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Nebraska Ground Water Law and Administration

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I. INTRODUCTION

Relative to other western states, Nebraska is rich in ground water.[1] In 1975, only California and Texas exceeded the state in ground water withdrawals and in the number of irrigated acres.[2] Nearly 2 billion acre feet[3] of ground water underlie Nebraska, enough to cover the entire state with 39 feet of water, yet ground water of good quality is in short supply or virtually unavailable in many parts of the state. Ground water supplies are generally limited in southeast Nebraska and in the state's border counties, while in several other areas ground water supplies are being mined (withdrawn at rates significantly in excess of natural recharge) for irrigation.[4] While 87% of the ground water used in 1975 was for irrigation,[5] ground water is also the primary source for other Nebraska water uses. In 1975 ground water supplied 99% of total municipal water use, 83% of rural domestic and stock watering use, 78% of the cooling water for power plants, and 100% of self-supplied industrial water use.[6] Other ground water uses in-

1. As used in this article "the western states" refers to the seventeen contiguous western states that to some extent follow the doctrine of prior appropriation in allocating rights to use water resources. These states are: Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming.
2. G. MURRAY & E. REEVES, ESTIMATED USE OF WATER IN THE UNITED STATES IN 1975, at 24-25 (U.S. Geol. Survey Circ. 765, 1977).
3. An acre foot of water is 325,851 gallons, or enough water to cover an acre of land one foot deep. An acre foot of water would be enough to irrigate a half acre of corn in most parts of Nebraska, and would supply a family of five for one year.
4. R. BENTALL & F. SHAFFER, AVAILABILITY AND USE OF WATER IN NEBRASKA, 1975, at 1, 32, 35 (Neb. Water Survey Paper No. 48, Conservation & Survey Div., Univ. of Neb., 1979).
5. The source of irrigation well and irrigated acreage figures is the well registration data compiled in the Nebraska Natural Resources Commission Data Bank Information System [hereinafter cited as NRC Data Bank]. Estimates of irrigated acreage in Nebraska vary considerably. For a discussion of the various methods of estimating irrigated acreage *see* L. JANSSEN, IRRIGATION ACREAGE STATISTICS FOR NEBRASKA (Dep't of Ag. Econ. Staff Paper No. 1976-11, Univ. of Neb., 1976). *See generally* M. JOHNSON & D. PEDERSON, GROUND WATER LEVELS IN NEBRASKA, 1979, at 58 (Nebraska Water Survey Paper No. 50, Univ. of Neb., July, 1980); K. MACKICHAN, ESTIMATED USE OF WATER IN THE UNITED STATES-1950, at 7 (U.S. Geol. Survey Circ. 115, 1951).
6. R. BENTALL & F. SHAFFER, *supra* note 4, at 88-89. These figures exclude the use of Missouri River water for power plant cooling and by Omaha for munic-

clude: maintenance of streamflow during dry periods; maintenance of lakes, particularly in the sandhills region; maintenance of marshes and wetlands; and subirrigation of plants where roots can reach ground water.[7] All four of these "natural" ground water uses significantly affect fish, wildlife, and recreation, while subirrigation also has agricultural significance.

Most western states have relatively complete ground water laws which provide a clear basis for resolving the major ground water policy issues. However, Nebraska ground water law is not so completely developed because the relative abundance of ground water has postponed many of the user conflicts that are the basis of legislative or judicial precedents. When significant ground water development occurs the equilibrium of the ground water system (including hydrologically related streams) is changed. This can lead to water use conflicts, including well interference conflicts between individual ground water users; ground water mining, where the ground water resource is gradually depleted; conflicts between surface and ground water users, where ground water withdrawals reduce streamflow and vice versa; and ground water quality degradation. The recent rapid development of ground water for irrigation in Nebraska is creating these user conflicts, thereby forcing consideration of ground water policy issues previously ignored.

In most western states the resolution of these conflicts is based on prior appropriation. In a few states, including Nebraska, the resolution of ground water conflicts is primarily based on common law principles. However, Nebraska ground water law has not yet fully addressed many of these topics. Historically, major developments in Nebraska ground water law have tended to follow drought periods. The major question facing legislators is whether ground water policy decisions regarding ground water mining, surface-ground water interrelationships, ground water transfers, and ground water quality protection will be addressed piecemeal through litigation, through legislative reaction to perceived water crises, or with a more deliberate consideration of water policy alternatives.

This article is divided into three parts. The first section surveys western ground water rights law in order to identify how emerging water policy issues, not addressed by Nebraska ground water law, have been addressed in other western states. Unlike surface water law, most of which was established with the enactment of an irrigation code in 1895, Nebraska ground water law has been evolu-

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ipal purposes. If such use is included, ground water use was 78% of total municipal use, and 35% of power plant cooling. *Id.*

7. *Id.* at 80-82.

tionary. Thus, the second section provides a brief description of the technological and historical conditions affecting ground water development and use and how these factors have influenced the evolution of Nebraska ground water law. The third section describes current Nebraska ground water law and explores the future direction of ground water law and policy.

II. WESTERN GROUND WATER RIGHTS LAW

The development of western ground water law reflects the earlier development of surface water law. In most states the doctrine of prior appropriation[8] has been applied to both surface and ground water. While there are many similarities in the allocation issues involving surface and ground water, significant differences exist. Surface water availability varies considerably within a single year and is replenished annually.[9] The major question is how

8. The doctrine of prior appropriation is based on two fundamental principles: (1) water rights (at common law) are acquired, not as an incident of land ownership, but by diverting water from a stream for beneficial use, and (2) conflicts are generally resolved on the basis of priority: the earliest ("senior") appropriator has a better right over subsequent ("junior") appropriators. In its modern version, appropriative water rights are acquired by application to a state water administrator, traditionally referred to as the state engineer. Priority is established when the application is received by the state engineer, and is "perfected" (completed) when water is ultimately used. Conflicts between users are resolved by the administrative enforcement of priorities: when a senior appropriator is unable to divert the quantity of water to which he is entitled, he so informs the state engineer who administratively orders upstream junior appropriators to stop diverting streamflow in inverse order of priority until the senior appropriator is able to divert the quantity of water to which he is entitled. *See generally* W. HUTCHINS, WATER RIGHTS LAWS IN THE NINETEEN WESTERN STATES (completed by H. Ellis & J. DeBraal, U.S. Dep't of Agriculture, Misc. Pub. No. 1206 (1971, 1974 & 1977)).

Appropriative water right disputes are sometimes resolved by preferences rather than priorities. Preferences are a constitutional or statutory enumeration of water use categories. A use higher on the list is a "superior" use; a use lower on the list is an "inferior" use. Under an absolute preference, a superior junior appropriator is entitled to an inferior senior appropriator's water without regard to priority and without compensation. Under a compensatory preference, the superior junior appropriator is entitled to the inferior senior appropriator's water but must purchase or condemn it. Trelease, *Preferences to the Use of Water*, 27 ROCKY MTN. L. REV. 133, 134-38 (1955) (the compensatory preference is Trelease's "power to condemn an inferior right" preference).

9. For a description of the hydrologic cycle and its relationship to ground water written for a general audience, see H. BALDWIN & C. MCGUINNESS, A PRIMER ON GROUND WATER (U.S. Geol. Survey, 1963); J. Crosby, *A Layman's Guide to Groundwater Hydrology*, in C. CORKER, GROUNDWATER LAW, MANAGEMENT AND ADMINISTRATION (Nat'l Water Comm'n Legal Study No. 6, 1971); L. LEOPOLD & W. LANBEIN, A PRIMER ON WATER (U.S. Geol. Survey, 1960); A MANUAL OF LAWS, REGULATIONS, AND INSTITUTIONS FOR CONTROL OF GROUND WATER

varying quantities of streamflow will be allocated annually. Ground water supply, in contrast, does not vary significantly during the year, and in the West, recharges slowly. Although seasonal well interference conflicts do occur which are analogous to surface conflicts, the more significant issue is unique to ground water law: how should ground water resources be allocated over time. The physical differences between ground and surface water has caused prior appropriation principles to be modified when applied to ground water allocation. This section describes the physical differences between surface and ground water and their implications for water allocation policies.

A. The Nature of the Ground Water Resource

Both surface water (the water in lakes, rivers and streams) and ground water (the water stored in ground water reservoirs called aquifers) are ultimately derived from precipitation. Rainfall and melting snow feeds streams and lakes as overland runoff. Some precipitation soaks into the ground, slowly moving laterally until it either drains into a lake or stream, or percolates downward where it becomes part of a ground water aquifer. The process of ground water storage is slow, since in the West natural recharge is only a few acre inches[10] per year. When the storage capacity of an aquifer is reached, ground water may be discharged into a stream or lake, or may be tapped by the roots of subirrigated plants, or may be evaporated from lakes or wetlands.[11]

This equilibrium condition may be changed by ground water development. When withdrawals exceed recharge the balance is taken from the ground water stored in the aquifer, reducing aquifer discharge. Common effects of ground water development are: falling ground water levels; greater pumping lifts and costs; and reduced aquifer discharge to streamflow or lakes, subirrigation, or wetlands. Discharge may be reduced such that a new equilibrium

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POLLUTION I-1 to I-40 (EPA-440/9-76-006, 1976) [hereinafter cited as GROUND WATER POLLUTION]; Tripp & Jaffe, *Preventing Groundwater Pollution: Towards a Coordinated Strategy to Protect Critical Recharge Zones*, 3 HARV. ENV. L. REV. 1, 3-4 (1979).

10. An acre inch is 27,154 gallons of water, enough to cover an acre of land one inch deep.
11. In some ground water reservoirs little or no discharge occurs. In these closed basins the pressure increases as ground water storage occurs. When wells are drilled into these closed aquifers, called artesian aquifers, the artesian pressure forces the water to rise in the well. If the artesian pressure is great enough, the well will be a flowing well. If enough ground water is withdrawn from an artesian basin, artesian pressure will decline ultimately to atmospheric pressure. *See generally* H. BALDWIN & C. MCGUINNESS, *supra* note 9, at 8-10.

condition is reached. In many cases, however, an equilibrium may not be reached until withdrawals are reduced, either by the reduced capacity of an aquifer to yield water, or by reducing pumping (e.g. by regulation).

Ground and surface water often are hydrologically interrelated. Streamflow may recharge alluvial aquifers. Similarly, ground water discharge forms the base flow of a stream, i.e. a stream's flow when overland runoff is negligible. However, ground and surface water have significantly different physical characteristics. The primary differences are their occurrence, distribution, and rates of flow. Surface water occurs seasonally in lakes and rivers whereas ground water is stored in ground water reservoirs. For large scale irrigation development, surface water must be stored and transported through canals or pipelines to service areas. In contrast, ground water is already stored underground and distribution is accomplished by the ground water reservoir: an overlying landowner needs only to install his irrigation well to withdraw ground water. This common pool property of ground water means that ground water supplies are not depleted and replenished annually as is surface water, but can be mined over longer periods of time.[12] The other significant difference between surface and ground water is their rates of movement. The movement of water flowing in a stream is measured in miles per day, whereas ground water movement is measured in feet per year. This difference in rates of movement is significant in resolving water user conflicts. Closing a junior surface water appropriator's headgates will usually increase the water supply of a downstream senior appropriator, but stopping a junior appropriator's ground water withdrawals will not necessarily improve the supply of a senior ground water appropriator.[13]

B. Legal Theories of Ground Water Ownership and Use[14]

Selecting a basis for ground water allocation is a significant policy decision for determining how a variety of ground water allocation issues will be resolved. This section describes generally the four basic western ground water allocation doctrines: absolute ownership, reasonable use, correlative rights, and prior appropriation. While all the doctrines are common law in origin, prior appro-

12. An exception is shallow surface aquifers which can be fully recharged annually.
13. *See* note 8 *supra.*
14. The legal rules discussed in this section generally apply to percolating ground water. In some states different rules apply to water in an underground stream, the subsurface flow of an underground stream and tributary ground water. *See* notes 87-109 & accompanying text *infra.*

priation has since been codified in most western states. The absolute ownership, reasonable use, and correlative rights doctrines all share the major premise that the right to use ground water is based on owning land overlying the ground water reservoir. These theories, which may be collectively referred to as overlying rights theories, differ primarily in the extent to which a landowner's right to withdraw ground water is restricted. Under prior appropriation, rights to use ground water are based not on land ownership, but on the act of physically withdrawing ground water, using it beneficially, and complying with state appropriation procedures.

One implication of retaining a common law ground water allocation theory is that as long as supplies are relatively abundant and disputes relatively infrequent, litigation is an efficient means of conflict resolution. Significant factors in the development of the modern administrative version of prior appropriation are that surface water supplies are generally inadequate to supply all potential uses, and that because surface water conflicts in the West are so predictably frequent, administrative conflict resolution is more efficient and effective than private litigation.[15] These considerations may explain why the common law overlying rights theories have been retained in the major ground water using states of California, Texas, Nebraska and Arizona where ground water supplies are relatively abundant.[16] Appropriation is the basis of ground water allocation in the other western states, and to a limited extent in California and Colorado.

1. Absolute Ownership

The earliest of the overlying rights theories of ground water use is the English rule of absolute ownership. The famous English case of *Acton v. Blundell*[17] established the absolute ownership

15. *See* Trelease, *Law, Water and People: The Role of Water Law in Conserving and Developing Natural Resources in the West*, 18 WYO. L.J. 3 (1963).
16. In 1975 ninety percent of the ground water used for irrigation in the West was withdrawn in seven states:

California	18 million acre feet
Texas	10 million acre feet
Nebraska	5.9 million acre feet
Kansas	5.2 million acre feet
Arizona	4.7 million acre feet
Idaho	3.9 million acre feet
Colorado	2.8 million acre feet

Ground water withdrawals in California, Texas, and Nebraska totaled 34 million acre feet or 60% of the total withdrawal of 56 million acre feet. G. MURRAY & E. REEVES, *supra* note 2, at 24-25.
17. 152 Eng. Rep. 1223 (Exch. Ch. 1843).

doctrine which is based on two major premises: a landowner owns everything from the center of the earth to the heavens and, because its movement is not easily discernible, courts should not attempt to apportion ground water among overlying landowners. Consequently, a landowner is virtually unrestricted in his use of ground water, and as a ground water user, he is not liable if he interferes with the ground water use of another unless he acts maliciously or negligently. Therefore, a landowner may waste ground water, use it on lands other than those overlying the ground water reservoir, or sell it.[18] The absolute ownership doctrine ironically affords a landowner little protection for the ground water under his land from a neighboring landowner with a deeper well or more powerful pump. The doctrine is essentially the law of capture: every landowner has the right to pump as much ground water as he can without regard to the rights of others. Absolute ownership was once the rule in most western states,[19] but has largely been replaced by appropriation.[20] Texas still follows the absolute ownership doctrine.[21]

2. Reasonable Use

The American rule of reasonable use[22] differs from the absolute ownership doctrine in two significant aspects: the quantity of

18. City of Corpus Christi v. City of Pleasanton, 154 Tex. 289, 276 S.W.2d 798 (1955). *See* Huber v. Merkel, 117 Wis. 355, 94 N.W. 354 (1903), *overruled by* State v. Michels Pipeline Constr., Inc., 63 Wis. 2d 278, 217 N.W.2d 339 (1974).
19. *See* Vineland Irr. Dist. v. Azusa Irr. Co., 126 Cal. 486, 58 P. 1057 (1899); Public Util. Comm'n v. Nataorium Co., 36 Idaho 287, 211 P. 533 (1922); Emporia v. Soden, 25 Kan. 588 (1881); Mosier v. Caldwell, 7 Nev. 363 (1872); Vanderwork v. Hewes, 15 N.M. 439, 110 P. 567 (1910); Metcalf v. Nelson, 8 S.D. 87, 65 N.W. 911 (1895); Houston & Tex. Cent. R.R. v. East, 98 Tex. 146, 81 S.W. 279 (1904); Herriman Irr. Co. v. Keel, 25 Utah 96, 69 P. 719 (1902); Hunt v. Laramie, 26 Wyo. 160, 181 P. 137 (1919); TERR. OKLA. STAT. § 4162 (1890).
20. Statutory citations are collected in note 33 *infra*.
21. City of Corpus Christi v. City of Pleasanton, 154 Tex. 289, 276 S.W.2d 789 (1955). The absolute ownership rule was modified somewhat in Friendswood Dev. Co. v. Smith-Southwest Indus., 576 S.W.2d 21 (Tex. 1978), where the court ruled that after November 29, 1978, the effective date of its decision, "if the landowner's manner of withdrawing ground water from his land is negligent, willfully wasteful, or for the purpose of malicious injury, and such conduct is a proximate cause of the subsidence of the land of others, he will be liable for the consequences of his conduct." *Id.* at 30. The court interpreted previous Texas decisions as making a landowner not liable for land subsidence caused by his ground water withdrawals. The court ended this immunity, but declined to apply the new rule retroactively. The court indicated no willingness to depart from the absolute rule regarding ground water use conflicts. *Id.* at 27-30. Two dissenting justices would have held plaintiffs liable following mineral law precedents. *Id.* at 31-35.
22. The first decision to enunciate the reasonable use rule was Bassett v. Salisbury Mfg. Co., 43 N.H. 569 (1862).

ground water that can be used, and the location of ground water use. As its name implies, the reasonable use doctrine entitles a landowner to the reasonable use of ground water. However, the concept of reasonableness does not involve a comparison of the relative utility of competing ground water uses.[23] Instead, when an action between landowners arises regarding rights to withdraw and use of ground water, the withdrawals of either landowner are not restricted if their use of the ground water is reasonable. In this context, reasonable has a rather specific meaning. First, the quantity of ground water used must not be wasteful.[24] Second, the use of ground water must be reasonable in relationship to the use of the overlying land—the land where the ground water is withdrawn.[25] In theory, the reasonable use doctrine is more restrictive than the absolute ownership doctrine, since it prohibits the waste of ground water as well as its use on non-overlying land. In practice, however, waste or non-overlying uses may occur in reasonable use jurisdictions since a landowner's use of ground water must be interfered with before he has standing to challenge wasteful or nonoverlying use by another.[26] The reasonable use doctrine was once followed by western courts to avoid the flexibility of the absolute ownership doctrine.[27] Nebraska, Arizona, and Oklahoma still follow reasonable use as a partial basis for ground water allocation.[28]

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23. This is the concept of reasonableness used in the surface water law doctrine of riparian rights. *See* Trelease, *The Concept of Reasonable Beneficial Use in the Law of Surface Streams*, 12 WYO. L.J. 1, 15-16 (1957).
24. Harnsberger, Oeltjen, & Fischer: *Groundwater: From Windmills to Comprehensive Management*, 52 NEB. L. REV. 179, 205 (1973).
25. *See* Jarvis v. State Land Dep't, 106 Ariz. 506, 479 P.2d 169 (1970).
26. *See* Canada v. City of Shawnee, 179 Okla. 53, 64 P.2d 694 (1937).
27. *See* Maricopa County Mun. Water Conserv. Dist. No. 1 v. Southwest Cotton Co., 39 Ariz. 65, 4 P.2d 369 (1931); Katz v. Waikinshaw, 141 Cal. 116, 70 P. 663 (1902), *aff'd on rehearing*, 141 Cal. 137, 74 P. 766 (1903); Ryan v. Quinlan, 45 Mont. 521, 124 P. 512 (1912); Olson v. City of Wahoo, 124 Neb. 802, 248 N.W. 304 (1933); Volkman v. Crosby, 120 N.W.2d 18 (N.D. 1963); Canada v. City of Shawnee, 179 Okla. 53, 64 P.2d 694 (1937); Bull v. Siegrist, 169 Or. 180, 126 P.2d 832 (1942); Horne v. Utah Oil Refining Co., 59 Utah 279, 202 P. 815 (1921); Evans v. City of Seattle, 182 Wash. 450, 47 P.2d 984 (1935); Binning v. Miller, 55 Wyo. 451, 102 P.2d 54 (1940).
28. *See* Bristor v. Cheatham, 75 Ariz. 227, 255 P.2d 173 (1953); Prather v. Eisenmann, 200 Neb. 1, 261 N.W.2d 766 (1978). In both states, legislation authorizes administrative regulation of ground water in designated areas. *See* notes 45-51, 57-78 & accompanying text *infra*. In Nebraska, the reasonable use doctrine has been modified by statutory preference provisions for resolving conflicts among those using ground water for different purposes, and by the correlative rights doctrine for resolving conflicts among those using ground water for the same purposes. *See* notes 395-406 & accompanying text *infra*. The historical basis for ground water allocation in Oklahoma is reasonable use. Rarick, *Oklahoma Water Law, Ground or Percolating Water in the Pre-1971 Period*,

3. Correlative Rights

The California rule of correlative rights differs from the reasonable use rule in three significant respects. First, although correlative rights are based on owning land overlying the ground water reservoir, ground water can be appropriated for nonoverlying use if local overlying users are not harmed.[29] Second, entities storing water underground are entitled to the exclusive use of such stored water.[30] Third, where ground water mining is occurring, courts will allocate each user his share of the "safe yield" of the ground water supply.[31] Although the correlative rights doctrine is followed only in California, the feature of sharing ground water proprortionately among users is followed in Nebraska and South Dakota.[32]

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24 OKLA. L. REV. 403, 409-10 (1971). The Oklahoma Ground Water Law of 1972 modified this by establishing administrative procedures for allocating rights to withdraw specified quantities of ground water on a basis similar to oil and gas utilization. OKLA. STAT. ANN. tit. 82, § 1020.1-.21 (West. Supp. 1979-80). *See* Jensen, *The Allocation of Percolating Water Under the Oklahoma Ground Water Law of 1972*, 14 TULSA L. REV. 437, 459-62 (1979).

29. Ground water surplus to the needs of overlying landowners may be appropriated for distant nonoverlying use. Ground water appropriation is non-statutory, obtained by withdrawing ground water and using it for a beneficial purpose. *See* 2 W. HUTCHINS, *supra* note 8, at 670-75.

30. Imported surface water is stored in the ground water storage space created by ground water mining. Water stored underground is subject to the exclusive recapture of the storing entity. Gleason, *Los Angeles v. San Fernando: Ground Water Management in the Grand Tradition*, 4 HASTINGS CONST. L.Q. 703, 711-12 (1977) [hereinafter cited as *Ground Water Management*]; Gleason, *Water Projects Go Underground*, 5 ECOLOGY L.Q. 625, 633-35 (1976) [hereinafter cited as *Water Projects*]; *see* Kreiger & Banks, *Groundwater Basin Management*, 50 CALIF. L. REV. 56, 70-71 (1962).

31. For example, if total withdrawals of ground water must be reduced by thirty percent to prevent ground water mining, each ground water user within the basin could be required by court order to reduce his ground water withdrawals by thirty percent without regard to priority. *See* Pasadena v. Alhambra, 33 Cal. 2d 908, 207 P.2d 17 (1949). The mutual prescription safe yield doctrine established in *Pasadena* was subsequently modified in Los Angeles v. San Fernando, 14 Cal.3d 199, 537 P.2d 1250, 123 Cal. Rptr. 1 (1975), when the California Supreme Court held that private ground water users could not obtain prescriptive ground water rights against public entities. This significantly changed the basis for safe yield adjudications when public entities are involved. *See* A. SCHNEIDER, GROUND WATER RIGHTS IN CALIFORNIA 29-37 (Governor's Comm'n to Review Cal. Water Law Staff Paper No. 2, 1977).

Although the safe yield portion of the correlative rights doctrine has not been used to prevent ground water mining, it has been used as a basis for allocating the cost of imported surface water used to recharge ground water basins. *See* notes 79-83 & accompanying text *infra*.

32. *See* notes 395-406 & accompanying text *infra*. South Dakota statutes authorize reducing equally the withdrawals of large capacity wells without regard to priority. S.D. COMP. LAW ANN. § 46.6-6.2 (Supp. 1979).

4. Prior Appropriation

In most western states the surface water law doctrine of prior appropriation has been applied to ground water.[33] An appropriative right to use ground water is based on obtaining a state permit to withdraw ground water, the physical withdrawal of ground water, and the use of ground water for some beneficial purpose.[34] Nonoverlying uses are permitted. The state permit may limit the quantity of ground water the appropriator is entitled to withdraw.[35] In many appropriation states, a permit may be denied if its issuance would impair the rights of existing appropriators, or if the ground water is "critical" or over-appropriated.[36]

C. Well Interference Conflicts[37]

A significant element of a ground water right is the extent to which a ground water user is protected in his original means of diverting ground water. If withdrawals by other ground water users are made, water levels may decline to the extent that the senior or superior[38] user's original well and pumping plant stop yielding water. In most cases the senior or superior user is able to restore his water supply by drilling a deeper well and installing greater pumping capacity. In other cases, ground water supplies may be temporarily inadequate to supply all users. When well capacity is inadequate to continue yielding water, the legal issue is whether a senior or superior user is entitled to compensation for

33. CAL. WATER CODE §§ 1200-1201 (West 1971) (however, appropriation is not the exclusive basis of California ground water law, *see* notes 29-32 & accompanying text *supra*); COLO. REV. STAT. § 37-90-137 (1973 & Supp. 1979) (apparently applying prior appropriation to non-tributary ground water outside of designated ground water basins, *see* 2 W. HUTCHINS, *supra* note 8, at 704; 3 W. HUTCHINS, *supra* note 8, at 236); IDAHO CODE § 42-103 (1977), KAN. STAT. ANN. § 82a-703 (1977); MONT. REV. CODES ANN. § 89-2916 (Supp. 1977); NEV. REV. STAT. § 534.020 (1973); N.M. STAT. ANN., § 75-11-1 (1968); N.D. CENT. CODE § 61-01-01 (1960); OR. REV. STAT. § 537.525 (1979); S.D. COMP. LAWS ANN. § 46-6-3 (Supp. 1979); UTAH CODE ANN. § 73-3-1 (1968); WASH. REV. CODE ANN. § 90.44.040 (1962); WYO. STAT. § 41-144 (Supp. 1975).

For a discussion of the historical development of the appropriative doctrine, see 1 W. HUTCHINS, *supra* note 8, at 157-80; Trelease, *supra* note 15. For a brief description of the major elements of prior appropriation, see note 8 *supra*.

34. *E.g.*, MONT. REV. CODES ANN. § 89-2913 (1963).
35. *E.g.*, OR. REV. STAT. § 537.620(4) (1979).
36. *See* notes 45-71 & accompanying text *infra*.
37. *See generally* Hutchins, *Protection in Means of Diversion of Ground-Water Supplies*, 29 CALIF. L. REV. 1 (1940); Widman, *Groundwater-Hydrology and the Problem of Competing Well Owners*, 14 ROCKY MTN. MIN. L. INST. 523 (1968).
38. *See* note 8 *supra*.

his increased pumping costs.[39] When the aquifer is inadequate to supply all users, the legal issue is how ground water will be allocated.[40]

The overlying rights ground water doctrines afford senior or superior ground water users little if any protection in well interference conflicts. Under the absolute ownership doctrine, each ground water user bears the increased pumping costs when well depth and pumping capacities must be increased.[41] By implication, where ground water supplies are inadequate for all users, each user takes whatever water he can pump. Under the reasonable use doctrine, a ground water user can obtain relief in a well interference conflict only by enjoining another user's wasteful or nonoverlying use. But if the use is reasonable, each user bears his own increased pumping costs and, by implication, where supplies are inadequate, each user is entitled to whatever water he can pump.[42] Under the correlative rights doctrine, an overlying user may enjoin a nonoverlying or wasteful use. Otherwise each user bears any increases in pumping costs. Where supplies are inade-

39. When wells are inadequate to fully utilize the available ground water supply, well interference conflict resolution options include: (1) reduce or stop withdrawals by junior or inferior users for the benefit of senior or superior users; (2) require junior or inferior appropriators to compensate (or make water available to) senior or superior water users; (3) prohibit additional development that would interfere with existing users; (4) establish restrictions on ground water development and use as to maximum pumping depths, but require each user to bear his own pumping costs; (5) rotate pumping to avoid interference; or (6) require each user to assume his own pumping costs without regard to priority or preference. Options 1 & 2 favor senior or superior ground water users while options 3 & 4 favor existing ground water users over potential ground water users. Options 3 to 6 favor existing junior or inferior users since they are treated on the same basis as senior or superior users.

40. When ground water supplies are inadquate to meet the needs of all users, well interference conflict resolution options include: (1) reduce or stop withdrawals by junior or inferior users for the benefit of senior or superior users; (2) require junior or inferior users to compensate (or make water available to) senior or inferior users; (2) permit senior or superior users to purchase or condemn junior or inferior water or water rights; (4) rotate pumping to avoid interference, or (5) allow each user to pump what water he can without regard to priority or preference. Options 1 to 3 generally favor senior or superior users, although to varying degrees. Options 4 & 5 favor junior or inferior users since they are treated on the same basis as senior or superior users.

41. However, Texas ground water conservation districts may establish well drilling permits and well spacing requirements to, *inter alia*, minimize well interference conflicts. TEX. WATER CODE ANN. tit. 2, § 52.114 (Vernon 1972 & Supp. 1979).

42. *See* Canada v. City of Shawnee, 179 Okla. 53, 64 P.2d 694 (1937). In Nebraska the reasonable use rule has been modified by well spacing statutes and court decisions. *See* notes 395-406 & accompanying text *infra*.

quate the available supply will be shared proportionally by all users.[43]

In appropriation states, senior appropriators are given varying degrees of legal protection in well interference conflicts although the distinction between well interference conflicts caused by inadequate well capacity and those caused by inadequate supply is generally not clearly defined. Priority is not rigidly followed in resolving well inadequacy conflicts because this could significantly restrict ground water development. However, priority is a significant element in resolving supply inadequacy conflicts.

The maximum beneficial use of water and the protection of senior users are the two basic policy objectives of prior appropriation.[44] While these objectives are largely compatible when applied in surface water law, they conflict in the well interference situation. Greater use of the water supply is achieved by allowing junior appropriators to reduce ground water levels but only by imposing additional pumping costs on senior appropriators. However, granting senior appropriators absolute protection of their original pumping depths would preclude development by junior appropriators and frustrate the policy of maximum beneficial use.

In view of this doctrinal inconsistency, it is not surprising that western states resolve well interference conflicts in a variety of ways. The most common approach is to consider the effect of proposed appropriations on existing wells, and then condition or deny applications for wells which would interfere with existing uses.[45] Several states authorize administrative regulation of junior appropriators for the benefit of senior appropriators when well interference occurs.[46] Idaho and Wyoming authorize senior appropriators to request an administrative determination of whether well interference is occurring.[47] In Utah, a junior appropriator interfering with a senior appropriator's withdrawals must either provide an

43. Hudson v. Dailey, 156 Cal. 617, 105 P. 748 (1909). However, the basis of the sharing is unclear. *See* note 31 *supra*.

44. *See* 1 W. HUTCHINS, *supra* note 8, at 5, 488-89.

45. COLO. REV. STAT. § 37-90-137 (Supp. 1979) (applies only to appropriation of nontributary ground water outside of designated ground water basins); MONT. REV. CODE ANN. § 89-2918 (Supp. 1977) (in control areas only); NEV. REV. STAT. § 534.110(7) (1973) (in designated basins only); N.M. STAT. ANN. § 73-11-3 (Supp. 1975) (Senior appropriators must tolerate some ground water level reduction, Mathers v. Texaco, Inc., 77 N.M. 239, 421 P.2d 771 (1967)); OR. REV. STAT. §§ 537.620(3), .620(4), .622 (1979); S.D. COMP. LAWS ANN. § 46-6-7 (1967); WASH. REV. CODE ANN. §§ 99.44.030, .040, .090 (1962); WYO. STAT. § 41-140 (Supp. 1975) (in control areas only).

46. MONT. REV. CODES ANN. § 89-2932 (Supp. 1977); NEV. REV. STAT. § 534.110(6) (1973); OR. REV. STAT. § 537.775 (1979); S.D. COMP. LAWS ANN. § 46-6-6.2 (Supp. 1979); WASH. REV. CODE ANN. §§ 90.44.130, .180 (1967); WYO. STAT. § 41-132 (Supp. 1975) (in control areas only).

47. IDAHO CODE § 42-237 (1977); WYO. STAT. § 41-128 (Supp. 1975).

alternative water supply, or be held liable for damages.[48] In five states, senior appropriators receive only limited protection in that reasonable pumping depths are maintained for all users through restrictions on ground water development and use.[49] In some states well interference conflicts can be resolved on the basis of preferences rather than priority,[50] or by rotation of pumping to minimize well interference.[51] This diversity of approaches for addressing well interference conflicts suggests that priority, which works fairly well in administering surface water rights, cannot be mechanically applied in administering ground water rights. While closing an upstream junior appropriator's headgates usually results in a timely increase in supply to the downstream senior appropriator, stopping or reducing ground water withdrawals by a junior appropriator may have no effect on the ground water supply of a senior appropriator, much less a timely one. Even though priority plays less of a role in resolving well inadequacy conflicts, it is a significant element in supply inadequacy conflicts and in protecting senior appropriators from the adverse impacts of proposed junior appropriations.

D. Ground Water Mining

Between 1950 and 1975 the quantity of ground water used annually for irrigation in the western states increased from eighteen million acre feet to fifty-six million acre feet.[52] This dramatic increase in ground water use has led to ground water mining in several western states, notably in the high plains region from Texas to Nebraska, in Arizona, and in southern California.[53] When ground water withdrawals exceed net recharge the difference comes from

48. Current Creek Irr. Co. v. Andrews, 9 Utah 2d 324, 344 P.2d 528 (1959); Hanson v. Salt Lake City, 115 Utah 404, 205 P.2d 255 (1949); UTAH CODE ANN. § 73-3-23 (1968). Idaho formerly followed this approach. Noh v. Stoner, 53 Idaho 651, 26 P.2d 1112 (1933); Bower v. Moorman, 27 Idaho 183, 147 P. 496 (1915). Subsequent legislation established that reasonable pumping depths would be maintained, but a senior appropriator's original means of diversion would not be protected. IDAHO CODE § 42-226 (1977). *See* Baker v. Ore-Ida Foods Inc., 95 Idaho 575, 513 P.2d 627 (1973).

49. IDAHO CODE § 42-226 (1977); NEV. REV. STAT. §§ 534.110(3), .110(4)(1973); S.D. COMP. LAWS ANN. § 46-6-6.1 (Supp. 1979); WASH. REV. CODE ANN. § 90.44.070 (1962); WYO. STAT. § 41-141 (Supp. 1975).

50. OR. REV. STAT. § 537.735 (1979) (absolute preference). WYO. STAT. § 41-128(a) (Supp. 1975) (absolute preference if domestic well is adequate). *See* Bishop v. Casper, 420 P.2d 466 (Wyo. 1966).

51. OR. REV. STAT. § 537.735 (1979); WYO. STAT. § 41-132 (Supp. 1975).

52. G. MURRAY & E. REEVES, *supra* note 2, at 24-25; K. MACKICHAN, *supra* note 5, at 6-7.

53. 1 UNITED STATES WATER RESOURCES COUNCIL, THE NATION'S WATER RESOURCES 1975-2000, at 58 (1978).

ground water stored in the aquifer. When storage is reduced, aquifer discharge to streams, lakes, subirrigation or wetlands is also reduced.[54] Sometimes discharge may be reduced to the point that a new equilibrium is reached. In many situations, however, this equilibrium will not be reached until withdrawals are limited, either by reduced pumping (e.g. by regulation) or by the reduced capacity of the aquifer to yield water. When this occurs, local and regional economies dependent on or affected by ground water use are likely to decline unless a supplemental water source is found.[55]

The absolute ownership and reasonable use doctrines do not directly address the issue of ground water mining. Under the absolute ownership doctrine, a landowner may withdraw ground water without regard to whether ground water is being mined. Under the reasonable use doctrine, a landowner's right to withdraw ground water will be restricted only if it is wasteful, or if the ground water is used on nonoverlying lands, or both. Otherwise, a landowner may withdraw ground water without regard to whether ground water is being mined.

The correlative rights doctrine addresses mining of ground water in theory by prorating the "safe yield" of an aquifer among ground water users. However, in practice, correlative rights in California is part of the legal basis for integrative use of ground and imported surface water supplies, rather than a ground water mining policy.[56]

Appropriation states vary in their approaches for dealing with ground water mining. In theory, one method of resolving disputes among appropriators is provided by the basic principle that a junior appropriator must stop using water when his withdrawals conflict with those of senior appropriators. Similarly, a policy of restricting new ground water appropriations may protect existing ground water users. However, neither approach will not, by itself, necessarily prevent ground water mining.

1. *Ground Water Regulation.* Two major approaches have evolved in the West for dealing with ground water mining: either regulate ground water development and use in critical areas; or obtain supplemental water supplies. The former is the most common approach, being implemented in appropriation and overlying use jurisdictions through special ground water development and use regulations in designated areas.[57] Twelve western states use this

54. The major consequences of ground water mining in artesian aquifers is the reduction or loss of artesian pressure. *See* note 12 *supra.*

55. NATIONAL WATER COMMISSION, WATER POLICIES FOR THE FUTURE 238-43 (1973).

56. *See* notes 80-84 & accompanying text *infra.*

57. General options for dealng with ground water mining through regulation include restricting development (i.e., well installation), restricting ground

approach for designated areas.[58] The general objective of such legislation is to slow or stop ground water mining and to protect existing irrigation-based economies. Specific policy objectives include protection and maintenance of current irrigation,[59] maintaining aquifer yield,[60] and preventing land subsidence.[61]

Designating special ground water control areas typically is a state responsibility.[62] The designation process can be initiated ei-

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water withdrawals, or both. Specific combinations include: (1) restrict neither development nor use; (2) restrict or prohibit additional development, but do not restrict current uses; (3) do not restrict development but restrict current use (at some point ground water use restrictions could be stringent enough that there would be no private incentive to develop; hence the use restrictions would also be a development restriction); and (4) restrict both development and current uses. Option 1, unrestricted development, favors current users over future users. Option 2, a fairly common approach, favors current users over those who would otherwise develop. Option 3 treats current users and immediate developers equally. Option 4 gives current users some advantage over those who would otherwise develop, depending on the severity of development controls. Future generations are ignored in option 1, but may benefit under options 2 to 4, depending on the severity of development and use controls.

58. 1980 Ariz. Sess. Laws, S.B. 1001, ch.1, § 86 (to be codified at ARIZ. REV. STAT. ANN. § 45-401 to -415); COLO. REV. STAT. § 37-90-102 (1974); IDAHO CODE § 42-233a (Supp. 1979); KAN. STAT. ANN. § 82a-1036 (Supp. 1979); MONT. REV. CODES ANN. § 89-2914 (Supp. 1977), NEB. REV. STAT. § 46-656 (Reissue 1978); NEV. REV. STAT. § 534.020 (1973); N.M. STAT. ANN. § 75-11-13 (1968); OR. REV. STAT. § 537.735 (1979); TEX. WATER CODE ANN. tit. 2, § 52.021 (Vernon Supp. 1979); WASH. REV. CODE ANN. § 90.44.130 (1962); WYO. STAT. § 41-129 (Supp. 1975). New Mexico also authorizes regulation of ground water in artesian basins and formation of artesian conservancy districts. N.M. STAT. ANN. §§ 75-12-2 to -13-1 (1968). States without some critical area legislation are California, North Dakota, Oklahoma, South Dakota and Utah. Oklahoma legislation authorizing special ground water regulation in designated areas was subsequently repealed. *See* 3 W. HUTCHINS, *supra* note 8, at 437-39; Rarick, *supra* note 28.

59. 1980 Ariz. Sess. Laws, S.B. 1001, Ch. 1, § 86 (to be codified at ARIZ. REV. STAT. ANN. § 45-401(A)); IDAHO CODE § 42-233a (Supp. 1979).

60. *See* 1980 Ariz. Sess. Laws, S.B. 1001, Ch. 1, § 86, (to be codified at ARIZ. REV. STAT. ANN. § 45-401(a)); WASH. REV. CODE ANN. § 90.44.130 (1962).

61. TEX. WATER CODE ANN. tit. 2, § 52.117 (Vernon Supp. 1979).

62. 1980 Ariz. Sess. Laws, S.B. 1001, Ch. 1, § 86 (to be codified at ARIZ. REV. STAT. ANN., §§ 45-412 to -414); COLO. REV. STAT. § 37-90-106(1) (1974); IDAHO CODE § 42-233a (Supp. 1979); KAN. STAT. ANN. § 82a-1038 (Supp. 1979); MONT. REV. CODES ANN. § 89-2914 (Supp. 1977); NEB. REV. STAT. § 46-658(1) (Cum. Supp. 1980); NEV. REV. STAT. § 534.030(2) (1973); N.M. STAT. ANN. § 75-11-13 (1968); OR. REV. STAT. § 537-730 (1979); WASH. REV. CODE ANN. § 90.44.130 (1968); WYO. STAT. § 41-129(b) (Supp. 1975).

Texas takes the unique approach of establishing ground water controls through the formation of underground water conservation districts. TEX. WATER CODE ANN. tit. 2, § 52.021 (Vernon Supp. 1979). State officials do not have a significant role in ground water policy development and implementation.

ther by state officials[63] or upon the petition of local ground water users.[64] Criteria for establishing control areas vary considerably and include: withdrawals approaching or exceeding a ground water basin's "safe yield" or recharge;[65] ground water level declines;[66] conflicts between ground water users;[67] water quality degradation;[68] and land subsidence.[69] The ground water controls authorized in designated areas also vary. Authorized controls include: (1) requiring permits for new wells;[70] (2) restricting ground water development through permit denials,[71] well spacing requirements,[72] or well drilling moratoria;[73] and (3) reducing ground

63. 1980 Ariz. Sess. Laws, S.B. 1001, Ch. 1, § 86 (to be codified at ARIZ. REV. STAT. ANN. § 46-412); COLO. REV. STAT. § 37-90-106(1) (1974); IDAHO CODE § 42-233a (Supp. 1979); KAN. STAT. ANN. § 82a-1036 (Supp. 1979); MONT. REV. CODES ANN. § 89-2914 (Supp. 1977); NEV. REV. STAT. § 534.030(2) (1973); N.M. STAT. ANN. § 75-11-13 (1968); OR. REV. STAT. § 537.730 (1979); WASH. REV. CODE ANN. § 90.44.130 (1968); WYO. STAT. § 41-129(b) (Supp. 1975).

Texas and Nebraska are the only states in which ground water controls cannot be initiated by state officials. *See* note 56 *supra* and notes 213-15 & accompanying text *infra*.

64. 1980 Ariz. Sess. Laws, S.B. 1001, Ch. 1, § 86 (to be codified at ARIZ. REV. STAT. ANN. § 45-415); KAN. STAT. ANN.. § 82a-1036 (Supp. 1979); MONT. REV. CODES ANN. § 89-2914 (Supp. 1977); NEB. REV. STAT. § 46-658(3) (Cum. Supp. 1980); NEV. REV. STAT. § 534.030(1) (1973); OR. REV. STAT. § 537.730 (1979); TEX. WATER CODE ANN. tit. 2, § 52.021 (Vernon Supp. 1979); WASH. REV. CODE ANN. § 90.44.130 (1968); WYO. STAT. § 41-132 (Supp. 1975).

65. 1980 Ariz. Sess. Laws, S.B. 1001, ch. 1, § 86 (to be codified at ARIZ. REV. STAT. ANN. § 45-412(1)); KAN. STAT. ANN. § 82a-1036(b) (Supp. 1979); MONT. REV. CODES ANN. § 89-2914(1) (Supp. 1977); OR. REV. STAT. § 537.730(3) (1979); WASH. REV. CODE ANN. § 90.44.130 (1968); WYO. STAT. § 41-129(a)(i) (Supp. 1975).

66. KAN. STAT. ANN. § 82a-1036(a) (Supp. 1975); OR. REV. STAT. § 537.730(1) (1979); WYO. STAT. § 49-129(a)(ii) (Supp. 1975).

67. NEB. REV. STAT. § 46-658(1)(a) (Cum. Supp. 1980); MONT. REV. CODES ANN. § 89-2914(3) (Supp. 1977); OR. REV. STAT. § 537.720(2) (1979); WYO. STAT. § 41-129(a)(iii) (Supp. 1975).

68. 1980 Ariz. Sess. Laws, S.B. 1001, ch. 1, § 86 (to be codified at ARIZ. REV. STAT. ANN. § 45-412(3)); KAN. STAT. ANN. § 82a-1036(d) (Supp. 1979); OR. REV. STAT. § 537.730 (1979).

69. 1980 Ariz. Sess. Laws, S.B. 1001, ch. 1, § 86 (to be codified at ARIZ. REV. STAT. ANN. § 45-412(2)).

70. COLO. REV. STAT. § 37-90-107 (1974 & Supp. 1979); NEB. REV. STAT. § 46-659(1) (Cum. Supp. 1980); NEV. REV. STAT. § 534.050 (1975); TEX. WATER CODE ANN. tit. 2, § 52.114 (Vernon 1972).

71. COLO. REV. STAT. § 37-90-107 (1974 & Supp. 1979); IDAHO CODE § 42-233a (Supp. 1974); NEV. REV. STAT. §§ 533.370(4), 534.110(3) (1973).

72. NEB. REV. STAT. § 46-666(1)(c) (Cum. Supp. 1980); TEX. WATER CODE ANN. tit. 2, § 52.117 (Vernon Supp. 1979); WYO. STAT. § 41-132(a)(v) (Supp. 1975).

73. KAN. STAT. ANN. § 82a-1038(b)(1) (Supp. 1979); NEB. REV. STAT. § 46-666(4) (Cum. Supp. 1980); NEV. REV. STAT. § 534.110(7) (1973); OR. REV. STAT. § 537.730(1) (1979); WYO. STAT. § 41-132(a)(i) (Supp. 1975). Arizona does not establish a well drilling moratorium per se, but additional land cannot be irrigated in "irrigation non-expansion areas," in "active management areas," and

water use by enforcing priorities,[74] reducing presently authorized withdrawals,[75] rotating pumping,[76] enforcing voluntary pumping agreements,[77] or purchase and retiring of ground water rights.[78]

2. *Supply Augmentation.* Where ground water supplies are being mined, withdrawal rates can be maintained if an adequate supplemental water supply can be obtained. Supplemental water supply development has been successfully implemented on a large scale only in California, although Arizona and Texas are attempting to obtain supplemental water for the areas mining ground water. This option has been pursued in California for many years, resulting in evolving policies for integrating the use of local ground water and imported surface water. A significant component of this integrated management of ground and surface water is the use of the storage capacity of mined ground water reservoirs to store imported surface water underground.[79] California Supreme Court decisions have facilitated the evolution of these integrated management policies by recognizing the exclusive right of recharge entities to control withdrawals of water stored underground.[80] If rights to withdraw ground water are adjudicated[81] and withdrawals limited to each user's proportionate share of the safe yield,[82]

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during the consideration of whether an active management area should be designated. 1980 Ariz. Sess. Laws, S.B. 1001, ch. 1, § 86 (to be codified at ARIZ. REV. STAT. ANN. §§ 45-432, -452, -416).

74. KAN. STAT. ANN. § 82a-1038(b)(2) (Supp. 1979); MONT. REV. CODES ANN. § 89-2915(1) (Supp. 1977); NEV. REV. STAT. § 534.110(6) (1978); OR. REV. STAT. § 537.730(a) (1979); WASH. REV. CODE ANN. § 90.44.130 (1962); WYO. STAT. §§ 41-132(a)(ii), -132(a)(iii) (Supp. 1975).

75. 1980 Ariz. Sess. Laws, S.B. 1001, ch. 1, § 86 (to be codified at ARIZ. REV. STAT. ANN. §§ 45-541 to -545, -563); KAN. STAT. ANN. § 82a-1038(b)(3) (Supp. 1979); NEB. REV. STAT. § 46-666(1)(a) (Cum. Supp. 1980); OR. REV. STAT. § 537.730(4) (1979).

76. KAN. STAT. ANN. § 82a-1036(b)(4) (Supp. 1979); NEB. REV. STAT. § 46-666(1)(b) (Cum. Supp. 1980); OR. REV. STAT. § 537-730(5) (1979); WYO. STAT. § 41-132(a)(iv) (Supp. 1975).

77. OR. REV. STAT. § 537.735 (1979); WYO. STAT. § 41-132(c) (Supp. 1975).

78. 1980 Ariz. Sess. Laws, S.B. 1001, ch. 1, § 86 (to be codified at ARIZ. REV. STAT. ANN. §§ 45-566(A)(6), -567(A)(6)).

79. *See* CALIFORNIA DEP'T OF WATER RESOURCES BULL. NO. 118, CALIFORNIA'S GROUND WATER 119-21 (1975).

80. City of Los Angeles v. City of San Fernando, 14 Cal. 3d 199, 537 P.2d 1250, 123 Cal. Rptr. 1 (1975). City of Los Angeles v. City of Glendale, 23 Cal.2d 68, 142 P.2d 289 (1943). Regarding the *Glendale* decision, see Kreiger & Banks, *supra* note 31. Regarding the *San Fernando* decision, see *Water Projects*, *supra* note 30, and *Ground Water Management*, *supra* note 30.

81. For a description of the adjudication process, see A. SCHNEIDER, *supra* note 31, at 19-37.

82. The California Supreme Court has defined "safe yield" to mean "the maximum quantity of water which can be withdrawn annually from a ground water supply under a given set of conditions without causing an undesirable result." A. SCHNEIDER, *supra* note 31, at 99. The phrase "undesirable result"

recharge entities can charge ground water users for water withdrawn in excess of the safe yield allocation.[83] The safe yield adjudication process essentially creates a presumption that ground water withdrawn in excess of the safe yield allocation is recharged ground water for which the recharge entity must be paid.

Washington water law also permits management of water stored underground. Washington statutes define ground water in two separate categories: natural and artificially stored.[84] Any person who has stored water underground can file a claim with the Washington Department of Ecology[85] and, if accepted, the storing entity is granted special rights to use that ground water.[86]

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is understood to refer to a "gradual lowering of the ground water levels resulting eventually in depletion of the supply." *Id.* at 99, citing Los Angeles v. San Fernando, 14 Cal. 3d 199, 278, 537 P.2d 1250, 1308, 123 Cal. Rptr. 1, 59 (1975). A related concept is that of "overdraft," which has been defined as "the condition of a ground water basin where the amount of water withdrawn by pumping exceeds the amount of water replenishing the [ground water] basin over a period of time. *San Fernando* defined overdraft as the point at which 'extractions from the basin exceed its safe yield plus any . . . temporary surplus.'" A. SCHNEIDER, *supra* note 31, at 99, quoting from Los Angeles v. San Fernando, 14 Cal. 3d 199, 280, 537 P.2d 1250, 1309, 123 Cal. Rptr. 1, 60 (1975). "Temporary surplus" is defined as "the amount of water that can be pumped from a basin to provide storage space for surface water that would be wasted during wet years if it could not be stored in the basin." A. SCHNEIDER, *supra* note 31, at 32.

The California Department of Water Resources assists the court in making the determination of what is the ground water basin's safe yield. CAL. WATER CODE § 2000 (West 1971); A. SCHNEIDER, *supra* note 31, at 84-85. Significantly, the basin adjudication process has not been invoked in the absence of a supplemental water supply, suggesting that the process has been used exclusively to establish a basis for allocating recharge costs rather than managing a ground water basin on a safe yield basis. *See id.* at 60-61; Corker, *Inadequacy of the Present Law to Protect, Conserve and Develop Groundwater Use*, 25 ROCKY MT. MIN. L. INST. 23-1, 23-8 (1979).

83. The money is used to finance recharge activities, including purchase of imported surface water.
84. WASH. REV. CODE ANN. § 90.44.035 (Supp. 1980).
85. *Id.* § 90.44.130 (1962).
86. The Department has recognized a claim of artificially stored ground water by the Federal Water and Power Resources Service (formerly the Bureau of Reclamation) which operates the Columbia River Basin Project in northern Washington. For over forty years, seepage from project surface irrigation has moved slowly as ground water from the upper toward the lower part of the project area. This ground water is captured in a surface reservoir for project reuse. This process has caused ground water levels to rise dramatically since the 1950s. The Department has recognized the Service's claims that this ground water is artificially stored ground water subject to Service control. Consequently, before a state permit can be obtained to drill a well within the area one must first contract with the Service to purchase the artificially stored ground water. Thorson, *Storing Water Underground: What's the Aqui-Fer?* 57 NEB. L. REV. 581, 606-09 (1978). In effect, the Service is selling ground water just as it sells surface water, and in addition, it can insure that ground

E. Conflicts Between Ground and Surface Water Users

In many parts of the West, ground and surface water supplies are physically interrelated. Where this occurs ground water withdrawals can reduce streamflow,[87] thus interfering with surface water appropriations and with enjoyment of instream values, such as fish and wildlife habitat maintenance, recreation, aesthetics, and water quality maintenance.[88] Similarly, changes in stream flow from surface water impoundments or withdrawals can reduce subirrigation and ground water recharge.[89] Where appropriation

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water withdrawals do not interfere with reservoir operations through its contracts to sell ground water.

One potential problem in managing ground water as part of a federal reclamation project is that the 160 acre limitation may be violated. *See* Taylor, *Excess Land Law: Calculated Circumvention*, 52 CALIF. L. REV. 978, 982 (1964); Comment, *Recapture of Reclamation Project Ground Water*, 53 CALIF. L. REV. 541, 542 (1965); Comment, *Project Ground Water: Problems and Possible Solutions in Application of the Federal Reclamation Act to a Disputed Resource*, 44 WASH. L. REV. 259, 260 (1968).

Regarding laws relating to ground water recharge in other states, see IDAHO CODE § 42-4202 (Supp. 1979) (formation of ground water recharge districts); NEB. REV. STAT. §§ 46-544, 70-677 (Reissue 1976 & Cum. Supp. 1980) (authority of irrigation districts to tax ground water recharge benefits); N.D. CENT. CODE § 61-14-13 (1960) (seepage water can be appropriated only upon payment to the ground water recharge entity).

87. Ground water withdrawals can reduce streamflow by inducing increased recharge from the stream (often called induced recharge) and by reducing aquifer discharge to a stream. General options for dealing with these conflicts include: (1) permitting unrestricted ground water withdrawals, (2) restricting junior or inferior ground water development and use for the benefit of senior or superior surface water users, and (3) sharing the available supplies without regard to priority or preference. Option 1, unrestricted development, in most cases, would ultimately result in completely depleting streamflow, and would favor ground water users over surface water users. Option 2 would restrict ground water development and use for the benefit of surface water users. Implementation of option 3, would, in many cases, require that surface water users receive supplemental water up to their allocated share. When water levels fall a stream may dry up but ground water usually can be obtained by drilling deeper wells. Ground water users could obtain their allocation, but surface water users could not unless they installed their own wells or obtained water from another source. How implementation of this option would affect surface and ground water users depends primarily on how the costs for any supplemental water supply are allocated.

88. In some states water can be appropriated for instream purposes. *See* Aiken, *The National Water Policy Review and Western Water Rights Law Reform: An Overview*, 59 NEB. L. REV. 327, 336-38 (1980); Comment, *Minimum Streamflows: The Legislative Alternatives*, 57 NEB. L. REV. 704 (1978).

89. General options for resolving these conflicts include: (1) permitting unrestricted surface water development and use, (2) restricting junior or inferior surface water users for the benefit of senior or superior ground water users, and (3) sharing the available supplies without regard to priority or preference. Option 1, unrestricted development, could adversely impact

applies to both surface and ground water any surface-ground water conflicts will be resolved on the basis of priority. Where ground water rights are overlying rather than appropriative, the legal categories of ground water which are recognized will determine how surface-ground water conflicts are resolved.

1. Legal Classifications of Ground Water

The major distinction between categories of ground water is percolating ground water versus water in an underground stream. Percolating ground water is defined as ground water not in an underground stream. An underground stream is a stream flowing underground, the channel of which is reasonably ascertainable from the surface without excavation. Although underground streams occur rarely in the physical world, they occur frequently in legal decisions,[90] probably because the concept can include the subsurface flow of a surface stream. The legal significance of the underground stream doctrine is that surface water allocation rules apply to underground streams. The underground stream doctrine is significant where surface water rights are appropriative and ground water rights are overlying. The effect of following the underground stream doctrine is that ground-surface water conflicts are resolved on the basis of priority, just as if appropriation applied. Because most western states now apply prior appropriation to surface and ground water, the distinction has lost much of its significance.[91] However, the underground stream doctrine is still followed in California[92] and Arizona,[93] where rights to use water from an underground stream are appropriative, not overlying.

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ground water users depending on the recharge rate. Option 2 would restrict surface water development and use for the benefit of ground water users. Option 3 would treat all water users equally without regard to water source, priority, or preference.

90. Howard v. Perrin, 8 Ariz. 347, 76 P. 460 (1904), *aff'd*, 200 U. S. 71 (1906); City of Los Angeles v. Pomeroy, 124 Cal. 597, 57 P. 585 (1899); Medano Ditch Co. v. Adams, 29 Colo. 317, 68 P. 431 (1902); Public Util. Comm'n v. Nataorium Co., 36 Idaho 287, 211 P. 533 (1922); Ryan v. Quinlan, 45 Mont. 521, 124 P. 512 (1912); Strait v. Brown, 16 Nev. 317 (1881); Taylor v. Welch, 6 Or. 198 (1876); Deadwood Cent. R. R. v. Barker, 14 S.D. 558, 86 N.W. 619 (1901); Little Cottonwood Water Co. v. Sandy City, 123 Utah 242, 258 P.2d 440 (1953); Meyer v. Tacoma Light & Water Co., 8 Wash. 144, 35 P. 601 (1894); 1865-66 DAK. TERR. LAWS, ch. 1, § 256, codified at N.D. CENT. CODE § 47-01-13, repealed, 1963 N.D. Sess. Laws, ch. 419, § 7, OKLA. TERR. STATS. § 4162 (1890), codified at OKLA. STAT. ANN. tit. 60, § 60 (West 1971). The concept of an underground stream has not explicitly been articulated in Kansas, Nebraska, Texas, or Wyoming.

91. Statutory citations are collected in note 33 *supra*. *See* 2 W. HUTCHINS, *supra* note 8, at 631-33.

92. Maricopa County Mun. Water Conserv. Dist. No. 1 v. Southwest Cotton Co., 39 Ariz. 65, 4 P.2d 369 (1931).

93. *See* 2 W. HUTCHINS, *supra* note 8, at 690-96.

Two other ground water classifications, similar to the underground stream concept, are significant with respect to ground-surface interrelationships: underflow of a surface stream and tributary ground water. The underflow or subflow of a surface stream is the subsurface flow associated with a stream or river. The ground water may be leaving or entering the stream. In many western states subflow is considered to be part of the stream and subject to the same rights of use.[94] In those states, the subflow doctrine provides a basis for correlating surface and ground water rights in a common source, particularly if prior appropriation does not uniformly apply to surface and ground water.[95]

Related to the subflow doctrine is the concept of tributary ground water: ground water which otherwise will reach a stream if not first intercepted by a well. Tributary ground water is treated as being part of the surface stream and is subject to the same rights of use.[96] The tributary ground water doctrine is the basis for an administrative mechanism for interrelating surface and ground water rights in a common water source in Colorado.[97]

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94. Maricopa County Mun. Water Conserv. Dist. No. 1 v. Southwest Cotton Co., 39 Ariz. 65, 4 P.2d 369 (1931); Rancho Santa Margarita v. Vail, 11 Cal. 2d 501, 81 P.2d 533 (1938); Larsen v. Appollonio, 5 Cal. 2d 440, 55 P.2d 196 (1936); Tulare Irr. Dist. v. Lindsay-Strathmore Irr. Dist., 3 Cal. 2d 489, 45 P.2d 972 (1935); Peabody v. Allejo, 2 Cal. 2d 351, 40 P.2d 486 (1935); City of San Bernadino v. City of Riverside, 186 Cal. 7, 198 P. 784 (1921); Vineland Irr. Dist. v. Azusa Irr. Co., 126 Cal. 486, 58 P. 1057 (1899); City of Los Angeles v. Pomeroy, 124 Cal. 597, 57 P. 585 (1899); Mutual Water Co. v. San Luis Rey Dev. Co., 78 Cal. App. 2d 900, 178 P.2d 844 (1947); Buckers Irr. Mill., & Improvement Co. v. Farmers' Independent Ditch Co., 31 Colo. 62, 72 P. 49 (1903); Platte Valley Irr. Co. v. Buckers Irr. Mill. & Improvement Co., 25 Colo. 77, 53 P. 334 (1898); Emporia v. Soden, 25 Kan. 588 (1881); Smith v. Duff, 39 Mont. 382, 102 P. 984 (1909); Texas Co. v. Burkett, 117 Tex. 16, 296 S.W. 273 (1927); Howcroft v. Union & Jordan Irr. Co., 25 Utah 311, 71 P. 487 (1903); *see* TEX. WATER CODE ANN. tit. 2, § 5.021 (Vernon 1972).

The Nebraska Supreme Court implicitly rejected the subflow doctrine in Metropolitan Util. Dist. v. Merritt Beach Co., 179 Neb. 783, 140 N.W.2d 626 (1966), probably to sustain a statute authorizing municipal ground water transfers. *See* notes 169-85 & accompanying text *infra*.

95. California, Texas, and Arizona follow the subflow doctrine. Maricopa County Mun. Water Conserv. Dist. No. 1 v. Southwestern Cotton Co., 39 Ariz. 65, 4 P.2d 369 (1931); Rancho Santa Margarita v. Vail, 11 Cal. 2d 501, 21 P.2d 533 (1938); TEX. WATER CODE ANN. tit. 2, § 5.021 (Vernon 1972).

96. Safranek v. Town of Limon, 123 Colo. 330, 228 P.2d 975 (1951); Nevius v. Smith, 86 Colo. 178, 279 P. 44 (1928); Union Cent. Life Ins. Co. v. Albrethsen, 50 Idaho 196, 294 P. 842 (1930); City of Albuquerque v. Reynolds, 71 N.M. 428, 379 P.2d 73 (1963); COLO. REV. STAT. § 37-92-101 (1973 & Supp. 1979); KAN. STAT. ANN. § 42-306 (1973).

97. *See* notes 106-09 & accompanying text *infra*.

2. Overlying Rights Theories·

Under the absolute ownership theory, a ground water user may withdraw ground water without liability to other water users. This implies that ground water users would not be liable for interfering with surface water uses.[98] However, because Texas has adopted the subflow doctrine, the rights to use the subflow of a surface stream in that state are subject to prior appropriation.[99]

Under the reasonable use theory, ground water withdrawals could not be enjoined for interfering with surface water uses unless the ground water use was wasteful or nonoverlying. This analysis may apply to surface-ground water disputes in Nebraska since the Nebraska Supreme Court has rejected the subflow doctrine.[100] However, the court might use preferences to resolve surface-ground water conflicts between those using water for different purposes, and the sharing element of the correlative rights doctrine to resolve surface-ground water conflicts between those using water for the same purposes.[101] On the other hand, because Arizona has adopted the subflow doctrine, surface-ground water conflicts there will be resolved on the basis of prior appropriation.[102]

Under the correlative rights doctrine ground water users share the available supply when shortages occur. California courts have correlated the rights to use surface and ground water from a common source. How each conflict is resolved depends on the facts and circumstances of each case.[103]

3. Prior Appropriation

Where prior appropriation applies to both surface and ground water law, the doctrine of priority is the basis for resolving surface-ground water disputes and may be enforced through private litigation[104] or administrative proceedings.[105] Ground water users may be placed at a legal disadvantage if prior appropriation is applied to interrelated ground and surface water. Since technological de-

98. *See* Davis, *Wells and Streams: Relationship at Law*, 37 MO. L. REV. 189 (1972).
99. Texas Co. v. Burkett, 117 Tex. 16, 296 S.W. 273 (1927); Motl v. Boyd, 116 Tex. 82, 268 S.W. 458 (1926); *see* TEX. WATER CODE ANN. tit. 2, § 5.021 (Vernon 1972).
100. *See* notes 169-85 & accompanying text *infra*.
101. *See* notes 426-39 & accompanying text *infra*.
102. Maricopa County Mun. Water Conserv. Dist. No. 1 v. Southwest Cotton Co., 39 Ariz. 65, 4 P.2d 369 (1931).
103. *See* 2 W. HUTCHINS, *supra* note 8, at 690-96.
104. Union Cent. Life Ins. Co. v. Albrethsen, 50 Idaho 196, 294 P. 842 (1930); Emporia v. Soden, 25 Kan. 588 (1881); Smith v. Duff, 39 Mont. 382, 102 P. 984 (1909); Howcroft v. Union & Jordan Irr. Co., 25 Utah 311, 71 P. 487 (1903).
105. COLO. REV. STAT. § 37-92-502 (1974); IDAHO CODE § 42-237a (Supp. 1979); WYO. STAT. § 41-128(b) (Supp. 1975). *See also* OR. REV. STAT. § 537.622 (1979).

velopments in well design, pumps, and irrigation water distribution systems have been relatively recent, ground water users will typically be junior appropriators relative to surface water users. Thus, the doctrine of priority means that ground water development and use will be restricted in order to protect senior surface water appropriators.

Colorado law goes the farthest of any appropriation state in recognizing that the doctrine of priority may be inequitable if rigidly applied to surface-ground water conflicts. In Colorado, tributary ground water is regulated as part of the surface water supply.[106] Colorado law adopts several features to accommodate junior ground water users. Surface water users are permitted to transfer their priority date to a well, in effect substituting a more reliable ground water supply for a less dependable surface water supply and still retain their earlier priority date.[107] In addition, junior ground water users are permitted to provide substitute water to senior surface water users to compensate for stream depletion by ground water withdrawals.[108] Finally, junior ground water users are not required to stop withdrawing ground water that depletes streamflow if the increase in streamflow will not occur soon enough to benefit the senior surface water appropriator.[109]

F. Ground Water Quality[110]

Many sources of ground water pollution, such as surface and subsurface waste disposal and mining activities, are unrelated to ground water development and use, while other potential sources of pollution are directly related to it. Improperly constructed wells can result in low quality ground water from one aquifer mixing with and degrading higher quality ground water from a different aquifer. Abandoned wells can be the means for pollution of ground water from surface sources. Ground water withdrawals can cause salt water intrusion in coastal areas, or cause concentra-

106. COLO. REV. STAT. § 37-92-501 (1974). *See also* Hillhouse, *Integrating Ground and Surface Water Use in an Appropriation State*, 20 ROCKY MTN. MIN. L. INST. 691 (1975).

107. COLO. REV. STAT. §§ 37-92-102(1), -301(3) (1974 & Supp. 1979). *See* Hillhouse, *supra* note 106, at 707-09.

108. COLO. REV. STAT. §§ 37-80-120, -92-501 (1974 & Supp. 1979).

109. COLO. REV. STAT. §§ 37-92-501(1), -502, -102(2)(d) (1974). *See* Hillhouse, supra note 106, at 706-07.

110. *See generally* GROUND WATER POLLUTION, *supra* note 9; Tripp & Jaffe, *supra* note 9; D. TODD & D. MCNULTY, POLLUTED GROUNDWATER (1974). (Reprint of United States Environmental Protection Agency Pub. No. EPA-600/4-74-001, *Polluted Ground Water: A Review of the Significant Literature* which was released by the United States Environmental Protection Agency in March, 1974).

tion of minerals in the ground water left in storage. In addition, applying more irrigation water than crops can use, may result in leaching of water soluble agricultural chemicals into ground water supplies.

Water quality is not directly addressed by overlying rights doctrines. Water quality conflicts resulting from ground water development are usually resolved on the basis of nuisance.[111] In appropriation jurisdictions, senior appropriators generally are entitled to damages for pollution caused by junior appropriators, although liability for pollution caused by a senior appropriator is unclear.[112] One commentator has suggested that the inability of the common law to deal with the interrelationship between water quality and water rights has led states to enact legislation dealing with specific problems.[113] Since state law defines the conditions under which ground water may be developed and used, ground water quality may be protected by appropriate restrictions on its development and use. A common practice is the regulation of well drilling practices by licensing well drillers[114] and establishing well construction standards.[115] Several states require abandoned wells to be sealed to prevent ground water pollution.[116] Oregon allows the direct regulation of wells the operation of which causes water pollution.[117] California allows restriction of ground water with-

111. B. GINDLER, *Water Pollution and Quality Controls*, in 3 WATER AND WATER RIGHTS 116-22 (R. Clark ed. 1967).

112. R. ROBIE, *Relationships Between Water Quality and Water Rights*, in CONTEMPORARY DEVELOPMENTS IN WATER LAW 72, 75-76 (C. Johnson & S. Lewis ed. 1970).

113. Hines, *Nor Any Drop to Drink: Public Regulation of Water Quality*, 52 IOWA L. REV. 186, 196-201 (1966).

114. 1980 Ariz. Sess. Laws, S.B. 1001, ch. 1, § 86 (to be codified at ARIZ. REV. STAT. ANN. § 45-595(B)); COLO. REV. STAT. § 37-91-101 (1974); IDAHO CODE § 42-238 (1977); KAN. STAT. ANN. § 82a-1202 (Supp. 1979); NEV. REV. STAT. § 534.140 (1973); N.M. STAT. ANN. § 75-11-13 to -18 (1968); OKLA. STAT. ANN. tit. 82, § 1020.16 (West Supp. 1979); OR. REV. STAT. § 537.747 (1979); S.D. COMP. LAWS ANN. § 46-6-9 (Supp. 1979); UTAH CODE ANN. §§ 73-3-24 to -26 (1968).

115. 1980 Ariz. Sess. Laws, S.B. 1001, ch. 1, § 86 (to be codified at ARIZ. REV. STAT. ANN. § 45-594); CAL. WATER CODE §§ 231, 13800-13806 (West 1971 & Supp. 1980); COLO. REV. STAT. § 37-90-138 (1974); MONT. REV. CODES ANN. § 89-2926 (Supp. 1977); NEV. REV. STAT. § 534.060 (1973); OR. REV. STAT. § 537-780 (1979); S.D. COMP. LAWS ANN. §§ 46-6-6.1(2), -6.1(3), -19, -20 (1967 & Supp. 1979); N.M. STAT. ANN. §§ 75-12-4, -5 (1968); WYO. STAT. § 41-126(f) (1959).

116. 1980 Ariz. Sess. Laws, S.B. 1001, ch. 1, § 86 (to be codified at ARIZ. REV. STAT. ANN. § 45-602); NEB. REV. STAT. §§ 46-602(3), -602(5) (Cum. Supp. 1980); OKLA. STAT. ANN. tit. 82, § 1020.15(10) (West Supp. 1979); S.D. COMP. LAWS ANN. § 46-6-18 (1967); TEX. WATER CODE ANN. tit. 2, §§ 23.001-.004 (Vernon 1972); UTAH CODE ANN. § 73-3-28 (1968); WYO. STAT. § 41-126(h) (1959).

117. OR. REV. STAT. § 537.775 (1979).

drawals to prevent saline water intrusion.[118] Similarly, Nebraska permits regulation of ground water withdrawals to prevent mineralization of ground water supplies.[119] South Dakota requires a soil-water compatibility test before appropriation for irrigation is granted.[120] Western states have yet to develop explicit policies for dealing with ground water quality problems associated with the leaching of agricultural chemicals from over-irrigation.[121]

III. THE HISTORICAL DEVELOPMENT OF NEBRASKA GROUND WATER LAW[122]

Unlike the surface water law, most of which was established with the enactment of the 1895 surface water irrigation code,[123] the development of Nebraska ground water law has been evolutionary. Courts and legislatures have reacted to particular problems, but have stopped short of establishing a comprehensive framework for ground water law.[124]

A. The Windmill Era: Before 1930

Ground water development during the pre-1930 period was primarily for the purpose of supplying water for domestic and livestock uses. A major technological innovation was the development of the windmill to power pumps for domestic and stock wells. Use of ground water for irrigation began on a limited scale around 1910 when well drilling techniques and pumping plant design were still not sufficiently advanced to allow development of high capacity water wells. The mass production of internal combustion engines permitted use of tractor engines to power irrigation well pumps, but because of limited pumping capacity, ground water irrigation was limited to flat valley lands where ground water was available at shallow depths.[125] This period also saw the development of Nebraska surface water laws, the establishment of what is now the Department of Water Resources to administer surface water

118. CAL. WATER CODE §§ 2100-2102 (West 1971). *See also Id.* §§ 12921-12924 (West 1971 & Supp. 1980).
119. NEB. REV. STAT. §§ 46-658(1)(b), -658(4) (Reissue 1978).
120. S.D. COMP. LAWS ANN. §§ 46-5-6.2, -6.8 (Supp. 1979).
121. *See* notes 445-47 & accompanying text *infra*.
122. *See generally* Danielson, *Ground Water in Nebraska*, 35 NEB. L. REV. 17 (1955); Harnsberger, *Nebraska Ground Water Problems*, 42 NEB. L. REV. 721 (1963); Harnsberger, Oeltjen & Fischer, *supra* note 24.
123. For a discussion of Nebraska surface water law, see Fischer, Harnsberger & Oeltjen, *Rights to Nebraska Streamflows: An Historical Overview With Recommendations*, 52 NEB. L. REV. 313 (1973).
124. *See* notes 362-82 & accompanying text *infra*.
125. NEBRASKA SOIL & WATER COMM'N, REPORT ON THE FRAMEWORK STUDY 46 (1971) [hereinafter cited as FRAMEWORK STUDY].

rights, and the state's first major surface water irrigation projects.[126] Major legal developments during this period included ground water pollution litigation, legislative authorization to use a stream to transport water, and artesian water conservation requirements.

The first Nebraska Supreme Court ground water decisions dealt with ground water quality protection. In *Beatrice Gas Co. v. Thomas*,[127] the plaintiff sued the gas company for alleged pollution of his domestic well. The gas company was disposing of wastes in a pit which plaintiff claimed contaminated his domestic well. The Nebraska Supreme Court ruled that landowners were entitled to protection of their drinking water from contamination, and that, under a private nuisance theory, one who pollutes his neighbor's drinking water supplies would be liable for the damage caused. A subsequent decision also dealt with protection of ground water quality. In *Lowe v. Prospect Hill Cemetery Ass'n*,[128] plaintiff-landowners sued to stop the cemetery from expanding, fearing that the use of land for a cemetery would pollute their domestic wells. Testimony presented by the plaintiffs persuaded the trial court that water would percolate through the graves, carrying disease-causing organisms into plaintiffs' wells, and contaminating their drinking water supplies. Based on this evidence, the Supreme Court affirmed the trial court decision enjoining the cemetery expansion.

In 1895, the first statute having some relationship to ground water was enacted.[129] This began a series of legislative inferences that ground water transfers were valid, in contrast to judicial dicta that they were not.[130] A section of the surface water irrigation code authorized individuals to use a stream or stream channel as a means for transporting water from one point to another.[131] This section was not explicitly limited to surface water and may be in-

126. *See* Fischer, Harnsberger & Oeltjen, *supra* note 123, at 331-58.
127. 41 Neb. 662, 59 N.W. 925 (1894).
128. 58 Neb. 94, 78 N.W. 488 (1899).
129. 1895 Neb. Laws, ch. 69, at 44 (codified at NEB. REV. STAT. § 46-252 (Reissue 1978)).
130. Ground water transfers are discussed generally at notes 383-94 & accompanying text *infra*. The inconsistency between legislative and judicial inferences has not yet been resolved.
131. 1895 Neb. Laws, ch. 69, § 45, at 260 (codified at NEB. REV. STAT. § 46-252 (Reissue 1978)). The written consent of a majority of the landowners and residents along the stream must be obtained before the stream or stream channel is used as for conveying water. Hydropower plant operators are exempted from the written consent requirement. The conveyer is liable for any damages caused. The Department of Water Resources (DWR) determines what amount of water conveyed has been lost to seepage in transit and how much may be withdrawn. Water conveyed pursuant to these requirements is not subject to appropriative rights. NEB. REV. STAT. § 46-252 (Reissue 1978). Presumably the DWR would regulate appropriators accordingly.

terpreted as legislative authorization of ground water transfer and use on nonoverlying land if a stream is used as the means of conveyance.

In 1897, a ground water statute was enacted which dealt with waste of artesian ground water.[132] To understand the significance of this statute, one must first understand the major characteristics of artesian ground water. Ground water is found in two major kinds of aquifers: water table aquifers (also called unconfined aquifers) and artesian aquifers (also called confined aquifers). Most ground water in Nebraska is in water table aquifers. Artesian aquifers are mainly found in eastern and extreme western Nebraska. The major difference is that an artesian aquifer has a clay or other impermeable layer which restrains the upward movement of the ground water. A water table aquifer does not have this confining layer. In an artesian aquifer, the ground water is under pressure because the upward movement of the water is restricted. When a well is drilled into an artesian aquifer, the artesian pressure will force the water level to rise in the well. For example, a well might be drilled 300 feet deep, 50 feet into an artesian aquifer which lies 250 feet beneath the surface, yet the artesian pressure could force the water level in the well much closer to the surface. If the artesian pressure is great enough the well could be a flowing well.

Generally a non-artesian well is pumped only when water is needed. The general exception would be a windmill, which pumps water into a stock tank when the wind blows hard enough. A flowing artesian well usually will flow constantly, whether water is needed or not. If the flow of water is not controlled (e.g., by a faucet), the water will be wasted unless it is being stored or used constantly. To address the problem of wasting ground water from flowing artesian wells, the 1897 statute required the control of flowing artesian wells.[133] All artesian wells were required to be controlled unless the water flow was not more than would pass through a one half inch pipe or unless the water were first used for irrigation or power.

B. Drought and Depression: 1930 to 1939

While surface water remained the primary source of irrigation water, farmers, spurred by the drought, turned to ground water to supplement their irrigation water supply. Approximately 1900 irrigation wells were constructed during the 1930s with over 1000 wells drilled in 1935.[134] The most significant water law development was

132. 1897 Neb. Laws, ch. 84, at 358 (codified at NEB. REV. STAT. §§ 46-281, -282 (Reissue 1978)).
133. *Id.*
134. NRC DATA BANK, *supra* note 5.

the 1936 Nebraska Supreme Court decision prohibiting interbasin surface water transfers.[135] The only significant ground water law development in this period was litigation regarding well interference conflicts.

The first Nebraska Supreme Court decision dealing with well interference conflicts was decided in 1933.[136] Plaintiff, a gravel pit operator, sued the city of Wahoo for the costs of replacing the well used in his gravel pit operation. Plaintiff claimed the city's subsequently drilled wells interfered with his water supply. The supreme court determined that plaintiff had not proved that the city's wells were interfering with the gravel pit operation and therefore was not entitled to damages. The court in dicta suggested it would have followed a combination of the reasonable use and correlative rights doctrines if the plaintiff had proved that well interference had occurred:

> [T]he owner of land is entitled to appropriate subterranean waters found under his land, but he cannot extract and appropriate them in excess of a reasonable and beneficial use upon the land which he owns, especially if such use is injurious to others who have substantial rights to the waters, and if the natural underground supply is insufficient for all owners, each is entitled to a reasonable proportion of the whole . . . .[137]

C. The Beginning of Irrigation Development: 1940 to 1949

The increased pumping power of the turbine pump, the major technological innovation of this period, permitted water to be withdrawn from greater depths.[138] Over 4000 irrigation wells were installed during the 1940s, as deep well irrigation spread steadily from river valleys to the tablelands of western and central Nebraska. More than 500,000 acres were being irrigated from ground water, more than 330,000 of which were first irrigated during the 1940s.[139]

The first major legislative consideration of ground water policy

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135. Osterman v. Central Neb. Public Power & Irr. Dist., 131 Neb. 356, 268 N.W. 334 (1936), *overruled by* Little Blue Nat. Res. Dist. v. Lower Platte N. Nat. Res. Dist., 206 Neb. 535, 294 N.W.2d 598 (1980). Regarding *Osterman*, see Oeltjen, Harnsberger & Fischer, *Interbasin Transfers: Nebraska Law and Legend*, 51 NEB. L. REV. 87 (1971). Regarding *Little Blue*, see notes 265-67 & accompanying text *infra*.

136. Olson v. City of Wahoo, 124 Neb. 802, 248 N.W. 304 (1933).

137. *Id.* at 811, 248 N.W. at 308. This dicta contains appropriative, reasonable use, and correlative rights language, but the court felt it was referring to the American rule of reasonable use. *Id.* at 811, 248 N.W. at 308. If plaintiff had proved that well interference had occurred, he probably would not have been entitled to relief under either the reasonable use or correlative rights doctrines because ample ground water was available to him at greater depths. *Id.* at 812-13, 248 N.W. at 308. *See* notes 42-43 & accompanying text *supra*.

138. FRAMEWORK STUDY, *supra* note 125, at 46.

139. NRC DATA BANK, *supra* note 5.

came in 1940 when Regulation of the Use of Groundwater in Nebraska was prepared for the Nebraska Legislative Council.[140] While the report did not include legislative proposals, a bill to establish a comprehensive ground water code, L.B. 460, was introduced and then subsequently withdrawn.[141] L.B. 460 would have established a statewide permit system for ground water by combining elements of overlying rights and appropriative theories. Ground water ownership was public[142] and existing uses were confirmed.[143] New irrigation uses could be initiated by applying to the Department of Roads and Irrigation (now the Department of

140. 14 Neb. Legis. Council Rep. (November 1940). The report suggested a number of reasons for establishing state laws regulating ground water use: (1) to protect existing ground water users; (2) to conserve ground water by prohibiting waste, encouraging ground water recharge, and restricting ground water uses to beneficial purposes; (3) to maintain and protect ground water quality; (4) to prevent serious or permanent depletion of ground water supplies, and (5) to obtain federal assistance for ground water development projects. *Id.* at 6-7. The report also identified seven general principles to be considered in developing ground water laws: (1) ownership of ground water should be public, and private ground water use should be subject to public regulation; (2) the state should be responsible for enforcing ground water laws; (3) the state should have authority to grant or deny permits for drilling non-domestic wells; (4) ground water should be legally defined, recognizing that ground and surface water often constitute a single, integrated water supply; (5) a rule should be established for resolving well interference conflicts; (6) comprehensive surveys of ground water availability, use, and development potential should be undertaken; and (7) ground water quality should be protected, particularly municipal ground water supplies. *Id.* at 13-15.

141. L.B. 460, 1941 Neb. Leg., 55th Sess. [hereinafter cited as L.B. 460]; 1941 NEB. LEGIS. J. 281, 1727-28.

142. L.B. 460, *supra* note 141, § 1(c). The bill stated that ground water use for domestic and irrigation purposes is a natural want. *Id.* § 1(b). *Compare* NEB. CONST. art. XV, § 4 (water for domestic use declared a natural want) *with* NEB. REV. STAT. § 46-201 (Reissue 1978) (Ground water use was dedicated to the public) *and* L.B. 460, *supra* note 141, § 1(d). *Compare* NEB. CONST. art XV, § 5 (natural stream water dedicated to the people for beneficial purposes) *with* NEB. REV. STAT. § 46-202 (Reissue 1978) (Rights to use ground water were not to be denied except when demanded in the public interest) *and* L.B. 460, *supra* note 141, § 1(e). *Compare* NEB. CONST. art. XV, § 6 (diversion of unappropriated water permissible except when contrary to the public interest) *with* NEB. REV. STAT. § 46-235 (Reissue 1978).

143. L.B. 460, *supra* note 141, § 3. Existing uses would have been required to be registered with the Department of Irrigation and Roads [now the Department of Water Resources]. *Id.* § 7. Individual domestic wells, municipal wells, and public water supply wells would have been exempted from the act. *Id.* § 5. The Department would have been responsible for adjudicating existing ground water uses and issuing certificates confirming such uses. *Id.* §§ 8, 9(1). Existing uses would have been subject to a withdrawal rate of up to 450 gallons per minute (gpm) per 70 acres irrigated and an annual allocation of up to three acre feet per year per acre irrigated. *Id.* § 9(2)(a). Enterprise Irr. Dist. v. Willis, 135 Neb. 827, 284 N.W. 326 (1939). Certificate holders would not have been regulated during periods of inadequate supply. L.B. 460, *supra*

Water Resources (DWR)) for an allocation permit.[144] Quantities were allocated considering the aquifer's sustained yield and potential development by other landowners.[145] Ground water could not be transferred for distant uses, but could be used freely within a farm or ranch operation.[146] Ground water users acquired no protection of their original pumping depths.[147] When supplies became inadequate, allocations would be reduced prorata and if the reduced quantities were not usable, withdrawals would be curtailed in reverse order of priority.[148] Except for its failure to address surface-ground water interrelationships, L.B. 460 would have been a fairly comprehensive ground water law.

The decade's only ground water litigation dealt with subirrigation. When the ground water level is near the land surface, crops and other plants may be subirrigated if their roots reach the ground water aquifer. While subirrigation may benefit crop production, very high ground water levels may make land too swampy for cultivation. The only Nebraska Supreme Court decision dealing directly with subirrigation is the 1941 case of *Luchsinger v. Loup River Public Power District*.[149] The plaintiff claimed the power district's canal drained his previously subirrigated cropland

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note 141, § 10. Certificate rights could be forfeited through four years nonuse. *Id.* § 9(3).

144. Two types of ground water rights could have been acquired: allocation permits and temporary allocation permits. Water not needed for certificate holders was available for allocation to new users. L.B. 460, *supra* note 141, § 9(2)(a). Allocation permits were to be obtained upon application to the Department. *Id.* § 9(2)(b). If water was available, an allocation could be established of up to three acre feet per year per acre irrigated, and could be diverted at a rate up to 450 gpm per 70 irrigated acres. *Id.* § 9(2)(a). An allocation could have been concentrated on a smaller quantity of land than that described in the permit. *Id.* § 9(5). Temporary allocation permits could have been obtained to use more than the regular three acre feet allocation if supplies were available. Temporary allocations would have been "junior and inferior" to certificate and allocation permits, but would have become permanent by prescription after ten consecutive years of use. *Id.* § 9(3). Temporary and regular allocation permits could be forfeited through four years nonuse. *Id.* § 9(3). Well logs were required for all new wells. *Id.* § 14.

145. *Id.* §§ 9(6), 9(2)(a). In making ground water allocations the Department would have determined the "reasonable proportion of the available supply to which each applicant . . . shall be entitled." *Id.* § 9(2)(a).

146. *Id.* §§ 9(2)(a), 9(5).

147. *Id.* § 9(6).

148. *Id.* § 10. Procedures to initiate ground water regulation could have been initiated by the Department or by ground water users. *Id.* Only holders of allocation and temporary allocation permits would be subject to regulation. *Id.* Presumably temporary allocation would be curtailed before regular allocations. *See id.* § 9(3). Section 9(7) provides for reallocation every three years, but is unclear as to whether this was reallocation of forfeited rights or a general reallocation regarding quantities that could be withdrawn. *Id.* at § 9(7).

149. 140 Neb. 179, 299 N.W. 549 (1941).

in Platte County, resulting in decreased dryland corn production. The supreme court ruled that subirrigation was a valuable property right, and that the power district was liable for the harm caused. The court further ruled that the measure of the compensation due was the reduction in cropland value resulting from the loss of subirrigation.

Legislative activity during this decade included the 1947 legislation authorizing the organization of reclamation districts to impound and distribute surface water for domestic, manufacturing, irrigation, power, and other beneficial uses.[150] One section of the reclamation law authorized reclamation districts to tax landowners receiving ground water recharge benefits from district operations while not purchasing district surface water.[151]

D. Drought, Development, and Legislative Response: 1950 to 1959

The drought of 1952 to 1956 and the development of sprinkler irrigation systems led to a ground water development explosion. Previously only level land could be irrigated with gravity irrigation systems. Development of sprinkler irrigation technology permitted irrigation of rougher land without the necessity of land leveling operations. Land formerly thought to be unirrigable was developed using sprinkler irrigation systems. Approximately 16,000 irrigation wells were installed during the 1950s, nearly four times the number installed during the 1940s. The number of acres irrigated with ground water increased from approximately 500,000 to over two million,[152] so that by 1959 more acres were irrigated from ground water than from surface water. With this explosive development came the first realization that, in some irrigated areas, ground water was being mined. This led to the establishment of limited public controls on ground water development through irrigation well spacing requirements, as well as initial attempts to develop policies to address ground water mining in problem areas through the establishment of ground water conservation districts.

150. 1947 Neb. Laws, ch. 173, at 523 (codified at NEB. REV. STAT. §§ 46-501 to -587 (Reissue 1978 & Cum. Supp. 1980)).

151. NEB. REV. STAT. § 46-544 (Cum. Supp. 1980). The reclamation district board of directors may assess lands not receiving district water service, but receiving special direct recharge benefits from water originating from district facilities, a levy of up to $0.14 per $100 actual property value. *Id.* §§ 46-507, -542, -544 (Reissue 1978 & Cum. Supp. 1980). A public hearing is required before assessments are made. *Id.* § 46-554 (Reissue 1978). These provisions were subsequently extended by implication to public power and irrigation districts. 1971 Neb. Laws, L.B. 626 (codified at NEB. REV. STAT. § 70-667 (Reissue 1976)). This statute may be unconstitutional, however, for not properly amending existing law. NEB. CONST. art. III, § 14.

152. NRC Data Bank, *supra* note 5.

Legislation requiring irrigation well registration and establishing ground water preferences also was enacted.

The second major legislative study of ground water law came in 1956 with the Report of the Nebraska Legislative Council Committee on Ground and Surface Water.[153] This resulted in Nebraska's first significant ground water legislation being enacted in 1957. Based on the 1956 study committee recommendations, the well registration legislation established the information base on ground water occurrence, development, and use necessary for future ground water management efforts.[154] The 1957 well registration statute required the owners of all irrigation wells to register their well with the state engineer (now the Director of Water Resources).[155] Information required in the registration included well location, pumping capacity, and the number of acres to be irri-

153. 81 Neb. Legislative Council Rep. (Nov. 1956). The report summarized public response at committee hearings: (1) strong opposition was expressed to immediate legislation regulating ground water use; (2) ground water regulation should be exercised locally rather than by state officials; (3) regulation should await further study by a permanent study group; (4) ground water conservation legislation should be pursued immediately rather than waiting for problem areas to develop; (5) plans for dealing with ground water depletion should begin immediately; and (6) well registration and spacing legislation should be considered. *Id.* at 37-38.

Committee observations and conclusions included: (1) no evidence indicated immediate danger of statewide ground water depletion; (2) in some areas ground water mining was occurring; (3) potential for additional ground water development existed, but ground water withdrawals should not exceed recharge rates; (4) no need existed to regulate ground water development or withdrawals, although in areas where ground water problems were developing the public should be made aware of them; (5) surface-ground water conflicts may require future legislative consideration; (6) integrated management of ground and surface water would be advantageous; (7) in problem areas regulation should be local; and (8) the cooperative ground water data collection program of the University of Nebraska Conservation and Survey Division and U.S. Geological Survey should receive additional state financial assistance. *Id.* at 38-41.

The committee recommended that irrigation wells be located 300 feet from property lines and 600 feet from other irrigation wells to prevent well interference conflicts and to reduce the likelihood of ground water mining by reducing the density of ground water development. The purposes of well registration were to develop complete information about the number of wells and their location and to formalize the voluntary well registration procedures of the Bureau of Irrigation, Water Power and Drainage (now the DWR). *Id.* at 41-42.

154. Well registration information is the basis for the NRC Data Bank information on ground water development and use. *See* note 5 *supra*. The information from well drilling logs is used to map underground strata and to identify ground water occurrence.

155. 1957 Neb. Laws, ch. 200, at 701 (codified at NEB. REV. STAT. §§ 46-601 to -607 (Reissue 1978 & Cum. Supp. 1980)).

gated.[156] Irrigation well spacing requirements were the first legislative step to regulate ground water development. The effect of the irrigation well spacing requirements is to reduce the likelihood of irrigation well interference conflicts and to reduce the density of ground water development. The statute requires that new irrigation wells be located at least 600 feet from any irrigation well owned by another.[157] Variance from the irrigation well spacing requirement can be obtained by applying to the state engineer, now the Director of the Department of Water Resources [hereinafter Director].[158]

The 1956 legislative water law study was followed in 1958 by the Report of the Nebraska Legislative Council Committee on Ground Water.[159] Based on public hearings revealing that irrigator sentiment favored local rather than state ground water regulation, the committee recommended that the Legislature authorize the organization of local ground water districts by initiative petition.[160] The state's first act to deal with ground water mining was passed by the 1959 Legislature to implement the 1958 study commission recommendation.[161] Ground water conservation districts (GWCDs) were formed and were authorized to manage ground water in problem areas.[162] GWCDs were authorized to establish corrective measures "to ensure the proper conservation of groundwater"

156. NEB. REV. STAT. § 46-602(1) (Cum. Supp. 1980). For a discussion of current well registration requirements, see notes 299-311 & accompanying text *infra.*

157. 1957 Neb. Laws, ch. 201, at 704 (codified at NEB. REV. STAT. § 46-609 (Reissue 1978)).

158. NEB. REV. STAT. § 46-610 (Reissue 1978). Well spacing requirements were subsequently extended to industrial, municipal, and public water supply wells. 1965 Neb. Laws, ch. 270, at 770 (codified at NEB. REV. STAT. §§ 46-651 to -655 (Reissue 1978 & Cum. Supp. 1980)); 1979 Neb. Laws, L.B. 201, at 729 (codified at NEB. REV. STAT. § 46-651 (Cum. Supp. 1980)); 1980 Neb. Sess. Laws, L.B. 643, § 8 (codified at NEB. REV. STAT. § 46-654 (Cum. Supp. 1980)). For a discussion of current well spacing requirements, *see* notes 266-80 & accompanying text *infra.*

159. 84 Neb. Legislative Council Rep. (Nov. 1958).

160. *Id.* at 12. The difficulties associated with implementing state ground water controls in Colorado were cited as justification for local control. *Id.* at 10-12. The committee further recommended that the ground water conservation districts proposed by the state geologist be a basis for forming ground water conservation districts. *Id.* at 12. *See id.* at 12-19.

161. Groundwater Conservation Act of Nebraska, 1959 Neb. Laws, ch. 220, at 773.

162. 1959 Neb. Laws, ch. 221, at 774 (codified at NEB. REV. STAT. §§ 46-614 to -634 (Reissue 1978 & Cum. Supp. 1980)). The formation of GWCDs after June 30, 1972 was subsequently prohibited. 1971 Neb. Laws, L.B. 544 (codified at NEB. REV. STAT. § 46-614.01 (Reissue 1978)). Existing GWCDs must be dissolved by April 1, 1982. 1978 Neb. Laws, L.B. 411, § 1, at 259 (codified at NEB. REV. STAT. § 46-634.01 (Reissue 1978)). Ground water management is a function assumed by Natural Resources Districts (NRDs). *See* notes 20-48 & accompanying text *infra.*

which could be enforced by court order.[163]

The 1957 Legislature also enacted ground water preference legislation establishing that domestic ground water uses were superior to any other ground water use, and agricultural ground water uses were superior to manufacturing or industrial uses.[164] The legislation did not establish whether domestic use included industrial water supply by municipalities, did not specify the type of preference created, and did not specify in what circumstances preferences would apply.[165]

E. The Center Pivot Boom: 1960 to 1969

In 1949, Frank Zybach of Columbus, Nebraska developed the center pivot sprinkler irrigation system which would revolutionize irrigation in Nebraska.[166] The widespread use of the center pivot began in the 1960s, allowing land with steep slopes to be developed for irrigation. Over 12,000 irrigation wells were installed during the 1960s, twenty-five percent less than the number of wells installed during the 1950s. However, the number of acres irrigated from ground water rose by 1.4 million acres, bringing the total to over 3.5 million acres.[167] Three acres were being irrigated with ground water in Nebraska for every acre irrigated with surface water.

The first statute dealing with ground water quality protection was enacted by the 1961 Legislature. Abandoned irrigation wells were to be sealed according to DWR regulations, primarily to prevent contaminants from reaching ground water supplies through the abandoned wells.[168]

The 1962 Report of the Nebraska Legislative Council Committee on Water Control was the third major legislative study of ground water.[169] The major issue addressed in the study was municipal

163. NEB. REV. STAT. §§ 46-629(6), -630 (Reissue 1978). GWCDs were organized in the late 1960s and early 1970s in York, Seward, Hamilton, Clay, and Fillmore counties in the Blue River basin, and in Chase and Dundy counties in the upper Republican River basin. The five Blue River basin GWCDs formed the Blue River Association of Groundwater Conservation Districts to coordinate enforcement of ground water irrigation runoff control regulations and to promote efficient use of irrigation water through irrigation scheduling programs. Blue River Ass'n of Ground Water Conservation Dists., 1 THE GROUND WATER MONITOR (Winter 1974); M. NOFFKE, D. AXTHELM, & H. MULLINER, THE BENEDICT PROJECT (Blue River Ass'n of Ground Water Conserv. Dists. Nov., 1975).

164. 1957 Neb. Laws, ch. 199, at 701 (codified at NEB. REV. STAT. § 46-613 (Reissue 1978)).

165. *See* notes 38-41 *supra*; notes 395-406 & accompanying text *infra*.

166. *See* Harnsberger, Oeltjen & Fischer, *supra* note 24, at 199.

167. NRC Data Bank, *supra* note 5.

168. 1961 Neb. Laws, ch. 230, at 683 (codified at NEB. REV. STAT. §§ 46-602(3), -602(4) (Reissue 1978 & Cum. Supp. 1980)).

169. 114 Neb. Legislative Council Rep. (1962) [hereinafter cited as 1962 Legislative

ground water transfers. Because previous court opinions had suggested that nonoverlying uses could be enjoined, municipal ground water transfers were in a precarious legal position.[170] Municipal representatives had sought to appropriate subflow to protect municipal wellfields in alluvial aquifers, but their applications were denied. Municipal representatives then proposed that the legislature adopt the subflow doctrine to make municipal ground water transfers more secure.[171] The study committee made several legislative recommendations related to ground water: (1) that domestic use should be defined; (2) that permits should be required before ground water was withdrawn from a well or pit within 200 feet of a natural stream, with permits being denied when the ground water was needed to supply the needs of surface water appropriators; and (3) that ground water should be defined to include water in underground streams.[172]

Surface-ground water interrelationships were addressed in two statutes enacted by the 1963 Legislature. The 1962 Legislative Study Committee recommended adopting a legal definition of ground water including the underground stream doctrine. The 1963 Legislature defined ground water, but excluded the suggested underground stream language which would have begun integrat-

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Study]. Topics studied by the committee included nitrate contamination of ground water supplies, ground-surface water conflict caused by pumping from wells near streams, the need for hydrogeological studies identifying ground-surface water interrelationships, and legal uncertainties regarding municipal ground water transfers. *Id.* at 4-11, 12-15, 18-21. In considering the streamflow reductions caused by ground water withdrawals near streams, the committee discussed the legal concept of underground streams. Through this concept the ground water flow of a surface stream is legally treated as part of the surface stream. Rights to use ground and surface water would be correlated on the basis of priority. *Id.* at 20. *See* notes 90-91 & accompanying text *supra.*

170. Olson v. City of Wahoo, 124 Neb. 802, 811, 248 N.W. 304, 308 (1933). *See* Harnsberger, Oeltjen & Fischer, *supra* note 24, at 214-17.

171. Municipal representatives presented a proposed bill to the study committee to deal with these issues. The proposed bill made water in definite underground streams, including the underflow of a surface stream, subject to surface water law; defined municipal water uses, except for industrial water supply by a municipality, as domestic; and presumed the ground water in the Platte, Loup, and Elkhorn River valleys to be water of an underground stream. 1962 Legislative Study, *supra* note 169, at 20-21.

172. *Id.* at 24-26. The proposed definition of ground water was: "that water which oozes, seeps, filters, or percolates through the ground under the surface without a definite channel, or in a course that is uncertain or unknown and not discoverable from the surface without excavation for that purpose, and that water under the surface flowing in fixed or definite channels, the existence and location of which are known or ascertainable from surface indications or other means without subsurface excavations for that purpose." *Id.* at 26.

ing ground and surface water rights.[173] However, the 1963 Legislature recognized to a limited extent the physical interrelationship between ground and surface water. It found "that the pumping of water for irrigation purposes from pits located within fifty feet of the bank of any natural stream may have a direct effect on the surface flow of such stream."[174] Thus, it established that a permit is required to pump from such a pit. In approving or disapproving a permit application, the DWR was required to "take into account the effect that such pumping may have on the amount of water in the stream and its ability to meet the requirements of appropriators from the stream."[175]

Two statutes enacted in 1963 dealt with municipal water supply issues. The first defined domestic use of ground water to exclude industrial water supply for municpalities.[176] The second authorized municipal ground water transfers.[177] The 1962 Legislative Study Committee did not make specific recommendations regarding municipal ground water transfers, although the inclusion of underground streams in the Committee's recommended ground water definition would have been the basis for appropriating subflow. L.B. 440 was introduced by Lincoln and Omaha senators in 1963 and contained most of the features proposed to the 1962 Study Committee by municipal representatives.[178] L.B. 440 was not enacted because of ground water irrigators' objections.[179] As a compromise between municipal and irrigation interests, the City, Village and Municipal Ground Water Permit Act was enacted in 1963.[180] The act gave cities, villages, and municipal corporations the option to obtain a permit from the Director of Water Resources

173. 1963 Neb. Laws, ch. 274, § 1, at 827 (codified at NEB. REV. STAT. § 46-635 (Reissue 1978)).
174. NEB. REV. STAT. § 46-636 (Reissue 1978).
175. *Id.* § 46-637.
176. *Id.* § 46-613.
177. *Id.* § 46-638 to -650 (Reissue 1978 & Cum. Supp. 1980).
178. L.B. 440, 73d Leg., 1st Sess. (1963). Section one made all ground water within one half mile of any stream bank public and subject to appropriation. Section three gave the DWR jurisdiction regarding the adjudication, appropriation, and administration of such ground water. Section four confirmed existing municipal and irrigation use of such ground water. Section six defined domestic use to include all municipal ground water uses except industrial water supply. Section seven excluded farm and ranch domestic wells from appropriation requirements.
179. Harnsberger, Oeltjen & Fischer, *supra* note 24, at 219.
180. 1963 Neb. Laws, ch. 276, § 1, at 829 (codified at NEB. REV. STAT. §§ 46-638 to -650 (Reissue 1978 & Cum. Supp. 1980)). The Act's title was changed in 1980 to the Municipal and Rural Domestic Ground Water Transfers Permit Act. 1980 Neb. Laws, L.B. 643, § 5 (codified at NEB. REV. STAT. § 46-650 (Cum. Supp. 1980)).

for ground water transfers.[181]

In 1965 the Metropolitan Utilities District of Omaha (MUD) applied for a permit under the Act. MUD, already diverting 140 million gallons per day (mgd) of surface water from the Missouri River, proposed to withdraw sixty mgd from thirty-five wells on the north bank of the Platte River and an adjacent island five miles west of the river's junction with the Missouri River. The water was to be transferred to Omaha, which is located in the Papio River basin. Of the sixty mgd of ground water proposed to be withdrawn, four mgd or seven percent would come from ground water storage. The remaining fifty-six mgd or ninety-seven percent would come indirectly from the Platte River as induced aquifer recharge. According to expert testimony the ground water withdrawals would have had a minimal effect on streamflow, lowering it no more than 1.1 inches.[182] The permit was granted by the Director and objectors appealed the decision to the Nebraska Supreme Court, arguing that the water which was to be withdrawn from MUD's wells was surface water and could not be diverted from one river basin for use in another.[183] The supreme court ruled that the grant of the permit was proper.[184] First, it held that because the proposed ground water diversion would not affect nearby wells and would lower Platte River flow by no more than 1.1 inches, the

181. NEB. REV. STAT. § 46-638 (Cum. Supp. 1980). The permit can be granted, after notice and hearing, if the DWR Director finds that the proposed ground water withdrawal and transportation is reasonable, is not contrary to the conservation and beneficial use of ground water, and is not otherwise detrimental to the public welfare. *Id.* §§ 46-639 to -642 (Reissue 1978). On the subject of notice and hearing, see Harnsberger, Oeltjen & Fischer, *supra* note 24, at 221-22. Permits for existing ground water transfers and ground water recharge can be obtained upon application to the DWR. NEB. REV. STAT. §§ 46-643, -645 (Reissue 1978 & Cum. Supp. 1980). Ground water users adversely affected by ground water transfers may sue for damages. *Id.* § 46-647 (Cum. Supp. 1980). This section has been interpreted as limiting an aggrieved ground water user's remedy against a section 46-638 permit holder to damages. Harnsberger, Oeltjen & Fischer, *supra* note 24, at 219 n.146. While a court could so interpret section 46-647, the language of the statute does not require such an interpretation. Section 46-647 is not a positive statement that possession of a section 46-638 permit precludes an injunction issuing against the holder although this may have been what the 1963 Legislature intended.

The provisions of the Act were extended in 1980 to public water supplies defined as those public districts supplying or intending to supply water to urban or rural areas for domestic or municipal purposes. Affected public districts include irrigation, reclamation, metropolitan utility, sanitary improvement, rural water, and natural resources districts. 1980 Neb. Laws, L.B. 643, §§ 2, 3 (codified at NEB. REV. STAT. §§ 46-638 to -645 (Cum. Supp. 1980)).

182. Metropolitan Util. Dist. v. Merritt Beach Co., 179 Neb. 783, 795, 140 N.W.2d 626, 634 (1966).

183. *Id.* at 786, 140 N.W.2d at 629-30.

184. *Id.*

objectors would not be harmed by the proposed transfer. Second, by relying on the statutory definition of ground water, the court ruled that all the water proposed to be withdrawn by MUD was ground water. Third, it ruled that the proposed interbasin ground water transfer by MUD was neither prohibited by statute nor by prior court decision, and was "reasonable, for a public purpose, beneficial, not against public policy, and in the public interest."[185]

A subsequent supreme court decision also dealt with municipal water supply issues.[186] Municipalities often offer incentives, such as reduced rates for taxes or utility service, to attract industry. They feel such inducements are justified because the industry will increase employment, economic well being, and ultimately tax revenues.[187] A municipal attempt to obtain industrial water supplies by condemnation led to litigation regarding whether such use of condemnation was valid. In 1964, construction of a large fertilizer plant outside the city limits of Beatrice was planned. The fertilizer company was unable to obtain the necessary water supply itself. The city agreed to supply water directly to the fertilizer plant, not from existing municipal supplies, but from wells on land condemned by the city solely for the purpose of supplying the fertilizer plant. The owners whose land was condemned appealed the city's action. The Nebraska Supreme Court ruled in favor of the plaintiffs stating that because the land was condemned solely to provide water directly for the fertilizer plant, the condemnation was for a private rather than a public purpose and thus was invalid. The court, however, affirmed the authority of the city to condemn land to obtain water to meet the domestic needs of its inhabitants.[188]

Public water supply problems in rural areas similar to those in urban areas led the legislature to authorize the organization of rural water districts. Because in eastern Nebraska and in many border counties ground water supplies are limited,[189] securing a reliable ground water supply for domestic purposes may be difficult. In recognition of this, the 1967 Legislature authorized the organization of rural water districts (RWDs).[190] Where local water supplies were inadequate, RWD could be organized upon petition and landowner ratification. RWDs are authorized to store, trans-

185. *Id.* at 802, 140 N.W.2d at 637. *See* Harnsberger, Oeltjen & Fischer, *supra* note 24, at 222-25.
186. Burger v. City of Beatrice, 181 Neb. 213, 147 N.W.2d 784 (1967).
187. *See* Harnsberger, Oeltjen & Fischer, *supra* note 24, at 225-27.
188. 181 Neb. 213, 147 N.W.2d 784 (1967).
189. R. BENTALL & F. SHAFFER, *supra* note 4, at 1.
190. 1967 Neb. Laws, ch. 279, § 1, at 747 (codified at NEB. REV. STAT. §§ 46-1001 to -1026 (Reissue 1978 & Cum. Supp. 1980)).

port, and use water for rural water supply purposes.[191]

Another aspect of the ground water transfers issue was addressed by the 1967 Legislature. In Nebraska's border counties a ranch or farm may be located in more than one state. Thus, a landowner withdrawing water in one part of his operation for use in another could be involved in interstate ground water transfer. To give the state some control over these and similar situations, the 1967 Legislature established a permit requirement for withdrawals from a pit or well in Nebraska for use in an adjoining state.[192]

Traditionally, natural resources development and control responsibilities have been given to local, single-purpose districts organized on a county basis. Limitations of this approach include organization by political boundaries rather than boundaries facilitating resource development or obtaining control objectives, and creation of a fragmented tax base. The 1969 Legislature began to reorganize over 150 single purpose districts into larger, more comprehensive natural resource districts (NRDs).[193] The legislation creating NRDs withdrew the authority to organize new ground water conservation districts and rural water districts.[194] The NRDs were authorized to establish ground water controls subject to ratification in a local referendum.[195] This authority was subsequently repealed and the NRDs were given broad ground water management authority when the 1975 Legislature enacted the Ground Water Management Act.[196]

The final statute of this period affecting ground water was the establishment of a natural resources data bank.[197] Well registra-

191. NEB. REV. STAT. § 46-1002 (Reissue 1978). RWDs cannot supply water for the cultivation of submarginal land. *Id.* § 46-1005. Subsequent legislation established that new RWDs could not be organized after June 30, 1972. 1971 Neb. Laws, L.B. 544, § 10 (codified at NEB. REV. STAT. § 46-1001.01 (Reissue 1978)). Rural water supply is one function assumed by NRDs. *See* NEB. REV. STAT. § 2-3229 (Reissue 1977).

192. 1967 Neb. Laws, ch. 281, § 5, at 761 (codified at NEB. REV. STAT. § 46-613.01 (Reissue 1978)). *See* notes 357-61 accompanying text *infra*.

193. 1969 Neb. Laws, ch. 9, § 1-59, at 100 (codified at NEB. REV. STAT. §§ 2-3201 to -3275 (Reissue 1977 & Cum. Supp. 1980)).

194. 1969 Neb. Laws, ch. 9, §§ 63-65, at 135-36 (codified at NEB. REV. STAT. §§ 46-614.01, -1001.01 (Reissue 1978)). Existing RWDs are not affected but existing GWCDs must be dissolved by April, 1982. 1978 Neb. Laws, L.B. 411, § 1, at 259 (codified at NEB. REV. STAT. § 46-634.01 (Reissue 1978)).

195. 1969 Neb. Laws, ch. 9, § 37, at 124 (codified at NEB. REV. STAT. § 2-3237 (Reissue 1977)).

196. 1975 Neb. Laws, L.B. 577, § 26, at 1158 (codified at NEB. REV. STAT. §§ 46-656 to -673 (Reissue 1978 & Cum. Supp. 1980)).

197. 1969 Neb. Laws, ch. 382, § 1-3, at 1348-49 (codified at NEB. REV. STAT., §§ 2-1568 to -1570 (Reissue 1977)). Establishment of the data bank was one recommendation in the Report of the Nebraska Legislative Council Committee on Ground and Surface Water, 165 Neb. Legislative Council Rep. at 9 (Nov. 1968).

tion data is part of the information collected in the data bank, including the number and location of registered wells, the number of acres irrigated and the types of wells drilled.[198]

F. Ground Water Mining and Management: 1970 to 1980

Drought and periods of high crop prices led to an explosion in ground water development for irrigation. Nearly half or 29,000 of the 63,000 irrigation wells in Nebraska were installed during the 1970s, doubling the number of acres irrigated with ground water.[199] By 1975 Nebraska ranked third nationally in the number of acres irrigated, as well as in ground water withdrawals.[200] By 1979, nearly eighty-five percent of the land irrigated in Nebraska was irrigated with ground water.[201]

The decade of the 1970s was one of environmental concern. State legislation protecting air, land and water quality, and public drinking water supplies was enacted. Surface water irrigation projects were delayed or defeated largely because of environmental challenges. In addition the reality of ground water mining became apparent in several parts of Nebraska. New legislation dealing with ground water mining led to the establishment of groundwater control areas and the first administrative regulation of ground water use in the state's history. Other topics addressed by the legislature included: ground water irrigation runoff control, water development and conservation, and state water policy assessment. Litigation addressed irrigation runoff, well interference, and water transfers.

In the first of several enactments dealing with environmental quality, the 1971 Legislature enacted the Environmental Protection Act.[202] The Act created the Department of Environmental Control, which is authorized to deal with a broad variety of environmental problems, including ground water pollution.[203] The Department

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The study committee also recommended legislation to replace a variety of single-purpose natural resource districts with multi-purpose natural resource districts and studied ground and surface water law and planning in Colorado, Texas, New Mexico, and California. *Id.* at 8-9. *See* notes 193-96 & accompanying text *supra.*

198. *See* note 5 *supra.*

199. Over 3.7 million additional acres were irrigated with ground water, bringing the total to 7.4 million. NRC DATA BANK, *supra* note 5.

200. G. MURRAY & E. REEVES, *supra* note 2, at 24-25.

201. M. JOHNSON & D. PEDERSON, *supra* note 5, at 58.

202. 1971 Neb. Laws, L.B. 939 (codified at NEB. REV. STAT. §§ 81-1501 to -1533 (Reissue 1976 & Cum. Supp. 1980)). The Act created an Environmental Control Council, which establishes standards for air, land, and water quality. NEB. REV. STAT. §§ 81-1503, -1505 (Cum. Supp. 1980).

203. Water pollution control authority extends to ground water. NEB. REV. STAT. §§ 81-1505(1), -1506(1), -1502(21) (Reissue 1976 & Cum. Supp. 1980). Waste dis-

has established ground water quality protection standards and regulations governing the use of disposal wells.[204] The 1972 Legislature enacted another bill which aimed at protecting ground water quality. Many irrigators add agricultural chemicals, such as fertilizers, pesticides and herbicides, to their irrigation water for application through their irrigation system. If the source of water is ground water, well pump failure can cause the chemicals to siphon down the well, contaminating ground water supplies. To deal with this problem, the 1972 legislation required ground water irrigators who apply fertilizer through their irrigation system to install a mechanical device, usually a check valve, to prevent the fertilizer from contaminating ground water supplies if the well pump stopped.[205]

A third bill aimed at water quality became law when the 1976 Legislature enacted the Safe Drinking Water Act, authorizing the Department of Health to protect drinking water quality by regulating the development and operation of public water supply systems.[206] The installation of wells for public water supply systems is regulated by the Department.

When evaluating the development of supplemental water supplies as an option for dealing with ground water mining, primary consideration usually is given to surface water impoundment projects. Another method for dealing with ground water mining is

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charges in violation of air, land and water quality standards are illegal. *Id.* § 81-1506. Air, land and water quality standards are enforced by the Department of Environmental Control. *Id.* §§ 81-1504, -1507 to -1513. Enforcement authorities may be delegated to local governmental subdivisions which have adopted Council approved pollution control programs. *Id.* § 81-1504(23). This suggests that ground water pollution control programs approved by the Council could be delegated to NRDs.

204. Nebraska Dep't of Environmental Control, Groundwater Protection Standards (March 1978); Nebraska Dep't of Environmental Control, Rules and Regulations for the Control of Disposal Wells to Protect Groundwater and Other Subsurface Resources of the State of Nebraska (June, 1975). The Act was amended in 1980 to give the Department authority to regulate hazardous waste disposal. 1980 Neb. Laws, L.B. 853 (codified at NEB. REV. STAT. §§ 81-1521.01 to .07 (Cum. Supp. 1980)).

205. 1972 Neb. Laws, L.B. 1343, at 1060 (codified at NEB. REV. STAT. § 46-612.01 (Reissue 1978 & Cum. Supp. 1980)). Subsequent legislation included herbicides and pesticides within the scope of check valve requirements. 1977 Neb. Laws, L.B. 421, at 1050 (codified at NEB. REV. STAT. § 46-612.01 (Cum. Supp. 1980)).

206. 1976 Neb. Laws, L.B. 821, at 616 (codified at NEB. REV. STAT. §§ 71-5301 to -5313 (Reissue 1976)). The Director of Health is required to adopt drinking water standards which apply to all public water supply systems, i.e., those having at least 15 service connections or regularly serving at least 25 individuals. *Id.* §§ 71-5301(9), -5302(1), -5302(3). A permit from the Director is required for the construction, operation, extension, or alteration of public water supply systems. *Id.* §§ 71-5303, -5305. Public water supply system operators must be certified by the Department of Health. *Id.* §§ 71-5307 to -5309.

to increase ground water recharge by reducing overland runoff through land conservation and management practices, e.g. contour farming, reduced tillage, or terracing. The 1977 Legislature enacted the Nebraska Water Conservation Act to increase ground water recharge by providing state financial support for land conservation and management practices.[207] Another option for dealing with ground water mining is to obtain supplemental water supplies through such means as surface water development. Water impoundment can affect ground water use in two significant ways: first, seepage from reservoir, canals, and irrigated fields can increase ground water recharge and, second, impounded surface water can be used to supplement ground water supplies in an integrated water management program. While most major water impoundment projects are federally financed, the 1974 Legislature established the Nebraska Resources Development Fund to provide limited state financial support for water impoundment projects.[208]

207. 1977 Neb. Laws, L.B. 450, at 1064 (codified at NEB. REV. STAT. § 2-1575 to -1582 (Reissue 1977 & Cum. Supp. 1980)). The intent of the Conservation Fund is to better conserve and use land and water resources, and to recharge ground water by financially assisting private landowners to practice water and land conservation measures. NEB. REV. STAT. § 2-1576 (Reissue 1977). The Nebraska Water Conservation Fund is administered by the Nebraska Natural Resources Commission (NRC). *Id.* § 2-1577. Landowners may receive up to 75% state cost sharing on eligible water conservation practices including construction of water impoundment structures draining up to 2000 acres, unless at least 90% of the land to be drained is grassland, in which case up to 5000 acres can be drained by the proposed impoundment. Cost sharing is also available for construction of terraces, ponds, and other temporary water and sediment retention measures. *Id.* §§ 2-1581(1), -1581(2) (Cum. Supp. 1980). As a condition of receiving Conservation Fund cost sharing landowners must agree to maintain the water conservation practice for 10 years or refund the state funds received unless the NRC approves the practice modification. *Id.* § 2-1581(3).

208. 1974 Neb. Laws, L.B. 975, at 937 (codified at NEB. REV. STAT. §§ 2-3264 to -3272 (Reissue 1977 & Cum. Supp. 1980)). Financial assistance is provided for programs and projects for: (1) pollution abatement; (2) flood control; (3) land acquisition for future resource development projects; (4) irrigation; (5) fish and wildlife preservation; (6) public land improvement; (7) outdoor recreation; and (8) soil and water conservation. NEB. REV. STAT. § 2-3263 (Reissue 1977). Grants and loans (when the program or project is revenue generating) from the Development Fund are made to state agencies or political subdivisions. *Id.* §§ 2-3265, -3266 (Reissue 1977 & Cum. Supp. 1980). The NRC is authorized to acquire land for future state resource development projects, and to acquire storage rights in water development projects. *Id.* § 2-3267 (Reissue 1977).

Development Fund project or program proposals are evaluated by an advisory board to determine whether: (1) the proposed program or project would conflict with any state land or water plan; (2) the proposed program or project is economically and financially feasible; (3) the proposed program or project is technically feasible; (4) adverse environmental impacts are minimized; (5) the applicant is qualified to implement the proposed program or project;

The legislature also addressed the problem of irrigation practices which damage roads and road rights of way. Irrigation runoff can collect in road ditches, reducing the road's lateral support and in some cases cause flooding of the road. Watering of roads, particularly with sprinkler irrigation systems, may also be safety hazards. The 1975 Legislature made road damage caused by irrigation a misdemeanor.[209]

The major legal development of the decade was the legislature's enactment of the Ground Water Management Act[210] and the subsequent designation of three ground water control areas. Extensive development of ground water for irrigation had led to ground water mining in several parts of Nebraska.[211] In 1975, concerns about this problem led to the enactment of the Act[212] which created a procedure for establishing ground water control areas where ground water problems were occurring. Once a control area has been established natural resources districts (NRDs) can regulate ground water development and use, subject to approval by the Department of Water Resources (DWR).

The first step in creating a control area is for an NRD to request that the DWR hold a public hearing to determine whether a control area should be designated.[213] A control area may be designated if the DWR Director concludes that the uncontrolled development

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(6) any loan requested can be repaid and that adequate operation and maintenance is provided for during the loan's term; (7) the proposed program or project is coordinated with other state programs; and (8) money is available from the fund. *Id.* §§ 2-3270, -3271. After considering the advisory board's recommendation, proposals may be approved by the NRC. *Id.* § 2-3272.

209. 1975 Neb. Laws, L.B. 85, at 180 (codified at NEB. REV. STAT. § 39-703 (Reissue 1978)). *See* notes 344-48 & accompanying text *infra*.

210. 1975 Neb. Laws, L.B. 577, at 1145.

211. Areas with major ground water level declines include: the Blue River basin (Adams, Clay, Fillmore, Hamilton, York, Polk and Seward counties); the Central Platte area (Buffalo and Hall counties); the Upper Republican area (Chase, Perkins, and Dundy counties); Holt County, and Box Butte County. R. BENTALL & F. SHAFFER, *supra* note 4, at 35.

212. 1975 Neb. Laws, L.B. 577, at 1145 (codified at NEB. REV. STAT. §§ 46-656 to -673 (Reissue 1978 & Cum. Supp. 1980)). *See* Aiken & Supalla, *Ground Water Mining and Western Water Rights Law: The Nebraska Experience*, 24 S.D. L. REV. 607, at 618-19 (1979).

213. NEB. REV. STAT. § 46-658(3) (Cum. Supp. 1980). In its request the NRD must identify the area proposed to be included in the control area. *Id.* The Nebraska Natural Resources Commission and University of Nebraska Conservation and Survey Division are required to testify at the hearing. *Id.* § 46-658(4)(b). Presumably, the Commission testifies regarding whether establishing the control area would be consistent with development of the state water plan and the Division testifies regarding the ground water hydrology of the area involved. *Id.* § 2-1507(b) (Reissue 1979); *Id.* § 85-163 (Reissue 1976). In addition, the DWR director can make any additional investigations he deems necessary. *Id.* § 46-658(4)(b) (Cum. Supp. 1980).

and use of ground water either has caused or is likely to cause an inadequate ground water supply to meet present or reasonably foreseeable needs, or a degradation of ground water quality due to ground water mining so that the water is unsuitable for current uses.[214] In determining whether either of these two criteria have been fulfilled, the Director must consider whether conflicts between ground water users are occurring or may be reasonably anticipated; or whether ground water users are experiencing or, in the foreseeable future, will experience substantial economic hardship as a direct result of current or anticipated ground water development or use.[215] If a control area is designated, DWR permits are required before any well can be installed within the control area.[216] In addition, after a public hearing and subject to DWR approval, an NRD can regulate ground water development and use

214. *Id.* §§ 46-658(1)(a), -658(b) (Cum. Supp. 1980). The order designating the ground water control area must define its geographic and stratrographic (*i.e.*, geologic) boundaries. *Id.* § 46-658(4)(e). In addition, the Director must consider these factors in establishing control area boundaries: the ground water supply or quality problem which led to the control area designation; the effect on political subdivisions; and the socio-economic and administrative factors directly affecting the ability of an NRD to implement a local ground water management and control program. *Id.* § 46-658(4)(c). The Director may include area within the control area not previously identified by the NRD for consideration. *Id.* §§ 46-658(4)(a), -658(4)(c). Areas from a contiguous NRD not requesting a control area hearing may also be included in the control area if the NRD consents to its inclusion. *Id.* § 46-658(4)(d). Control area boundaries may be modified by following the designation procedure. *Id.* § 46-658(5).

215. *Id.* § 46-658(2). Previously the Director could have considered whether "[o]ther conditions exist that indicate the inadequacy of the ground water supply or that require the area be designated as a control area for protection of the public welfare." *Id.* § 46-658(1)(c) (Reissue 1978), repealed by 1979 Neb. Laws, L.B. 26, at 139.

216. NEB. REV. STAT. § 46-659(1) (Cum. Supp. 1980). Information required in the application includes: (1) the applicant's name and address; (2) whether the proposed use of the well is for domestic, municipal, irrigation, industrial, or other purposes; (3) the location of the proposed well; (4) the location and number of acres of land to be irrigated if the proposed well will be used for irrigation purposes; (5) the proposed well's anticipated diameter, depth, and capacity; and (6) the expected well log (i.e., a description of the geologic materials encountered in drilling the hole) if known from test drilling. Nebraska Dep't of Water Resources, *Application For A Permit To Construct A Water Well Within A Ground Water Control Area* (Form 577-1 undated).

If a well has been drilled in a control area without one's first having obtained a permit a late permit may be obtained if the well was otherwise in compliance with control area rules and regulations when the well was installed and when the late permit was sought, and if the failure to obtain the control area well permit was in good faith. NEB. REV. STAT. §§ 46-659(3), -659(5), -660(1). An additional $250 fee for late permit applications must be paid to the NRD. *Id.* § 46-659(4). Otherwise application procedures are the same as for regular control area well permits. *Id.*

within a control area.[217] Authorized controls include regulation of well spacing, well pumping, ground water withdrawals, and well drilling.[218] Regardless of whether a control area has been designated, the Act also requires all NRDs to establish regulations to control ground water irrigation runoff, and authorizes them to stop the construction and use of illegal wells.[219]

Six control area hearings have been requested and held. Control areas have been designated by the Director in the Upper Republican, Upper Big Blue, and Little Blue NRDs. Control area requests were denied in the North Platte, Lower Platte South, and Lower Loup NRDs.

The first control area request dealt with interference between irrigation and domestic wells in Scotts Bluff and Banner counties. Domestic wells had been drilled into an artesian aquifer where artesian pressure forced the water in the well near the surface. Withdrawals from subsequently developed irrigation wells reduced the artesian pressure, causing water levels in domestic wells to fall below the well pumps. The domestic wells had to be replaced when the wells stopped yielding water and the well pumps burned up. The domestic well owners sued the irrigator for the cost of replacing their wells. In a 1974 opinion, the Scotts Bluff County District Court held that because the irrigator's pumping

217. NEB. REV. STAT. § 46-666 (Cum. Supp. 1980). Controls may be varied within a control area based on differing climatic, hydrologic, geologic, or soil condition. *Id.* § 46-666(4). *See* note 234 *infra.* In adopting and approving ground water controls the NRD and DWR Director must consider whether the controls will (1) mitigate or eliminate the condition that led to control area designation, (2) encourage a high degree of water use efficiency, or (3) improve control area administration. NEB. REV. STAT. §§ 46-666(2), -666(3). If controls are not adopted by the NRD within 18 months after control area designation, the power to establish controls vests in the DWR Director. *Id.* § 46-666(8). The Director is authorized to administer controls if, after a public hearing requested by local ground water users, the director determines that the NRD is administering the controls unfairly. *Id.* § 46-667 (Reissue 1978).

218. NEB. REV. STAT. §§ 46-666(1), -666(5) (Cum. Supp. 1980). Apparently the well drilling moratorium is intended to be used as a last resort. *Id.* § 46-666(5). This section is unclear regarding whether the NRD may consider establishing a moratorium before the proposed rules are published and the NRD public hearing held pursuant to section 46-665, or cannot consider a moratorium until after a section 46-665 public hearing. If the latter interpretation is correct an additional section 46-665 public hearing would be required before the NRD could adopt a moratorium. Ground water control authorities are evaluated in Aiken & Supalla, *supra* note 208, at 629-40.

Control area activities are financed by a property tax of up to $0.009 per $100 actual value on all taxable property in the control area. NEB. REV. STAT. § 46-673 (Cum. Supp. 1980). The general NRD levy of $0.035 per $100 actual value can be increased by popular vote. *Id.* § 2-3225(1) (Reissue 1977).

219. *Id.* §§ 46-663(6), -664 (Reissue 1978 & Cum. Supp. 1980). Regarding illegal wells, see notes 284-94 & accompanying text *infra.*

disrupted the domestic water supplies, he was required to pay for replacing the domestic wells.[220] The North Platte NRD subsequently requested a control area hearing but after the public hearing the Director declined to designate a control area.[221] The Director's order noted that: (1) while irrigation development was causing seasonal (temporary) artesian pressure reductions and water level declines, ground water mining was not occurring; (2) the private economic hardships of the irrigation-domestic well interference conflicts were not substantial and could be dealt with through private litigation; and (3) while the availability of ground water was somewhat diminished because of seasonal artesian pressure reduction, the adequacy of the ground water supply was undiminished.[222]

In 1977, the first ground water control area was designated in the Upper Republican area of Chase, Perkins, and Dundy counties, where ground water mining is occurring.[223] Center pivot irrigation development has led to ground water level declines of up to thirty feet in some areas, streamflow reductions in Frenchman Creek, and reduction in surface water storage at Enders Reservoir.[224] After a public hearing requested by the Upper Republican NRD, the Director designated a control area.[225] The Director's order noted that: (1) ground water mining was occurring; (2) conflicts between ground and surface water users were occurring; (3) unless supplemental water supplies could be developed, current ground water supplies were inadequate to meet present or reasonably foreseeable needs; and (4) substantial economic hardships affecting regional prosperity and water user conflicts could be anticipated if ground water mining continued.[226]

The first controls approved under the Act required flowmeters on all wells[227] and certification of irrigated acres within the

220. Buchfield v. Adams, Ci. 74-36 & 74-37 (Scotts Bluff Dist. Ct., Neb. 1974).
221. Nebraska Dep't of Water Resources Order Denying a Request to Create a Ground Water Control Area (January 7, 1977) (North Platte Control area).
222. *Id.*
223. M. JOHNSON & D. PEDERSON, *supra* note 5, at 3, 36-38.
224. *See generally* E. LAPALLA, QUANTITATIVE HYDROGEOLOGY OF THE UPPER REPUBLICAN NRD, SOUTHWEST NEBRASKA (U.S. Geol. Survey Water Resources Investigation 78-38, June 1978). Ground water levels are expected to fall as much as 140 feet by the year 2000 if ground water development and use is not restricted. *Id.* at 1.
225. Nebraska Dep't of Water Resources Order Granting a Request to Create a Ground Water Control Area (August 1, 1977) (Upper Republican control area). The control area covers 2600 square miles, including an estimated 2400 irrigation wells that irrigate nearly 310,000 acres.
226. *Id.* at 2-3.
227. Upper Republican NRD, Rules and Regulations for Ground Water Control: Order No. 1, Rule 3(b) (February 7, 1978) [hereinafter cited as Upper Republican Order No. 1]; Nebraska Dep't of Water Resources Order of Approval for

NRD.[228] New wells are required to be located at least 1320 feet from existing stock and domestic wells.[229] In "critical townships," those where annual withdrawals exceed one percent of the remaining ground water supply,[230] new wells must be located at least 3300 feet from existing wells.[231] The regulations limit ground water transfers,[232] and indicate that the NRD would adopt a ground water allocation of 14 to 17 acre inches per certified irrigated acre in 1980.[233] A subsequent amendment establishes ground water withdrawal limitations for irrigators. Withdrawals are limited to 66 acre inches per certified irrigated acre from January 1, 1980 to December 31, 1982, an annual average of 22 acre inches per acre.[234]

Proposed Ground Water Control Rules and Regulations (March 27, 1978) (Upper Republican NRD). Meters must meet NRD specifications and must be sealed by the NRD. Upper Republican Order No. 1, Rules 3(a), 3(c)(1). Violation of well metering requirements can result in a loss of up to one year's ground water allocation. *Id.* Rule 3(c).

228. Upper Republican Order No. 1, *supra* note 227, Rule 4.

229. *Id.* Rule 5(b).

230. *Id.* Rule 1(d). Twenty-three critical townships have been designated. Upper Republican NRD, Rules and Regulations for Ground Water Control: Order No. 2, Rule 1(d) (January 2, 1979) [hereinafter cited as Upper Republican Order No. 2]; Nebraska Dep't of Water Resources Order of Approval for Proposed Amendments to Ground Water Rules and Regulations (January 9, 1979) (Upper Republican control area). The critical township designation remains in effect for a minimum of three years. Upper Republican Order No. 2, Rule 1(d).

231. Upper Republican Order No. 1, *supra* note 227, Rule 5(a).

232. *Id.* Rule 2(d). *See* Aiken & Supalla, *supra* note 212, at 643.

233. Upper Republican Order No. 1, *supra* note 227, Rule 2(c).

234. Upper Republican NRD, Rules and Regulations for Ground Water Control: Order No. 3, Rules 4(a)(1), (2) (March 4, 1980) [hereinafter cited as Upper Republican Order No. 3]; Nebraska Dep't of Water Resources Order of Approval for Proposed Amendments to Ground Water Rules and Regulations (March 7, 1980) (Upper Republican control area).

Earlier regulations submitted by the NRD proposed to vary ground water allocations for different irrigation water distribution systems. Upper Republican NRD, [Proposed] Rules and Regulations for Ground Water Control: Order No. 3 (February 7, 1980) [hereinafter cited as Upper Republican Proposed Order No. 3]. Irrigators using gravity flow irrigation systems would have received a five year allocation of 110 acre inches per certified irrigated acre, an annual average of twenty-two acre inches per acre. *Id.* Rule 4(a)(1). Irrigators using sprinkler irrigation systems would have received a five year allocation of eighty acre inches per certified irrigated acre, an annual average of sixteen acre inches per acre. *Id.* Rule 4(a)(2). The Director rejected this allocation as being unauthorized by statute. Memorandum from Michael Jess to Rex Haberman (February 22, 1980) [hereinafter cited as Jess Memorandum]. NEB. REV. STAT. § 46-666(4) (Cum. Supp. 1980) authorizes varying control area regulations based on differing climatic, hydrologic, geologic, or soil conditions. The Director interpreted section 46-666(4) as excluding variable regulations based on type of water distribution system. Jess Memorandum.

The proposed regulations submitted to the Director also included reduced

Violation of this requirement can result in loss of up to half of either the remaining or the next allocation.[235] The regulations also adopt the ground water managment objective of limiting ground water supply reductions to a "manageable rate."[236]

The second control area was designated in the Upper Big Blue NRD. The Blue River basin is one of the major irrigated areas where ground water is being mined. After a public hearing requested by the Upper Big Blue NRD, the Director designated a ground water control area.[237] The Director's findings were similar to those noted in designating the Upper Republican control area.

While the Upper Big Blue ground water controls do not establish immediate limitations on withdrawals,[238] the controls encourage installation of flow meters and irrigation water reuse systems and the use of irrigation scheduling techniques as well as other voluntary measures to improve water use efficiency and control ground water mining.[239]

The fourth control area designation request involved conflicts between domestic and irrigation wells drilled in a semi-artesian aquifer in Butler, Lancaster, Seward, and Saunders Counties. Ground water withdrawals for irrigation caused temporary (seasonal) reductions in artesian pressure, interferring with withdrawals from domestic wells. After the public hearing requested by the Lower Platte South NRD, the Director declined to designate a con-

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allocations for four townships in Chase County at the request of local landowners. The gravity irrigation system allocations were 100 acre inches per certified irrigated acre, an annual average of twenty acre inches per acre. Upper Republican Proposed Order No. 3, Rule 4(b)(1). The sprinkler irrigation system allocation was seventy acre inches per certified irrigated acre, an annual average of fourteen acre inches per acre. *Id.* Rule 4(b)(2). These provisions were disapproved, based on the Director's interpretation of section 46-666(4). Jess Memorandum.

235. Upper Republican Proposed Order No. 3, *supra* note 234, Rule 12.

236. *Id.* at 1. Previously the NRD had adopted a goal of limiting the rate of ground water depletion to one percent of the remaining supply per year. Upper Republican Order No. 1, *supra* note 227, Rule 2(b). *See* Aiken & Supalla, *supra* note 212, at 642 n.165.

237. Nebraska Dep't of Water Resources Corrected Order Granting a Request to Create a Ground Water Control Area (December 22, 1977) (Upper Big Blue control area). The control area includes 2700 square miles, including 9400 irrigation wells irrigating 1.1 million acres. *See* Aiken & Supalla, *supra* note 212, at 629.

238. Upper Big Blue NRD, Control Area Rules and Regulations, Rules 2(I)(B), 2(II) (December 26, 1978) [hereinafter cited as Upper Big Blue Rules]; NEbraska Dep't of Water Resources Order of Approval of Control Area Rules and Regulations, (January 9, 1979) (Upper Big Blue control area). If there is an increase in the rate of ground water decline, a three-year irrigation allocation of forty-eight acre inches per certified irrigated acre (annual average of sixteen acre inches per year) will take effect. *Id.*

239. Upper Big Blue Rules, *supra* note 238, Rule 2(I)(A).

trol area[240] noting that: (1) while ground water irrigation withdrawals were causing seasonal artesian pressure reductions and water level declines, ground water mining was not occurring; (2) the private economic hardships associated with irrigation-domestic well interference were not substantial and could be dealt with through means other than control area regulation (i.e. private litigation); and (3) while the availability of ground water was somewhat diminished because of seasonal artesian pressure reduction, the adequacy of the ground water supply was essentially undiminished.[241]

After a public hearing request by the Little Blue NRD,[242] the third ground water control area was designated within the Blue River basin. The Director's findings were similar to those in the Upper Republican and Upper Big Blue control area designation orders. The control area regulations establish limitations on ground water withdrawals and wells must be metered by March 31, 1982.[243] Irrigators will be given an annual ground water allocation which can be subsequently varied by no more than one inch annually[244] with unused allocations carried forward into future years. Future allocations can be drawn upon, but whenever an irrigator has used up one year's allocation in advance he cannot irrigate the following year.[245] Ground water allocations for municipal, industrial, recreational, fish and wildlife, and livestock uses will be established by February 15, 1983.[246]

The most recent control area designation request involved intensive irrigation development in the sandhills region. In recent years large sandhills ranches have been developed with center pivot irrigation for purchase by investors. Area residents have expressed concern that such intensive irrigation development could cause loss of wet hay meadows, increasing nitrate levels in ground water, interference with domestic and stock wells, streamflow re-

240. Nebraska Dep't of Water Resources Order Denying a Request to Create a Ground Water Control Area (March 30, 1978) (Lower Platte South NRD).
241. *Id.*
242. Nebraska Dep't of Water Resources Order Granting a Request to Create a Ground Water Control Area (January 2, 1979) (Little Blue control area). The control area includes 500,000 acres, sixty percent of which are irrigated from 2500 irrigation wells. *See* Aiken & Supalla, *supra* note 212, at 629.
243. Little Blue NRD, Ground Water Control Area Rules and Regulations, Rule II (A)(1) (June 24, 1980) [hereinafter cited as Little Blue Rules]; Nebraska Dep't of Water Resources Order for Approval for Rules and Regulations for Ground Water Control (July 31, 1980) (Little Blue control area).
244. Little Blue Rules, *supra* note 243, Rule II(B)(2). The allocations will vary across the control area because of precipitation differences. The basis of the allocation is certified irrigated acres. *See id.* Rules II(A)(5), II(A)(6).
245. *Id.* Rule II(B)(2).
246. *Id.* Rule II(B)(3).

ductions, and soil erosion associated with cultivation of sandy soil with steep slopes. After a public hearing requested by the Lower Loup NRD, the Director declined to designate a control area.[247] The order noted that (1) while irrigation ground water withdrawals were causing seasonal ground water level reductions, ground water supply reduction was not significant; (2) substantial local or regional economic hardships were neither existing nor reasonably forseeable; (3) ground water quality degradation was occurring in isolated areas, but was not caused by ground water mining and did not interfere with existing water uses; (4) conflicts between ground water users could be dealt with through private litigation; and (5) regulation of agricultural practices to prevent soil erosion was beyond the scope or intent of the Ground Water Management Act.[248]

The last major legislative action of the decade was the authorization by the 1978 Legislature of several water policy studies

247. Nebraska Dep't of Water Resources Order Denying a Request to Create a Ground Water Control Area (May 1, 1980) (Lower Loup NRD).

248. Another way to deal with soil erosion resulting from the cultivation of sandy soils is land use control. NRDs are authorized to establish land use controls to conserve soil and water and to prevent and control soil erosion. NEB. REV. STAT. § 2-3244 (Reissue 1977). The proposed controls must be approved by seventy-five percent of the landowners within the NRD voting in a public referendum. *Id.* § 2-3246. The land use controls may vary according to different land characteristics, but otherwise must be uniform throughout the NRD. *Id.* § 2-3249. The land use controls cannot conflict with any municipal, county, or regional land use controls. *Id.* § 2-3244. Specific land use controls authorized include: (1) requiring the installation of terraces, dams, ponds, dikes, and other structures; (2) requiring particular types of cultivation and cropping practices; (3) prevention of cultivation of highly erodable soils; and (4) other measures to conserve soil and water and prevent soil erosion. *Id.* § 2-3248.

Counties are also authorized to control agricultural land use. If the county board has created a planning commission and adopted a county comprehensive development plan, the board may adopt a zoning resolution regulating, *inter alia*, the use of land for agricultural purposes. *Id.* § 23-114 (Reissue 1977). The comprehensive development plan must address *inter alia* land use, including agricultural land use. *Id.* § 23-114.02. Zoning regulations, which can be adopted only after a comprehensive development plan has been developed, must be consistent with such plan and may address: (1) classifying land use to assure adequate provision for drainage, water supply, and soil fertility; (2) protecting property against blight and depreciation; (3) fostering agriculture; and (4) encouraging the most appropriate land use. *Id.* § 23-114.03. In adopting the zoning resolution the board must consider, *inter alia*, soil conservation, water supply conservation, and drainage. *Id.* § 23-114. The county board may establish districts within which land use, *inter alia*, is regulated. *Id.* § 23-114.03. Any land use in violation of zoning requirements is a class III misdemeanor ($0-500 fine, no imprisonment to 3 months imprisonment, or both). *Id.* §§ 23-114.05, 28-106(1) (Reissue 1977 & Reissue 1979). Each day of continued violation after notice of violation has been given is a separate offense. *Id.* § 23-114.05 (Reissue 1977). For other county zoning authorities, see *id.* §§ 23-164 to -174.10 (Reissue 1977 & Cum. Supp. 1980).

through Nebraska's state water planning process. State water planning originated as a cooperative state-federal effort to integrate federal water project planning with state natural resource policies. The federal government has several programs financing water resources development. To ensure that federal water development projects are consistent with state policies, federal funds are available to states to develop state water plans. The primary purpose of this is to identify how state and federal water development programs should be implemented.[249] The 1978 Legislature changed the direction of Nebraska's state water planning efforts to place greater emphasis on analyzing state water policy issues.[250] Reports analyzing several water policy issues are being prepared for legislative consideration. Policy studies directly relating to ground water management include studies of water quality, ground water reservoir management, supplemental water supplies, municipal water needs, water use efficiency, and interbasin water transfers.[251]

Water law litigation in the 1970s involved problems of well interference, irrigation runoff and interbasin transfers. Inefficient ground water use in irrigation can lead to land drainage problems. In *Peters v. Langrehr*,[252] a Howard County landowner claimed that an upper landowner's ground water irrigation runoff made part of

249. 42 U.S.C. § 1962c. (1979). *See* Aiken, *supra* note 88, at 343-44.

250. 1978 Neb. Laws, L.B. 595. The state water planning and review process has five major activities: policy issue analysis, state initiated problem analysis and area planning, project and program review, state project planning and design, and base activites. NEBRASKA NATURAL RESOURCES COMMISSION & WORK PLAN DEVELOPMENT COMMISSION, REPORT TO THE LEGISLATURE AND GOVERNOR ON THE NEBRASKA STATE WATER PLANNING AND REVIEW PROCESS 2-1 to -2 (November 15, 1978) [hereinafter cited as WORK PLAN].

The policy reports, *infra* note 251, were being prepared as part of the policy issue analysis activity. Water supply conditions and alternatives in problem areas can be analyzed through the state initiated problem analysis and area planning activity. The impact of proposed projects and programs, such as a proposed federal reclamation project, could be analyzed through the project and program review activity. If state water project development activities go beyond the current planning and financing activities into project design and construction activities, the state project planning and design activity could be implemented. Finally, data collection for water resources planning, analysis, and management is implemented through the base activities element. *Id.* at 4-6 to -11. The act was automatically repealed July 1, 1980. For a discussion of previous state water planning efforts, see generally Framework Study, *supra* note 125.

251. The water quality report has been completed. NEBRASKA NATURAL RESOURCES COMMISSION, POLICY ISSUE REPORT ON WATER QUALITY (March 1980) [hereinafter cited as WATER QUALITY]. Other policy issues to be analyzed include instream flow, selected water rights issues, and weather modification. WORK PLAN, *supra* note 250, at 4-6 to -11.

252. 188 Neb. 480, 197 N.W.2d 698 (1972).

plaintiff's pasture unusable. The irrigation runoff drained into a natural depression or draw onto the pasture and from there eventually to the Platte River. Defendant argued that, by statute,[253] he was entitled to drain his irrigation runoff into the draw. The Nebraska Supreme Court ruled that the statute entitled the irrigator to drain diffused surface waters and some irrigation runoff into the draw as long as the amounts were not harmful to the lower landowners.[254]

The major ground water litigation of the decade involved interference between domestic and irrigation wells. In *Prather v. Eisenmann*,[255] a case quite similar to the one which prompted the request for a North Platte Control Area,[256] domestic wells had been drilled into an artesian aquifer, where artesian pressure forced the water in the well to a level near the surface. Withdrawals from subsequently developed irrigation wells reduced the artesian pressure, causing the water in the domestic wells to fall below the well pumps. The well pumps burned up when the domestic wells stopped yielding water. The domestic well owners sued the irrigator for damages. In a 1977 opinion, the Madison County District Court held that because the irrigator's ground water withdrawals disrupted the domestic water supplies, he was liable for damages. The Nebraska Supreme Court affirmed,[257] interpreting the ground water preference statute[258] as making the irrigator liable for damages. The court suggested a two-part rule for resolving ground water disputes. First, when conflicts arise between those using ground water for the same purpose, each user will be entitled to a proportional share of the available supply. Second, conflicts between those using ground water for different purposes will be resolved on the basis of preferences: domestic uses of ground water would be preferred over all other uses, and agricultural ground water uses would be preferred over industrial uses.[259]

A third court decision dealt indirectly with the issue of ground water transfers suggesting that ground water must be used on the well owner's land without waste, and implying that any ground

253. NEB. REV. STAT. § 31-201 (Reissue 1978). The statute says that owners may drain by discharging the water "into any natural watercourse or into any natural depression or draw . . . and when such drain or ditch is wholly on the owner's land, he shall not be liable in damages . . . ." *Id.*
254. 188 Neb. at 486, 197 N.W.2d at 702.
255. 200 Neb. 1, 261 N.W.2d 766 (1978).
256. *See* notes 220-222 & accompanying text *supra.*
257. Prather v. Eisenmann, 200 Neb. 1, 261 N.W.2d 766 (1978).
258. NEB. REV. STAT. § 46-613 (Reissue 1978); *See* notes 164-65 & accompanying text *supra.*
259. 200 Neb. at 8-10, 261 N.W.2d at 770-71. *See* notes 395-406 & accompanying text *infra.*

water transfer is illegal.[260] Nebraska statutes authorize ground water transfers by public water suppliers, although before 1980 this authority extended only to cities, villages, and municipal corporations.[261] A proposed rural water district (RWD) ground water transfer led to a 1979 Nebraska Supreme Court decision in *McDowell v. Rural Water District No. 2*.[262] The RWD proposed to withdraw ground water from land it owned in Holt County and transport the water to neighboring Boyd County for public water supply purposes. Holt County landowners challenged the RWD's proposed ground water transfer as being illegal. The Holt County District Court ruled that the RWD was required to obtain a permit from the DWR under the City, Village and Municipal Ground Water Permit Act (now the Municipal and Rural Domestic Ground Water Transfers Permit Act). The Nebraska Supreme Court reversed the district court opinion, ruling that the RWD was not a municipal corporation and did not come within the scope of the Act.[263] The court did not discuss the validity of the RWD's proposed ground water transfer, although it noted that RWDs are authorized to transport water into their service area.[264]

260. Prather v. Eisenmann, 200 Neb. 1, 5-7, 261 N.W.2d 766, 769 (1978); Metropolitan Util. Dist. v. Merritt Beach Co., 179 Neb. 783, 800-01, 140 N.W.2d 626, 637 (1966); Olson v. City of Wahoo, 124 Neb. 802, 811, 248 N.W. 304, 308 (1933).

261. *See* notes 180-81 & accompanying text *supra*.

262. 204 Neb. 401, 282 N.W.2d 594 (1979).

263. *Id.* at 411-12, 282 N.W.2d at 600.

264. The issue of interstate ground water transfers was raised in the recent Chase County District Court decision of State of Nebraska v. Sporhase, No. 4096 (Chase County Dist. Ct., Neb. 1978). The decision dealt with the transfer of ground water from Chase County, Nebraska to irrigate land in Phillips County, Colorado. NEB. REV. STAT. § 46-613.01 (Reissue 1978) requires a DWR permit before ground water withdrawn in Nebraska can be transported for use in another state. Before a permit can be granted the Director must find that the proposed ground water withdrawal: (1) is reasonable; (2) is not contrary to the conservation and use of ground water; (3) is not otherwise detrimental to the public interest; and (4) the state into which the ground water is proposed to be transferred has reciprocal legislation. *Id.* Defendants, Nebraska-Colorado Farms, registered their irrigation well as required by Section 46-602, but did not apply for a Section 46-613.01 ground water transfer permit. If they had done so the permit probably would have been denied because Colorado law prohibits interstate ground water transfers. COLO. REV. STAT. § 36-90-136 (1978). The Upper Republican NRD complained to the DWR that defendants were withdrawing ground water in Nebraska for use in Colorado in violation of Section 46-613.01. Defendants argued that the ground water transfer permit requirement was unconstitutional because it interferred with interstate commerce, citing City of Altus v. Carr, 255 F. Supp. 828 (W.D. Tex. 1966) *aff'd per curiam*, 385 U.S. 35 (1966), which had invalidated Texas legislation restricting interstate ground water transfers. The Chase County District Court decided that the permit requirement was a reasonable burden on interstate commerce. The court based its decision on differences between Texas and Nebraska ground water law: in Texas landowners can

In 1980, Nebraska law regarding interbasin surface water transfers changed abruptly when the Nebraska Supreme Court overruled an earlier decision prohibiting such transfers. In *Little Blue Natural Resource District v. Lower Platte North Natural Resource District*,[265] the court unanimously ruled that unappropriated surface water could be transferred from one river basin to another except when such diversion in contrary to the public interest.[266] The

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sell ground water for nonoverlying uses whereas Nebraska Supreme Court dicta suggests that Nebraska landowners cannot do so. *See, e.g.*, Olson v. City of Wahoo, 124 Neb. 802, 811, 248 N.W. 304, 308 (1933). The Texas statute meant ground water transfers within Texas were valid but interstate ground water transfers were invalid. This discrimination against out of state users was the feature of the Texas statute the federal courts found unconstitutional.

The court in *Sporhase* also observed that the federal government had left ground water management to the states. While the interstate ground water transfer permit requirement might impose a slight burden on interstate commerce, the local purpose served by that burden was legitimate. In this regard the court referred to the ground water controls established in the Upper Republican NRD, suggesting that interstate ground water transfers could thwart the achievement of the NRD's ground water management objectives. *Accord*, Corker, *Can A State Embargo the Export of Water by Transbasin Diversions?* 12 IDAHO L. REV. 135, 146-48 (1976).

265. 206 Neb. 535, 294 N.W.2d 598 (1980), *overruling* Osterman v. Central Neb. Pub. Power & Irr. Dist., 131 Neb. 356, 268 N.W. 334 (1936). The *Little Blue* decision arose from applications to the DWR by the Little Blue NRD to divert 125,000 acre feet of water from the Platte River to irrigate land in the Blue River basin. The Director determined that sufficient unappropriated water was available to meet the Little Blue project water supply requirements, but denied the applications based on *Osterman*.

Osterman involved the Tri-County irrigation project which originally proposed to impound Platte River water in Lake McConaughy to irrigate land in the Platte, Blue, and Republican River Basins. The Nebraska Supreme Court interpreted NEB. REV. STAT. §§ 46-206 and 46-265 as prohibiting interbasin surface water transfers. Originally enacted in 1893, section 46-206 states that interbasin transfers would be permitted only on streams wider than 100 feet, and that up to seventy-five percent of the flow could be appropriated for use in another river basin. Section 46-265, enacted in 1895, requires that unused irrigation water be returned to the river of origin or to the Missouri River. This statute, the apparent intent of which is to prevent waste of water from irrigation canals, was interpreted by the court in *Osterman* to prevent interbasin surface water transfers. The court found sections 46-206 and 46-265 to be inconsistent, and followed section 46-265 because it has been enacted later. The court ruled that since it would be impractical to transport unused irrigation water back to the river of origin, section 46-265, in effect, prohibited interbasin surface water transfers. Later commentators suggested that the court's decision in *Osterman* was influenced by the drought conditions of the 1930s and was a reaction to fears that the irrigation project would dry up the Platte River valley while benefiting irrigators in other river basins. *See generally* Oeltjen, Harnsberger & Fischer, *supra* note 135.

266. 206 Neb. at 543-44, 294 N.W.2d at 603. The court stated that it should not interpret legislation to make it meaningless. The court interpreted section 46-265 to permit interbasin transfers when the unused water was returned to the

court remanded the interbasin transfer application to the DWR for an administrative determination of whether the proposed transfer would be contrary to the public interest. That determination is likely to be appealed to the Nebraska Supreme Court.[267] The interbasin transfer decision is significant because it may make surface water available for importation to areas where ground water is being mined.

Missouri River, noting that all of Nebraska is ultimately drained by the Missouri River.

267. The court ruled that the DWR Director was required to determine whether the proposed interbasin transfer "is contrary to the public interest." *Id.* at 548, 294 N.W.2d at 604. Section 46-235 states that appropriation applications shall be approved "[i]f there is unappropriated water in the source of supply" and "if such application and appropriation when perfected [*i.e.*, when actual water use begins] is not otherwise detrimental to the public welfare." NEB. REV. STAT. § 46-235 (Reissue 1978). The Director's decision is likely to be appealed to the supreme court by project opponents if the applications are granted, and by the Little Blue NRD if its applications are denied, or perhaps by both parties if the applications are approved by the Director with conditions imposed to protect the public interest.

In considering the public interest issue, the Director will have to face two questions not directly addressed by Nebraska water law: the interrelationship of ground and surface water, and instream water uses. The Platte River generally recharges ground water supplies from Kearney east to the Missouri River. If the proposed Little Blue interbasin transfer is implemented, streamflow east of Grand Island and downstream will be reduced, although the significance of the reduction is disputed. Ground water users, including irrigators and municipalities, benefit from Platte River recharge, as do landowners with subirrigated land. State statutes do not directly address the question of ground-surface water interrelationship, except insofar as permits are required for water withdrawals from pits located within 50 feet of a streambank. NEB. REV. STAT. § 46-637 (Reissue 1978).

In addition to recharging ground water the Platte River, in its "big bend" reach, is considered to be critically important habitat for migratory waterfowl, including the endangered whooping crane. Nebraska water statutes do not directly address the question of instream water uses such as wildlife protection. Nebraska wildlife statutes do, however, provide for the protection and conservation of endangered animal species. NEB. REV. STAT. §§ 37-430 to -438 (Reissue 1978).

In the *Little Blue* opinion, the Nebraska Supreme Court offered little guidance regarding how the public interest issue should be resolved. On one hand the court repeated the constitutional declaration that the use of water for domestic and irrigation purposes is a "natural want" and stated that it would be a sad commentary on Nebraska water laws "if, in rationing this necessity of life, large areas . . . outside a particular [river] valley were ruined while unappropriated water flowed into the Missouri River and on to other states." 206 Neb. at 547, 294 N.W.2d at 604. On the other hand the court noted that while water use for domestic and irrigation purposes is a natural want, it should not be denied to potential users "who can obtain it *without doing harm to others.*" *Id.* at 547-48, 294 N.W.2d at 604 (emphasis supplied).

IV. NEBRASKA GROUND WATER LAW AND POLICY

As demonstrated in the preceeding section, the development of Nebraska ground water law has been an evolutionary process. Legislative and judicial decisions were made in response to particular problems, resulting in an incomplete and sometimes inconsistent legal framework. This section attempts to synthesize current Nebraska ground water law and explores directions for future ground water policy.

A. Institutional Framework

To understand current Nebraska ground water law one must first understand the administrative activities that affect ground water development and use. In Nebraska, how ground water is developed and used, with few exceptions, is left to the discretion of individual landowners. State and local agencies, however, have significant ground water management and administration responsibilities. State programs affecting ground water development and use are administered by the Nebraska Department of Water Resources, the Nebraska Department of Health, and the Nebraska Department of Environmental Control. Significant ground water management responsibilities are given to local natural resources districts (NRDs).

The Department of Water Resources (DWR) is the state agency responsible for allocating and administering surface water rights.[268] Those wishing to appropriate surface water must obtain a DWR permit to do so. The DWR also administers several programs regulating aspects of ground water development and use including: well registration, well abandonment, ground water withdrawals from pits near streams, interstate ground water transfers, and ground water transfers for public water supply. The DWR is responsible for overseeing the designation and administration of ground water control areas.

Several other state agencies have water-related responsibilities. The Department of Environmental Control is responsible for water quality protection[269] while the Department of Health is responsible for protecting drinking water quality.[270] The University of Nebraska Conservation and Survey Division is responsible for collecting ground water quantity and quality information;[271] and the Natural Resources Commission is responsible for state water

268. NEB. REV. STAT. §§ 46-201 to -287 (Reissue 1978 & Cum. Supp. 1980). *See* Fischer, Harnsberger & Oeltjen, *supra* note 123.
269. NEB. REV. STAT. §§ 81-1504, -1505 (Reissue 1976).
270. *Id.* §§ 71-5301 to -5313.
271. *Id.* § 85-163.

planning,[272] administering state funds for natural resources development,[273] and maintaining the natural resources data bank information system.[274]

Natural Resource Districts (NRDs) are local units of government established by the legislature to manage natural resources. Replacing over 150 single-purpose districts, the twenty-four NRDs are generally organized along river basin lines,[275] are financed by a property tax,[276] and are governed by a locally elected board of directors.[277] NRDs have broad natural resource management responsibilities, including soil and water conservation, flood and soil erosion control, drainage, water supply, pollution control, wildlife habitat management, recreation, and forestry and range management.[278] The regulatory authority given to NRDs relate to ground water management. NRDs have the exclusive authority to initiate the process of designating ground water control areas.[279] In addition, they are authorized to regulate, with DWR approval, ground water development and use within control areas,[280] to regulate ground water irrigation runoff,[281] and to stop the construction or use of illegal wells.[282] The Ground Water Management Act gives NRDs the option of enforcing several state ground water statutes. Wells in violation of statutory requirements are illegal wells,[283] the construction or use of which may be stopped by an NRD cease and

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272. *Id.* § 2-1507(6) (Reissue 1977).
273. *Id.* §§ 2-3263 to -3272 (Reissue 1977 & Cum. Supp. 1980).
274. *Id.* §§ 2-1568 to -1570 (Reissue 1977).
275. *Id.* § 2-3203.
276. *Id.* § 2-3225.
277. *Id.* §§ 2-3213 to -3222.
278. *Id.* § 2-3229 (Reissue 1977). Regarding NRD water supply authorities, NRDs are authorized to establish improvement project areas, within which project costs are borne by beneficiaries rather than being financed from general NRD tax revenues. *Id.* § 2-3252. Improvement project area may be initiated by landowner petition or by the NRD board of directors. *Id.* §§ 2-3252, -3253. Improvement project areas may be established by the NRD board after a public hearing. *Id.* § 2-3254(1) (Cum. Supp. 1980). Water supply projects must be approved by the DWR except domestic water supply systems, which are approved by the Department of Health. *Id.* § 2-3254(2) (Cum. Supp. 1980). Conceivably the project improvement area authority could be used to develop supplies to supplement mined ground water supplies. *See* notes 416-25 & accompanying text *infra.*
279. NEB. REV. STAT. § 46-658(3) (Cum. Supp. 1980). *See* note 213 *supra.*
280. NEB. REV. STAT. § 46-666 (Cum. Supp. 1980). *See* note 217 *supra*; notes 227-36, 238-39, 243-46 & accompanying text *supra.*
281. NEB. REV. STAT. § 46-664 (Reissue 1978). *See* notes 340-43 & accompanying text *infra.*
282. NEB. REV. STAT. §§ 46-663(6), -657(8) (Reissue 1978 & Cum. Supp. 1980).
283. For a discussion of whether irrigation wells, the use of water from which causes road damage, are illegal wells, *see* notes 345-48 & accompanying text *infra.*

desist order.[284] These requirements include: (1) well registration requirements,[285] (2) well spacing requirements,[286] (3) well abandonment regulations,[287] (4) check valve requirements,[288] (5) irrigation runoff controls,[289] (6) artesian water control requirements,[290] (7) permit requirements for withdrawals from pits near streams,[291] (8) permit requirements for interstate ground water transfers,[292] (9) permit requirements in ground water control areas,[293] and (10) control area regulations.[294]

B. Rights of Use

The limits of private rights to use ground water in Nebraska are unclear. Nebraska Supreme Court decisions have established that landowners have the right to develop ground water, and suggest that ground water use must be without waste and on the land of the well owner.[295] The court has ruled that an irrigator is liable for damages for interfering with domestic wells,[296] and has suggested that well interference conflicts involving the same use would be resolved on the basis of proportional sharing of the available supply.[297]

General ground water policy has not been legislatively established, suggesting a legislative acquiescence to judicial decisions establishing a Nebraska ground water allocation rule which combines reasonable use, correlative rights, and preference theories. The basis by which rights to use ground water are established and

284. NEB. REV. STAT. 46-657(8), 46-663(5), (6) (Cum. Supp. 1980).
285. *See* notes 298-311 & accompanying text *infra.*
286. *See* notes 312-31 & accompanying text *infra.*
287. *See* notes 332-36 & accompanying text *infra.*
288. *See* notes 337-39 & accompanying text *infra.*
289. *See* notes 340-43 & accompanying text *infra.*
290. *See* notes 349-51 & accompanying text *infra.*
291. *See* notes 352-56 & accompanying text *infra.*
292. *See* notes 357-61 & accompanying text *infra.*
293. *See* note 216 & accompanying text *supra.*
294. For a discussion of a control area regulatory authorities and their implementation, see notes 217-247 & the accompanying text *supra.*
295. Prather v. Eisenmann, 200 Neb. 1, 5-7, 261 N.W.2d 767, 769 (1978); Metropolitan Util. Dist. v. Merritt Beach Co., 179 Neb. 783, 800-01, 140 N.W.2d 626, 637 (1966); Olson v. City of Wahoo, 124 Neb. 802, 811, 248 N.W. 304, 308 (1933).
296. Prather v. Eisenmann, 200 Neb. 1, 261 N.W.2d 767 (1978).
297. *Id.* at 9, 261 N.W.2d at 771. Earlier decisions resolved conflicts involving ground water pollution on the basis of private nuisance. Lowe v. Prospect Hill Cemetery Ass'n, 58 Neb. 94, 78 N.W. 488 (1899); Beatrice Gas Co. v. Thomas, 41 Neb. 662, 59 N.W. 926 (1894). In a decision not involving competing ground water uses, but rather competing land uses, the Nebraska Supreme Court held that a landowner enjoying subirrigation was entitled to damages when his land was drained by a power district canal. Luchsinger v. Loup River Pub. Power Dist., 140 Neb. 179, 299 N.W. 549 (1941).

acquired can be used to implement state ground water policy objectives. However, legislation has established several requirements relating to or restricting ground water development and use, including: (1) well registration requirements, (2) well spacing requirements, (3) well abandonment requirements, (4) check valve requirements, (5) irrigation runoff control requirements, (6) liability for road damage from irrigation, (7) artesian water control requirements, (8) permit requirements for ground water withdrawals from pits near streams, (9) permit requirements for interstate ground water transfers, (10) ground water control area regulations, and (11) regulation of illegal wells. But this legislation does not establish a general ground water policy. Consequently, policy is established by the private actions of landowners and the ground water management activities of NRDs. This section describes existing judicial and legislative restrictions related to ground water development and use, and explores whether ground water rights could be modified to achieve state ground water policy objectives. Subsequent sections briefly analyze current ground water issues within this basic legal framework, and explore future policy directions.

1. Registration of wells. Although the Nebraska statutes do not have a general permit requirement for well installation, all wells, other than those which serve domestic uses, must be registered with the DWR.[298] The scope of the exemption of domestic wells from registration requirements is unclear, particularly in regard to municipal wells. A well is defined as "any artificial opening or excavation in the ground through which ground water flows under natural pressure or is artificially drawn."[299] A domestic use is defined as "all uses of ground water required for human needs as it relates to health, fire control, and sanitation and shall include the use of ground water for domestic livestock as related to normal farm and ranch operations."[300] If a community did not supply water for agricultural, manufacturing or industrial purposes, its well or wells could be domestic wells exempt from registration and well abandonment regulations.[301] However, statutory provisions are in conflict concerning well registration requirements for public water supply wells for which a DWR permit has been obtained under the provisions of the Municipal and Rural Domestic Ground

298. NEB. REV. STAT. § 46-602(1) (Reissue 1978).
299. *Id.* § 46-657(3) (Cum. Supp. 1980).
300. *Id.* § 46-613 (Reissue 1978).
301. *Id.* § 46-602(1), -602(3), -602(4) (Cum. Supp. 1980). An unregistered municipal well would not be entitled to well spacing protection unless a permit was obtained under the Municipal and Rural Domestic Ground Water Transfers Permit Act. *Id.* §§ 46-652(1), -654(1).

Water Transfer Permit Act. Section 46-602(1) exempts public water supply wells from general registration requirements if a DWR permit has been obtained pursuant to the Municipal and Rural Domestic Ground Water Transfers Permit Act.[302] Section 46-652(1), which extends well spacing protection to registered public water supply wells, requires that all public water wells be registered rather than making registration voluntary: "each public water suplier *shall*, to obtain such [well spacing] protection, register any unregistered well now existing or drilled in the future with the Department of Water Resources . . . ."[303] Although the legislature may have intended to make public water supply well registration voluntary, the language of section 46-652(1) indicates that the well registration requirement is mandatory. A reviewing court, however, reading sections 46-602(1) and 46-652(1) together, could interpret well registration as voluntary rather than mandatory.

Two forms are required to be filed to meet well registration requirements: a well registration form and a well driller's certificate. The well registration form must be completed by the owner within 20 days after the well has been installed.[304] The well driller's certificate must be completed by the well driller within 30 days after the well has been installed.[305] Both the well registration form and the well driller's certificate are filed with the DWR by the well

302. *Id.* § 46-602(1).
303. *Id.* § 46-652(1). (emphasis supplied).
304. *Id.* § 46-602(1). Information required on the registration form includes: (1) the purpose of use; (2) whether the well is a replacement well; (3) the names and addresses of the owner and well driller; (4) the location of the well; (5) the distance to the nearest municipal, irrigation, or industrial well; (6) for irrigation wells, the amount and location of land to be irrigated; (7) the pumping rate; (8) the total well depth; (9) the inside diameter of the casing; (10) the depth to the static water level; (11) the depth to the pumping water level (drawdown); (12) the diameter and length of the pump column; (13) the date the well was completed; and (14) in control areas, the permit number. Nebraska Department of Water Resources, Well Registration, DWR Form 602, (December 1978). The completed well registration form must be forwarded to the well driller so that he can submit both the registration form and the well driller's certificate to the DWR. NEB. REV. STAT. § 46-602(2) (Cum. Supp. 1980).
305. NEB. REV. STAT. § 46-603 (Reissue 1978). Information required in the well driller's certificate includes: (1) the well driller's name and address; (2) the owner's name; (3) the dates drilling and construction began and ended; (4) the diameter of the drilled hole; (5) whether the hole was electronically logged; (6) whether and how the drilled hole was sealed; (7) whether the well is artificially gravel stabilized; (8) the pumping rate; (9) the depth to water before pumping; (10) the depth to water after pumping (no standard time period is specified); and (11) a log describing the material encountered in drilling. Nebraska Dep't of Water Resources, State of Nebraska Certificate of Well Driller (April 1976).

driller,[306] and must be filed for replacement wells in the same manner as for other wells.[307] When the ownership of a registered well changes, the new owner must notify the DWR so that well registration records can be updated.[308] Failure to comply with well registration requirments is a class IV misdemeanor.[309] Wells in violation of registration requirements are illegal wells,[310] the use of which may be stopped by an NRD.[311]

2. Well spacing requirements. To reduce the likelihood of well interference conflicts, well spacing is required between high capacity wells, but not low capacity domestic wells. The effective date of well spacing requirements vary with the category of wells. Any irrigation well installed after September 20, 1957 must be located at least 600 feet from an irrigation well owned by another.[312] Replacement wells for irrigation wells drilled prior to September 20, 1957 may be located within 600 feet of an irrigation well owned by another if the replacement well is located within 50 feet of the well it is replacing.[313] Variance of the irrigation well spacing requirement may be obtained by applying to the DWR Director for a special spacing permit.[314] In evaluating the variance application, the Director shall consider (1) the size, shape, and irrigation needs of the land to be irrigated, (2) the ground water supply, and (3) the effect on other ground water users.[315] Violations of irrigation well spacing requirements are class IV misdemeanors.[316] If an irrigation well violates these spacing requirements it must be sealed[317] and, as an illegal well, the NRDs may prohibit its construction or use.[318]

The well spacing distance required among irrigation, industrial, and public water supply wells is 1000 feet. Whether the well spac-

306. One copy of the registration form and well driller's certificate are forwarded to the local NRD and the University of Nebraska Conservation and Survey Division. NEB. REV. STAT. § 46-604 (Reissue 1978).
307. *Id.* § 46-602(4) (Cum. Supp. 1980).
308. *Id.* § 46-602(1).
309. *Id.* § 46-607 (Reissue 1978). The penalty upon conviction is a $100-500 fine. *Id.* § 28-106 (Reissue 1979).
310. An illegal well is defined as "any well not in compliance with any other applicable laws of the State of Nebraska or with rules and regulations adopted pursuant to this act." *Id.* § 46-657(8)(c).
311. *Id.* §§ 46-657(8)(b), -663(5), -663(6) (Cum. Supp. 1980).
312. *Id.* § 46-609 (Reissue 1978). Exempted are domestic wells and wells irrigating no more than two acres. *Id.*
313. *Id.*
314. *Id.* § 46-610.
315. *Id.* § 46-610(2).
316. *Id.* § 46-612. The penalty upon conviction is a $100-500 fine. *Id.* § 28-106 (Reissue 1979).
317. *Id.* § 46-612 (Reissue 1978).
318. *Id.* §§ 46-657(8)(c), -663(5), -663(6) (Cum. Supp. 1980).

ing requirement applies depends on when the particular well was installed. Any irrigation well installed after November 18, 1965 must be located at least 1000 feet from a registered public water supply well.[319] Formerly this well spacing protection applied only to the wells of cities, villages and municipal corporations [hereinafter referred to as municipal wells].[320] In 1980, the spacing provisions were extended to public water supply wells which are defined as wells used by a city, village, municipal corporation, metropolitan utilities district, rural water district, natural resources district, irrigation district, reclamation district, or sanitary improvement district which supplies or intends to supply water to city, village, or rural residents for domestic or municipal purposes.[321] The 1980 additions may be invalid if applied retroactively to irrigation, industrial, and non-municipal public water supply wells drilled within 1000 feet of a registered non-municipal public water supply well between November 18, 1965 and July 19, 1980 since prior law applied only to municipal wells during that period.

Irrigation wells installed after August 24, 1979 must be located at least 1000 feet from a registered industrial well.[322] Any industrial well installed after November 18, 1965 must be located at least 1000 feet from a registered public water supply well[323] while industrial wells installed after August 24, 1979 must be located at least 1000 feet from a registered irrigation well or industrial well owned by another.[324] A public water supply well drilled after November 19, 1965 must be located at least 1000 feet from a registered irrigation or industrial well, or the registered well of any other public water supplier.[325]

Variance of these well spacing requirements may be obtained by applying to the DWR for a special permit.[326] Unregistered wells are granted well spacing protection for the 30 day registration period.[327] Under the Municipal and Rural Domestic Ground Water Transfers Permit Act, well spacing protection is extended to unregistered public water supply wells for which a DWR permit has been obtained.[328] Public water suppliers may obtain temporary

319. *Id.* §§ 46-651(1), -652(1).
320. *Id.* § 46-652 (Reissue 1978), as amended by 1980 Neb. Laws, L.B. 643, §§ 2, 3 (codified at NEB. REV. STAT. §§ 46-651(1), -652 (Cum. Supp. 1980)).
321. *See* NEB. REV. STAT. § 46-651(1), -652 (Cum. Supp. 1980).
322. *Id.* §§ 46-651(2), -652(1).
323. *Id.*
324. *Id.*
325. *Id.*
326. *Id.* § 46-653 (Reissue 1978).
327. *Id.* § 46-652(2) (Cum. Supp. 1980).
328. *Id.* § 46-654(1). *But cf. id.* § 46-652(1) (public water supply wells apparently must be registered to obtain protection).

spacing protection for test holes and wells under construction by applying to the DWR and by notifying affected landowners.[329] Violation of spacing requirements among irrigation, industrial, and public water supply wells, and between industrial and public water supply wells, may be enjoined,[330] and the construction or use of such illegal wells may be stopped by an NRD.[331]

3. Well abandonment requirements. With two exceptions all wells that are abandoned must be sealed in accordance with DWR regulations.[332] Exempted from well abandonment requirements are (1) domestic wells and (2) public water supply wells for which a DWR permit has been obtained under the Municipal and Rural Domestic Ground Water Transfers Permit Act.[333] The owner of an abandoned well must notify the DWR director of his intent to abandon the well by written notice within 60 days of abandonment.[334] Violation of these requirements is a class IV misdemeanor[335] and such wells are illegal wells.[336] However, illegal well sanctions would be difficult to enforce against the owner of an abandoned well because enjoining its use or construction would be difficult. A better remedy might be to authorize an NRD or other public agency to seal the well and bill the landowner for the costs if the landowner was unwilling to comply himself.

4. Check valve requirements. If a ground water irrigator applies fertilizer, herbicides, or pesticides through his irrigation system, he is required to install a mechanical device, usually a check valve,

329. *Id.* § 46-654(2).
330. *Id.* § 46-655 (Reissue 1978). However, injunctive relief extends only to public water suppliers who have obtained a DWR permit under the Municipal and Rural Domestic Ground Water Transfers Permit Act. *Id.* § 46-654 (Cum. Supp. 1980).
331. *Id.* §§ 46-657(c), -663(5), -663(6).
332. *Id.* § 46-602(3); NEBRASKA DEPARTMENT OF WATER RESOURCES, RULES FOR GROUND WATER, Rules 2-4 (1980).
333. NEB. REV. STAT. §§ 46-602(1), -602(3) (Cum. Supp. 1980). A well that is part of a public supply system would be subject to the well abandonment requirements unless public supply ground water transfer permit had been obtained. *Id.* §§ 46-602(1), -602(3). *See id.* § 46-642. However, the Department of Health informally encourages public water supply system operators not subject to the well abandonment requirements to seal abandoned wells in accordance with DWR regulations. Public water supply system operating permits could be revoked if the failure to seal an abandoned well could result in violation of drinking water quality standards. *Id.* § 71-5303 (Reissue 1976).
334. *Id.* § 46-602(3) (Cum. Supp. 1980).
335. *Id.* § 46-607 (Reissue 1978). The penalty upon conviction is a $100-500 fine. *Id.* § 26-108 (Reissue 1979).
336. *Id.* § 46-657(8)(c) (Cum. Supp. 1980).

on the well pump[337] in order to prevent the chemicals from being siphoned down the well and contaminating ground water supplies if the well pump stops. Violation of check valve requirements is also a class IV misdemeanor[338] and, once again, wells operated in violation of check valve requirements are illegal and may be shut down by a NRD.[339]

5. Irrigation runoff controls. After August 24, 1975, each person using ground water for irrigation must control or prevent irrigation water runoff.[340] NRDs are required to adopt regulations to control ground water irrigation runoff, and are authorized to enforce runoff control regulations.[341]

A common irrigation runoff control practice is to install a reuse pit to catch runoff before it leaves an irrigated field and pump the water out of the pit for reuse. If irrigation reuse pits are located near streams, the question arises whether the water in the pit is either surface or ground water rather than runoff water. If the water is surface water, a section 46-233 surface water appropriation permit may be required. If the water is ground water and the pit is located within 50 feet of a stream bank, a section 46-637 permit is required.[342] To clarify this situation legislation was enacted in 1980 to exempt irrigation water reuse pits from these permit requirements if the pit is located in the headwater segment of a stream, which is defined as that portion of the stream at or near the stream's origin.

Wells used in violation of runoff controls are illegal wells, the use of which may be stopped by a NRD.[343] The primary objectives of runoff controls are to encourage reuse of irrigation water and to reduce ground water withdrawals for irrigation.

6. Road damage caused by irrigation. Road damage caused by irrigation runoff, spray from sprinkler irrigation systems, or other irrigation practices is a class V misdemeanor.[344] However, an irrigator would not be guilty of a misdemeanor, if the road damage resulted from equipment malfunction, or the damage would not

337. *Id.* § 46-612.01. *See* P. FISCHBACH, NEBRASKA COOPERATIVE EXTENSION SERVICE, ANTI-POLLUTION DEVICES FOR APPLYING CHEMICALS THROUGH THE IRRIGATION SYSTEM (G73-43, Univ. of Neb. 1973).
338. NEB. REV. STAT. § 46-612.01 (Cum. Supp. 1980). The penalty upon conviction is a $100-500 fine. *Id.* § 28-106 (Reissue 1979).
339. *Id.* §§ 46-657(8)(c), -663(5), -663(6) (Cum. Supp. 1980).
340. *Id.* § 46-664(1) (Reissue 1978).
341. *Id.* §§ 46-664(2), -664(3).
342. *See* notes 353-56 *infra.*
343. NEB. REV. STAT. §§ 46-657(8)(c), -663(5), -663(6) (Cum. Supp. 1980).
344. *Id.* § 39-703 (Reissue 1978).

have occurred under normal weather conditions.[345]

If irrigation practices damage a road or road right of way it is unclear whether the well supplying such water is an illegal well. Section 46-657(8)(c) defines illegal wells as: "any well not in compliance with any other applicable laws of the State of Nebraska [other than control area permit requirements and well registration requirements] or with rules and regulations adopted pursuant to this act."[346] A well could be properly registered, spaced, and equipped with a check valve and be in compliance with state laws relating to wells. The use of water from such a well could violate section 37-703, however, by damaging a road or road right of way. If the damage were caused by irrigation runoff then the well would be illegal because it violated section 46-664(1) runoff control requirements.[347] If the damage were caused by direct irrigation of the road with sprinkler irrigation equipment, however, it is unclear whether this would constitute improper runoff (which is not defined by statute) particularly because the water did not drain off the property, but was directly applied to the road. However, if improper runoff were broadly defined in terms of its ground water conservation objective, direct irrigation on a road or road right of way with sprinkler irrigation equipment could be considered improper runoff because the ground water was wasted.[348]

7. Artesian water controls. Flowing artesian wells (i.e. wells that yield water without pumping) must have a mechanism to control the flow unless the well discharge pipe is no larger than one half inch in diameter, or the water is used for irrigation or power production.[349] Violations of artesian water control requirements are a class V misdemeanor.[350] Wells operated in violation of artesian water control requirements are illegal wells, the use of which may be stopped by a NRD.[351]

8. Pumping from pits near streams. To a limited extent, one statute recognizes the physical interrelationship between ground and surface water.[352] A DWR permit is required to withdraw

345. *Id.*
346. *Id.* § 46-657(8)(c) (Cum. Supp. 1980).
347. *Id.*
348. *Id.* § 46-664(1) (Reissue 1978).
349. *Id.* § 46-281.
350. *Id.* § 46-282. The penalty upon conviction is a $0-100 fine. *Id.* § 28-106 (Reissue 1979). Each day of continued violation after conviction is a separate offense. *Id.* § 46-282 (Reissue 1978).
351. *Id.* §§ 46-657(8)(c), -663(5), -663(6) (Cum. Supp. 1980).
352. *Id.* § 46-637 (Reissue 1978).

ground water from a pit located within 50 feet of a streambank.[353] The single exception to this rule is that no permit is required to withdraw water from an irrigation water reuse pit located within a stream's headwaters.[354] In evaluating a permit application, the DWR must consider the effect of the proposed ground water withdrawals on surface water appropriations.[355] Pits for which DWR permits have not been obtained may be illegal wells, the construction or use of which may be stopped by a NRD.[356]

9. Interstate ground water transfers. A DWR permit is required before ground water withdrawn in Nebraska can be used in another state.[357] The permit may be granted if the ground water withdrawal is reasonable. A withdrawal is reasonable if it is not contrary to the conservation and use of ground water, is not detrimental to the public welfare, and the state into which the ground water is to be transferred grants reciprocal rights to transport into and use ground water in Nebraska.[358] Failure to obtain a permit is a class IV misdemeanor.[359] Ground water withdrawals can be enjoined until the DWR permit has been obtained.[360] Wells in violation of this permit requirement are illegal wells, the construction or use of which may be stopped by a NRD.[361]

10. Constitutional Issues. Most of the statutory requirements described above have only an incidental effect on ground water development and use and would undoubtedly be upheld by the Nebraska Supreme Court as a legitimate exercise of the state's police power. Where permit requirements preclude the development of ground water, or where ground water use is sharply curtailed through ground water allocations in control areas, the taking issue is raised.[362] The questions of whether the state can require landowners to obtain permits to use ground water, and whether it can

353. *Id.*
354. *Id.* § 46-287 (Cum. Supp. 1980). *See* note 341 *supra.*
355. NEB. REV. STAT. § 46-637 (Reissue 1978).
356. *Id.* §§ 46-657(8)(c), -663(5), -663(6) (Cum. Supp. 1980). A well is defined as "any artificial opening or excavation in the ground through which ground water flows under natural pressure or is artificially withdrawn." *Id.* § 46-657(3). Wells with a capacity of less than 100 gallons per minute are excluded from the definition of a well if they are used solely for domestic purposes. *Id.* § 46-657(3). Otherwise, this broad definition would encompass a pit unless the pit had no hydrologic connection with the ground water aquifer.
357. *Id.* § 46-613.01 (Reissue 1978).
358. *Id.* For a discussion of a district court decision holding that the permit requirement was a reasonable burden on interstate commerce, *see* note 264 *supra.*
359. NEB. REV. STAT. § 46-613.02 (Reissue 1978). The penalty upon conviction is a $100-500 fine. *Id.* § 28-106 (Reissue 1979).
360. *Id.* § 46-613.02 (Reissue 1978).
361. *Id.* §§ 46-657(8)(c), -663(5), -663(6) (Cum. Supp. 1980).
362. *See generally* F. BOSSELMAN, D. CALLIES & J. BANTA, THE TAKINGS ISSUE (U.S.

deny applications to use ground water have not been litigated in Nebraska. When such issues have been litigated in other western states, the courts have unanimously ruled that such legislation and regulations were valid, even when new water uses were prohibited.[363] The only analogous situation in Nebraska is when common law riparian surface water rights (which are based on owning land near a stream) were replaced by statutory appropriative water rights (which are based on obtaining a DWR permit).[364] Nebraska Supreme Court decisions have ruled that such legislation is valid, and that new water users must follow appropriation procedures to obtain a surface water right.[365] Assuming that the court would follow a similar approach regarding ground water, restrictions on ground water development would be found constitutional.

Regulation of existing ground water uses is also likely to receive judicial approval if contested. Nebraska Supreme Court decisions have already stated that ground water must be used without waste,[366] suggesting that regulations controlling waste (e.g., irrigation runoff controls) would be valid. Similarly, the court has suggested that when ground water supplies are being mined the available supplies should be shared by all users proportionately.[367] Thus, ground water withdrawal limitations in control areas would likely be found valid by the court as being the administrative equivalent of this judicial sharing doctrine.

Some commentators have suggested that ground water be allocated by prior appropriations in Nebraska.[368] Such a change prob-

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Council on Environmental Quality, 1973) [hereinafter cited as TAKINGS ISSUE].

363. Bauman v. Smrha, 145 F. Supp. 617 (D. Kan.), *aff'd per curiam*, 352 U.S. 863 (1956); Baker v. Ore-Ida Foods, 95 Idaho 575, 513 P.2d 627 (1973); Williams v. City of Wichita, 190 Kan. 317, 374 P.2d 578 (1962); Bliss v. Dority, 55 N.M. 12, 225 P.2d 1007 (1950), *appeal dismissed*, 341 U.S. 924 (1951); Yeo v. Tweedy, 34 N.M. 611, 286 P. 970 (1929); Boeth v. Hoisveen, 157 N.W.2d 728 (N.D. 1968); Knight v. Grimes, 80 S.D. 517, 127 N.W.2d 708 (1964); Peterson v. Dep't of Ecology, 92 Wash. 2d 306, 596 P.2d 285 (1979).

364. 1895 Neb. Laws, ch. 69, at 244; NEB. REV. STAT. § 46-201 to -207 (Reissue 1978 & Cum. Supp. 1980).

365. Wasserburger v. Coffee, 180 Neb. 149, 141 N.W.2d 738 (1966); Farmer's Canal Co. v. Frank, 72 Neb. 136, 100 N.W. 286 (1904); Crawford Co. v. Hathaway, 67 Neb. 325, 93 N.W. 781 (1903). *But see* Herminhaus v. So. Cal. Edison Co., 200 Cal. 81, 252 P. 607 (1926); Lux v. Hagen, 69 Cal. 255, 10 P. 674 (1886).

366. Prather v. Eisenmann, 200 Neb. 1, 5-7, 261 N.W.2d 767, 769 (1978); Metropolitan Util. Dist. v. Merritt Beach Co., 179 Neb. 783, 800-01, 140 N.W.2d 626, 637 (1966); Olson v. City of Wahoo, 124 Neb. 802, 811, 248 N.W. 304, 308 (1933).

367. Prather v. Eisenmann, 200 Neb. 1, 5-7, 261 N.W.2d 767, 769 (1978); Olson v. City of Wahoo, 124 Neb. 802, 811, 248 N.W. 304, 308 (1933).

368. Harnsberger, Oeltjen & Fischer, *supra* note 24, at 264-80; Holland, *Conflicts Between Private Appropriators of Stream Flows and Users of Ground Water in Nebraska*, 10 CREIGHTON L. REV. 592 (1977).

ably would be resisted by ground water users because priority is too narrow a basis for resolving well interference conflicts,[369] and because priority would place ground water users at a severe legal disadvantage in surface-ground water conflicts—they would be junior to surface appropriators.[370] Where seventy-two percent of irrigation water withdrawals comes from ground water, the political likelihood of legislating priority as a basis for resolving surface-ground water disputes seems low.[371]

Even though prior appropriation may not be an adequate or politically acceptable basis for ground water allocation, state control of ground water development and use is appropriate where the state desires to implement water management objectives. For example, ground water development could be restricted, through well development moratoria and well spacing requirements, to prevent development of marginal land for irrigation,[372] to prevent ground water quality degradation in important recharge areas,[373] or to reduce the likelihood of water user conflicts.[374] Ground water development could be conditioned in order to achieve ground water quality protection and ground water data collection objectives through well construction and check valve requirements.[375] Ground water use would be restricted to meet water quality,[376] water use efficiency or ground water mining[377] objectives by allocating an amount of ground water that would require a high degree of water use efficiency and prevent ground water quality degradation by over-irrigating. Any or all of these objectives would be achieved by permit and water use reporting requirements.

Some of these policies are being implemented statewide through statutory regulation, while others are being implemented in varying degrees in ground water control areas which could be required statewide if the benefits realized would justify the admin-

369. For a discussion of the need for a flexible basis for resolving well interference conflicts, see notes 395-406 & accompanying text *infra*.
370. *See* notes 104-09, 178-81 & accompanying text *supra*.
371. R. BENTALL & F. SHAFFER, *supra* note 4, at 88-89. This assumes, however, that irrigators continue to dominate legislative water policy making. Urban interests have attempted to establish priority as a basis for resolving surface-ground water conflicts. *See* notes 169-81 & accompanying text *supra*. Instream flow proponents, municipal interests, and surface water users might ally themselves against ground water irrigators to establish priority as a basis for resolving surface-ground water conflicts if ground water withdrawals were perceived as a principal cause of streamflow depletions.
372. *See* WATER QUALITY, *supra* note 251, at 2-18.
373. *See id.* at 19-24.
374. *See* notes 395-439 & accompanying text *infra*.
375. *See* notes 115, 337-39 & accompanying text *supra*.
376. *See* notes 122-25 & accompanying text *supra*.
377. Regarding water use efficiency, see Aiken, *supra* note 88, at 329-33.

istrative costs involved. If a statewide permit program was instituted and permits to develop ground water were denied, the major legal issue is whether unexercised overlying rights are legally vested property rights for which compensation is due if they are damaged or destroyed.[378] Regarding ground water rights, western and federal courts have unanimously upheld legislation divesting landowners of their unexercised overlying rights.[379] Similarly, the Nebraska Supreme Court has upheld legislation divesting landowners of unexercised riparian surface water rights.[380] Based on these precedents it seems likely that restricting ground water development through a permit procedure would be constitutional.

Legislation regulating existing ground water uses is more difficult to analyze. Restrictions to prevent waste or to address ground water mining are likely to be approved as extensions of the Nebraska Supreme Court's repeated comments on prohibiting waste of ground water and requiring ground water supplies to be shared proportionally during shortages.[381] Whether the court would uphold the validity of other restrictions on ground water use is unclear, although the *Merritt Beach Co.* decision suggests the court is willing to defer to legislative ground water policy initiatives.[382]

C. Ground Water Transfers

Because ground water supplies are relatively abundant in Nebraska, importing ground water to supplement local water supplies is an option for dealing with water supply problems. Ground water transfers may be local, regional or interstate. However, Nebraska does not have a consistent ground water transfers policy. Transfers for public water supply purposes are valid if a DWR permit has been obtained.[383] NRDs and rural water districts are author-

378. *See* TAKINGS ISSUE, *supra* note 362; Ausness, *Water Use Permits in a Riparian State: Problems and Proposals*, 66 Ky. L. J. 191, 240-52 (1977).
379. *See* note 363 *supra.*
380. *See* note 365 *supra.*
381. *See* Prather v. Eisenmann, 200 Neb. 1, 5-7, 261 N.W. 2d 767, 769 (1978); Metropolitan Util. Dist. v. Merritt Beach Co., 179 Neb. 783, 800-01, 140 N.W. 2d 626, 637 (1966); Olson v. City of Wahoo, 124 Neb. 802, 811, 240 N.W. 304, 308 (1933).
382. Dicta in *Olson*, which was repeated in the *Merritt Beach Co.* decision, implied that ground water transfers were invalid. Olson v. City of Wahoo, 124 Neb. 802, 811, 248 N.W. 304, 308 (1933). *See* Metropolitan Util. Dist. v. Merritt Beach Co., 179 Neb. 783, 800-01, 140 N.W. 2d 626, 637 (1966). When the Nebraska Legislature, in effect, overruled this dicta by establishing a procedure to allow municipal ground water transfers, the court deferred to the legislative judgment, even though the procedure established was questionable on constitutional grounds. *Id.* at 801-02, 140 N.W.2d at 637-38. *See* Harnsberger, Oeltjen, Fischer, *supra* note 24, at 221-22; Metropolitan Util. Dist. v. Merritt Beach Co., 179 Neb. at 802-05, 140 N.W.2d at 638-39 (Spencer, J., dissenting).
383. NEB. REV. STAT. §§ 46-634 to -650 (Reissue 1978 & Cum. Supp. 1980). For a

ized to transport water, but the scope of this authority has not been determined.[384] A statute also provides that a stream may be used to transport water from one point to another.[385] Although this statute has not been judicially interpreted, the DWR interprets it as permitting ground water transfers. Finally, interstate ground water transfers are allowed if a DWR permit has been obtained.[386] The Nebraska Supreme Court has not directly ruled on the issue of whether ground water can be used on nonoverlying land and, aside from the validity of DWR ground water transfer permits for municipal purposes,[387] the court has not ruled on the validity of other statutes relating to ground water transfers. In several opinions the court has suggested that landowners do not have the right to transfer ground water, particularly if local ground water users are harmed.[388] However, *Merritt Beach Co.*[389] implies that the Legislature may constitutionally authorize ground water transfers.[390]

A principal argument against ground water transfers is that they may harm local ground water users. However, ground water transfers could be authorized in a manner to prevent or minimize such conflicts. Transfers could be allowed in any amount as long as other users are not harmed, either through well interference[391]

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discussion of the procedures to obtain a DWR permit under the Municipal and Rural Domestic Ground Water Transfers Permit Act, see notes 180-81 & accompanying text *supra*.

384. NEB. REV. STAT. § 46-101 (Reissue 1978); *id.* § 2-3238 (Reissue 1977).

385. *Id.* § 46-252 (Reissue 1978).

386. NEB. REV. STAT. § 46-613.01 (Reissue 1978). *See* notes 357-61 & accompanying text *supra*.

387. In McDowell v. Rural Water Dist. No. 2, 204 Neb. 401, 282 N.W.2d 594 (1979), the Nebraska Supreme Court ruled that rural water districts were not required to obtain ground water transfer permits under the City, Village and Municipal Ground Water Permit Act (now the Municipal and Rural Domestic Ground Water Transfers Permit Act). The court noted that the district was authorized by NEB. REV. STAT. § 46-1003 (Reissue 1978) to transfer water into its service area, but did not address the validity of that provision. 204 Neb. at 411, 282 N.W.2d at 600. Rural water districts are now authorized to obtain ground water transfer permits under the Municipal and Rural Domestic Ground Water Transfers Permit Act. NEB. REV. STAT. §§ 46-638, -645 (Cum. Supp. 1980).

388. Prather v. Eisenmann, 200 Neb. 1, 5-7, 261 N.W.2d 767, 769 (1978); Metropolitan Util. Dist. v. Merritt Beach Co., 179 Neb. 783, 800-01, 140 N.W.2d 626, 637 (1966); Olson v. City of Wahoo, 124 Neb. 802, 811, 248 N.W. 304, 308 (1933). Each opinion reiterates that a ground water user may use ground water "on the land that he owns," suggesting that ground water transfers within single farm or ranch ownership units could occur. However, courts might disallow transfers between discontiguous tracts under a single ownership.

389. Metropolitan Util. Dist. v. Merritt Beach Co., 179 Neb. 783, 140 N.W.2d 626 (1966).

390. *Id.* at 801-02, 140 N.W.2d at 637-38.

391. Well interference could be minimized by acquiring land as a buffer zone.

or ground water mining. Where local users were harmed, ground water transfers could be permitted in an amount equal to the net ground water use that would occur if the ground water were used locally. For example, if the ground water could be used locally for irrigation, ground water transfers could be authorized up to an amount equal to the net water use for irrigation. In this way the physical effect on local users would be the same as if the ground water were withdrawn and used locally. Local users could also be authorized to sue for damages resulting from transfers.[392]

Authorization of ground water transfers on a general basis could affect the state's policy regarding interstate ground water transfers. Federal court decisions suggest that state prohibition of interstate ground water transfers is an unconstitutional burden on interstate commerce if intrastate ground water transfers are authorized.[393] Nebraska common law appears to prohibit intrastate ground water transfers, so state restrictions on interstate transfers probably would not be discriminatory. If, however, intrastate transfers were generally authorized, the commerce clause probably required that interstate transfers be permitted on the same basis.[394] In any event, the relationship between intrastate and interstate ground water transfers should be considered when evaluating intrastate ground water transfer policy options.

D. Well Interference Conflicts

Nebraska well spacing statutes[395] reduce, but do not prevent, the occurrence of well interference conflicts, particularly those involving individual domestic wells for which well spacing requirements have not been established. In *Prather v. Eisenman*,[396] the Nebraska Supreme Court suggested that well interference conflicts will be resolved on the basis of proportional sharing if the parties use ground water for the same purpose, using preferences as the basis to resolve conflicts between parties using ground water for different purposes.[397] The *Prather* rules does not adequately address a variety of issues, including: (1) whether resolution of well interference conflicts will vary depending on whether

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This strategy was used by the Metropolitan Utilities District of Omaha in establishing its Platte River well field. *Id.* at 794, 146 N.W.2d at 633-34.

392. *Cf.* NEB. REV. STAT. § 46-647 (Cum. Supp. 1980) (statute will not limit right of landowner to recover damages).

393. City of Altus v. Carr, 255 F. Supp. 828 (W.D. Tex.), *aff'd per curiam*, 385 U.S. 35 (1966). *See also* Corker, *supra* note 264.

394. Corker, *supra* note 264, at 146-48.

395. NEB. REV. STAT. §§ 46-608 to -611, -651 to -655 (Reissue 1978 & Cum. Supp. 1980). *See* notes 312-31 & accompanying text *supra*.

396. 200 Neb. 1, 261 N.W.2d 767 (1978).

397. *Id.* at 8-9, 261 N.W.2d at 770-71.

the conflict is the result of well capacity inadequacy or aquifer inadequacy, (2) whether an absolute or compensatory preference will be followed in conflicts involving domestic, agricultural, manufacturing and industrial purposes, and (3) whether conflicts not involving such preferred uses, such as fish and wildlife habitat maintenance, will be resolved on the basis of reasonable use or preferences.

Well interference conflicts may be physically classified in two general categories. Well inadequacy conflicts arise when the wells do not have sufficient capacity to fully utilize the available ground water supply, but larger capacity wells could supply the needs of all users. These conflicts can be resolved by installing new wells that can more fully utilize the aquifer. The issue is who pays for the new well. The second catagory, aquifer inadequacy conflicts, occur when the total ground water supply is inadequate, either temporarily or permanently, to supply the needs of all users. When the ground water supply itself is inadequate to supply all users the issue is how the supply will be allocated. Different well interference policies could apply in each situation. For example, a well may be required to have sufficient capacity to use the available ground water supply before one user can compel another to restrict withdrawals.[398] In *Prather*, the court suggested that such a rule would apply in well interference conflicts between domestic users, but did not indicate whether the requirement of an adequate well would apply in other conflicts where the parties used ground water for the same purpose.[399] The *Prather* court did not indicate what type of preference would be used, or whether the type of preference would vary depending on whether the conflict was based on well inadequacy or aquifer inadequacy. In appropriative surface water conflicts, preferences are either absolute or compensatory.[400] An absolute preference exists where the superior user is treated as a senior appropriator regardless of actual priority. A compensatory preference exists when the superior user is authorized to condemn an inferior right, and, in effect, acquiring the earlier priority date. The significant difference between these types of preference is that the superior user with an absolute preference is entitled to obtain an inferior user's water

398. *See* Bishop v. Casper, 420 P.2d 446 (Wyo. 1966) (well must be adequate to enjoy preferences protection); WYO. STAT. § 41-128(a) (Supp. 1975). Another way to define well adequacy is to establish reasonable pumping depths which would yield water to (by implication) adequate wells. See IDAHO CODE § 42-226 (1977); NEV. REV. STAT. §§ 534.110(3), .110(4) (Supp. 1979); S.D. COMP. LAWS ANN. § 46-6-6.1 (Supp. 1979); WASH. REV. CODE ANN. § 90.44.070 (1962); WYO. STAT. § 41.141 (Supp. 1975).

399. 200 Neb. at 9, 261 N.W.2d at 771.

400. *See* note 8 *supra*.

without compensation, whereas with a compensatory preference the superior user must compensate the inferior user.

Since ground water rights in Nebraska are overlying rather than appropriative, the application of preferences will be different than in the surface water appropriation situations where the basic preference doctrines developed. The ground water preference statute itself does not indicate whether absolute, compensatory, or some other kind of preference is intended.[401] The domestic preference established in *Prather* is analogous to an absolute preference because the inferior user compensated the superior user, the net effect being the same as if the superior user obtained the inferior user's water without compensation. However, the court in *Prather* did not distinguish between absolute and compensatory preferences.

The court in *Prather* also did not address how well interference conflicts involving non-preferred users (those using ground water for purposes other than domestic, agricultural, industrial, or manufacturing) would be resolved. Clearly domestic uses would be preferred over any other use, including nonpreferred uses, although the preference could be either absolute or compensatory.[402] Irrigation uses probably would be preferred over all other non-domestic uses, including nonpreferred uses, based on the constitutional declaration that water use for domestic and irrigation purposes is a "natural want."[403] However, it is unclear whether such a preference would be absolute or compensatory.

Regarding other well interference conflicts there is little guidance as to what rules a court would follow. Under the reasonable use rule of Nebraska ground water law, landowners can use ground water on their own land without waste, even if that use af-

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401. Preference in the use of underground water shall be given to those using the water for domestic purposes. They shall have preference over those claiming it for any other purpose. Those using ground water for agricultural purposes shall have the preference over those using the same for manufacturing or industrial purposes.

NEB. REV. STAT. § 46-613 (Reissue 1978). In contrast surface water preferences are better defined, but contradictory. An absolute statutory preference was enacted in 1895. 1895 Neb. Laws, ch. 69, § 43, at 260, codified at NEB. REV. STAT. § 46-204 (Reissue 1978). A compensatory constitutional preference was adopted in 1920. NEB. CONST. art. XV, § 6. *See* Trelease, *Preferences to the Use of Water*, 27 ROCKY MTN. L. REV. 133, 150-54 (1955).

402. NEB. REV. STAT. § 46-613 (Reissue 1978) states that domestic users are preferred over all other users.

403. NEB. CONST. art. XV, § 4. In Little Blue Nat. Res. Dist. v. Lower Platte N. Nat. Res. Dist., 206 Neb. 35, 294 N.W.2d 598 (1980), the court said: "The constitution tells us that the desire and need for water for domestic and irrigation purposes is a 'natural want' of all our citizens and we should not unnecessarily deny it to any who can obtain it without doing harm to others." *Id.* at 547-48, 294 N.W.2d at 604.

fects another's use. If the reasonable use rule were followed, nonpreferred users would have no liability if their use interfered with an industrial, manufacturing or non-irrigation agricultural use or another nonpreferred use. Alternatively, the industrial, manufacturing, or non-irrigation agricultural use could be treated as a superior use and given either an absolute or compensatory preference.

One problem with using preferences, particularly absolute preferences, as a basis for resolving well interference conflicts is that in some situations the superior user may have an "inadequate well" in an equitable sense, rather than in the sense of being insufficient to fully use the available ground water supply. In *Prather*, the court stated that the domestic wells involved in that case were adequate because they would have continued to yield water if irrigation wells had not been installed in the same aquifer.[404] One wonders whether a domestic well would be adequate if it had not been installed and equipped to avoid foreseeable interference with existing irrigation wells. If the interference were reasonably foreseeable and easily avoided by installing pumps deeper an absolute domestic preference in a well capacity inadequacy situation is hard to justify. The court in *Prather* did not address this issue, but the observation that the domestic wells in that case were adequate suggests that the court would be willing to consider whether the superior well were adequate, rather than rigidly applying preferences without considering other factors as well.

A more flexible approach than the preferences-correlative rights approach of *Prather* would be to resolve well interference conflicts by considering the facts and circumstances of each case, including, but not limited to, the preference status of the parties. This approach is similar to that established by the Nebraska Supreme Court in *Wasserburger v. Coffee*[405] in resolving riparian-appropriative surface water conflicts. The *Wasserburger* test generally includes a consideration of: (1) the social utility associated in the respective water uses; (2) the extent of the harm caused by the interference; (3) the relative priorities of the parties; (4) the suitability of the water uses relative to the water supply; and (5) the parties' respective ability to prevent or avoid the harm caused by the interference.[406] Preferences would bear heavily on the consideration of the relative social utility of the parties' uses, but other factors would be considered as well. The *Wasserburger* approach is attractive because it gives the court considerable flexibility to deal with the circumstances of each case. Given the wide

404. *See* 200 Neb. at 8-9, 261 N.W.2d at 77-71.
405. 180 Neb. 149, 141 N.W.2d 738, *modified*, 180 Neb. 569, 144 N.W.2d 209 (1966).
406. *Id.* at 158, 141 N.W.2d at 745-46.

variety of conditions that would be involved in well interference cases, such as the priorities and preferences of the parties, the nature of the aquifer, whether the interference is caused by well capacity inadequacy or aquifer inadequacy, and whether the wells were adequate to avoid foreseeable interference, a judicial approach that considers all aspects of each case is preferable to one focusing on only one element. The discussion of whether the domestic wells in *Prather* were adequate may be an indication that the court might consider a more flexible approach.

E. Ground Water Mining

Irrigation is widely credited for stabilizing Nebraska's agricultural economy from production fluctuations caused by weather changes. But this stability may be threatened by ground water mining. The development and implementation of ground water mining policies will play a significant role in Nebraska's future economic stability and prosperity. Two general approaches can be used to deal with ground water mining: restrict withdrawals and increase water supplies. These management alternatives are not mutually exclusive; a strong case can be made for requiring a high degree of water use efficiency as a precondition to receiving publicly subsidized supplemental irrigation water, rather than making supplemental water the reward for careless and unmanaged water use. As of yet use constraints and supply augmentation have not been integrated in Nebraska.

The 1975 Legislature required all ground water irrigators to control their irrigation runoff, and required NRDs to establish runoff control regulations.[407] Runoff controls are enforced on a complaint basis and are not likely to be invoked unless runoff actually damages another landowner. These controls undoubtedly have increased water use efficiency and reduced waste, while providing a good foundation for more restrictive policies in problem areas. Runoff controls stop short of requiring a high degree of water use efficiency. Such efficiency could insure that the statewide benefits from irrigation are more long-lived than they would otherwise be.

Nebraska has followed the common western state approach of authorizing ground water development and use controls in problem areas.[408] For many years, ground water management efforts were limited to educational and voluntary efforts. The first legislation dealing with ground water mining was the 1956 Act authorizing the formation of ground water conservation districts.[409] This

407. *See* notes 340-43 & accompanying text *supra*.
408. *See* notes 57-78 & accompanying text *supra*.
409. *See* notes 161-163 & accompanying text *supra*.

was modified with the creation of NRDs and the 1975 enactment of the Ground Water Management Act.[410] Controls on ground water development and use are authorized in ground water control areas if a NRD requests a control area designation and if the DWR Director designates it as a control area. The controls that have been adopted include: well spacing regulations, well metering requirements, and limitations on ground water withdrawals.

The Act gives NRDs substantial authority, although little direction, to deal with ground water mining in problem areas. The Act has two deficiencies in that development of ground water mining policies is a local option with no recourse for local inaction where mining is occurring and that establishment of ground water controls cannot be implemented until mining is imminent.[411] In at least three areas, ground water supplies are being mined for irrigation, but control area designation procedures have not been initiated.[412] Because ground water is of economic importance to the state ground water mining policies should not be established by default. The Act could be amended to give the DWR authority to designate control areas and to require ground water management plans and programs where ground water is being mined.[413]

A significant element of ground water mining policy development is determining which controls can be implemented at each stage of the mining process. Ground water use controls should be established at an early phase of ground water development in order to require a high degree of water use efficiency. This would prevent or reduce the rate of ground water mining and discourage development of marginal land. If ground water mining subsequently develops, controls on ground water development could be authorized. Current law does not distinguish between use controls (e.g., limitations on withdrawals) and development controls (e.g.,

410. *See* notes 210-48 & accompanying text *supra.*

411. *See* notes 213-14 & accompanying text *supra.*

412. These areas are in Holt County, Box Butte County, and Buffalo and Hall Counties. R. BENTALL & F. SHAFFER, *supra* note 4, at 35.

413. A similar approach was recommended by the Governor's Commission to Review California Water Rights Law. The Commission recommended legislation which would require local government areas, identified by the California Department of Water Resources as experiencing ground water problems (principally ground water mining), to develop and implement ground water management programs. If the local response is inadequate, the Department would be authorized to request the state Attorney General to initiate a judicial determination of ground water rights. GOVERNOR'S COMMISSION TO REVIEW CALIFORNIA WATER LAW, FINAL REPORT 140-41, 158-61, 168 (December 1978). The Commission's approach could be strengthened by requiring local ground water management programs to meet state policy objectives. If the reviewing state agency found the local programs inadequate, it could be authorized to establish state management programs in those areas.

well spacing or well drilling restrictions): either can be exercised within a designated control area.[414] Perhaps for this reason the criteria for designating control areas have been interpreted conservatively. DWR control area decisions suggest that ground water controls cannot be established until ground water supplies clearly will be inadequate in light of current development.[415] The Act could be modified to authorize or require the establishment of ground water use controls to prevent or reduce ground water mining and leave ground water development controls to be implemented when mining will render supplies inadequate for existing uses. Because of the possibility of ground water control area designation, courts are unlikely to establish ground water mining policies, except perhaps in the more limited circumstance of well interference conflicts.

One alternative method for dealing with ground water mining is to obtain supplemental water supplies. The source of supplemental water may be intrabasin or interbasin surface or ground water. Existing state supplemental water supply policies are modest, being limited to cost sharing on soil conservation measures and small surface water impoundments.[416] Both programs indirectly affect ground water recharge although neither program could be used to obtain a supplemental water supply large enough to be a significant part of a regional ground water management program. The use of supplemental water to deal with ground water mining has not been seriously considered in Nebraska: from 1936 to 1980 the possibility of interbasin surface water transfers was not an option to deal with ground water mining because of judicial prohibition of interbasin transfers.[417] However, the decision in *Little Blue Natural Resource District v. Lower Platte North Natural Resource District*[418] held that interbasin surface water transfers were valid if unappropriated surface water was available and the transfer was determined by the DWR to be in the public interest,[419] meaning that interbasin surface water transfers are an option to consider in dealing with ground water mining. However, the cost of such transfers and environmental concerns will affect their ultimate implementation. In any event the costs of such transfers are likely to be higher than those incurred by implementing ground water development and use controls. Another potential source of supple-

414. NEB. REV. STAT. § 46-666 (Cum. Supp. 1980).
415. *See* notes 221-22, 225-26, 240-41, 247-48 & accompanying text *supra*.
416. *See* notes 207-08 & accompanying text *supra*.
417. Osterman v. Central Neb. Pub. Power & Irr. Dist., 131 Neb. 356, 268 N.W. 334 (1936). *See* note 265 *supra*.
418. 206 Neb. 535, 294 N.W.2d 598 (1980). *See* notes 265-67 & accompanying text *supra*.
419. 206 Neb. at 548, 294 N.W.2d at 604.

mental water is ground water. Local or regional ground water transfers could be an option for dealing with ground water mining if their legal status were clarified. Whether this is permissible under current law is unclear.[420] Use of supplemental water can be integrated with the use of local ground water supplies to improve water supply reliability. Integrated water management operations may involve restricting ground water use when surface water is available and using ground water in dry years.[421]

Ground water recharge may be part of an integrated water management system in surface water irrigation projects. Ground water can be recharged indirectly by seepage from reservoirs, canals, and irrigated land, or directly from specially designed injection wells. Recharged ground water may be deliberately managed as part of an integrated water use system.[422] Ground water recharge is occurring in surface water irrigation projects.[423] Reclamation districts do have the authority to tax landowners who do not purchase district surface water for ground water recharge benefits.[424] This authority has not been exercised, however. Integrated management activities have been limited to preventing rising ground water levels from interfering with surface land uses and using irrigation district wells to improve surface water deliveries in irrigation surface areas.[425]

F. Surface-Ground Water Conflicts

Surface-ground water conflicts are addressed by statute only to the extent that a DWR permit is required before water can be withdrawn from pits located within 50 feet of a stream bank.[426] A variety of conflicts between surface and ground water uses are not

420. *See* text accompanying notes 383-94 *supra.*
421. *See* text accompanying notes 79-86 *supra.*
422. See Comment, *Recapture of Reclamation Project Ground Water*, 53 CALIF. L. REV. 541 (1965); Comment, *Project Ground Water: Problems and Possible Solutions in Application of the Federal Reclamation Act to a Disputed Resource*, 44 WASH. L. REV. 259 (1968).
423. Harnsberger, Oeltjen, & Fischer, *supra* note 24, at 284-92.
424. NEB. REV. STAT. § 46-544 (Cum. Supp. 1980). By implication these provisions were expanded to public power and irrigation districts. *Id.* § 70-667 (Reissue 1976). However, this statute may be unconstitutional since it does not properly amend existing law. NEB. CONST. art. III, § 14.

While reclamation districts and perhaps irrigation districts can charge for ground water recharge benefits, they also may be liable for damage caused by ground water recharge. Owners of water storage reservoirs are "liable for all damages arising from leakage or overflow of the water therefrom." NEB. REV. STAT. § 46-241(2) (Reissue 1978). It is unclear whether this statute would apply to seepage from district canals or fields irrigated with district surface water.
425. *But see* Harnsberger, Oeltjen, & Fischer, *supra* note 24, at 287-90.
426. NEB. REV. STAT. § 46-636 to -637 (Reissue 1978).

directly addressed in current law, including conflicts involving subirrigation, ground water recharge, instream water uses, domestic surface water uses, and appropriative surface water uses.

Surface water may help keep ground water levels high by recharging ground water supplies. Since recharge from streams may help maintain subirrigation in some areas, a long run reduction in streamflow could reduce streamflow such that subirrigation is lost. Owners of subirrigated land could maintain their subirrigated cropping patterns by irrigating, although that would involve considerable expense. Alternatively, subirrigation could be maintained by preventing the surface water development or use that would interfere with subirrigation.

The legal rules for resolving disputes between surface water users and subirrigators are not clear. In the 1941 *Luchsinger* decision, the Nebraska Supreme Court ruled that a landowner was entitled to compensation when his subirrigation was interfered with by construction of a power district canal.[427] In future cases, courts could resolve such disputes by ruling that if the subirrigator can prove who caused his loss of subirrigation he would be entitled to compensation. This seems unlikely, however, because *Luchsinger* did not involve a conflict between water users, but rather a drainage dispute. When surface water uses interfere with subirrigation, water use conflict rules are likely to be applied. Subirrigation conflicts could be resolved on the basis of priority. Courts in other western states, however, have not recognized surface water appropriations for subirrigation because the amount of streamflow necessary to maintain subirrigation was too large relative to alternative uses for the water.[428] Alternatively, the court could resolve such disputes on the basis of preferences: assuming the sub-

427. Luchsinger v. Loup River Pub. Power Dist., 140 Neb. 179, 299 N.W. 549 (1941). *See* note 149 & accompanying text *supra*.

428. In this arid country, where the largest duty and the greatest use must be had from every inch of water in the interest of agriculture and home building, it will not do to say that a stream must be dammed so as to cause subirrigation of a few acres at a loss of enough water to surface irrigate 10 times as much by proper application.

Van Camp v. Emery, 13 Idaho 202, 208, 89 P. 752, 754 (1907). *Accord*, Tulare Irr. Dist. v. Lindsay-Strathmore Irr. Dist., 3 Cal. 2d 489, 526, 45 P.2d 972, 986-87 (1935); Peabody v. City of Vallejo, 2 Cal. 2d 351, 375, 40 P.2d 486, 495 (1935). In Metropolitan Util. Dist. v. Merritt Beach Co., 179 Neb. 783, 140 N.W.2d 626 (1966), the court quoted from *Tulare*:

> 'The use of the entire flow of a stream, surface or underground, for subirrigation cannot be held to be a reasonable use of water in an area of such need as the Kaweah delta.' If such is not the rule, every appropriation of water from a stream would be defeated by lower riparian owners having subirrigated lands because of the lowering of the water table which every diversion does to some extent.

Id. at 796, 140 N.W.2d at 634. For similar reasons courts are unlikely to be

irrigation use is agricultural, a subirrigator would probably be entitled to compensation only if the interfering surface water use is neither domestic nor agricultural. Subirrigators are unlikely to be able to obtain injunctive relief in any event since they can obtain the water necessary to maintain their existing cropping pattern by installing an irrigation well.[429] Subirrigators might obtain damages from municipal, industrial, or nonpreferred surface water users, depending on the equities, if the conflict is resolved as if it is a well interference conflict.[430]

Seepage from streams may recharge ground water aquifers. Many municipalities have located well fields in alluvial aquifers to take advantage of induced recharge from the stream. Significant long term reductions in streamflow could reduce this ground water recharge. In several western states such conflicts are resolved by treating ground and surface water users as if they were surface water users and resolving conflicts on the basis of priority.[431] This protects ground water users from interference by subsequent surface water users and vice versa. This approach was rejected legislatively when ground water was defined in 1963 to exclude recognition of the underground stream doctrine.[432] In *Merritt Beach Co.*, the Nebraska Supreme Court similarly interpreted the legislative definition of ground water to exclude recognition of surface-ground water interrelationships.[433] In conflicts between surface and ground water users, the court could resolve the conflicts on the same basis as well interference conflicts.[434] This might be a more appropriate basis for conflict resolution if the primary water source of the surface-ground water system is ground water.

In reaches of most Nebraska streams, ground water is a significant streamflow component.[435] Ground water withdrawals can reduce streamflow, which could interfere with instream water uses such as fish and wildlife protection, recreation, and water quality maintenance. The legal basis for resolving such conflicts is unclear. Instream water uses are not included in water preferences provisions, so well interference rules do not suggest a basis for conflict resolution. Such cases could be resolved on the basis of reasonable use, or the court could consider all the circumstances

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sympathetic to subirrigators when ground water withdrawals interfere with subirrigation.

429. *See* notes 42-43 & accompanying text *supra*.
430. *See* notes 395-406 & accompanying text *supra*.
431. *See* notes 104-09 & accompanying text *supra*.
432. *See* notes 169-73 & accompanying text *supra*.
433. Metropolitan Util. Dist. v. Merritt Beach Co., 179 Neb. 783, 140 N.W.2d 626 (1966).
434. *See* notes 395-406 & accompanying text *supra*.
435. R. BENTALL & F. SHAFFER, *supra* note 4, at 12.

in each case and attempt to do equity. If the ground water use is for domestic or irrigation purposes, they could be favored by the court over instream uses based on the constitutional declaration that water use for domestic and irrigation purposes is a "natural want."[436]

In parts of Nebraska, streamflow is an important source of water for domestic purposes, particularly livestock watering. Where ground water withdrawals affect streamflow, it may interfere with domestic water uses. These conflicts are likely to be resolved by preferences. Because a dependable domestic water supply is necessary for livestock survival, courts are likely to protect domestic water uses. A domestic surface water user could be entitled to an injunction if alternative domestic water supplies were not available.[437] However, if alternative supplies were available, the domestic user's remedy would probably be limited to damages.

Under Nebraska appropriative water law, DWR permits have been obtained to use surface water principally for irrigation and power production purposes.[438] Where ground water withdrawals reduce streamflow, appropriative water uses could be affected. These conflicts could be resolved on the basis of reasonable use or preferences. If a court followed well interference rules and held that agricultural users were entitled to share available surface and ground water supplies, ground water users probably would be required to provide water to surface water users if ground water withdrawals had stopped streamflow.[439] The amount of water probably would be less than the appropriator would otherwise have been entitled to because allocations would be made on a proportional rather than a full allocation basis.

G. Ground Water Quality Protection

Several features of Nebraska ground water law address the interrelationship between ground water development and use and ground water quality protection. Check valves are required on irrigation wells to prevent agricultural chemicals from siphoning into ground water supplies.[440] Abandoned wells must be sealed to pre-

436. NEB. CONST. art. XV, § 4.
437. *See* Wasserburger v. Coffee, 180 Neb. 149, 141 N.W.2d 738, *modified*, 180 Neb. 569, 144 N.W.2d 209 (1966).
438. For a general discussion of Nebraska surface water law, see Fischer, Harnsberger, & Oeltjen *supra* note 123.
439. *See* note 87 *supra*.
440. NEB. REV. STAT. § 46-612.01 (Cum. Supp. 1980). *See* notes 337-39 & accompanying text *supra*.

vent ground water contamination.[441] Ground water controls may be established to prevent ground water quality degradation caused by ground water mining.[442] In addition, court decisions have recognized the right of individuals to go to court to protect the quality of their domestic water supplies.[443]

The issue of ground water quality degradation from leaching of agricultural chemicals has not been directly addressed by current law.[444] The Department of Environmental Control has established ground water quality standards, but has not yet developed an enforcement program.[445] In addition, individuals may protect domestic ground water supplies under the private nuisance theory.[446] In the proposed O'Neill and North Loup irrigation projects, irrigators will be required to schedule their irrigation and fertilizer applications as a condition of receiving project irrigation water.[447]

Nebraska has not established well construction standards. However, the Department of Health regulates construction of public water supply wells and has sponsored publication of recommended domestic well construction and abandonment standards.[448]

V. SUMMARY AND CONCLUSIONS

Most western states have adopted prior appropriation as the basis for ground water allocation. Consequently, well interference and surface-ground water conflicts are generally resolved by following priority. Nebraska is among a minority of western states which follow common law ground water allocation rules. Well interference conflicts in Nebraska are resolved through a combina-

441. NEB. REV. STAT. § 46-602(3) (Cum. Supp. 1980). *See* notes 332-36 & accompanying text *supra*.
442. NEB. REV. STAT. § 46-666(1)(b) (Cum. Supp. 1980). *See* notes 213-18 & accompanying text *supra*.
443. Lowe v. Prospect Hill Cemetery Ass'n., 58 Neb. 94, 78 N.W. 488 (1899); Beatrice Gas Co. v. Thomas, 41 Neb. 662, 59 N.W. 925 (1894). *See* notes 127-28 & accompanying text *supra*.
444. *See* WATER QUALITY, *supra* note 251, at 19-24.
445. NEBRASKA DEP'T OF ENVIRONMENTAL CONTROL, GROUNDWATER PROTECTION STANDARDS (March 1978).
446. *See* note 443 *supra*.
447. Memorandum of Understanding Among the United States, N. Cent. Neb. Reclamation Dist. and Niobrara Basin Irr. Dist. Concerning Compliance with Federal Water Pollution Control Standards for Ground Water (February 15, 1979); Memorandum of Understanding Among the United States, Twin Loup Reclamation Dist., and Twin Loup Irr. Dist. Concerning Compliance with Federal Water Pollution Control Standards for Ground Water (undated).
448. NEBRASKA DEP'T OF HEALTH, REGULATIONS GOVERNING PUBLIC WATER SUPPLY SYSTEMS, Rule 5(6) (1977); NEBRASKA DEP'T OF HEALTH, NEBRASKA WELL DRILLERS ASS'N, & UNIV. OF NEB. CONSERVATION & SURVEY DIV., MINIMUM STANDARDS FOR A PRIVATE WATER WELL IN NEBRASKA (1972).

tion of the common law doctrines of reasonable use and correlative rights as well as statutory preferences. No clear basis exists for resolving surface-ground water disputes, because the subflow doctrine, which would interrelate rights to use surface and ground water from a common source, has been implicitly rejected legislatively and judicially.

Ground water transfers are freely allowed in appropriative states, but their status is unclear in Nebraska. Several statutes imply legislative consent to ground water transfers, but judicial dicta has consistently suggested that such transfers are invalid *per se*. Legislation authorizing municipal ground water transfers was sustained by the Nebraska Supreme Court, suggesting that legislative ground water policy initiatives will meet with judicial acquiescence.

The Nebraska Legislature followed the typical western response to ground water mining by authorizing administrative controls on ground water development and use in ground water control areas. A significant difference in the Nebraska Ground Water Management Act is the state's inability to establish ground water controls, and the absence of state ground water management objectives. Efforts to supplement declining ground water supplies by importing surface water have historically been precluded by a judicial prohibition on interbasin surface water transfers. The recent reversal of this judicial policy may lead to the integrated use of local and imported water supplies if financial and environmental issues can be resolved.

Ground water quality is protected to a limited extent through check valve and well abandonment requirements. Well construction standards, a common practice to protect water quality in the west, have not been established except for public water supply wells. A major issue yet to be addressed is ground water pollution by agricultural chemicals resulting from cultivation and irrigation of highly permeable sandy soils.

Major legislative ground water policy decisions have tended to follow periods of rapid ground water development. The major ground water policy decision of the 1970s, enactment of the Ground Water Management Act, was prompted by explosive ground water development for irrigation and concomitant ground water mining. Continued ground water development and mining are likely to force legislators and judges to deal with the issues of ground water transfers, ground water recharge, and ground water quality protection, and perhaps to reexamine current ground water mining policies.