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Hydrologically-Connected Ground Water, Section 858, and the Spear T Ranch Decision

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Hydrologically-Connected Ground Water, Section 858, and the *Spear T Ranch* Decision¹

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I. INTRODUCTION

Sources of streamflow in Nebraska during any given year are [1] inflow from adjacent states, [2] overland runoff resulting from precipitation, [3] releases from reservoir-storage holdovers from the preceding year, and [4] natural seepage of groundwater into stream channels. Amounts of inflow, overland runoff, and reservoir releases are much more variable than is the amount of groundwater contributed to streamflow.²

[N]atural overflow from the groundwater reservoir constitutes a large part of total streamflow in [Nebraska].³

Tributary ground water, the ground water that reaches a stream, is a major source of streamflow. The United States Geological Survey estimates that ground water is the source of nearly forty percent of all streamflow in the United States.⁴ This figure is higher in Nebraska. Ground water was the source of fifty-five percent of total streamflow

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1. NEBRASKA EXPERIMENT STATION JOURNAL NO. 14576.

2. Ray Bentall & F. Butler Shaffer, *Availability and Use of Water in Nebraska 1975*, at 12 (Univ. of Neb.-Lincoln, Nebraska Water Survey Paper No. 48, 1979).

3. *Id.* at 1.

4. David W. Moody et al., *National Water Summary 1986*, U.S. GEOLOGICAL SURVEY, WATER SURVEY PAPER NO. 2325, 3 (1988).

in Nebraska in 1975 (fifty-one percent on average).⁵ This important, but largely unrecognized, fact has not been taken into account by Nebraska water policy makers.

Despite the incontrovertible fact that ground water provides the baseflow for most Nebraska streams and is the most stable (and often the largest) contribution to streamflows, Nebraska surface water law ignores the baseflow phenomenon. Instead, surface water and ground water are allocated on almost opposite bases: "prior appropriation" (first in time is first in right) for surface water;⁶ and "correlative rights" (proportional sharing) for ground water.⁷ The inevitable colli-

5. Bentall and Shaffer calculate the relative amounts of overland runoff and ground water discharge in 1975 for the thirteen major drainage areas in Nebraska, as summarized below. "KAF" stands for thousand acre-feet; an acre-foot is 325,851 gallons of water. RICHARD S. HARNSBERGER & NORMAN W. THORSON, *NEBRASKA WATER LAW AND ADMINISTRATION* 7 (1984).

Drainage Area(s)	Ground Water KAF	Overland Runoff KAF	Ground Water %
Hat Creek, White Clay Creek & White River (at 98)	12.4	38.3	24.46%
Niobrara River & Ponca Creek (at 100)	872	275	76.02%
Missouri River Tributaries (at 103)	142	275	34.05%
North Platte River (at 105)	943	372	71.71%
South Platte River (at 107)	12.4	74.8	14.22%
Middle Platte River (at 109)	274	90	75.27%
Loup River (at 110)	1385	430	76.31%
Elkhorn River (at 112)	306	330	48.11%
Lower Platte River (at 115)	174	401.4	30.24%
Republican River (at 117)	195	463	29.64%
Little Blue River (at 118)	91	334	21.41%
Big Blue River (at 119)	97	367	20.91%
Nemaha River (at 121)	110	376	22.63%
1975 State Totals	4613.80	3826.50	54.66%
Average State Totals	4613.80	4449.42	50.91%

Bentall & Shaffer, *supra* note 2, at 98–121 (the numbers in parentheses are the corresponding page numbers in Bentall & Shaffer for each drainage basin). The 1975 Nebraska precipitation was eighty-six percent of normal. *Id.* at 7–8. So, in the last row (Average State Totals) the overland runoff figure for the entire state is increased to one hundred percent of normal, which reduces the ground water portion of total Nebraska streamflow from fifty-five to fifty-one percent. Precipitation is rarely normal in Nebraska. *See id.* at 7.

6. Under prior appropriation, "senior," or prior, appropriators are entitled to water at the expense of "junior," or subsequent, appropriators during periods of shortage. HARNSBERGER & THORSON, *supra* note 5, at 92–97; A. DAN TARLOCK, *LAW OF WATER RIGHTS AND RESOURCES* §§ 5:29–35 (2004).
7. Under the correlative rights theory, those using ground water for the same purpose are entitled to share the available supply during shortages. HARNSBERGER & THORSON, *supra* note 5, at 214–17; TARLOCK, *supra* note 6, §§ 4:13–19; Joseph W. Dellapenna, *Correlative Rights Today*, in 3 *WATERS AND WATER RIGHTS* ch. 21 (Robert E. Beck ed., 2003); Richard S. Harnsberger, *Nebraska Ground Water Problems*, 42 NEB. L. REV. 721, 730 (1963) [hereinafter Harnsberger, *Problems*]; Richard S. Harnsberger et al., *Groundwater: From Windmills to Comprehensive*

sion⁸ between inconsistent water allocation theories finally occurred in *Spear T Ranch v. Knaub*,⁹ in which the Nebraska Supreme Court adopted section 858 of the *Restatement (Second) of Torts* as the basis for resolving conflicts between competing users of hydrologically connected ("HC") surface water and ground water. In doing so, Nebraska became the first state to apply the *Restatement* rule to conflicts involving HC surface and ground water. This Article will describe the tributary ground water issue, discuss the *Spear T Ranch* decision, and analyze the likely role of the *Restatement* rule in future Nebraska HC surface and ground water disputes.

II. TRIBUTARY GROUND WATER

Before discussing what tributary ground water and HC ground water are, it is necessary to define terms. The Nebraska Supreme Court did not use the term "tributary ground water" in the *Spear T Ranch* opinion. The term is also not present in Nebraska water statutes; however, the Nebraska Ground Water Management and Protection Act ("GWMPA")¹⁰ does refer to HC ground water.¹¹ While HC ground water is not yet statutorily defined, the Nebraska Department of Natural Resources ("DNR") has developed an administrative definition to aid the agency in making its determinations of whether a river basin or portion thereof is fully appropriated.¹² The DNR definition

Public Management, 52 NEB. L. REV. 179, 206-08 (1973) [hereinafter Harnsberger et al., *Comprehensive Management*].

8. For predictions that the collision would inevitably occur, see Harnsberger, *Problems*, *supra* note 7, at 741, 744; Harnsberger et al., *Comprehensive Management*, *supra* note 7, at 182-83.
9. 269 Neb. 177, 691 N.W.2d 116 (2005). For a brief analysis of the *Spear T Ranch* decision by one of the surface water amici attorneys, see LeRoy W. Sievers, *Nebraska Water Law Facing Dramatic Changes in our State: The Spear T Ranch Case*, NEB. LAW., June 2005, at 14. For a review disapproving of the *Spear T Ranch* decision by one of the ground water attorneys, see Donald Blankenau et al., *Spear T Ranch v. Knaub: The Reincarnation of Riparianism in Nebraska Water Law*, 38 CREIGHTON L. REV. 1203 (2005).
10. NEB. REV. STAT. §§ 46-701 to -753 (Reissue 2004).
11. *Id.* § 46-740. Section 46-740 does not define the term HC ground water. *Cf. id.* § 46-706 (providing no definition for HC ground water in GWMPA definitions section). However it is clear from the GWMPA that HC ground water has for all practical purposes the same meaning as tributary ground water.
12. See J. David Aiken, *The Western Common Law of Tributary Groundwater: Implications for Nebraska*, 83 NEB. L. REV. 541, 587-91 (2004). In its annual reports identifying whether a river basin is fully appropriated, the DNR must describe inter alia "the geographic area within which the department preliminarily considers surface water and ground water to be hydrologically connected and the criteria used for that determination." NEB. REV. STAT. § 46-713(1)(a)(ii). The DNR, following a negotiated rule-making proceeding, adopted a 10%/50 year test, where HC wells are defined as those which, if pumped "for 50 years will deplete the river or a base flow tributary thereof by at least 10% of the amount [of ground water] pumped in that time." NEB. ADMIN. CODE title 457, ch. 24, § 001.02 (2005).

includes a time dimension, fifty years, within which a specified portion of the total ground water pumped from an HC well, ten percent, will deplete streamflow or base flow. Ultimately, this DNR definition of HC ground water may be used by the courts to establish ground water users' liability for interfering with surface water appropriations. In this Article, "tributary ground water" refers to all ground water that is tributary to the stream with no time dimension or stream depletion factor specified. Therefore, tributary ground water is a more inclusive term than the DNR definition of HC ground water, although there is significant overlap between the two.

A. Hydrology

In order to understand the long term impacts of uncontrolled withdrawals of tributary ground water on streamflow and their policy implications, one must first understand the dynamics of ground water recharge, ground water discharge to streams, and how ground water pumping affects discharge and streamflow. 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.¹³ Rainfall and melting snow form overland runoff, which constitutes approximately forty-nine percent of Nebraska streamflow.¹⁴ Some precipitation soaks into the ground, slowly moving until it either drains into a stream, or percolates downward and becomes part of the ground water aquifer.¹⁵ The uppermost level of the aquifer is called the "water table."¹⁶

Presumably, the phrase "base flow tributary thereof" refers to base flow or ground water that is tributary to the stream.

13. HELENE L. BALDWIN & C. L. MCGUINNESS, *A PRIMER ON GROUND WATER* 5 (1963); Bentall & Shaffer, *supra* note 2, at 2; *see also* NATURAL RES. COMM'N, STATE OF NEB., *POLICY ISSUE STUDY ON INTEGRATED MANAGEMENT OF SURFACE WATER AND GROUNDWATER* 9 (1986) [hereinafter *INTEGRATED MANAGEMENT*]; Peter N. Davis, *Wells and Streams: Relationship at Law*, 37 MO. L. REV. 189, 194-95 (1972); Harnsberger, *Problems*, *supra* note 7, at 722-23.
14. *See* *INTEGRATED MANAGEMENT*, *see also supra* note 13, at 11; *supra* note 5. Bentall and Shaffer estimate that, in 1975, ninety-five percent of total Nebraska precipitation was lost to evaporation or to plant transpiration. Bentall & Shaffer, *supra* note 2, at 2. These two processes are sometimes called evapotranspiration, or "ET". *See* Robert Jerome Glennon & Thomas Maddock III, *In Search of Sub-flow: Arizona's Futile Effort to Separate Groundwater from Surface Water*, 36 ARIZ. L. REV. 567, 567-68, 578 n.72, 580 (1994).
15. BALDWIN & MCGUINNESS, *supra* note 13, at 5; Davis, *supra* note 13, at 195-96; Harnsberger, *Problems*, *supra* note 7, at 722-23; John D. Leshy & James Belanger, *Arizona Law Where Ground and Surface Water Meet*, 20 ARIZ. ST. L.J. 657, 661 (1988).
16. *INTEGRATED MANAGEMENT*, *supra* note 13, at 16; BALDWIN & MCGUINNESS, *supra* note 13, at 4-6; Davis, *supra* note 13, at 196; Harnsberger, *Problems*, *supra* note 7, at 723; Leshy & Belanger, *supra* note 15, at 661. For graphical representations of the water table, *see* *INTEGRATED MANAGEMENT*, *supra* note 13, at 10; BALDWIN

The amount of precipitation that becomes part of the ground water supply depends on the quantity of annual precipitation and the permeability of the soil overlying the aquifer. In the United States, slightly more than three inches per surface acre of land percolates into the ground each year.¹⁷ In Nebraska, annual ground water rates vary widely, depending upon soil permeability and rainfall. In the Sandhills region, where soils are highly permeable, the recharge rate is twenty-five to thirty percent of annual precipitation. Therefore, since rainfall averages eighteen to twenty inches per year, the recharge averages 5.25 inches per year.¹⁸ In eastern Nebraska, with its tighter soils, recharge rates are only one to five percent. So, even though rainfall averages twenty-eight to thirty-four inches per year, the average annual recharge is less than one inch.¹⁹ The process of ground water storage is measured in millennia, because in Nebraska, natural recharge is usually only inches per surface acre annually.²⁰

When the storage capacity of an aquifer is reached, any subsequent aquifer recharge will be discharged into a spring, a wetland, or a stream.²¹ In other words, when ground water can no longer move

& MCGUINNESS, *supra* note 13, at 6; ROBERT GLENNON, *WATER FOLLIES* 40 (2002); Gary L. Widman, *Groundwater-Hydrology and the Problem of Competing Well Owners*, 14 ROCKY MTN. MIN. L. INST. 523, 524 (1968).

17. Davis, *supra* note 13, at 195.

18. INTEGRATED MANAGEMENT, *supra* note 13, at 45-47.

19. *Id.* The greatest amount of ground water recharge occurs in the lower Platte River valley, where the recharge rate is twenty to thirty percent of annual precipitation. Annual precipitation averages twenty-eight to thirty inches per year; thus, annual recharge averages 7.3 inches. *Id.* Approximate recharge averages for selected irrigated areas of Nebraska are as follows: four inches in Scottsbluff; 2.6 inches in McCook; 5.5 inches in North Platte; 2.7 inches in Kearney; 6.2 inches Grand Island; and one inch each in Hastings, York, and Norfolk. *Id.* In contrast, annual irrigation ground water withdrawals probably range from nine to eighteen inches per irrigated acre in Nebraska, averaging 15.9 inches statewide in 1975. Bentall & Shaffer, *supra* note 2, at 77. So in areas heavily irrigated from wells, ground water withdrawals will significantly exceed ground water recharge.

20. BALDWIN & MCGUINNESS, *supra* note 13, at 5, 18; GLENNON, *supra* note 16, at 25, 27; Bentall & Shaffer, *supra* note 2, at 4; Glennon & Maddock, *supra* note 14, at 574 n.58.

21. INTEGRATED MANAGEMENT, *supra* note 13, at 9, 37-45; BALDWIN & MCGUINNESS, *supra* note 13, at 7-8, 25; Harnsberger, *Problems*, *supra* note 7, at 723-24. 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, 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. BALDWIN & MCGUINNESS, *supra* note 13, at 8-9. Regarding special legal rules which apply to artesian ground water basins, see generally 2 WELLS A. HUTCHINS ET AL., *WATER RIGHTS LAWS IN THE NINETEEN WESTERN STATES* 653-59 (U.S. Dep't of Agric., Misc. Publ'n No. 1206, 1974).

down (because the ground water reservoir is full), it will move laterally, seeking a lower point or outlet.²² The rate of ground water movement towards a stream or other outlet in Nebraska ranges from several feet per day to inches per year.²³ This slow moving discharge from a full aquifer is what provides the baseflow of a stream.²⁴

When an aquifer discharges water to a stream, the aquifer water table is higher than the stream, so the ground water seeks the lowest point, finding an outlet in the stream. Streams that are ground water fed are called "gaining streams" or "effluent streams."²⁵ If the stream has baseflow (from aquifer discharge) on a year-round basis, the stream is also called a "perennial stream" because it has streamflow even when there is no overland runoff from recent precipitation.²⁶

22. Davis, *supra* note 13, at 196.

23. INTEGRATED MANAGEMENT, *supra* note 13, at xiv, 16. One important factor in dealing with HC surface and ground water supplies is the differences in surface water flow and tributary ground water flow. In Nebraska, for example, streamflow may move twenty-five miles per day or more, whereas ground water flow may be 300 feet per year. Harnsberger et al., *Comprehensive Management*, *supra* note 7, at 183; see also BALDWIN & MCGUINNESS, *supra* note 13, at 7; Willis H. Ellis, *Water Rights: What They are and How They are Created*, 13 ROCKY MTN. MIN. L. INST. 451, 470 (1967); Harnsberger, *Problems*, *supra* note 7, at 725-26; David L. Harrison & Gustave Sandstrom, Jr., *The Groundwater-Surface Water Conflict and Recent Colorado Water Legislation*, 43 U. COLO. L. REV. 1, 18 (1971); Widman, *supra* note 16, at 529. This difference is significant in resolving water user conflicts. Closing a junior surface appropriator's headgate will usually increase the water supply of a downstream senior appropriator, but stopping a junior appropriator's well pumping will not necessarily improve the supply to the senior well in a timely fashion. See Douglas L. Grant, *The Complexities of Managing Hydrologically Connected Surface Water and Groundwater Under the Appropriation Doctrine*, 22 LAND & WATER L. REV. 63, 74-80 (1987).

24. Davis, *supra* note 13, at 196; Harnsberger, *Problems*, *supra* note 7, at 723-24, 741; see also DEP'T OF NATURAL RES., STATE OF NEB., A REPORT OF PRELIMINARY FINDINGS FROM A STUDY OF HYDROLOGICALLY CONNECTED GROUND AND SURFACE WATER AND ITS CONTRIBUTION TO CONFLICTS BETWEEN GROUND WATER USERS AND SURFACE WATER APPROPRIATORS IN THE NORTH PLATTE NATURAL RESOURCES DISTRICT 7 (2004) [hereinafter DNR NORTH PLATTE NRD Study]; INTEGRATED MANAGEMENT, *supra* note 13, at 11, 26; NATURAL RES. COMM'N, STATE OF NEB., PROGRESS REPORT ON THE SANDHILLS AREA STUDY 35 (1984) (on file with the NEBRASKA LAW REVIEW).

25. GLENNON, *supra* note 16, at 43; Davis, *supra* note 13, at 196; Glennon & Maddock, *supra* note 14, at 578; Robert Jerome Glennon & Thomas Maddock III, *The Concept of Capture: The Hydrology and Law of Stream/Aquifer Interactions*, 43 ROCKY MTN. MIN. L. INST. 22-1, 22-8 (1997); Widman, *supra* note 16, at 527; see also INTEGRATED MANAGEMENT, *supra* note 13, at 11. For graphical representations of gaining streams, see GLENNON, *supra* note 16, at 43; Widman, *supra* note 16, at 529.

26. BALDWIN & MCGUINNESS, *supra* note 13, at 10; Bentall & Shaffer, *supra* note 2, at 12, 15; Harrison & Sandstrom, *supra* note 23, at 5; Leshy & Belanger, *supra* note 15, at 662-63; Widman, *supra* note 16, at 527. For cross sections of perennial stream segments in Nebraska, see INTEGRATED MANAGEMENT, *supra* note 13, at 26-30.

The ground water system thus far described is one in equilibrium: ground water recharge equals ground water discharge.²⁷ This equilibrium changes when high-capacity wells are developed and pumped. When this occurs, the water table is lowered as ground water flows from the aquifer near the well to replace the water pumped out of the well. This lowering of the water table is called a "cone of depression" because the pumping forms a depression in the water table resembling an inverted cone.²⁸ Ground water flows towards the cone in an attempt to fill the depression in the water table. When the pumping stops, the ground water continues to flow into the depression until the water table levels out.²⁹ The occurrence of ground water drawdown during the irrigation season and the water level recovery in the following months constitutes a familiar pattern in Nebraska.³⁰ Further, when there are many wells, as in intensively irrigated areas, seasonal recovery may be incomplete when ground water withdrawals significantly exceed local recharge, which leads to falling ground water levels.³¹

When ground water pumping creates a cone of depression, the well intercepts tributary ground water that otherwise would have been discharged into the stream. In other words, when the ground water aquifer is discharging to a stream—and providing the stream's base flow—any significant ground water withdrawals will reduce aquifer discharge on a gallon per gallon basis.³²

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27. Glennon & Maddock, *supra* note 25, at 22-10. This simple system does not include the effect of losses from phreatophytes (water loving plants) and other vegetation. Bentall & Shaffer, *supra* note 2, at 40-41; Davis, *supra* note 13, at 195; Glennon & Maddock, *supra* note 25, at 22-6; Glennon & Maddock, *supra* note 14, at 567-68, 585. Regarding the appropriation implications of water harvesting through phreatophyte eradication, see TARLOCK, *supra* note 6, § 5:19.
 28. BALDWIN & MCGUINNESS, *supra* note 13, at 15; Charles E. Corker, *Groundwater Law, Management and Administration* 13, 46 (Nat'l Water Comm'n, Legal Study No. 6, 1971); Davis, *supra* note 13, at 197; Glennon & Maddock, *supra* note 25, at 22-12 to -13; Leshy & Belanger, *supra* note 15, at 663-64; Widman, *supra* note 16, at 533. For graphical representations of cones of depression, see BALDWIN & MCGUINNESS, *supra* note 13, at 21; GLENNON, *supra* note 16, at 46; Glennon & Maddock, *supra* note 14, at 577, 579; Widman, *supra* note 16, at 534.
 29. INTEGRATED MANAGEMENT, *supra* note 13, at 46-47.
 30. See, e.g., Mark S. Johnson & Darryll T. Pederson, *Groundwater Levels in Nebraska 1980*, at 6-7, 10-11, 16-21, 24-25, 28-31, 34-35, 39-43, 50-51 (Univ. of Neb.-Lincoln, Nebraska Water Survey Paper No. 51, 1980) (showing the irrigation season drawdown and recovery periods through hydrographs of recorder wells throughout Nebraska).
 31. See *id.* at 3 (showing map of Nebraska ground water declines). The downward trend is also illustrated by selected recorder wells. See *id.* at 16 (Hastings recorder well); *id.* at 21 (York recorder well); *id.* at 34 (O'Neill recorder well); *id.* at 39 (Chase county and Dundey county recorder wells).
 32. Glennon & Maddock, *supra* note 25, at 22-8; Thomas C. Winter et al., *Ground Water and Surface Water: A Single Resource*, U.S. GEOLOGICAL SURVEY, CIRCULAR No. 1139, 11 (1998).

For example, take the hypothetical Nebraska case where recharge is three inches per surface acre and irrigation consumes an annual average of twelve inches per acre irrigated. If only twenty-five percent of the land in the area is irrigated, net irrigation pumping over the entire area equals recharge. This means that there will be no future aquifer discharge to the stream from this area, because all the recharge is being used for irrigation. Aside from seasonal ground water level variations, long-term ground water levels will not change significantly because ground water is not being removed from storage.³³ As a result, the area will not show up on the ground water decline map, even though aquifer discharge to the stream has stopped.

Conventional wisdom says that the area is in a water supply balance because there are no ground water level declines, even though the reductions in aquifer discharge will ultimately reduce streamflow. Of course, the corresponding baseflow reduction will not actually occur for years or decades, depending upon how far the irrigated area is from the stream.³⁴ But when the reduction or cessation of aquifer discharge finally reaches the stream, the stream will change from a perennial stream to an "intermittent stream," one that has some base flow for part of the year but not the whole year.³⁵

Before continuing, it is necessary to clarify terms dealing with the interrelationship between HC ground water and streamflow. There is some disagreement regarding whether gaining and losing streams have two categories or three. The Nebraska Natural Resources Commission, in its influential 1986 Integrated Management report, recognized only two categories: "continuous" and "intermittent."³⁶ Professors Glennon and Maddock recognize three stream categories: "perennial," "intermittent," and "ephemeral." "A perennial stream flows all year long."³⁷ "An intermittent stream has flow in certain reaches but not in others, and flows only when: (1) there is a hydrologic connection between the groundwater and the stream water and (2) the groundwater levels next to the stream are higher than the bottom of the stream channel."³⁸ Finally, "an ephemeral stream flows

33. There will be annual variations of course. In a dry year, the careful irrigator may consume fifteen inches per acre irrigated, and in a wet year, only nine acre inches. But these annual changes are evened out in the long run.

34. Regarding the slow rate of ground water lateral movement, see *supra* note 23.

35. INTEGRATED MANAGEMENT, *supra* note 13, at 10-11.

36. "Naturally intermittent streams depend almost entirely upon overland runoff for their flow. . . . Naturally continuous flow at a given point along a stream indicates that upstream from that point at least some of the stream, or one or more of its tributaries, is receiving seepage from groundwater." *Id.*

37. Glennon & Maddock, *supra* note 14, at 574 n.55.

38. *Id.* at 574 n.56.

only after a storm event.”³⁹ Professors Leshy and Belanger provide the most comprehensive explanation:

Surface streams are generally classified as either perennial, ephemeral, or intermittent. Although intended to describe only surface flow characteristics, each classification suggests a different degree of interaction between ground-water and surface water. The constant surface flow of so-called perennial streams generally consists of precipitation run-off and base flow contributed by a water table that breaks the surface. Such streams are also known as effluent or “gaining” streams; that is, the water table directly supports and feeds the surface stream, resulting in surface flows even when there is no precipitation or runoff.

Ephemeral streams contain water only after precipitation or during snowmelt. Where they exist, the water table is so far removed from the surface that there is no contribution to surface flows. Ephemeral streams are also called influent or “losing” streams, because the water table does not support surface flow. In such cases surface flows infiltrate through the stream bed and recharge the underlying aquifer.

Intermittent streams are a hydrological hybrid, combining characteristics of both perennial (effluent) and ephemeral (influent) streams. They flow seasonally, having surface flows for long periods and at other times having no surface flow at all. Such streams may lie over a water table that for parts of the year is transcendent, giving the stream the characteristics of an effluent stream, and at other times fall below the surface, giving the stream the characteristics of an influent stream. This fluctuation in the water table can be attributable to seasonal rainfall, seasonal water demand, phreatophyte consumption, snowmelt, and other factors.

The characteristics of a surface stream—perennial, intermittent, or ephemeral—are thus suggestive of the relationship of the surface stream to the underlying aquifer and to the level of the water table in the aquifer. Perennial streams are indicative of, and generally dependent upon, continuous ground water discharge into the stream from the supporting aquifer beneath it and adjacent to it. Intermittent streams indicate a regular, although not continuous, connection between water in an aquifer and water in the stream. Ephemeral streams have no connection with water in an aquifer other than to recharge the aquifer through infiltration. Consequently, *if the water table of an aquifer is lowered, a perennial stream can be converted to an intermittent or ephemeral stream, and likewise, an intermittent stream can be converted to an ephemeral stream.*⁴⁰

39. *Id.* at 574 n.57.

40. Leshy & Belanger, *supra* note 15, at 662–63 (citations omitted) (emphasis added). For the source of these definitions, see ARIZ. DEP’T OF WATER RES., GILA RIVER SYSTEM: GROUNDWATER–SURFACE WATER INTERACTION STUDY (1987). Irrigation activities can also increase the ground water table and aquifer discharge to streams. Surface water irrigation projects often recharge ground water supplies as water leaks out of unlined irrigation canals and percolates from heavily-irrigated fields. INTEGRATED MANAGEMENT, *supra* note 13, at xiv–xv, 32; Bentall & Shaffer, *supra* note 2, at 35–36 (showing areas of ground water rise on ground water decline map and discussing how the ground water rise occurred). This can result in increased aquifer discharges to streams. Nebraska has adopted unintentional ground water storage statutes to give surface water entities some measure of control over the withdrawal and use of such unintentionally stored ground water. NEB. REV. STAT. §§ 46-295 to -2,106 (Reissue 2004). See HARNSBERGER & THORSON, *supra* note 5, at 271–79.

The perennial-intermittent-ephemeral classification is the most useful for the present inquiry, as it captures the stages that a stream goes through as the ground water discharge to that stream is reduced. In our hypothetical Nebraska case where irrigation withdrawals consumed all the ground water recharge of an area, the irrigation withdrawals reduce aquifer discharged to zero but the level of the water table had not yet fallen.⁴¹ So in this case, when the cessation in aquifer discharge finally reaches the stream, it will change from perennial to intermittent.

Now assume the same hypothetical Nebraska area, but increase the amount of land that is irrigated to fifty percent. Long-term ground water levels will begin to fall because average irrigation ground water withdrawals across the area are six inches per surface acre and recharge is only half of that. In time, this area will be identified as a ground water decline area, the declines signaling that action must be taken to manage the ground water supply for the long term.⁴² In addition, when the ground water levels fall, the stream will begin its transition from intermittent to ephemeral. When the ground water level falls below the bottom of the stream, the stream will become a losing (ephemeral) stream.⁴³ At this point, the stream will continuously lose flow to the lowered aquifer. If the stream has a porous, sandy bed (such as the Platte River), little water will flow when the streambed is dry; the water will seek the lower point which is the lowered ground water aquifer. When this occurs, it will take decades or longer to restore streamflow even if all tributary ground water pumping is stopped. The recharge will have to refill the aquifer first before

41. The DNR has expressed this phenomenon as follows:

[T]he first noticeable impact of increased consumptive use from an aquifer hydrologically connected to a stream will likely be a change in the quantity of stream flow rather than a change in the water table elevation of the aquifer. In many cases, change in water table elevations are detected only when stream flows decline to the point they are no longer able to recharge the aquifer. Thus, any steady decline in stream flow that cannot be explained by a change in precipitation or other factors affecting ground water recharge is a good indication that [the] current level of consumptive use of the hydrologically connected ground water aquifer cannot be sustained in the long term.

DNR NORTH PLATTE NRD STUDY, *supra* note 24, at 7.

42. Ground water declines create an opportunity for additional ground water storage. INTEGRATED MANAGEMENT, *supra* note 13, at 48; Harnsberger, *Problems*, *supra* note 7, at 724; Harrison & Sandstrom, *supra* note 23, at 5. If the aquifer water level is lowered, any recharge that is not pumped (e.g., for irrigation) will be stored in the aquifer storage space created by ground water level declines. Note, however, that the aquifer will need to be completely refilled if at all possible before aquifer discharge to the stream can resume.

43. For graphic representations of losing streams, see INTEGRATED MANAGEMENT, *supra* note 13, at 26, 28–30 (showing cross-sections of losing Nebraska stream segments); GLENNON, *supra* note 16, at 43; Widman, *supra* note 16, at 529.

ground water discharge to the stream can be restored. In practical terms, when the regional ground water level is lower than the stream, the stream is no longer a live stream.

Induced recharge wells are a special case. Induced recharge wells are wells located near a stream where the well's cone of depression actually intersects with the stream.⁴⁴ In this case the water from the stream is pulled into the well. In Nebraska, both Lincoln and Omaha have located induced recharge wells on the Platte River, and induced recharge appropriation statutes were adopted in 1993 to allow municipalities to obtain surface water appropriations for such induced recharge wells.⁴⁵ Induced recharge wells thus can deplete streamflow in two ways: by directly inducing recharge from the stream and by intercepting tributary ground water discharged from the aquifer before it reaches the stream.⁴⁶

In summary, any significant ground water development will deplete the base flow of a perennial stream gallon for gallon, even if ground water pumping does not exceed the rate of recharge. When ground water withdrawals are increased such that they significantly exceed recharge, ground water levels will decline, continued tributary ground water flows will end, and in time, so will the stream's baseflow.⁴⁷ As ground water levels fall and approach the stream's average water level, tributary ground water flows are further reduced, as is baseflow, and the stream transitions from being a gaining stream to an intermittent stream.⁴⁸ When ground water levels fall below the stream level, aquifer discharge stops and water moves from the stream to the aquifer. The stream has become a losing (ephemeral) stream, and will carry flow only after heavy rains.⁴⁹

44. Harrison & Sandstrom, *supra* note 23, at 16-17; Leshy & Belanger, *supra* note 15, at 663-64.

45. NEB. REV. STAT. §§ 46-226.03, -228, -231, -233, -235, -235.01 to -235.04, -237, -288; see Stephen D. Mossman, *Whiskey is for Drinkin' but Water is for Fightin' About: A First-Hand Account of Nebraska's Integrated Management of Ground and Surface Water Debate and the Passage of L.B. 108*, 30 CREIGHTON L. REV. 67, 79-81 (1996).

46. Davis, *supra* note 13, at 197; Glennon & Maddock, *supra* note 25, at 22-10.

47. Remember the lag between when the ground water recharge occurs and when the ground water recharge actually reaches the stream—this process can take decades. See *supra* note 23. So if ground water discharge stops in 2000, the reductions in aquifer discharge to the stream may not be felt for ten to twenty years or more.

48. Part of what is happening at this stage is that the gradient, or slope, between the aquifer and the stream is changing. When the aquifer is, say, twenty feet higher than the stream, the ground water will flow toward the stream more quickly than if the aquifer is only one foot higher than the stream. So as the water table is lowered, the rate of tributary ground water moving towards the stream will slow down correspondingly.

49. Here the gradient has changed again, only water is flowing out of the losing stream to the lowered aquifer. Again, the steeper the gradient between the losing

Regional water level changes are not a reliable guide as to when ground water pumping may reduce streamflows or even when ground water supply problems are developing. Ground water level declines will become apparent only when aquifer discharge to the stream has stopped, and when the transition from a gaining perennial stream to a losing ephemeral stream will be difficult to reverse. Tellingly, Nebraska ground water management statutes from 1975 to today have focused on ground water level declines as the trigger for ground water regulations.⁵⁰ However, it is beginning to be more widely understood that significant ground water management challenges can arise well in advance of significant ground water level declines. Not until 2004 did the impact of pumping HC ground water on streamflow become an official factor triggering ground water regulations.⁵¹

stream and the aquifer, the quicker the water will move from the losing stream to the aquifer.

50. The original section 46-656 GWMPA intent section discussed regulations in "geographic areas where ground water may be declining or where shortages of ground water may occur." NEB. REV. STAT. § 46-656 (Supp. 1975). The original criteria for designating ground water control areas, now ground water management areas, was whether "there is an inadequate ground water supply." *Id.* § 46-658(1). Presumably in this context, an inadequate supply means either that uses are increasing beyond the aquifer's ability to yield water, or else supplies have been depleted such that aquifer yield has declined. It is difficult to imagine either alternative in a scenario that does not include declining ground water levels. In 1982, the section 46-656 ground water shortages language was replaced with "the goal shall be to extend ground water reservoir life to the greatest extent practicable." NEB. REV. STAT. § 46-656 (Cum. Supp. 1982). So ground water is being depleted—in other words, water levels are declining—but we want to make the supply last as long as possible. In 1996, the ground water control area process was replaced by ground water management areas, and the section 46-658(1) inadequate ground water supply language was repealed. Neb. Laws 1996 L.B. 108 § 80. However, the aquifer life extension language from section 46-656 was retained in the new section 46-656.02. NEB. REV. STAT. § 46-656.02 (Cum. Supp. 1996), *currently codified at* NEB. REV. STAT. § 46-702 (Reissue 2004). Further depletion language is contained in a legislative finding that Natural Resource Districts ("NRDs") "already have significant legal authority to regulate activities which contribute to declines in ground water levels." *Id.* § 46-656.05(3), *currently codified at* NEB. REV. STAT. § 46-703(3) (Reissue 2004). Section 46-702 contains a new statement, added in 2004, that NRDs "as local entities are the preferred regulators of activities which may contribute to ground water depletion." NEB. REV. STAT. § 46-702 (Reissue 2004). It is fair to state that the GWMPA, since 1975, has had a clear focus on ground water depletions as justifying the regulation of ground water development and use. NRDs were given the option to regulate HC ground water to protect streamflow in 1996. NEB. REV. STAT. § 46-656.12(11) (Cum. Supp. 1996), *currently codified at* NEB. REV. STAT. § 46-709(11) (Reissue 2004). It is doubtful that NRDs would have had legal authority to regulate ground water withdrawals to maintain aquifer discharge to a stream prior to 1996.
51. If the DNR designates all or part of a stream as fully-appropriated, the designation triggers an automatic ban on new HC wells and new appropriations. NEB. REV. STAT. §§ 46-713 to -714 (Reissue 2004). It also triggers a process for the

The fact that the aquifer must remain full in order to provide this discharge poses a dilemma for managing tributary ground water. If full aquifer discharge to the stream is to be maintained, few if any high-capacity wells may tap the aquifer. When, inevitably, high-capacity wells do tap the aquifer, they will first pump the annual recharge, reducing aquifer discharge to the stream (i.e., tributary ground water). Ground water levels will not begin their long-term decline until ground water withdrawals exceed recharge and aquifer discharge to the stream has been stopped. When pumping does exceed recharge, the remaining ground water withdrawn will come from ground water storage.

The implications of this process are profound. The typical recommended ground water management strategy is to draw down the ground water reservoir in dry years and allow recharge to restore ground water supplies in wet years while still maintaining a long-term equilibrium.⁵² But utilizing aquifer storage capacity in this manner must inevitably first capture the aquifer recharge, reducing aquifer discharge and tributary ground water flow ultimately to zero. The fundamental policy issue is that much of the ground water pumping in Nebraska (and in the West) involves the pumping of tributary ground water without regard to its future impact on streamflow.⁵³ The long-run impact of this will be to turn gaining streams into losing streams.⁵⁴

B. Western Water Law

Because it is impossible to escape legal concepts even when discussing hydrologic principles, a brief lesson in surface water law terminology is needed. The major surface water law doctrine in the West is "prior appropriation." Under the prior appropriation doctrine, water rights are acquired, not as an incident of land ownership, but by diverting water from a stream for beneficial use. Conflicts are generally resolved on the basis of *priority*: the earliest or "senior" appro-

affected NRDs and the DNR to develop an integrated management plan to regulate existing surface and ground water uses. *Id.* §§ 46-715 to -718. In making the fully-appropriated determination, the DNR director must evaluate "the expected long-term availability of hydrologically connected water supplies for both existing and new surface water uses and existing and new ground water uses." *Id.* § 46-713(1)(a). The DNR must also identify geographic areas within which the DNR believes "surface and ground water to be hydrologically connected" and "the extent to which the then-current uses affect available near-term and long-term water supplies." *Id.* § 46-713(1)(a)(ii)-(iii). In other words, the DNR will have to consider *inter alia* whether current ground water uses will deplete streamflow in the short term and long term.

52. Corker, *supra* note 28, at 75-78; Dellapenna, *supra* note 7, § 18.05.

53. INTEGRATED MANAGEMENT, *supra* note 13, at 65-66; Glennon & Maddock, *supra* note 25, § 22.03.

54. See Glennon & Maddock, *supra* note 25, at 22-8 to -9, -22.

priator has a better right over subsequent or "junior" appropriators. In its modern version, appropriative water rights are acquired by application to the 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. In some western states, senior appropriators may request priority administration from the state engineer by placing a priority call. The state engineer's office will shut off diversions by sufficient upstream junior appropriators until there is sufficient streamflow for the senior. Even in times of shortage, the senior appropriator is entitled to the full amount of her appropriation, even if the appropriator's irrigation practices are inefficient according to current practices.⁵⁵

In the West, ground water rights are either appropriative (usually statutory) or based on the common law. The common law ground water theories are collectively referred to as "overlying rights" theories because they are all based on owning land overlying the ground water supply. The common law theories are "absolute ownership" (followed in Texas), "reasonable use" (followed in Arizona), and "correlative rights" (followed in California and Nebraska).⁵⁶ In overlying rights jurisdictions, courts sometimes recognize ground water as either percolating or as water in an underground stream.⁵⁷ Some courts also recognize the subflow doctrine, in which the ground water in close hydrologic contact with the stream is legally considered part of the stream.⁵⁸ These categories, long criticized as being unscientific,⁵⁹ nonetheless serve a useful function in that they provide a sometimes crude method for integrating HC surface and ground water. Finally, the tributary ground water doctrine has been recognized in Colorado, and to a lesser extent in California.⁶⁰ Under the underground stream, subflow, and tributary ground water doctrines, the ground water is considered to be legally part of the stream and therefore (in the West)

55. See generally HARNSBERGER & THORSON, *supra* note 5, ch. 3; TARLOCK, *supra* note 6, ch 5.

56. See TARLOCK, *supra* note 6, §§ 4:6-:18; Aiken, *supra* note 12, at 548-49, 557-79.

57. HARNSBERGER & THORSON, *supra* note 5, at 13-14; TARLOCK, *supra* note 6, §§ 4:5, 4:35; Davis, *supra* note 13, at 201-04; Dellapenna, *supra* note 7, § 19.05; Harnsberger, *Problems*, *supra* note 7, at 726-31; Widman, *supra* note 16, at 530-31.

58. HARNSBERGER & THORSON, *supra* note 5, at 12-13; WELLS A. HUTCHINS, SELECTED PROBLEMS IN THE LAW OF WATER RIGHTS IN THE WEST 152 (U.S. Dep't of Agric., Misc. Publ'n No. 418, 1942); TARLOCK, *supra* note 6, § 4:35.

59. RESTATEMENT (SECOND) OF TORTS § 858 (1979); HARNSBERGER & THORSON, *supra* note 5, at 14; TARLOCK, *supra* note 6, § 4:35; Aiken, *supra* note 12, at 547-48; Corker, *supra* note 28, at 147; Dellapenna, *supra* note 7, § 19.05.

60. HUTCHINS, *supra* note 58, at 165; TARLOCK, *supra* note 6, §§ 6:16-:17; Dellapenna, *supra* note 7, § 19.05(a)(4); Widman, *supra* note 16, at 531-32.

subject to prior appropriation.⁶¹ This is particularly important in overlying rights jurisdictions where appropriation does not apply to ground water in general.

A brief discussion of the extent of these doctrines is merited because whether section 858 of the *Restatement (Second) of Torts* will be applied only to subflow or will be applied more generally to all tributary ground water is a significant issue.⁶² The subflow of a surface stream is a fairly narrow band of ground water, basically the ground water that is in close hydrologic contact to the stream. In Arizona, the traditional test of whether ground water is subflow was stated in *Maricopa County Municipal Water Conservation District No. 1 v. Southwest Cotton Co.*:⁶³

Does drawing off the subsurface water tend to diminish appreciably and directly the flow of the surface stream? If it does, it is subflow, and subject to the same rules of appropriation as the surface stream itself; if it does not, then, although it may originally come from the waters of such stream, it is not, strictly speaking, a part thereof, but is subject to the rules applying to percolating waters.⁶⁴

In recent Arizona stream adjudication proceedings,⁶⁵ ground water users sought to be excluded on the basis that they were withdrawing percolating ground water and not subflow. The issue then was what test would meet the *Southwest Cotton* criteria of a subflow withdrawal which would "tend to diminish appreciably and directly the flow of the surface stream."⁶⁶ A 50%/90 day standard was proposed by the Arizona Department of Water Resources ("ADWR"). This meant if the volume of stream depletion would reach fifty percent of the total ground water pumped within ninety consecutive days, the ground water was subflow and therefore subject to appropriation (including the assignment of a priority date junior to most if not all direct surface water appropriators). This administrative test was rejected in *Gila River II*⁶⁷ as being broader than the *Southwest Cotton* test.⁶⁸ Upon remand, the ADWR developed a revised subflow standard which, simply stated, may be broadly described as limiting subflow to ground

61. Aiken, *supra* note 12, at 547-48; Frank J. Trelease, *Conjunctive Use of Groundwater and Surface Water*, 27 ROCKY MTN. MIN. L. INST. 1853, 1856-57 (1982).

62. See *infra* Part IV.

63. 4 P.2d 369 (1931).

64. *Id.* at 380-81. For historical background on *Southwest Cotton*, see Leshy & Belanger, *supra* note 15, at 671-90.

65. In streamwide adjudication proceedings, the state engineer will require all would-be appropriators to file their claims with the state, and the state will then adjudicate whether the claimants have complied with appropriation requirements and determine priority dates and quantities appropriated. See generally TARLOCK, *supra* note 6, ch. 7.

66. *Southwest Cotton*, 4 P.2d at 380.

67. *In re Gen. Adjudication of All Rights to Use Water in the Gila River Sys. & Source (Gila River II)*, 857 P.2d 1236 (Ariz. 1993).

68. *Id.* at 1244-48.

water pumping from the saturated floodplain of the stream. This approach was judicially approved in *Gila River IV*.⁶⁹ The court noted that if the 50%/90 day test had been followed, it would have defined pumping from the entire river valley as subflow.⁷⁰

This litigation illustrates the difference between subflow and tributary ground water. Subflow is a fairly narrow band of land (perhaps as much as half a mile, but rarely more than that) bordering a stream where pumping from a well would affect streamflow within minutes, hours, or possibly days. Tributary ground water is all the HC ground water miles away from the stream that flows towards the stream and provides the stream's baseflow. *Gila River II* and *IV* provide some insight into how hotly the question of what constitutes subflow (and, consequently, which wells would be treated as subflow wells), and which non-subflow wells would be largely unregulated under the Arizona common law doctrine of reasonable use. One can envision a similar conflict emerging where Nebraska ground water users seek to narrow the number of wells possibly subject to section 858 liability for unreasonably interfering with streamflow.⁷¹

C. Nebraska Water Law

Nebraska follows prior appropriation for surface water law,⁷² and a combination of common law and the GWMPA for ground water.⁷³ Surface water rights are administered by the DNR,⁷⁴ while under the GWMPA, local Natural Resource Districts ("NRDs") have the option to regulate ground water development and use.⁷⁵ Seasonal disputes between high-capacity wells has been reduced through well spacing requirements.⁷⁶ The DNR (and its predecessors) have traditionally had

69. *In re Gen. Adjudication of All Rights to Use Water in the Gila River Sys. & Source (Gila River IV)*, 9 P.3d 1069, 1076-81 (Ariz. 2000). The court admitted that subflow is a legal and not a scientific concept. *Id.* at 1076.

70. *Id.* at 1074. Both Glennon and Maddock, *see supra* note 14, and Leshy and Balingier, *see supra* note 15, argued in favor of the broadest definition of subflow.

71. Alternatively, ground water users may seek to have section 858 ground water judicially defined differently than the DNR's administrative definition of HC ground water. *See supra* text accompanying notes 10-12.

72. NEB. CONST. art. XV, § 6; NEB. REV. STAT. §§ 46-201 to -2,138 (Reissue 2004 & Supp. 2005); *see* HARNSEBERGER & THORSEN, *supra* note 5, ch. 3.

73. *See* NEB. REV. STAT. §§ 46-601 to -753; HARNSEBERGER & THORSEN, *supra* note 5, ch. 5; J. David Aiken, *Nebraska Ground Water Law and Administration*, 59 NEB. L. REV. 917 (1980). For a brief review of Nebraska tributary ground water law prior to *Spear T Ranch*, *see* Aiken, *supra* note 12, at 579-91.

74. NEB. REV. STAT. §§ 61-201 to -217 (Reissue 2003 & Cum. Supp. 2004 & Supp. 2005). *See generally* HARNSEBERGER & THORSEN, *supra* note 5, §§ 3.16-20; Aiken, *supra* note 73, at 973.

75. NEB. REV. STAT. §§ 46-709 to -711, -739 to -741; *see* HARNSEBERGER & THORSEN, *supra* note 5, §§ 6.21-25; Aiken, *supra* note 73, at 960-67.

76. NEB. REV. STAT. § 46-651; *see* HARNSEBERGER & THORSON, *supra* note 5, § 5.13; Aiken, *supra* note 73, at 948-50, 978-80.

a small ground water role, with the greater discretion entrusted to locally-elected NRDs.⁷⁷ However, NRDs were not actively regulating ground water development (well drilling) or use (pumping restrictions) until recently. For many years, only one NRD restricted well drilling and ground water withdrawals,⁷⁸ although two NRDs began regulating ground water withdrawals in the 2005 irrigation season.⁷⁹

However, the DNR's role was broadened dramatically in 2004, with statutory authority to determine all or portions of river basins as being fully-appropriated. This new authority meant the DNR had automatic bans on new wells or surface water appropriations.⁸⁰ The water quantity focus of the GWMPA had been on ground water depletion exclusively until 1996, when NRDs were given the option to regulate ground water withdrawals to protect streamflows.⁸¹ Now, however, the impact of tributary ground water depletions is considered in the

77. See Aiken, *supra* note 73, at 974–75. For the NRD GWMPA regulatory authorities, see NEB. REV. STAT. §§ 46-739 to -740.

78. The Upper Republican has regulated ground water withdrawals since 1980. See Aiken, *supra* note 73, at 963–65. The Upper Republican NRD allocation is 13.5 inches per irrigated acre, beginning with the 2005 irrigation season. NEB. DEP'T OF NATURAL RES. & UPPER REPUBLICAN NATURAL RES. DIST., INTEGRATED MANAGEMENT PLAN 16, R. 8.01, http://www.dnr.state.ne.us/LB962/NRD/UpperRep/Final_IMP05.pdf (last visited Feb. 14, 2006). The Upper Republican Integrated Management Plan ("IMP") was adopted by the NRD on May 3, 2005, and was approved by the DNR on May 9, 2005. *In re* Upper Republican Natural Res. Dist. Integrated Mgmt. Plan, Order Adopting Integrated Management Plan and Associated Surface Water Controls (May 9, 2005), <http://www.dnr.state.ne.us/LB962/NRD/UpperRep/URNRDOOrderFinal5-9-05.pdf> (last visited Feb. 14, 2006).

79. The Middle Republican NRD instituted a ground water allocation of thirteen inches per irrigated acre beginning with the 2005 irrigation season. MIDDLE REPUBLICAN NATURAL RESOURCES DISTRICT, INTEGRATED MANAGEMENT PLAN AND ASSOCIATED RULES, R. 5-3.7 (Nov. 9, 2004), http://www.dnr.state.ne.us/LB62/NDR/MiddleRep/MRNRD_IMP_FINAL_0105.pdf (last visited Feb. 14, 2006). The Middle Republican IMP was approved by the DNR on December 16, 2004. *In re* Middle Republican Natural Res. Dist. Integrated Mgmt. Plan, Order Adopting Integrated Management Plan and Associated Surface Controls (Dec. 16, 2004), http://www.dnr.state.ne.us/LB962/NRD/MiddleRep/MRNRD_IMP_Order_1204.pdf (last visited Feb. 14, 2006).

The Lower Republican NRD instituted a ground water allocation of twelve inches per irrigated acre in the western portion of the NRD and eleven inches per irrigated acre in the eastern portion of the NRD beginning with the 2005 irrigation season. LOWER REPUBLICAN NATURAL RESOURCES DISTRICT, GROUND WATER MANAGEMENT RULES AND REGULATIONS AND INTEGRATED MANAGEMENT PLAN, R. 7-2.2, http://www.dnr.state.ne.us/LB962/NRD/LowerRep/LRNRDRules_IMP_Final5-19-05.pdf (last visited Feb. 14, 2006). The Lower Republican IMP was adopted by the NRD on May 19, 2005, and approved by the DNR May 23, 2005. *In re* Lower Republican Natural Res. Dist. Integrated Mgmt. Plan, Order Adopting Integrated Management Plan and Associated Surface Water Controls (May 23, 2005), http://www.dnr.state.ne.us/LB962/NRD/LowerRep/LRNRDOOrder_IMP_5-23-05.pdf (last visited Feb. 14, 2006).

80. See *supra* note 51 and accompanying text.

81. See *supra* note 50 and accompanying text.

DNR's designation of all or part of river basins as fully-appropriated.⁸²

III. *SPEAR T RANCH v. KNAUB*

The above discussion (how significant ground water development inevitably reduces aquifer discharge to streams prior to ground water declines)⁸³ is largely new information, at least in Nebraska water law circles. Consequently, none of this analysis was presented to the *Spear T Ranch* court. Rather, the court only had a relatively thin legal literature⁸⁴ and a set of briefs that seemed determined to avoid analyzing the issue of how tributary ground water should be legally treated. From at least the 1930s until the mid-1960s (when local ground water irrigation development began), Pumpkin Creek, the source of the plaintiff's appropriations, flowed between 20,000 and 30,000 acre-feet of water annually.⁸⁵ In 1998, after over 500 irrigation wells had been installed and operated within the Pumpkin Creek watershed, average annual streamflows fell to less than 10,000 acre-feet.⁸⁶ The plaintiff surface appropriator argued that defendants' junior ground water withdrawals interfered with plaintiff's senior surface

82. NEB. REV. STAT. § 46-713(1)(a)(ii).

83. See *supra* section II.A.

84. The literature on tributary ground water law outside of Colorado and Arizona is thin. The leading general articles, Davis, *supra* note 13; Trelease, *supra* note 61; Grant, *supra* note 23, offer little advice that would have been helpful to the *Spear T Ranch* court. The more recent work of Professor Robert Glennon has significantly raised the visibility of the long-term consequences of ignoring the impact of tributary ground water withdrawals on streamflow. See GLENNON, *supra* note 16; Robert Glennon, *Pinching Straws: Reforming Groundwater and Surface Water Law to Protect the Environment*, 49 ROCKY MTN. MIN. L. INST. 7A-1 (2003); Glennon & Maddock, *supra* note 25. For Arizona references, see Glennon & Maddock, *supra* note 14; Leshy & Belanger, *supra* note 15. For Colorado references, see Harrison & Sandstrom, *supra* note 23; William H. Hillhouse II, *Integrating Ground and Surface Water Use in an Appropriation State*, 20 ROCKY MTN. MIN. L. INST. 691 (1975); Ramsey L. Kropf, *Colorado Groundwater Law: Integration (Or Not?) of Groundwater and Surface Water*, 49 ROCKY MTN. MIN. L. INST. 7B-1 (2003); Lawrence J. MacDonnell, *Colorado's Law of "Underground Water": A Look at the South Platte Basin and Beyond*, 59 U. COLO. L. REV. 579 (1988). While all these articles provide useful background, none point to an obvious solution to the *Spear T Ranch* controversy.

85. Sievers, *supra* note 9, at 14-15.

86. *Id.* at 15. It is not clear how much of the reduced Pumpkin Creek streamflow is related to drought and how much is related to improved soil conservation practices that reduce overland runoff. Bentall & Shaffer, *supra* note 2, at 14. However, if Pumpkin Creek were an average Nebraska stream receiving half its flow from aquifer discharge, the loss of seventy-five percent of the flow certainly suggests that the stream's base flow has been reduced. Regarding the ground water contribution to Nebraska streams, see *supra* note 5.

water appropriations⁸⁷ for irrigation and livestock watering, and that Nebraska courts could adjudicate such claims.⁸⁸ Defendant ground water irrigators contended that such disputes were within the exclusive legal jurisdiction of the DNR and NRDs under the GWMPA.⁸⁹ Plaintiff's reply brief argued that its lawsuit was not precluded by the GWMPA.⁹⁰

The defendant ground water irrigators and their amici successfully framed the issue of whether courts had legal jurisdiction over disputes between competing surface water appropriators and ground water users, which had the effect of largely precluding any significant analysis of what legal rule should be followed in adjudicating such disputes. Amici NRD coalition argued, for example, that the factual complexity of tributary ground water disputes suggested that such disputes were better reserved to legislative and administrative action, instead of litigation.⁹¹ The Nebraska Attorney General argued that the DNR was not obliged to protect surface water appropriators from the effects of ground water pumping.⁹² In response, amici irrigation district coalition argued that the NRD regulation under the GWMPA was optional, not mandatory, and that the GWMPA did not preclude judicial resolution of the *Spear T Ranch* case.⁹³ Amici Central Nebraska Public Power and Irrigation District ("CNPPID") pointed out that courts in other western states had adjudicated disputes between competing surface water users and ground water users, and argued that the Ne-

87. *Spear T Ranch* held two surface water appropriations with priority dates of November 16, 1954, and December 21, 1956. Sievers, *supra* note 9, at 15. This would make *Spear T Ranch*'s appropriations senior to virtually every irrigation well in the Pumpkin Creek valley. See Aiken, *supra* note 73, at 951, 957 (discussing the center pivot boom in ground water irrigation development in the 1960s and 1970s); Harnsberger et al., *Comprehensive Management*, *supra* note 7, at 198-203 (discussing the growth in ground water irrigation from 1950 to 1972); Leslie F. Sheffield & Brad Rundquist, *Circles of Green on the Plains: Frank Zymbach, Valmont & the Center Pivot Revolution*, in *FLAT WATER: A HISTORY OF NEBRASKA AND ITS WATER* 132-33 (Charles A. Flowerday ed., 1993) (discussing the invention of center pivot irrigation system and its impact on Nebraska ground water development).

88. Brief for Plaintiff-Appellant at 8-9, 16-17, 25-34, *Spear T Ranch*, 269 Neb. 177, 691 N.W.2d 116 (No. A-03-000789).

89. Joint Brief for Appellees at 21-39, *Spear T Ranch*, 269 Neb. 177, 691 N.W.2d 116 (No. A-03-000789).

90. Reply Brief for Plaintiff-Appellant at 1, *Spear T Ranch*, 269 Neb. 177, 691 N.W.2d 116 (No. A-03-000789).

91. Brief of Amicus Curiae Nebraska Groundwater Management Coalition at 10-14, *Spear T Ranch*, 269 Neb. 177, 691 N.W.2d 116 (No. A-03-000789).

92. Brief of Amicus Curiae Nebraska Attorney General at 3-8, *Spear T Ranch*, 269 Neb. 177, 691 N.W.2d 116 (No. A-03-000789).

93. Brief of Amici Curiae Pathfinder Irrigation District et al. at 10-20, *Spear T Ranch*, 269 Neb. 177, 691 N.W.2d 116 (No. A-03-000789).

braska Supreme Court should follow these precedents.⁹⁴ The Nebraska State Irrigation Association ("NSIA") argued that when the United States Supreme Court accepted the Special Master's report in *Kansas v. Nebraska and Colorado*,⁹⁵ the Court "acknowledged not only the physical connection [between tributary ground water and surface water] but [also] the legal obligation of Nebraska to regulate groundwater users for the benefit of surface water users in Kansas."⁹⁶ The NSIA also argued that the United States Supreme Court ruling in *Texas v. New Mexico*⁹⁷ imposed a similar requirement on Texas to restrict its ground water use in order to meet interstate compact water delivery obligations to New Mexico.⁹⁸ The NSIA finally argued that the Nebraska correlative rights doctrine was not inconsistent with judicial resolution of conflicts between users of surface water and tributary ground water.⁹⁹ The City of Lincoln, which had applied for induced ground water recharge appropriation permits for its Platte

94. Brief of Amicus Curiae Central Nebraska Public Power & Irrigation District at 4-13, *Spear T Ranch*, 269 Neb. 177, 691 N.W.2d 116 (No. A-03-000789). The CNPPID, which operates the Kingsley Reservoir and Lake McConaughy on the Platte River near Sutherland, Nebraska, has sued the DNR for failing to regulate junior ground water withdrawals, reducing North Platte River inflows into Lake McConaughy. Sievers, *supra* note 9, at 17. On April 21, 2005, the CNPPID filed a complaint seeking to intervene in the *Spear T Ranch* trial on the theory that any ground water pumping that depletes Pumpkin Creek also depletes the flow of the North Platte River. Pumpkin Creek is tributary to the North Platte River, and the North Platte River is a major component of the CNPPID's appropriative water supply. Complaint, *Spear T Ranch*, 269 Neb. 177, 691 N.W.2d 116 (No. CI 03-16, District Court of Morrill County) (on file with the NEBRASKA LAW REVIEW).

95. 530 U.S. 1272 (2000). Regarding the *Kansas v. Nebraska and Colorado* decision and subsequent settlement, see Aaron M. Popelka, Note, *The Republican River Dispute: An Analysis of the Parties' Compact Interpretation and Final Settlement Stipulation*, 83 NEB. L. REV. 596 (2004).

96. Brief of Amicus Curiae Nebraska State Irrigation Association at 4, *Spear T Ranch*, 269 Neb. 177, 691 N.W.2d 116 (No. S-03-000789) [hereinafter NSIA Brief].

97. 446 U.S. 540 (1980).

98. NSIA Brief, *supra* note 96, at 6-7. The NSIA also discussed the Blue River Compact, under which Nebraska is required to restrict ground water users during times of shortage in order to make compact water deliveries to Kansas. *Id.* at 7-8; see also Blue River Basin Compact, NEB. REV. STAT. § 1-115 art. V, § 5.2(b)(4) (Reissue 1997) (providing that Nebraska must restrict both surface water withdrawals and ground water withdrawals from wells within one mile of the stream that are junior to November 1, 1968). Amicus Nebraska Farm Bureau contended that none of the United States Supreme Court decisions cited by the NSIA made junior ground water users subject to the claims of senior surface appropriators. Brief of Amicus Curiae Nebraska Farm Bureau Federation at 5-7, *Spear T Ranch*, 269 Neb. 177, 691 N.W.2d 116 (No. S-03-000789).

99. NSIA Brief, *supra* note 96, at 8-10. In fact, the California correlative rights doctrine, upon which the Nebraska correlative rights doctrine is based, correlates the interrelated rights of surface and ground water users utilizing a common water supply. See Aiken, *supra* note 12, at 567-73.

River wellfield,¹⁰⁰ argued that the GWMPA gave NRDs no authority to adjudicate water right disputes,¹⁰¹ that tributary ground water was legally part of a stream,¹⁰² and that junior tributary ground water users were junior to senior surface appropriators.¹⁰³ The Nebraska Supreme Court requested an additional round of briefing and argument regarding the issues of primary jurisdiction and the effect of L.B. 962's enactment in 2004 on the case.¹⁰⁴

The Nebraska Supreme Court characterized the case as involving whether the plaintiff had a cause of action, whether that claim was abrogated by the GWMPA, and whether NRDs had primary jurisdiction over the dispute.¹⁰⁵ After reviewing the case's procedural history,¹⁰⁶ the court began its analysis of Nebraska tributary ground water law. The court forthrightly acknowledged that surface water and ground water are hydrologically interrelated.¹⁰⁷ The court also acknowledged the legal and institutional confusion for dealing with surface water and tributary ground water: surface water law is based on prior appropriation and is administered state-wide by the DNR, while ground water is allocated by common law rules, the GWMPA, and local NRD regulations.¹⁰⁸

The first issue addressed by the court was whether the plaintiff could state a claim for relief, either under the theory of appropriation or of conversion.¹⁰⁹ The court declined to apply the appropriation doctrine to tributary ground water, stating that to do so would require the court to adopt the underground stream doctrine which the court char-

100. Application A-17312, Nebraska Department of Natural Resources. See NEB. REV. STAT. §§ 46-226.03(4), -228, -233, -235, -235.01 to -235.04, -237 (Reissue 2004); DEPT OF NATURAL RES., STATE OF NEB., FIFTY-FOURTH BIENNIAL REPORT FOR 2001-2002 TO THE GOVERNOR ON THE DEPARTMENT OF NATURAL RESOURCES 91, 93, 421, 442 (2002) (on file with the NEBRASKA LAW REVIEW). Section 46-226.03(4) defines induced recharge as follows: "Induced ground water recharge means the process by which ground water withdrawn from wells near a natural stream is replaced by surface water flowing in the stream." NEB. REV. STAT. § 46-226.03(4).

101. Brief of Amicus Curiae City of Lincoln, Nebraska at 2-10, *Spear T Ranch*, 269 Neb. 177, 691 N.W.2d 116 (No. A-03-000789).

102. *Id.* at 12-18.

103. *Id.* at 18-19. Amicus Reban Corporation also argued that the appropriation doctrine applied to surface water and tributary ground water. Brief of Amicus Curiae Reban Corporation at 1-7, *Spear T Ranch*, 269 Neb. 177, 691 N.W.2d 116 (No. A-03-000789).

104. *Spear T Ranch*, 269 Neb. at 182, 691 N.W.2d at 124.

105. *Id.* at 181, 691 N.W.2d at 124.

106. *Id.* at 181-82, 691 N.W.2d at 124.

107. *Id.* at 183, 691 N.W.2d at 125. However, the court did not discuss the importance of time lags between ground water withdrawals and the resulting reductions in streamflow. See Grant, *supra* note 23, at 74-80. The court also did not review its own past efforts regarding HC ground water issues. See Aiken, *supra* note 12, at 579-86.

108. *Spear T Ranch*, 269 Neb. at 183-84, 691 N.W.2d at 125.

109. *Id.* at 184-86, 691 N.W.2d at 126-27.

acterized as a legal fiction.¹¹⁰ The court also noted that there was no statutory basis in Nebraska for extending the appropriation doctrine to tributary ground water.¹¹¹ Finally, the court observed that extending the appropriation doctrine to tributary ground water could "have the effect of shutting down all wells in any area where surface water appropriations are hydrologically connected to ground water."¹¹² For these reasons the court declined to apply the appropriation doctrine to tributary ground water.¹¹³ The court also concluded that the plaintiff did not state a claim for conversion or trespass.¹¹⁴

The court then considered whether the plaintiff could state a different common law claim. The court ably reviewed the common law ground water law theories of absolute ownership, reasonable use, correlative rights, and "eastern correlative rights" (which in essence is the *Restatement* rule).¹¹⁵ The court then began a more detailed consideration of the *Restatement* rule for resolving ground water disputes: section 858.¹¹⁶ The court quoted from the *Restatement* comments that "the general rule is phrased in terms of nonliability in order to carry forward the policy of . . . permitting more or less unrestricted development of the [ground water] resource by those who have access to it."¹¹⁷

110. *Id.* at 184–85, 691 N.W.2d at 126; *see also* Aiken, *supra* note 12, at 553–54, 557–58, 566–67, 575–76 (arguing that the tributary ground water doctrine, in fact, has a significant basis in reality in describing streams such as the Platte River which disappear and reappear during droughts).

111. *Spear T Ranch*, 269 Neb. at 185, 691 N.W.2d at 126. The court ignored the fact that California includes tributary ground water within its correlative rights doctrine, and that Nebraska ground water law has adopted the correlative rights doctrine at least in dicta. *See* NEB. REV. STAT. § 46-702 (Reissue 2004) (providing for legislative adoption of correlative rights doctrine); HARNSEBERGER & THORSON, *supra* note 5, at 267; Aiken, *supra* note 12, at 567–73; Harnseberger, *Problems*, *supra* note 7, at 730.

112. *Spear T Ranch*, 269 Neb. at 185, 691 N.W.2d at 126. This comment ignores two major points: (1) that junior tributary ground water users could be required to pay damages to injured senior surface appropriators in order to continue their ground water pumping; and (2) that tributary ground water users could avoid priority administration, for example, having their pumping restricted, by providing a substitute source of water to senior surface appropriators. *See generally* MacDonnell, *supra* note 84 (discussing how these policies have been implemented in tributary ground water disputes on the South Platte River in Colorado). The court also seemed to ignore the fact that plaintiff requested damages for defendants' interference with its surface water rights. *Spear T Ranch*, 269 Neb. at 181, 691 N.W.2d at 124.

113. *Spear T Ranch*, 269 Neb. at 185, 691 N.W.2d at 126.

114. *Id.* at 185–86, 691 N.W.2d at 126–27.

115. *Id.* at 186–89, 691 N.W.2d at 127–29. The court did not acknowledge that California courts have used the correlative rights doctrine to resolve disputes involving the interrelated rights of surface and ground water users utilizing a common water supply. *See* Aiken, *supra* note 12, at 567–73.

116. *Spear T Ranch*, 269 Neb. at 189–92, 691 N.W.2d at 129–31.

117. *Id.* at 190, 691 N.W.2d at 130 (quoting RESTATEMENT (SECOND) OF TORTS § 858 cmt. b (1979)).

This statement accurately describes Nebraska's historic approach to ground water allocation, and in this regard section 858 is a more appropriate policy choice than, say, prior appropriation.¹¹⁸ The court noted that section 858 differs from the common law ground water doctrines in that it embraces conflicts between users of surface water and HC ground water.¹¹⁹ The court also noted that section 858 balances the equities and hardships between competing water users on a case-by-case basis, unlike the reasonable use doctrine and similarly to the correlative rights doctrine.¹²⁰

Given that Nebraska's local control approach to ground water management has led to few constraints on ground water development for irrigation, it is probably appropriate to seek integration of HC surface and ground water uses by balancing the equities rather than by woodenly following priority. Of course, this means that outcomes will neither be clear nor easily anticipated—a consistent criticism of section 858.¹²¹ But section 858 will allow juries and judges to balance the equities when defendants have made their irrigation development decisions with virtually no expectation that their irrigation wells might, within a few decades, begin to deplete streamflow of a river miles away.

The *Spear T Ranch* court listed the factors from section 850A for determining the reasonableness of a new interfering use, which are the *Restatement* factors for resolving surface water disputes among competing riparians, as well as the factors for resolving disputes involving HC surface and ground water.

The determination of the reasonableness of a use of water depends upon a consideration of the interests of the riparian proprietor making the use, of any riparian proprietor harmed by it and of society as a whole. Factors that affect the determination include the following:

- (a) The purpose of the use,
- (b) the suitability of the use to the watercourse or lake,
- (c) the economic value of the use,
- (d) the social value of the use,
- (e) the extent and amount of harm it causes,
- (f) the practicality of avoiding the harm by adjusting the use or method of use of one proprietor or the other,

118. Clearly the tributary ground water doctrine, under which ground water tributary to the stream is legally considered to be part of the stream, more closely mirrors hydrologic reality, as argued by Professor Glennon. See Glennon & Maddock, *supra* note 25, at 22-32 to -35. However, given that Nebraska ground water users historically have faced few development constraints, it seems fairer to put surface water appropriators and ground water users on a more or less equal footing legally, which the section 858 approach of balancing the equities essentially does.

119. *Spear T Ranch*, 269 Neb. at 189-190, 691 N.W.2d at 129-130.

120. *Id.* at 190, 691 N.W.2d at 130.

121. See, e.g., John S. Lowe et al., *Beyond Section 858: A Proposed Ground-Water Liability and Management System for the Eastern United States*, 8 *ECOLOGY L.Q.* 131, 140-47 (1979).

(g) the practicality of adjusting the quality of water used by each proprietor,

(h) the protection of existing values of water uses, land, investments, and enterprises, and

(i) the justice of requiring the user causing the harm to bear the loss.¹²²

Finally, the court adopted section 858(1)(c) to govern conflicts between users of HC surface water and ground water.

Initially we reject a rule that would bar a surface water appropriator from recovering in all situations. Such a rule would ignore the hydrological fact that a ground water user's actions may have significant, negative consequences for surface water appropriators.

Instead, the common law should acknowledge and attempt to balance the competing equities of ground water users and surface water appropriators; the Restatement approach best accomplishes this. The Restatement recognizes that ground water and surface water are interconnected and that in determining the rights and liabilities of competing users, the fact finder needs broad discretion. Thus, when applying the Restatement, the fact finder has flexibility to consider many factors such as those listed in [section] 850A, along with other factors that could affect a determination of reasonable use.¹²³

The court noted that Professor Harnsberger has recommended adoption of the *Restatement* rule.¹²⁴ The court stated the Nebraska HC ground water rule as:

A proprietor of land or his [or her] grantee who withdraws ground water from the land and uses it for a beneficial purpose is not subject to liability for interference with the use of water of another, unless . . . the withdrawal of the ground water has a direct and substantial effect upon a watercourse or lake and unreasonably causes harm to a person entitled to the use of its water.¹²⁵

The court intended an expansive view of the section 858 reasonableness test, emphasizing that "the text is flexible and that a trial court should consider any factors it deems relevant."¹²⁶

The court then offered some guidance on remedies. Acknowledging that it might take years for a stream to recover if the pumping of HC wells were enjoined, the court stated that an injunction in such circumstances "would be unreasonable and inequitable."¹²⁷ The court also suggested that the trial court consider the possibility of the sur-

122. *Spear T Ranch*, 269 Neb. at 192, 691 N.W.2d at 131 (quoting RESTATEMENT (SECOND) OF TORTS § 850A).

123. *Id.* at 193, 691 N.W.2d at 131–32.

124. *Id.* at 194, 691 N.W.2d at 132 (citing Harnsberger et al., *Comprehensive Management*, *supra* note 7). For Professor Harnsberger's discussion of the *Restatement*, see Harnsberger et al., *Comprehensive Management*, *supra* note 7, at 252–54. This recommendation is echoed in HARNSEBERGER & THORSON, *supra* note 5, at 266–68. In fact, in 1986 the Nebraska Natural Resources Commission also recommended adoption of the *Restatement* rule in its important Integrated Management study. INTEGRATED MANAGEMENT, *supra* note 13, at iii–iv.

125. *Spear T Ranch*, 269 Neb. at 194, 691 N.W.2d at 132 (citing RESTATEMENT (SECOND) OF TORTS § 858(1)(c)) (alterations in original).

126. *Id.* at 194, 691 N.W.2d at 132.

127. *Id.*

face water user obtaining a well as a remedy for the loss of stream-flow.¹²⁸ The court concluded that *Spear T Ranch*'s complaint did not state a claim under the new *Spear T Ranch* rule, but determined that the plaintiff should be allowed to amend its complaint.¹²⁹

The court finally addressed the assertion that the GWMPA had abrogated the plaintiff's claim against HC ground water pumpers and appropriately concluded that it had not.¹³⁰ The court concluded with the statement that, "We adopt Restatement (Second) of Torts [sections] 858 and 850A (1979) for resolving disputes between users of hydrologically connected ground water and surface water," and remanded the case for further proceedings.¹³¹ We turn next, in Part IV, to a consideration of sections 858 and 850A and how they may be applied to disputes involving HC surface and ground water in Nebraska.

IV. THE RESTATEMENT RULE

A brief review of the origin of section 858 will aid in understanding how the *Restatement* rule might be applied to HC surface and ground water disputes in Nebraska. Dean Frank Trelease was the Associate Editor for the water rights sections of the *Restatement (Second) of Torts*, and unsuccessfully argued for a uniform rule of priority for resolving riparian water disputes. While this priority proposal was rejected, protection of prior uses remained a core principle in section 850A.¹³² Professor Dan Tarlock believes that prior uses will be protected against subsequent uses under section 850A if the plaintiff can prove "substantial interference" with plaintiff's prior use.¹³³

In introducing section 850A, Trelease is unabashed in stating that the *Restatement* rule seeks to encourage putting water to use.¹³⁴ The section 850A concept of reasonableness applies to both the competing

128. *Id.* Interesting issues will need to be addressed if the area in question has been closed to new wells due to NRD ground water management area regulations or designation of the stream as either over-appropriated or fully appropriated. Essentially if a surface water plaintiff is to be allowed a new irrigation well (or wells), the defendants probably would have to, in effect, retire an offsetting number of irrigation wells in the same area in order to obtain either judicial relief or administrative approval from the well drilling prohibition.

129. *Id.* at 194-95, 691 N.W.2d at 132-33.

130. *Id.* at 195-201, 691 N.W.2d at 133-36. The court also concluded that the 2004 GWMPA amendments, L.B. 962, were not retroactive and thus did not affect the *Spear T Ranch* court's decision. *Id.* at 201, 691 N.W.2d at 136-37. The court also ruled that the plaintiff's suit was not precluded by the primary jurisdiction doctrine, and that plaintiff was not required to join all HC ground water pumpers. *Id.* at 201-04, 691 N.W.2d at 137-39.

131. *Id.* at 204, 691 N.W.2d at 139.

132. TARLOCK, *supra* note 6, at 3-119.

133. *Id.* at 3-121 & n.6 (citing several riparian decisions to this effect).

134. RESTATEMENT (SECOND) OF TORTS ch. 2, pt. 3, introductory note, at 216 (1979).

water uses of plaintiff and defendant.¹³⁵ In the usual case, where both uses are reasonable but there is insufficient water to support both uses, courts following the *Restatement* rule will look to the section 850A balancing factors to resolve the conflict.¹³⁶ If the harm can be avoided by adjusting one or both parties' water use, the question is then who should bear the burden of making the change.¹³⁷ Where such water use adjustments do not resolve the conflict, the courts will look at the remaining section 850A(1) factors, including priority of use.¹³⁸ "It is usually unreasonable, in the absence of a clearly overriding title, for a new user to destroy existing [property] values created by a [water] use that was reasonable in its inception."¹³⁹ As to requiring the user who causes the harm to pay for the loss, Trelease writes:

If the defendant's use is of lesser value than that of the plaintiff, he will suffer a smaller loss if his use is held unreasonable than would the plaintiff under the opposite ruling. If the use of the defendant is of greater utility than that of the plaintiff, it may be socially desirable to have the water move to the higher and more valuable use, yet it may be unreasonable for the defendant to enrich himself at the expense of the plaintiff, especially when the greater values created by the defendant give him the means to pay for the harm he has created the plaintiff.¹⁴⁰

In further comments, Trelease writes:

Although few property interests are absolute and unqualified, the law of resource use generally follows a strong policy of encouraging enterprise and development and implements the policy with a system of policy rights that gives some reasonable assurance that the activity will not be subject to premature termination without compensation.¹⁴¹

Regarding the difficult question of who should bear the financial loss, the plaintiff or defendant, Trelease writes:

The court must inquire whether imposing liability upon the innovator [i.e., the junior water user] will discourage or deter desirable progress. Ordinarily it will not. . . . Quite generally, an increase in [public] welfare is not regarded as desirable if it is achieved by the method of impoverishing one person to enrich another. A new use may have much social and economic value, but if it will cause substantial harm by taking the water supply from an existing use,

135. *Id.* § 850A cmt. a.

136. *Id.* Courts will seek to accommodate as many uses as possible. *Id.* The harm to the plaintiff must be substantial. *Id.* (referring to subsection (e)).

137. *Id.* (referring to subsections (f)–(g)).

138. *Id.* (referring to subsection (h)).

139. *Id.*

140. *Id.* (referring to section 850A(1)(i)). Here, Trelease seems to assume that, for example, a municipal or industrial user is interfering with an irrigator, similar to *City of Colorado Springs v. Bender*, 366 P.2d 552 (Colo. 1961). See Trelease, *supra* note 61, at 1870–71. Professor Dellapenna concludes that under section 850(A), "courts will decide whether a use is reasonable by comparing the cost to the plaintiff caused by the defendant's conduct to the cost of the defendant of modifying the defendant's conduct to accommodate the plaintiff's use. This process is necessarily complex and difficult." Dellapenna, *supra* note 7, at 22–42.

141. RESTATEMENT (SECOND) OF TORTS § 850A cmt. k.

even one with less value, it may nevertheless be characterized as unreasonable unless compensation is paid.¹⁴²

This approach would seem to require the junior defendant to pay the senior plaintiff when the other reasonableness factors between plaintiff and defendant are evenly balanced.

Turning to ground water and section 858, Trelease notes that most ground water conflicts involve not an apportionment of an inadequate supply but, rather, disputes about who bears the increased costs to fully utilize an adequate supply.¹⁴³ Regarding section 858(1)(c), Trelease's comments suggest that subflow is the only category of ground water subject to potential liability for interfering with surface water uses, and that tributary ground water pumpers would not be subject to liability under the *Restatement*, suggesting an intent that is significantly narrower than the actual language of section 858(1)(c) itself:

If the withdrawal of *adjacent* ground water has a more or less *immediate* and substantial effect upon the stream of flowing water, it is an interference with the watercourse, *although it occurs outside the channel that defines the watercourse*.¹⁴⁴

The italicized language is significant. First the ground water withdrawn is adjacent to the stream, and presumably not distant from the stream. Second, the effect of pumping on streamflow must be immediate, and presumably not gradual. Finally, the implication of the phrase, "although it occurs outside the channel that defines the watercourse," is that Trelease considers the ground water at issue to legally be surface water, even though the well is located outside the channel of the stream. By implication, wells located miles away from the stream would not be considered surface water, but ground water. All three of these factors point to Trelease's intention that section 858(1)(c) impose liability only on withdrawing subflow and not also on pumping tributary ground water located further from the stream.

Trelease then provides three illustrations of how section 858(1)(c) is to be interpreted. In the first illustration, a junior city installs induced recharge wells near the bank of a "small" river, reducing flows to a downstream riparian surface water user. In this case Trelease says that the city is liable for harm to the downstream riparian.¹⁴⁵

142. *Id.* § 850A cmt. b. Trelease's comments conclude with a brief discussion of whether the defendant has the capacity to bear the costs of compensation, and whether compensation is impractical if the harm is spread among a large number of plaintiffs, each of whom suffer a small harm but whose collective harm is significant. *Id.* § 850A cmt. l.

143. *Id.* ch. 3, pt. 4, introductory note, at 255.

144. *Id.* § 858 cmt. h (emphasis added).

145. *Id.* § 858 cmt. h, illus. 5. One wonders if the outcome would be different if the stream had been a larger stream, and the induced recharge therefore more appropriate to the watercourse. *Cf. id.* § 850A(b) (speaking to "the suitability of the use to the watercourse or lake").

Trelease presumably arrives at this result for two reasons. First, the municipal ground water withdrawal and use is not suitable to the small stream. Second, under Trelease's subflow interpretation of section 858(1)(c), the induced recharge wells are withdrawing surface water and therefore should be legally treated as surface water withdrawals. In the second illustration, farmers located varying distances from a river install irrigation wells that in time reduce the river's flow. None of these wells appear to be induced recharge wells (i.e., subflow wells). Trelease states that the farmers are not liable for the stream depletion effects of their wells, because "they are withdrawing ground water." By this, Trelease presumably means that the ground water withdrawn by the farmers is not surface water, which it would be if it were withdrawn from an induced recharge well (i.e., subflow well), as per the municipal-induced recharge wells in the first illustration.¹⁴⁶ Finally, in the third illustration, large wells "materially reduce" the flow from a spring that supports a "sizeable stream." The junior well owner is liable to the senior downstream riparians.¹⁴⁷ The only apparent difference between reducing the flow of the spring in the third illustration and reducing the flow of tributary ground water in the second illustration is the time factor—reducing the flow of the spring would reduce streamflow quickly (or "immediately" under Trelease's comment to section 858(1)(c)). On the other hand, reducing the flow of tributary ground water to a stream would take years or decades to occur. While Trelease does not explicitly discuss time lags between tributary ground water withdrawals and the consequent streamflow reductions, it would appear to be the only basis for the different outcomes in illustrations two and three.

Recall that the *Spear T Ranch* rule (and the section 858(1)(c) rule) imposes liability for ground water withdrawals unreasonably interfering with surface water uses if the ground water withdrawals have a *direct* and substantial effect upon streamflow. Trelease's comments substantially qualify this, as they refer to withdrawals of "adjacent" ground water that have a "more or less *immediate* and substantial effect" upon streamflow. Trelease's comments suggest a subflow limitation upon section 858(1)(c) instead of a broader tributary ground water interpretation. Under the subflow doctrine, ground water that is in close hydrologic contact with the stream is legally considered to be

146. *Id.* § 858 cmt. h. Would this outcome have changed for Trelease if the wells completely depleted the flow of the stream? *Cf.* Harnsberger et al., *Comprehensive Management*, *supra* note 7, at 252–54 (discussing section 858).

147. RESTATEMENT (SECOND) OF TORTS § 858 cmt. h, illus. 7. This illustration appears to be patterned after *Pecos County Water Control & Improvement Dist. v. Williams*, 271 S.W.2d 503 (Tex. Civ. App. 1954). See Trelease, *supra* note 61, at 1855–56.

part of the stream.¹⁴⁸ Tributary ground water is ground water that would ultimately reach the stream—including, but not limited to, subflow—if not first intercepted by a well.¹⁴⁹ Subflow wells are near enough to the stream to induce recharge from the stream, while tributary wells may be miles away. Trelease's use of "adjacent" to describe the ground water and "more or less immediate and substantial" to describe the effect of the adjacent ground water withdrawals upon streamflow could be a fairly clear reference to the subflow doctrine. Trelease's statement that the irrigators in his second illustration are withdrawing ground water and, by inference, not surface water, strongly suggests that Trelease would exclude tributary ground water pumpers from liability under section 858(1)(c).

It is doubtful that the *Spear T Ranch* court necessarily intended to follow Trelease's lead in this regard. The question of interpretation is whether section 858(1)(c)'s "direct and substantial" are equivalent to "more or less immediate and substantial." There is no issue regarding substantial, which is present in both statements. The question then is whether "direct" and "more or less immediate" mean the same thing. "Direct" and "immediate" both have very similar definitions in relation to causation—a direct cause and an immediate cause both refer to the last or proximate cause which gives a certain result.¹⁵⁰ Immediate also means "without delay" or "instant" as a temporal adjective, a meaning that "direct" lacks.¹⁵¹ The distinction is crucial—if the ground water withdrawals must have occurred "more or less immediately" prior to the resulting streamflow depletions, section 858(1)(c) is a subflow rule, pure and simple. The rule would exclude the vast majority (probably ninety-nine percent) of irrigation wells that are depleting streamflows in Nebraska because the well pumping that is causing current streamflow depletions occurred weeks, months, or years earlier, not immediately before.¹⁵² On the other hand, if the *Spear T Ranch* court meant that the ground water pumping at issue is the direct cause of the streamflow depletions, then pumpers of tributary ground water may be liable for unreasonable harm caused by their pumping.

148. HARNESBERGER & THORSON, *supra* note 5, at 12–13; HUTCHINS, *supra* note 58, at 152; TARLOCK, *supra* note 6, § 4:35. For a discussion of current legal debates regarding the status of the subflow doctrine in Arizona, see *supra* notes 62–71.

149. HUTCHINS, *supra* note 58, at 165; TARLOCK, *supra* note 6, §§ 6:16–17; Dellapenna, *supra* note 7, § 19.05(a)(4); Widman, *supra* note 16, at 531–32.

150. BLACK'S LAW DICTIONARY 234, 492 (8th ed. 2004).

151. *Id.* at 764.

152. Wells deliberately located near a stream to induce recharge from the stream are almost exclusively municipal wells in Nebraska. The Author would be astounded if as many as one to two percent of Nebraska irrigation wells could be classified as subflow wells even under the loosest definition of subflow. Probably none of the wells at issue in the *Spear T Ranch* litigation would qualify as subflow wells.

While this issue was not raised before the court—indeed the advantages and disadvantages of section 858(1)(c) were not argued by counsel—the *Spear T Ranch* court seemed inclined towards the more inclusive, tributary ground water approach. First, the court explicitly rejected “a rule that would bar a surface water appropriator from recovering in all situations.”¹⁵³ Adopting the Trelease comment and illustrations would do precisely that—ground water pumpers would, in effect, only be liable for interfering with streamflow if the irrigation well were located on the banks of the stream.¹⁵⁴ Irrigation wells located farther away from the stream would not be liable under section 858(1)(c) because they were pumping ground water and not HC ground water. It is hard to believe that the *Spear T Ranch* court intended a construction of section 858(1)(c) that would mean, as a practical consequence, that the ground water pumpers would always prevail.

This interpretation is bolstered by the court’s direction that fact-finders exercise broad discretion, and that consideration not be limited to section 850A factors.¹⁵⁵ If this approach is taken, ground water pumpers will not automatically be immune from section 858(1)(c) liability¹⁵⁶ because they are pumping tributary ground water rather than subflow.¹⁵⁷ Finally, this outcome is consistent with the general *Restatement* philosophy that, other things being, equal junior users should in most circumstances compensate senior users for interfering with their senior use.

153. *Spear T Ranch, Inc. v. Knaub*, 269 Neb. 177, 193, 691 N.W.2d 116, 131–32 (2005).

154. This is only a slight revision of Trelease’s illustration, where the junior ground water pumper was liable for reducing streamflow. *Cf.* RESTATEMENT (SECOND) OF TORTS § 858 cmt. h, illus. 5 (1979).

155. *Spear T Ranch*, 269 Neb. at 193, 691 N.W.2d at 132.

156. There is another narrower basis in the *Restatement* for holding common law Nebraska ground water irrigators liable for interfering with plaintiffs’ statutory appropriative rights. Section 856(3) states that “a riparian proprietor is subject to liability for making a use of the water of a watercourse or lake that causes harm to a nonriparian exercising a right created by a governmental authority, permit or license to use public or private water.” RESTATEMENT (SECOND) OF TORTS § 856(3).

157. If “common law” were substituted for “riparian” and if “ground water” were substituted for “water of a watercourse or lake,” this provision would sustain liability for common law ground water pumpers interfering with the exercise of DNR granted surface water appropriations. Section 856(4) imposes similar liability for a riparian (i.e., common law) use interfering with the public’s right to use water, supporting liability for common law ground water pumpers depleting streamflows that support, for example, Lake McConaughy, a major aquatic recreational resource in Nebraska. *See id.* § 856(4).

The handful of ground water cases involving section 858 shed no light on this issue.¹⁵⁸ All the decisions involve choosing a ground water allocation rule—absolute ownership, reasonable use, or the *Restatement*. In *State v. Michels Pipeline Construction, Inc.*,¹⁵⁹ plaintiffs contended that defendant's dewatering activities as part of sewer line construction drained water from plaintiffs' wells.¹⁶⁰ The defendant argued the absolute ownership rule precluded liability, and the trial court agreed, dismissing the case.¹⁶¹ In reversing and remanding, the Wisconsin Supreme Court adopted the draft *Restatement* section 858A (now section 858) for ground water allocation over the common law overlying rights theories.¹⁶² The court remanded the case to the trial court which had dismissed the complaint, citing absolute ownership precedents. In *Maerz v. United States Steel Corp.*,¹⁶³ plaintiffs alleged defendant's dewatering associated with its quarrying drained water from their wells.¹⁶⁴ The trial court had dismissed the case, ruling that the dewatering was reasonably necessary for the use of the land, based upon the American rule of reasonable use.¹⁶⁵ The Michigan Court of Appeals reversed and remanded, adopting section 858.¹⁶⁶ In *Wiggins v. Brazil Coal & Clay Corp.*,¹⁶⁷ plaintiffs alleged defendant's dewatering associated with its strip-mining drained water from a lake bordering plaintiffs' land.¹⁶⁸ The trial court found that the dewatering was reasonably necessary for the land's beneficial use (reasonable use rule) and dismissed the complaint without considering section 858.¹⁶⁹ The Indiana Supreme Court affirmed the trial court's reliance upon the reasonable use rule and the dismissal.¹⁷⁰ The dissent would have adopted section 858 and remanded the case for trial.¹⁷¹ In *Cline*

158. For a general discussion of section 858 and its impact on American ground water law, see TARLOCK, *supra* note 6, §§ 3:69, 4:18 (discussing sections 850 and 858, respectively); Dellapenna, *supra* note 7, § 22.04(c)-(d).

159. 217 N.W.2d 339 (Wis. 1974). The decision is analyzed in Dellapenna, *supra* note 7, at 22-33 to -35, -38 to -40.

160. *Michels Pipeline*, 217 N.W.2d at 339-40.

161. *Id.*

162. *Id.* at 350-51. The case is famous for inter alia overruling a famous American absolute ownership decision, *Huber v. Merkel*, 94 N.W. 354 (Wis. 1903).

163. 323 N.W.2d 524 (Mich. Ct. App. 1982).

164. *Id.* at 526.

165. *See id.* at 526-27.

166. *Id.* at 530, 532.

167. 452 N.E.2d 958 (Ind. 1983).

168. *Id.* at 959-61.

169. *See id.* at 961-62.

170. *Id.* at 962-64. If the majority had adopted section 858, it would have been the first decision applying the *Restatement* rule to a conflict between a ground water user—the mining company pumping the ground water out in order to dewater property it wished to strip mine—and a surface water user—the lakefront plaintiffs. Consequently, *Spear T Ranch* has that privilege.

171. *Id.* at 964-68 (citing both *Wiggins* and *Michels Pipeline*).

v. American Aggregates Corp.,¹⁷² plaintiffs alleged that defendant's dewatering activities drained water from and polluted plaintiffs' wells.¹⁷³ The trial court dismissed the case,¹⁷⁴ basing its ruling on one of the earliest American absolute ownership decisions, *Frazier v. Brown*.¹⁷⁵ The Ohio Supreme Court reversed and remanded, adopting section 858.¹⁷⁶ In *Maddocks v. Giles (Maddocks II)*,¹⁷⁷ plaintiffs alleged that defendant's gravel mining operation caused an underground spring flowing beneath plaintiffs' property to go dry.¹⁷⁸ In *Maddocks v. Giles (Maddocks I)*,¹⁷⁹ the Maine Supreme Court remanded the case to the trial court to determine whether the ground water that fed the spring was an underground stream, interference with which could be actionable under the Maine absolute ownership rule.¹⁸⁰ At the trial, the jury unanimously ruled that the source of the spring was not an underground stream.¹⁸¹ In *Maddocks II*, the Maine Supreme Court was faced with the issue whether it should replace the absolute ownership rule (styled as the absolute dominion rule in Maine) with section 858.¹⁸² The court declined to do so, noting inter alia that the Maine legislature had recently conducted a comprehensive study of Maine water law and elected to make no changes.¹⁸³ Finally, in *Sipriano v. Great Spring Waters of America, Inc.*,¹⁸⁴ plaintiff contended that defendant water bottler's ground water withdrawals depleted plaintiff's well.¹⁸⁵ The trial court dismissed and plaintiff appealed, arguing that the Texas Supreme Court should replace the Texas absolute ownership doctrine with section 858.¹⁸⁶ After reviewing the development of Texas ground water law, the Texas Supreme Court affirmed the trial court and declined to replace absolute ownership with section 858.¹⁸⁷

Interestingly, only *Sipriano* involved a conflict between two ground water users; the remaining five decisions involved aquifer dewatering that interfered with the plaintiffs' surface or ground water use. The

172. 474 N.W.2d 324 (Ohio 1984).

173. *Id.* at 325.

174. *Id.*

175. 12 Ohio St. 294 (1861).

176. *Cline*, 474 N.W.2d at 327.

177. 728 A.2d 150 (Me. 1999).

178. *Id.* at 151. The plaintiff apparently made no direct use of the spring. *Id.*

179. 686 A.2d 1069 (Me. 1996).

180. *Id.* at 1071.

181. *Maddocks II*, 728 A.2d at 151-52.

182. *Id.* at 152.

183. *Id.* at 153-54.

184. 1 S.W.3d 75 (Tex. 1999).

185. *Id.* at 75-76.

186. *Id.* at 76.

187. *Id.* at 76-81. A concurring opinion of two justices suggested that they might vote to adopt section 858 in the absence of legislative action sometime in the future. *Id.* at 81-83 (Hecht, J., concurring).

only decision involving a dispute over HC surface and ground water use, *Wiggins*, involved littoral rights of lakefront owners who apparently sued simply to maintain lake levels rather than to continue a direct surface water use. In any event, the *Wiggins* court rejected section 858. In *Michels Pipeline*, *Maerz*, and *Cline*, the courts adopted section 858 and remanded the case for further consideration; while in *Wiggins*, *Maddocks II*, and *Sipriano*, the courts declined to make section 858 a part of their state water jurisprudence. None of the cases are a "second generation" section 858 decision, where the state supreme court reviewed how section 858 had been applied in resolving a specific HC water dispute. Thus, none of the cases provide any indication regarding whether section 858 is limited to subflow, as Dean Trelease's comments suggest, or whether section 858 pertains more broadly to tributary ground water. Perhaps that will be an issue in *Spear T Ranch II*.

V. CONCLUSION

In 1982 Dean Frank Trelease, the leading water law scholar of his generation, wrote, "Today it seems clear that the basic rule of prior appropriation will be applied to connected ground and surface waters in the western states."¹⁸⁸ Trelease probably would have been surprised by the *Spear T Ranch* decision.

Regardless of such difficulties [in administering priorities to HC surface and ground water], if we are to correlate the rights in interconnected waters, the essential starting point is to put all rights to both types of water within the same framework; the rights in one source must be relative to the rights in the other. There must be a single schedule of priorities; all rights of one class cannot be placed above all those in another.¹⁸⁹

However, given the common law ground water tradition in Nebraska, it is not surprising that the *Spear T Ranch* court chose a common law-based solution for dealing with HC water conflicts. There is some justice in considering all relevant factors in resolving the case rather than only temporal priority. It also seems fair, for reasons that Trelease has well expressed, that temporal priority be given special weight even if it does not, standing alone, dictate the outcome.

It is treacherous to predict the outcome of a specific conflict, particularly one where facts are unclear and the law is evolving. It should be beyond argument, however, that uncontrolled ground water pumping can deplete streamflow in two ways: (1) by depriving the stream of its baseflow, constituting roughly half its permanent supply, by lowering ground water levels below the stream; and (2) by causing the ephemeral stream to lose its remaining flow to the lowered aquifer. As a consequence, the once perennial stream will remain an ephem-

188. Trelease, *supra* note 61, at 1857.

189. *Id.* at 1860.

eral stream, probably forever, but at least for generations. Streams can go dry, but irrigation wells can almost always be deepened, which gives the ground water pumper an inevitable advantage over surface appropriators. If the law wants to treat the parties equitably, it should not penalize the surface appropriator for her inherent disadvantages. The broad approach to section 858 adopted by the *Spear T Ranch* court will doubtless take these factors into account.

If a *Spear T Ranch* trial concludes that the pumping of many or most of the over 500 wells in the Pumpkin Creek valley, in essence, dried up the senior Spear T Ranch appropriations, that outcome could tip the court towards a tributary ground water interpretation of section 858, and away from the subflow interpretation. Given the fact that tributary ground water pumping is what will turn (and has turned) perennially flowing streams into essentially drainage ditches, it would be wrong to limit section 858 liability for streamflow interference to only subflow wells.

Regarding remedies, there seems little realistic possibility of streamflow restoration in the *Spear T Ranch* case. Consequently, it would be appropriate that the ground water pumpers share among them the costs of providing an alternative irrigation and livestock watering supply. In the likely debate over how such costs should be allocated between the ground water irrigators and the ranch, the ground water irrigators will point to portions of the *Restatement* suggesting that all irrigators individually bear the expenses of deepening their own wells to deal with lowering water tables.¹⁹⁰ Ground water users could then argue that the ranch needs to pay for its own well to tap the available water supply, just as the ground water users themselves have. An unsurprising outcome would be to impose on the numerous ground water pumpers the costs of providing the ranch with a ground water supply to replace the lost streamflow. In this regard, the ranch would argue that while one can consider the ranch simply to be another irrigator that should bear its own water supply costs (including the cost of wells) similar to its ground water-using neighbors, it is more accurate to portray the ground water users collectively as the proverbial "800 pound gorilla" whose total ground water use dwarfs that of the ranch. In Trelease's analysis, the "800 pound gorilla" is typically an industrial or municipal water user, whose use dwarfs the senior local user.¹⁹¹ However, Trelease also discusses the possibility

190. See RESTATEMENT (SECOND) OF TORTS § 858 cmt. e (1979); see also Trelease, *supra* note 61, at 1866–72 (discussing conflicting rules regarding whether one party should bear the burden of making both wells viable once again, or whether the burden should fall equally upon each well owner).

191. RESTATEMENT (SECOND) OF TORTS § 858 cmt. e; Trelease, *supra* note 61, at 1870–72 (discussing *City of Colorado Springs v. Bender*, 366 P.2d 552 (Colo. 1961)).

that with numerous plaintiffs and defendants, making each user liable for his or her own water supply costs might be simpler in the long run.¹⁹² But even in that circumstance, the ranch would correctly argue that it should not have to pay the higher costs involved for developing ground water if, for instance, it is required that existing irrigation wells be retired in order for the ranch to develop and use its new wells.¹⁹³

There is also a larger issue here. If ground water users are not financially liable for the harm resulting from dried up streams, the message is that protecting streamflows has no value, a message that could well doom future administrative efforts to protect Nebraska streamflows. Payment of significant damages by ground water pumpers for drying up Nebraska streams would support the political case that protecting streamflows now by restricting ground water development and use is a better policy than waiting for the streams to go dry and *then* fighting it out in court.

Nebraska has finally recognized in both its statutes and in its water jurisprudence that surface and ground water are hydrologically connected. However, just as streamflow depletion from tributary ground water pumping has taken decades to become manifest, there will likely be decades of trial and error iteration before our HC water policies become comprehensive. Many legal and administrative gaps need to be filled before we realize such a comprehensive HC water policy. The *Spear T Ranch* decision filled one important legal gap, and its progeny will likely fill more.

192. See Trelease, *supra* note 61, at 1871-72.

193. See *supra* note 128.