer administration. In the Aamodt Litigation Settlement Act of 2010, the Pueblos agreed to inform the local state engineer or non-Indian water users about aspects of their water management. In the Navajo proposed final decree arising out of the Northwestern New Mexico Rural Water Projects Act Settlement Act of 2009, the Nation agreed to seek New Mexico State Engineer approval of any lease of their rights for uses off of trust lands. Tribes may also agree to forbearance provisions or to administer through tribal water codes as set forth in the Crow Tribe Water Rights Settlement Act of 2010.

None of the New Mexico tribe settlements include tribal water code provisions. However, in a survey conducted by the Tribal Law Journal, several New Mexico tribes have indicated that they have codes addressing water. These Pueblos and Nations include: Acoma Pueblo, Mescalero Apache Tribe, Ohkay Owingeh Pueblo, San Felipe Pueblo, Pueblo de San Ildefono, and Santa Clara Pueblo. The survey, however, does not contain details of the content of these water codes which could be related to groundwater, surface water, water management and/or water quality.

References 3

KEY PRINCIPLES OF NEW MEXICO LAW CONCERNING GROUNDWATER

In New Mexico, water belongs to the public, but individuals, public entities and private entities may acquire a right to use water. State statutes identify the core elements of water rights which include: priority, amount, purpose, periods and place of use and, as to irrigation water, the specific tracts of land to which it is appurtenant. These principles apply to both surface and groundwater.

Permits: By issuing a permit the State Engineer grants the applicant permission to drill a well and to develop water up to a certain amount. The permit is not proof of a water right in and of itself. The appropriator must diligently pursue development and application of water to beneficial use. The maximum amount allowed under a permit is governed by regulation and/or adjudication. Following development, the Engineer may issue a license upon inspection and proof of actual beneficial use. The hierarchy of formal recognition of a ground or surface water right has a declaration of water use at the bottom, rises through a permit to a license, and ends up with a decreed right from a court.

The decision of whether to issue a groundwater permit depends on the type of permit desired; whether unappropriated water is available; whether senior groundwater users will be impaired; whether additional depletions on fully appropriated streams will occur or interstate compact streams will be impaired; whether the use is contrary to the conservation of water in the State; and, whether granting the permit will be detrimental to public welfare.

The State Engineer determines impairment on a case-by-case basis. There is no statutory guidance except that the impairment must be substantial and specific to existing water rights. Lowering of a water level in a well, shortening of the useful life of a well, adding to lift costs, reducing the ability to produce, slight increases in salinity, and making it necessary to drill more wells to produce the same amount of water do not necessarily constitute impairment but these factors provide some evidence of substantial impairment. Considerations that can mitigate an impairment claim include the age and construction of the allegedly impaired well, the ability of the well owner to continue to use the well, and whether the well can be productively deepened.

If the proposed water right will impair a hydrologically connected surface water right, the State Engineer will deny the application unless that effect is *de minimis*, the permit can be conditioned to avoid the impairment, or the effect can be offset. Typically, an applicant offsets effects by purchasing and retiring existing valid senior surface water rights. In the past, these offsets could be purchased and retired over time as the pumping effects were observed on the affected surface water through a process known as ‘dedication’. This practice was discontinued in 1994 after the state attorney general declared it illegal.

There is little case law or statutory guidance regarding the tests of “contrary to the conservation of water within the state or detrimental to the public welfare of the state.” These tests are also examined on a case-by-case basis and may be overcome by a showing of conservation practices or benefit to the public welfare. Thus, recent municipal applications by Albuquerque and Alamogordo were supported by descriptions of present and future conservation successes and plans. One case, *State v. City of Las*

Vegas, suggests that the detrimental public welfare test can be overcome where there is evidence of well development as a part of a municipality's forty year plan to accommodate reasonable population growth. However, development of such wells could meet the test of 'detrimental to the public welfare' if the proposed development threats compact obligations, municipal water supply or senior rights.

All rights for which permits are issued must undergo this analysis, with one exception - domestic well permits. Under New Mexico statutes, the State Engineer must issue permits for domestic uses. The constitutionality of this statute is presently under consideration by the New Mexico Supreme Court in *Bounds v. D'Antonio,* No. 28,860 (2011 N.M.C.A. 011), *cert. granted,* Nos. 32,713 and 32,717 (N.M. January 27, 2011).

Priority and Priority Calls: The priority of a water right is related to the date on which the water either was put to beneficial use; the date of an application for a permit, or the date of some other indicia of intent to appropriate. The rules for determining a priority date of a groundwater right are the same as for a surface water right. Water associated with a supplemental well is an exception. In that case, the supplemental groundwater right priority relates back to that of the original water right.

Priority calls are the mechanism for managing water when there is a shortage. In that event, the State Engineer arrays the water rights in order of priority and administers deliveries water from the most senior down to the most junior. This system works fairly well where surface water users are involved. However in some cases, such as where senior surface users are downstream from junior groundwater users, the call against the junior users may not result in timely delivery to the seniors.

The Carlsbad Irrigation District (CID) priority call illustrates the problem. The Carlsbad area was settled before Roswell area and so surface water rights in Carlsbad are senior to groundwater rights in the Roswell Basin. In order to gain control of illegal and excessive pumping in the Roswell Artesian basin, the State Engineer initiated the *Lewis* adjudication of water uses in the Basin. In 1976, the CID placed a priority call with the State Engineer. The Engineer contended that there would be devastating effect on local economies of shutting down groundwater uses in Roswell. It was also not clear that shutting down groundwater uses above the CID would get surface water to the District farmers. State Engineer policy at the time also allowed administration only where rights were adjudicated. Since the CID's rights were not adjudicated, the Engineer expanded the *Lewis* adjudication to include the rest of the Pecos. As of 2012, the adjudication continues. Although the priority call never materialized, the 2003 Pecos Settlement provides some relief to District farmers through the purchase and retirement of water rights by the state, and development of a pumping plan of groundwater from the Roswell artesian aquifer to augment downstream supplies for the farmers.

Domestic Rights: The State Engineer must grant applications for domestic wells. The priority of domestic right is the date on which the application for a permit was filed, if the well was drilled after the affected groundwater basin was declared. The date of a pre-basin well is the date when the well was drilled, dug or the intent to do so was formed. The amount of a water right depends on the amount of water put to beneficial use, while staying within the permitted cap or maximum. Thus, prior to the 2006 regulations domestic water rights were limited to 3 acre-feet per year. This water was intended to serve a family's domestic uses, its livestock and the irrigation of 1 acre of land for home food production. Today, the average domestic well serves only the household domestic needs, and by regulation in 2006, the State Engineer reduced the cap to 1 acre-foot per year. These uses cannot be

transferred except under very limited circumstances set forth in the 2011 domestic well rule amendments.

Supplemental Wells: The source of irrigation rights may be surface water, groundwater or a combination of the two. Under the *Templeton* doctrine, when a surface water right owner is no longer able to get a sufficient supply of water from a surface source, the owner is entitled, as a matter of right, to drill a supplemental well in an aquifer that supports the surface water. If it becomes necessary to drill a supplemental well, the amount of the water right does not change. Supplemental wells may also be obtained for other types of water rights that can no longer be satisfied with an existing source.

Water Transfers: Under New Mexico law, water rights may be severed from the original place or purpose of use and moved to a new place or purpose of use. The State Engineer requires an owner wishing to make a transfer to apply for a permit to do. As with any permit, the applicant must provide public notice and if the application is protested, defend the application in a hearing before the OSE's Administrative Hearing Unit. When considering a groundwater right transfer, the State Engineer must consider the local effect of the new withdrawal in the move-to basin. The priority date of the right travels with it to the new location and when fit into the priority scheme, can cause impairment to existing water rights. Minor impairment will not block a transfer, but more extensive impairment could. These decisions are made on a case-by-case basis.

References 4

V. UNRESOLVED QUESTIONS

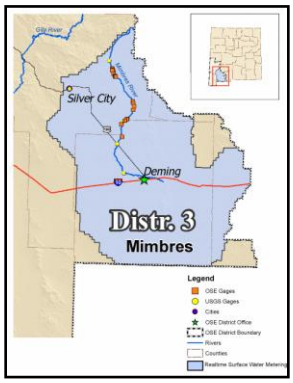
Several groundwater issues present today are: the effects of groundwater pumping on surface water; the constitutionality of domestic wells; and groundwater supplies for municipalities.

As groundwater is pumped, a cone of depression is created. A cone of depression is a dewatered area around a well shaft. Surrounding water flows along the cone toward the well shaft from every direction. Over time as pumping continues, the cone of depression expands, lowers the water table and eventually reaches hydrologically connected surface water. Where pumping lowers the water table, wells may be impaired or cease to function. Where there is a sufficient connection between surface water and an aquifer, surface water flows into the aquifer and toward the well, thus depleting the surface water resource.

Domestic Wells: Since 1943 the State Engineer has not required either publication of notice or a hearing on protests before issuing a permit since the issuance is mandatory. In 1953, the legislature formalized this practice in the first domestic well statute. The amount of water withdrawn from each domestic well is minimal, or *de minimis.* In areas where wells are widely distributed, this minor amount of withdrawal per well has little effect on water rights in surrounding ground or surface water.

Concentrations of domestic wells, however, can have a significant adverse effect on surrounding wells, surface water flows, and senior users. According to OSE records from 2000, there are about 137,000 domestic wells throughout the state. Of these, 26% are within one mile and another 27% are within 5

miles of a perennial stream. For purposes of hydrologic modeling, the OSE assumes that withdrawals from wells within 1 mile have a 100% effect on the stream. While the effects of pumping take time to reach any nearby stream, they will eventually reduce surface water flow. Since surface water is fully appropriated in the state, the rights of senior users will be impaired as the cone of depression intersects with streams.



Mimbres Underground Basin

In the mid-2000's, the case of *Bounds v. D'Antonio* took on the question of mandatory issuance of domestic well permits. Horace and Jo Bounds are farmers who hold senior water rights in the fully appropriated Mimbres Groundwater Basin in southwest New Mexico. The Mimbres Basin has been closed to new development since 1972, but since the final adjudication of water rights in 1993, 45 additional domestic well permits had been issued at the time the case was filed. The Bounds argue that the domestic well statutes allow a proliferation of wells that will affect surface water flow and impair their senior surface water rights. They assert that this impairment constitutes a taking of private property (their right to water) without just compensation or due process. They also argue that the statute is unconstitutional because it violates the prior appropriation doctrine and prevents the State Engineer from protecting senior users. The trial court found in Bounds' favor in 2008, but the Court of Appeals reversed in October 2010. The New Mexico Supreme Court granted *certiorari* in 2011 and the matter is currently under review.

Municipal Wells: In the Albuquerque area, 92 municipal wells supplied 19.6 billion gallons of drinking water in 2010. These wells have created cones of depression on both the east and the west sides of the Rio Grande. In 2004, the east side cone covered about 40 miles and in places lowered the water table about 150 feet. While the west side cone is smaller, similar effects were noted. Studies show that one half of the withdrawn water is being recharged while the other half is mined.

The USGS developed a groundwater flow model that predicts what will happen if pumping continues at the same rate to the year 2060. The model predicts, even with conservation goals in place, significant aquifer drawdowns and land surface subsidence. Significant drawdown jeopardizes the City's ability to provide water to its residents into the future. While relatively little land subsidence has been observed in Albuquerque, as depletions continue, the City can look to Tucson's experience. Downtown Tucson has dropped 6 inches in the last 20 years due to aquifer depletion, and suffered property damage and other problems as a result.

In an effort to forestall these problems, the Albuquerque Bernalillo County Water Utility (utility) was formed and a Water Resources Management Strategy developed. The strategy's goal is to reduce reliance on the aquifer, to reduce demand through conservation and to switch to renewable resources.


The New Surface-Water Treatment Plant

To reduce reliance on groundwater, the San Juan – Chama Drinking Water Project which replaces groundwater with treated contract surface water and the Reclamation/Reuse Project which uses treated effluent for irrigated sites such as parks and golf

courses were developed. Through utility's the conservation program, City residents have reduced their use by 252 gallons per person per day in the mid-1990s to 150 gallons per day in 2011. The utility met this goal three years early. The goal of the three programs is to reduce annual pumping to 60,000 acre-feet a year to rest the aquifer so that it recovers through recharge. This strategy reserves groundwater for the future and for times of shortage. The strategy also calls for implementing an aquifer storage and recovery program whereby the utility stores water underground during the winter while demand is low for withdrawal in the summer when demand is high. This project is not designed to recharge the aquifer but rather to provide temporary underground storage.

The utility continues to use surface water as it is available, but must rely on the groundwater more than originally anticipated. First, the transition to surface water was delayed and then, ash from the Los Conchas fire in the surface water excessive treatment costs requiring reversion to groundwater for two (2) months in 2010. Almost as soon as the San Juan-Chama Project was completed, drought conditions set in. As a result, the San Juan-Chama diversions were reduced by more than half in 2012. Surface flows in the river declined and as did the predicted natural recharge from runoff. In spite of these setbacks, the USGS reported in 2011 rising groundwater levels in the Albuquerque Basin at fifteen (15) of its eighteen (18) monitoring sites.

Rural Wells Supply Growing Cities: Supplying water to municipal users underlies the controversy of the San Agustin Basin Project. In that project, a group of New York based investors sought a permit from the State Engineer for the right to pump 54,000 acre-feet a year from a deep well field of 37 wells in the San Agustin Plains near Datil, New Mexico. Augustin Plains Ranch LLC planned to market water to municipalities and the state to help meet its obligations under the Rio Grande Compact. Nearly 900 protests were filed with the OSE's Administrative Hearing Unit. After a hearing and a recommendation from the hearing officer, the State Engineer "denied the application [without prejudice] because it was vague, over broad, lacked specificity, and the effects of granting it cannot reasonably be evaluated; problems which are contrary to public policy." On April 9, 2012, the Augustin Plains Ranch LLC filed its appeal in state district court.

Groundwater for Agriculture: Supplying water to thirsty agriculturalists is an issue exemplified by the situation in the Lower Rio Grande region of New Mexico. The Rio Grande is fully allocated through the Compact, the Rio Grande Project and existing users. There is a significant connection between the surface water flows of the Rio Grande and some of the surrounding groundwater basins of Rincon Valley, Mesilla, Jornada del Muerto and Hueco. Recharge in the Jornada and Hueco is very low and pumping above the recharge rate is mining the groundwater. The Rincon Valley and Mesilla Valley are interconnected with the Rio Grande which provides recharge in above-normal flow years. However, if pumping increases over 2004 levels, these basins will also be mined and the Rio Grande flows will be reduced.

Agriculture is an intrinsically valued part of the economy of the area. Yet, with the arid climate, crop evapotranspiration rates are high. Under conditions of prolonged drought, available surface water is insufficient to meet the needs of the crops. The irrigators turn to groundwater to keep their crops and economies alive. The 2004 Lower Rio Grande Regional Water Plan reports that the OSE lists 1,738 irrigation wells in the Plan area and 140 livestock wells. As the groundwater is mined, and the surface water is depleted through recharge and drought, the obligations to Texas and Mexico under the Compact, to New Mexico and Texas farmers and ranchers in the Rio Grande Project, to the

municipalities and other users cannot all be met. The question of how to divide and manage the water between all competing interests and obligations during times of plenty is hard, and in times of drought, very difficult.

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