THE TRANSPORTATION PROVISIONS OF ARIZONA'S 1980 GROUNDWATER MANAGEMENT ACT: A PROPOSED DEFINITION OF COMPENSABLE INJURY

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The 1980 Arizona Groundwater Management Act (the "Act")[1] was the Arizona Legislature's first comprehensive effort to take control of the allocation of groundwater in the state. Until 1980, the legislature had effectively abdicated its authority in the area of groundwater rights, abandoning the field to the Arizona Supreme Court.[2] The court's rulings—culminating in 1976 with *FICO v. Bettwy*[3]—fueled a slow burning political fire that finally consumed both the legislature's inertia and the court-made groundwater law itself.[4]

During the decades of the fifties, sixties and seventies, Arizona's economy developed in such a way that the major competitors for shares of the finite groundwater resource fell into three groups: the agricultural interests; the resource development industry (principally mines and mills); and

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1. ARIZ. REV. STAT. ANN. §§ 45-401 to -637 (1982).

2. Spurred by the Federal Bureau of Reclamation, which threatened to withhold support for the Central Arizona Project if a groundwater code was not passed, the legislature stirred from its passivity in 1948 to adopt the stop-gap Critical Groundwater Code. 1948 Ariz. Sess. Laws 600. This Code called for administrative designation of "critical groundwater areas" within the state, defined as areas without sufficient groundwater to provide a reasonably safe supply for irrigation at then current rates of withdrawal. No new irrigation wells could be drilled in critical groundwater areas. But the 1948 Code placed no limits on the *quantity* that could be withdrawn and was widely viewed even at the time it passed as being entirely inadequate to the task of halting groundwater depletion. D. MANN, THE POLITICS OF WATER IN ARIZONA 49-54 (1963). In 1977, the legislature took the first step toward the groundwater law reform of 1980 by amending the Critical Groundwater Code. 1977 Ariz. Sess. Laws 67. The 1977 Amendments liberalized the common law rules on groundwater transportation and established the Groundwater Management Study Commission ("Commission") to draft a comprehensive groundwater code. ARIZ. GROUNDWATER MGMT. STUDY COMM'N, DRAFT REPORT OF TENTATIVE RECOMMENDATIONS I-13 to -14 (1979) [hereinafter cited as DRAFT REPORT].

3. 113 Ariz. 520, 558 P.2d 14 (1976).

4. Connall, *A History of the Arizona Groundwater Act*, 1982 ARIZ. ST. L.J. 313, 315-18.

the burgeoning city suppliers of domestic and urban industrial needs.[5] In the years preceding the Act's passage, this tripartite conflict reached the Arizona Supreme Court several times.[6] Building a common law of groundwater, the court early established and consistently protected the primacy of the farmers over the cities and the mines. Primacy for the agricultural interests was achieved through the court's adoption of the rule that groundwater pumpers could not transport the water off the overlying land (generally a necessity for the cities and mines) if injury resulted to a neighboring landowner (*i.e.*, an irrigating farmer). "Injury" was vaguely but expansively conceived as further depletion of an already diminishing supply.[7] The injured farmer had an action for injunction against the transporting city or mine.[8]

The transportation doctrine had its apotheosis when the *FICO* decision threatened to close down mining operations in certain areas of the state and to severely restrict the cities' ability to serve their customers. *FICO* proved to be a crucial precipitating factor in moving the legislature toward groundwater law reform.[9]

In the transportation provisions of the Act,[10] the legislature reversed *FICO* and by so doing reordered the competitive positions of the three groups of groundwater claimants. Under the Act, injunction is no longer an available remedy against a transporter. Cities and mines can transport groundwater for use within the subbasin of origin entirely free of liability.[11] As a compromise with the agricultural interests, the Act makes transportation across subbasin lines "subject to payment of damages"[12] for "injury or impairment of supply."[13]

Perhaps because the balance of legislative compromise was too fragile to permit every issue to be resolved, or perhaps through simple lack of attention, the terms "injury" and "impairment of supply" are not defined in the Act.[14] Left for lawyers and judges to explore, then, is the concept of compensable harm for which a transporting groundwater pumper may be held under the Act. That inquiry is the subject of this Article.

Since, as noted above, the basic premise of the Act's damages provisions—that a transporter can do actionable wrong to a neighbor—was laid down by the Arizona Supreme Court, this Article begins by surveying the cases which led to adoption of the transportation provisions of the Act. This review of the case law focuses on the court's conception of the nature of the legal injury caused by transporting cities and mines which justified

5. MANN, *supra* note 2, at 9-12.

6. FICO v. Bettwy, 113 Ariz. 520, 558 P.2d 14 (1976); Jarvis v. State Land Dept., 113 Ariz. 230, 550 P.2d 227 (1976) [hereinafter *Jarvis III*]; Jarvis v. State Land Dept., 106 Ariz. 506, 479 P.2d 169 (1970) [hereinafter *Jarvis II*]; Jarvis v. State Land Dept., 104 Ariz. 527, 456 P.2d 385 (1969) [hereinafter *Jarvis I*].

7. *Jarvis I*, 104 Ariz. at 530, 456 P.2d at 388.

8. *See* cases cited *supra* note 6.

9. Connall, *supra* note 4, at 317.

10. ARIZ. REV. STAT. ANN. §§ 45-541 to -545 (1982).

11. ARIZ. REV. STAT. ANN. §§ 45-541 to -544(1).

12. ARIZ. REV. STAT. ANN. §§ 45-543 to -544 (2).

13. ARIZ. REV. STAT. ANN. § 45-545.

14. The Act has no formal legislative history.

the granting of injunctive relief. Next, the relevant sections of the Act are described and their meaning assessed on the question of what injury is compensable in damages. Finally, this Article advances a definition of compensable injury, drawn in light of case law history and based upon relevant statutory sections and statements of intent by the Arizona Groundwater Management Study Commission, which drafted the Act.

I. THE ARIZONA COMMON LAW OF GROUNDWATER TRANSPORTATION

In the common law of groundwater transportation fashioned by the Arizona Supreme Court, irrigating farmers were in effect accorded the power to control the rate of groundwater depletion in the state. Awarding such a powerful priority to the agricultural interests in the allocation of groundwater was a public policy judgment carrying the most critical consequences for Arizona's present and future economy. Yet the supreme court's decisions in this area are remarkably deficient in that they neither display an analysis of the weighty resource allocation issues involved nor provide a convincing statement in justification of the promulgated doctrine.

A. *The Transportation Doctrine*

1. Bristor v. Cheatham

Bristor v. Cheatham[15] was the first in the line of Arizona Supreme Court cases dealing with the transportation issue. Bristor alleged that for 36 years he had pumped groundwater for domestic use on his overlying property. He complained that Cheatham had recently sunk a number of large wells equipped with powerful pumps, withdrawing groundwater from the common supply. Cheatham transported this water to irrigate lands he owned three miles away. The operation of Cheatham's pumps allegedly dried up Bristor's wells.

In *Bristor II*, the supreme court adopted the doctrine of reasonable use to control private rights in groundwater. This doctrine accords to the overlying landowner a qualified proprietary interest in the water percolating beneath his land.[16] Despite its recognition of Cheatham's proprietary interest in groundwater, the court held that Bristor had stated a cause of action.[17] This result followed from the court's adoption in *Bristor II* of a rule prohibiting transport of groundwater away from the land from which it is taken when a neighboring landowner can show he is injured thereby.[18] Conversely, the supreme court declared that groundwater could be applied to beneficial use on the land from which it was taken without liability,

15. Bristor v. Cheatham, 75 Ariz. 227, 255 P.2d 173 (1953) [hereinafter *Bristor II*]; Bristor v. Cheatham, 73 Ariz. 228, 240 P.2d 185 (1952) [hereinafter *Bristor I*]. In *Bristor I* the court ruled that percolating groundwater in the state was held in public ownership with private rights assigned on the basis of the doctrine of prior appropriation. A year later, after rehearing, the court reversed itself. For a description of the political climate in which *Bristor II* was decided, see MANN, *supra* note 2, at 54-61.

16. 75 Ariz. at 235, 255 P.2d at 178.

17. *Id.* at 238, 255 P.2d at 180.

18. *Id.* at 237, 255 P.2d at 180.

regardless of the impact on the neighbors' supply.[19] Since Cheatham had exported the water for use elsewhere, he could be subject to liability.

Although *Bristor II* involved a dispute between two farmers, the court's adoption of the transportation rule carried important implications for the competition among the farmers, the mines and the cities in the allocation of groundwater supplies. The mines require that groundwater be utilized at the site of their ore deposits and milling facilities. The cities must deliver water to customers' establishments, located within their service areas. In both instances, the point of groundwater use does not necessarily—if ever—coincide with the point of withdrawal. For the cities and the mines, transportation of groundwater is a necessity.

Under the transportation rule adopted in *Bristor II*, irrigating farmers who applied groundwater to use on the overlying land were accorded the right to halt or impose damage liability on the transporting cities or mines. Thus the agricultural interests were placed in a position to control the allocation of groundwater among themselves and their competitors. In effect, the farmers were appointed to referee the very game in which they were playing.

2. Jarvis v. State Land Department

After *Bristor II*, the next noteworthy groundwater transportation cases were the court's three opinions in *Jarvis v. State Land Department*.[20]

In 1968, the City of Tucson drilled several wells in the Avra and Altar Valleys, west of the city.[21] The wells lay in a "critical groundwater area," designated under the Critical Groundwater Code of 1948.[22] The city proposed to pump 30,000 acre feet per year from its wells (an amount equal to one-fourth the total then being pumped in the valleys) and to transport the water outside the boundaries of the critical groundwater area a distance of approximately 15 miles to its customers in Tucson.[23]

Plaintiff Jarvis and other irrigating farmers in the valleys sued to enjoin the State Land Department from allowing the city to transport groundwater through a pipeline over state lands.[24] In *Jarvis I*, the court issued the injunction petitioners sought, despite the fact that the city had incurred almost $3 million in project costs.[25]

The next year, recognizing that its pro-farmer rulings had strained at

19. *Id.* This formulation of the transportation rule carries strong echoes of riparianism. Under the traditional riparian regime, uses not made in connection with "riparian lands" were subject to injunction by riparian owners. *See* R.E. CLARK, WATERS AND WATER RIGHTS § 614.1 (1976). ARIZ. CONST. art. XVII, § 1 decrees: "The common law doctrine of riparian water rights shall not obtain or be of any force or effect in the State." The Arizona Supreme Court has never addressed the provocative question whether its adoption of the reasonable use doctrine was unconstitutional.

20. *Jarvis III*, 113 Ariz. 230, 550 P.2d 227 (1976); *Jarvis II*, 106 Ariz. 506, 479 P.2d 169 (1970); *Jarvis I*, 104 Ariz. 527, 456 P.2d 385 (1969).

21. 104 Ariz. at 528, 456 P.2d at 386.

22. *Id.* at 530, 456 P.2d at 388. "Critical groundwater area" is defined *supra* note 2.

23. 104 Ariz. at 530, 456 P.2d at 388.

24. *Id.* at 528, 456 P.2d at 386.

25. *Id.* at 531, 456 P.2d at 389.

the limits of practical and political acceptability, the court in *Jarvis II*[26] loosened the handcuffs it had placed upon the city. The court modified its decree in two particulars. First, it permitted the city to pump and deliver groundwater to Ryan Field, a county-owned airfield located within the same critical groundwater area from which the water was extracted. Because Ryan Field overlay the basin from which Tucson was pumping and because it could legally sink wells to meet its needs, no harm was done by the city's delivery of groundwater to Ryan Field.[27]

Second, the court amended its injunction to permit Tucson to deliver groundwater outside the boundaries of the critical groundwater area *provided* the city purchased and retired irrigated land.[28] The city was limited to withdrawal of an amount equal to the "annual historical maximum use" on the acquired farmland.[29] The supreme court viewed these modifications as a clear departure from the transportation rules it had established, but justified this exercise of its equitable powers on the basis that "the problem is critical to municipalities in Arizona."[30] While the ruling that the city could pump and transport groundwater after acquiring and retiring farmland may have represented a deviation from the strictures of the reasonable use doctrine, it clearly did nothing to detract from the court-conferred primacy of the farming interests in groundwater allocation.[31]

3. FICO v. Bettwy[32]

Farmers Investment Company ("FICO") owned and irrigated 7000 acres of pecan orchards in a designated critical groundwater area located in the Santa Cruz Valley south of Tucson.[33] Anamax Corporation acquired well sites in the same critical groundwater area, intending to pump groundwater for transport to its millsite four miles from the well and one mile outside the boundary of the critical groundwater area.[34] Anamax' millsite was situated over the groundwater basin which supplied both its

26. 106 Ariz. 506, 479 P.2d 169.

27. *Id.* at 510, 479 P.2d at 173. This reasoning seems contradicted in the court's subsequent decision in FICO v. Bettwy, 113 Ariz. 520, 558 P.2d 14 (1976). In *FICO*, the court held that transportation for use above the common source of groundwater supply was wrongful since the relocated recharge points might be downgradient of the original points of return to the detriment of overlying users in between.

28. 106 Ariz. at 511, 479 P.2d at 174.

29. *Id.*

30. *Id.* at 510, 479 P.2d at 173.

31. In *Jarvis III*, 113 Ariz. 230, 550 P.2d 227, the supreme court construed the phrase from *Jarvis II*, "annual historical maximum use," as a severe limitation upon the quantification of the city's pumping rights. The court rejected the city's argument that it was entitled under *Jarvis II* to pump for transport the highest amount of water used in any one year in the farming of a parcel purchased by the city. *Id.* at 232, 550 P.2d at 229. Instead, the court held the city to the "*average* of the annual maximum amount of water used." (emphasis added.) *Id.* In addition, the court ruled that "use" meant "consumption use." In other words, the city was authorized to withdraw only the amount historically consumed (lost to the water table) in irrigation and not the total amount historically applied to the land. *Id.*

32. 113 Ariz. 520, 558 P.2d 14.

33. *Id.* at 522, 558 P.2d at 16.

34. *Id.* at 524-25, 558 P.2d at 18-19.

wells and FICO's.[35] Thus water not consumed by Anamax in its milling activity returned to the basin from which it was withdrawn.

FICO moved to enjoin Anamax' pumping for transportation. The mines argued that their activity was not actionable under *Bristor II* because the water they pumped would be used on the land from which it was withdrawn—that is, a location situated above the groundwater basin of supply.[36]

The City of Tucson intervened, claiming that FICO and the mines were polluting the Santa Cruz River basin upon which Tucson relied for most of its water.[37] The mines counterclaimed against the city on the same theory that FICO asserted against the mines—that is, that the city should be enjoined under *Bristor II* from pumping for transportation away from the area.[38]

In what was by far its most controversial ruling on the subject of groundwater transportation, the Arizona Supreme Court enjoined the city and the mines.[39] Whatever flexibility the court had displayed in *Jarvis II* was abandoned in *FICO*. That the groundwater was being transported for use beyond the boundary of the critical groundwater area was in the court's view dispositive of FICO's claim against the mines.[40]

The court's ruling threatened to destroy the mining industry in southern Arizona and imposed serious constraints upon the cities' ability to meet their customers' growing demand for water service.[41] In response to this threat, an informal political alliance between the cities and mines was created, an ironic outcome considering that the two interests had opposed each other in the *FICO* litigation itself.[42] Pressure from the allied interests brought the 1977 amendments to the Critical Groundwater Code of 1948, which led ultimately to adoption of the Act in 1980.[43]

B. *The Supreme Court's Conception of the Legal Injury Caused by the Transporter*

Suppose that with his powerful pumps Cheatham withdrew groundwater in large quantities for cultivation of the overlying land and caused his neighbor Bristor's well to run dry. Under the reasonable use doctrine

35. *Id.* The boundaries of critical groundwater areas were drawn along political, rather than hydrologic, lines. *See* DRAFT REPORT, *supra* note 2, at III-3 to -5.

36. *Id.* at 526, 558 P.2d at 20.

37. *Id.* at 528-29, 558 P.2d at 22-23.

38. *Id.* at 529, 558 P.2d at 23.

39. *Id.* at 527, 530, 558 P.2d at 21, 24. Tucson was not completely prohibited from pumping for transportation. Rather, the city was held to pumping levels in effect before the date of the mines' counterclaim. *See* Connall, *supra* note 4, at 317.

40. 113 Ariz. at 527, 558 P.2d at 21.

41. Connall, *supra* note 4, at 317.

42. *Id.* at 318.

43. *See supra* note 2. Overruling *FICO*, the 1977 Amendments permitted transportation of groundwater conducted before January 1, 1977, to continue provided a certificate of exemption was obtained from the State Land Department. 1977 Ariz. Sess. Laws. 69-70. To export from a critical groundwater area in quantities above pre-1977 levels, the transporter was required to retire irrigated acreage and obtain a transportation certificate. *Id.* at 70-71. Transport away from the boundaries of a critical groundwater area was not enjoinable but could subject the transporter to liability for damages. *Id.* at 72.

adopted by the Arizona Supreme Court in *Bristor II*, Bristor would not state a cause of action against Cheatham for interfering with his well;[44] the adverse effect of Cheatham's activity upon his neighbor would not constitute a legally compensable injury. But if, as was the fact in *Bristor II*, Cheatham were pumping to transport groundwater for use away from the overlying land, then the harmful effects he caused upon the operation of Bristor's well would constitute legal injury.

On what basis in logic or policy did this legal distinction rest? Why did the fact that the pumper transported groundwater create the potential for liability? These questions were suggested by the court's analysis of Bristor's claim against Cheatham in *Bristor II*, but surprisingly were neither posed nor answered in that opinion. The court simply announced the transportation rule, with no analysis or discussion of its reasons.[45]

In the later cases—*Jarvis* and *FICO*—the supreme court essayed a generalized notion of groundwater conservation as the rationale for the transportation rule. Both cases arose in areas of the state where the quantity of groundwater withdrawn for irrigation purposes exceeded the amount annually replenished.[46] Therefore, in both cases the parties were contending for a depleting groundwater supply.

In these opinions, the supreme court asserted that the transporting defendants did legal harm to the farmer plaintiffs by further depleting the scarce supply. Thus in *FICO* the court stated:

> [T]he parties are in agreement that the water table within the Sahuarita-Continental Critical Groundwater Area of the Santa Cruz basin is being lowered and the reservoir of supply is being depleted. It is apparent, therefore, that the additional pumping proposed by Anamax from the well complained of in FICO's petition for injunction of April 15, 1974, will necessarily further deplete the source of supply of the existing users.[47]

The same rationale was employed in *Jarvis I*:

> [I]t is readily apparent that any additional uses must necessarily deplete the source of supply of existing users. . . . Tucson . . . would withdraw and transport from an area that is already critical an amount of water equal to about one-fourth of that presently being consumed with the resulting diminution and earlier depletion of the

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44. *See supra* note 19 and accompanying text.

45. In fact, the court laid down the law on groundwater transportation by double quotation—borrowing from an opinion of the Oklahoma Supreme Court which was itself quoting a lower New Jersey court, as follows:

> [T]he rule of reasonable use . . . "does prevent the withdrawal of underground waters for distribution or sale for uses not connected with any beneficial ownership or enjoyment of the land whence they are taken, if it thereby results that the owner of adjacent or neighboring land is interfered with in his right to the reasonable user of subsurface water upon his land, or if his wells, springs, or streams are thereby materially diminished in flow or his land is rendered so arid as to be less valuable for agriculture, pasturage, or other legitimate uses."

Bristo II, 75 Ariz. at 238, 255 P.2d at 180 (quoting Canada v. City of Shawnee, 179 Okla. 53, 55, 64 P.2d 694, 697 (1937)).

46. *See supra* notes 22 and 33.

47. 113 Ariz. at 526, 558 P.2d at 20.

existing water supply. Tucson's action is clearly illegal.[48]

Even casual reflection compels the conclusion that the court's conception of the legal harm caused by the transporting pumper was not sufficient to justify fixing liability on the transporter where none attached to the irrigating pumper. In the first place, it was the irrigating farmers in these critical groundwater areas who had begun and persisted in the practice of depletion by pumping more groundwater than was being annually replenished.[49] Why should the parties responsible for creating the condition of scarcity be permitted to invoke the equitable powers and protections of the court on grounds of the existence of that same scarcity? The supreme court did not answer the question.[50]

In addition, the court's transportation rule was hardly generous enough to serve the conservation purpose claimed for it. Only pumping for transport and use away from the point of withdrawal was enjoinable. The court made no provision for prohibiting or controlling additional withdrawals by overlying users (mainly irrigating farmers).[51] The cities and mines were prevented from placing additional demands on the finite supply, with the stated purpose to cause it to last longer. But no means were allowed to prevent an overlying user from increasing withdrawals and exhausting the supply in rapid fashion.

Thus the stated aim of conservation cannot explain the distinction made in the legal liability of transporters and overlying users. Nor was the imposition of legal liability on the cities and mines sufficient to halt depletion of the supply by agriculture. The court's application of the conservation rationale in fact amounted to a statement that irrigating farmers would be permitted to control the rate of groundwater depletion in Arizona.

II. THE TRANSPORTATION PROVISIONS OF THE 1980 GROUNDWATER MANAGEMENT ACT

A. *Transportation Without Liability*

Reversing *FICO*, the Act permits transportation of groundwater for

48. 104 Ariz. at 530, 456 P.2d at 388.

49. The supreme court conceded this point early in the *FICO* opinion when it noted that annual recharge in the area "is sustantially less than the amount used for agricultural purposes and the water table has been for many years gradually lowering and the reservoir of supply has been gradually depleting." 113 Ariz. at 522, 558 P.2d at 16.

50. In fact, the court expressly begged the question in FICO:

> [A] court will [not] prefer one economic interest over another on an ad hoc basis where there are not enough of the material goods of existence to go around. Rather, courts will protect rights acquired in good faith under previous pronouncements of the law. If it is to the State's interest to prefer mining over farming, then the Legislature is the appropriate body to designate when and under what circumstances such economic interest will prevail.

Id. at 527, 558 P.2d at 21.

51. As its name indicates, the reasonable use doctrine adopted by the supreme court in *Bristor II* limits groundwater claimants to beneficial or reasonable uses. The court never dealt with classification of various groundwater uses as reasonable or not, except to hold in the cases discussed in this Article that transportation of groundwater away from the overlying land where the supply is depleting is *not* a reasonable use. *See Bristor II*, 75 Ariz. at 235, 255 P.2d at 178.

use within the subbasin[52] from which it is withdrawn without liability or injunction.[53] Going further, the Act allows transportation within a subbasin to be carried out without liability for damages.[54] These rules apply to subbasins located both within and outside the boundaries of "active management areas" ("AMA's"), geographical areas around which administration of the Act is organized.[55]

Under certain limitations,[56] groundwater withdrawn pursuant to an "irrigation grand-fathered right"[57] or from farmland which is retired from irrigation[58] may be transported *between* subbasins or away from an AMA without payment of damages.[59] No more than three acre feet per acre per

52. The Act defines "groundwater basin" as a "relatively hydrologically distinct body or related bodies of groundwater" as designated by the Director of the State Department of Water Resources. ARIZ. REV. STAT. ANN. § 45-402(12). "Subbasin" is similarly defined as "a relatively hydrologically distinct body of groundwater within a groundwater basin." ARIZ. REV. STAT. ANN. § 45-402(27).

53. ARIZ. REV. STAT. ANN. §§ 45-541, -544(1). The Act does not in terms expressly state that transportation for use within a subbasin is not subject to injunction. This fundamental element of the new groundwater transportation policy is inferred from the express and exclusive provision of the damages remedy in the Act. ARIZ. REV. STAT. ANN. §§ 45-543, -544. It is further to be inferred from the history of events leading to the Act's passage and the reports of the Commission that drafted the Act. DRAFT REPORT, *supra* note 2, at VI-8. Also see ARIZ. GROUNDWATER MGMT. STUDY COMM'N, FINAL REPORT III-9 (1980) [hereinafter cited as FINAL REPORT].

54. ARIZ. REV. STAT. ANN. §§ 45-541, -544(1). This represents an important departure from the 1977 Amendments, which allowed a damages remedy to landowners injured by such water transfers. 1977 Ariz. Sess. Laws 77. For a discussion of the policy considerations that led the Commission to recommend this change in the law, see DRAFT REPORT, *supra* note 2, at VI-5 to -10.

55. ARIZ. REV. STAT. ANN. §§ 45-541, -544(1). "Active Management Area" is defined in § 45-402(2). The Act itself designates four areas of the state as AMA's at § 45-411. Procedures for creation of additional AMA's are provided in §§ 45-412 to -417. Sections 45-418 to -421 deal with administration of the AMA's. The Commission characterized the AMA's as "areas in which intensive groundwater management will be required." FINAL REPORT, *supra* note 53 at III-2. According to the Commission, "[t]he boundaries of all AMA's will correspond as closely as possible to groundwater basin boundaries." *Id.* Section 45-412(B) expressly so provides as to creation of additional AMA's.

56. These limitations generally restrict groundwater irrigation use to the land from which the water is withdrawn or to contiguous acres in common ownership. *See* ARIZ. REV. STAT. ANN. § 45-472. A groundwater right arising through retirement of irrigated land includes the right to use the water away from the land from which it is withdrawn if: (i) such land is located outside the service area of a municipal or private water company; (ii) the distant use commenced before designation of the AMA in which the land is located; or (iii) the distant use was undertaken by the original owner of the water right pursuant to a development plan filed prior to inclusion of the land within the water company's service area. ARIZ. REV. STAT. ANN. § 45-473(C), (D).

57. An "irrigation grandfathered right" is the right to irrigate land for commercial agricultural production. ARIZ. REV. STAT. ANN. §§ 45-402(17), -465. The Act sets down a formula for determining the maximum amount of groundwater which may be used pursuant to an irrigation grandfathered right. ARIZ. REV. STAT. ANN. § 45-465.

58. Under the Act, groundwater may be withdrawn in specified quantities for non-irrigation use pursuant to a "non-irrigation grandfathered right." There are two types of non-irrigation grandfathered rights. A Type 1 right is based on retirement of land from irrigation use. ARIZ. REV. STAT. ANN. § 45-463. A Type 2 right is based on the owner's historical withdrawals of groundwater for uses other than commercial agricultural irrigation. ARIZ. REV. STAT. ANN. § 45-464.

59. ARIZ. REV. STAT. ANN. § 45-542. Transporting groundwater withdrawn pursuant to a Type 2 non-irrigation grandfathered right across subbasin lines subjects the transporter to liability for damages. ARIZ. REV. STAT. ANN. § 45-543(A)(1). Neither the Act itself nor the Commission reports express the reason for distinguishing between Type 1 and Type 2 rights on the issue of the transporter's potential liability. Because of the variety of uses which can give rise to Type 2 rights, historic consumptive use cannot be estimated categorically. It may be for this reason that the

annum may be transported free of liability pursuant to these provisions.[60] The apparent intent is to permit transportation beyond the subbasin without liability where the net effect on groundwater supply in a given locale approximates the effect had irrigation use continued there.[61] The three-acre-foot limitation is the legislative approximation of the amount which would have been consumptively used in irrigation.[62] Transportation of more than this amount across subbasin lines is subject to damages liability.[63]

B. *Transportation Subject to Damages*

The Act provides that groundwater transportation *between* subbasins or beyond the boundaries of an AMA[64] may be "subject to the payment of damages."[65] This represents a further rejection of *FICO* and the *Jarvis* cases, which granted injunctive relief against the transporting mines and city. Injunction is no longer an available remedy in such cases. The Act further states that "in any action to recover damages, neither injury to nor impairment of the water supply of any landowner shall be presumed from the fact of transportation."[66] This provision repudiates the supreme court's view that an overlying user could successfully claim relief against a transporting pumper solely upon a showing that the pumping occurred in an area where the common groundwater supply was diminishing.[67] Now plaintiffs must shoulder the burden of proving that, as a consequence of

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drafters of the Act left questions of the impact of groundwater transportation under Type 2 rights to case by case determination.

60. ARIZ. REV. STAT. ANN. § 45-542(C).

61. FINAL REPORT, *supra* note 53, at III-9.

62. *Id.* "Consumptive use" means the water cannot be reused because it is lost to evaporation or transpiration or is incorporated into plants or products.

63. ARIZ. REV. STAT. ANN. § 45-542(C).

64. In theory, one who transports groundwater across an AMA boundary is also crossing a subbasin (or, more accurately, basin) line. This is because AMA boundaries are supposed to be hydrologically based, corresponding to groundwater basin boundaries. *See supra* note 55.

65. ARIZ. REV. STAT. ANN. §§ 45-543, -544(2). Section 45-543 concerns groundwater pumped within AMA boundaries. Specifically, § 45-543(A) provides that groundwater may be transported across subbasin or AMA lines by municipal or private water companies or irrigation districts operating within their service areas, and by others pumping under Type 2 non-irrigation grandfathered rights or industrial use permits. Section 45-543(B) allows municipal water companies, under certain conditions and subject to possible damage liability, to cross subbasin lines and deliver water outside their service areas.

Section 45-544(2) permits intersubbasin and inter-basin transport in locations outside AMA's, subject to payment of damages.

66. ARIZ. REV. STAT. ANN. § 45-545(A).

67. In *Jarvis I*, petitioners were granted an injunction against the City of Tucson without showing that they had suffered any immediate, individualized harm of the type alleged in *Bristor*. The court explained:

> To require petitioners . . . to now prove damages which may result at some time in the indefinite future when the lands become marginal or wait until the groundwater level has so dropped that the lands overlying are no longer productive is unconscionable, harsh and inequitable. The interests are too great for such a cavalier treatment of the rights here sought to be preserved.

104 Ariz. at 531, 456 P.2d at 389.

Similarly, the court in *FICO* stated: "Even if it be assumed that damage to FICO's wells has not yet taken place, still such damage must, inevitably, occur. FICO need not wait for its farms to be devastated before applying for injunctive relief against unlawful acts." 113 Ariz. at 526, 558 P.2d at 20.

the transporting defendants' conduct, they have actually and individually experienced "injury" or "impairment of the water supply."[68] Unhappily for judges who will oversee litigation on groundwater transportation under the Act, the terms "injury" and "impairment of supply" are not defined.

Enumerated in the Act are a number of factors which courts must consider "in determining whether there has been injury and the extent of any injury," including:

1. Retirement of land from irrigation.
2. Discontinuance of other preexisting uses of groundwater.
3. Water conservation techniques.
4. Procurement of additional sources of water which benefit the active management area, sub-basin or landowners within the active management area or sub-basin.[69]

Finally, the transportation provisions of the Act provide courts with discretion to award attorney fees, expert witness costs and fees, and court costs to the prevailing party in an action for damages.[70]

III. A Proposed Definition of Compensable Injury

A. *Elimination of Return Flows*

The Arizona Supreme Court never satisfactorily identified the nature of the harm done by the transporting groundwater pumper which justified enjoining its activities. Petitioners in the important *Jarvis* and *FICO* cases were successful on the basis that defendants contributed generally to depletion of the common groundwater supply. But petitioners also were contributing to that depletion, though under the common law of groundwater developed by the supreme court they could continue to do so free of liability. Despite the court's denial in *FICO*,[71] it is entirely reasonable to conclude that the transportation doctrine was in fact based upon the court's preference for one type of use—irrigated agriculture—over competing municipal and industrial uses.

That preference, reflected in the primacy accorded agricultural interests in the allocation of groundwater, has been eliminated from the comprehensive groundwater management scheme established under the Act. Competing uses have been accorded at least equal, if not higher, priority. This can be seen, for example, in comparing the withdrawal and use rights accorded to irrigators and municipal water companies. The Act prohibits expansion of irrigation in AMA's,[72] and irrigators are limited in the quantity of groundwater they can put to use.[73] On the other hand, municipal

68. Section 45-545(A) also rejects the view adopted in the 1977 Amendments that transportation of groundwater beyond the boundaries of a critical groundwater area was conclusively presumed to cause injury. 1977 Ariz. Sess. Laws 72.

69. ARIZ. REV. STAT. ANN. § 45-545(B).

70. ARIZ. REV. STAT. ANN. § 45-545(C).

71. *Supra* note 50.

72. ARIZ. REV. STAT. ANN. § 45-452.

73. The Act sets out the formula for determining the maximum amount of groundwater which may be used under an irrigation grandfathered right. The formula has two components: (1) the quantity determined by the Department of Water Resources to be reasonably used on the

water companies are not confined to historic use levels. They may increase the quantities they pump within their expandable service areas, consistent only with state-promulgated conservation requirements.[74] The Act's rejection of the court's rule that groundwater transportation is injurious *per se* and its denial of injunctive relief to overlying users equally reflect the legislative reordering of priorities.

Determining the nature and extent of transporters' potential liability to overlying users has to be approached in light of the reality that, with adoption of the Act, agricultural irrigation is no longer the preferred use for Arizona groundwater. The legislature has rejected the supreme court's broadly prohibitory approach to groundwater transportation. This fact dictates a circumscribed interpretation of the landowners' remedy against the transporting cities and mines.

At the same time, transporters do face liability under the Act where they cause "injury or impairment of supply." It is important to note here that the Act does not provide a corresponding private remedy against overlying users who impose adverse impacts upon their neighbors' access to the common supply.[75] Like the common law doctrine of reasonable use, the Act singles out transporting pumpers for the imposition of liability. But unlike the Arizona Supreme Court, the legislature's purpose in providing landowners with a remedy against pumpers for transportation was not to ensure primacy for agricultural interests in the competition for the scarce resource. The legislature clearly declined to follow the court's policy of exalting local users over exporters of groundwater.

The Arizona Groundwater Management Study Commission ("Commission"), which drafted the Act,[76] explained the provision of a damages remedy against transporters on the basis of the effect of their activities on return flow levels in the subbasin of origin. Where groundwater is applied to use on land overlying the subbasin, some amount is not consumed, but infiltrates the soil and returns to the subbasin.[77] The pumper who transports groundwater for use beyond subbasin lines generates no return flows to replenish the common supply. According to the Commission:

> The question of damages was central because of the fact that the availability of groundwater to other landowners whose lands overlie the common supply can be adversely affected when groundwater is

land, taking into account conservation measures; and (2) the number of acres which may be irrigated, based upon historic farming practices. ARIZ. REV. STAT. ANN. § 45-465.

74. ARIZ. REV. STAT. ANN. § 45-492(A).

75. *See, e.g.*, ARIZ. REV. STAT. § 45-601, authorizing the Director of the Department of Water Resources to regulate pumping from multiple wells within AMA's "to minimize damage to adjacent groundwater users." This indicates that some measure of harm to neighbors is expected to result and will be tolerated. Similarly, § 45-598 requires the Director to regulate the location of new and replacement wells "to prevent unreasonably increasing damage to surrounding land or other water users . . ." Here the legislature apparently contemplated that some increases in damages may be reasonable. Yet the Act provides no privately enforceable damage remedy against overlying users.

76. *Supra* note 2.

77. Crosby, *A Layman's Guide to Groundwater Hydrology* in C. CORKER, GROUNDWATER LAW, MANAGEMENT AND ADMINISTRATION 58 (1971). Crosby reports that, depending upon the physical setting and the amount of groundwater pumped for irrigation, as much as half the groundwater withdrawn may return to the source. *Id.*

> transported for use away from that supply. Adverse effects can arise if recharge to the groundwater basin is eliminated due to the use of the water in a different hydrological area.[78]

Conversely, consideration of return flow patterns explained the Commission's proposal to allow intra-subbasin transfers without damages:

> Subsection A of the Commission's recommendations provides that transportations of groundwater within a sub-area of an AMA shall be freely allowed without payment of damages. This provision is based on the assumption that if groundwater is pumped and transported for use within the same hydrological sub-area, any recharge theoretically returns to the same groundwater supply and injury will not result from the transportation. Therefore, it is reasoned, damages from such transportation should not be allowed.[79]

Since transporters have been set apart from other groundwater users in the assessment of damages under the Act, their liability should be related to those external effects which are uniquely attributable to their conduct. As the Commission observed, the special impact caused by the conduct of the transporting groundwater pumper, as contrasted with the overlying user, is reduction or elimination of return flows. It is this occurrence which appropriately forms the basis of landowners' claims and transporters' liability.

B. *Compensable Injury*

The Act states that compensable "injury" or "impairment of supply" will not be presumed simply from the fact that groundwater is being transported.[80] To succeed, plaintiff must now demonstrate the occurrence of individual harm: for example, dry wells, increased pumping costs, impairment of water quality, land subsidence, or some combination of these effects. A showing of the impact of defendant's conduct upon the subbasin generally is no longer sufficient.

The proposition that it is the transporter's impact upon return flow levels that forms the basis of liability and the rule, made explicit in the Act, that individual harm must be shown, combine in a two-part definition of compensable injury. First, plaintiff must show immediately and individually experienced harm. Second, plaintiff must prove that his injury resulted not from defendant's pumping activity as such, but more precisely from the transporting defendant's impairment or elimination of preexist-

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78. DRAFT REPORT, *supra* note 2 at VI-5.

79. *Id.* at VI-8. Interestingly, it was consideration of return flows that implicitly formed the basis for the court's equitable remedy in *Jarvis II* and *III*. *See supra* notes 26-31 and accompanying text. Tucson was limited to historic consumptive levels in its withdrawals for transportation, on the theory that this limitation would protect petitioning farmers from harm while allowing the city a means of meeting its needs. In *Jarvis III*, the court articulated its purpose: "the agricultural users of the water underlying the Avra-Altar Valleys should be no worse off than they would have been had the lands retired by Tucson remained in private use, dedicated to the cultivation of crops." 113 Ariz. at 231, 550 P.2d at 228. Implicit in the court's holdings in *Jarvis II* and *III* is the notion that the legal injury against which the farmers are to be protected is the City's interference with historic levels of recharge.

80. ARIZ. REV. STAT. § 45-545(A). *See supra* notes 66-68 and accompanying text.

ing return flows.[81]

A few simple hypotheticals will help to illustrate the dimensions of this two-part concept of compensable injury:

1. *Transporter Pumping Upgradient from Plaintiff's Wells*

Suppose defendant city acquired several wells on property adjacent to plaintiff's irrigated farmland and overlying the same subbasin of supply. The city's predecessors had used groundwater for irrigation on the land from which it was withdrawn.[82] Suppose further that the city wells are located upgradient from plaintiff's property. This means that groundwater not consumed in irrigation had percolated through the soil and replenished the supply of those pumping downgradient, including plaintiff. Now the city has begun to pump groundwater in greater quantities than was historically withdrawn and is transporting the water beyond the subbasin boundary to serve distant customers. As in *Bristor v. Cheatham*, plaintiff's wells have gone dry since the defendant began to pump. Under the Act, can plaintiff succeed in a damages action against the City?

Plaintiff can satisfy the first requirement for compensable injury under the Act by demonstrating that he has suffered immediate and individual harm in that his wells have ceased to function. As to the second element, plaintiff will have to prove that the operation of his wells was dependent upon maintenance of irrigation return flows and that the harm he suffered was caused by the city's elimination of those return flows.[83]

2. *Transporter Pumping Downgradient from Plaintiff's Wells*

Assume the same facts as presented in the first hypothetical except that the city wells are situated downgradient from plaintiff's wells. This means that plaintiff has not been directly advantaged from the return flow generated by the city's predecessors.

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81. The first three mitigation measures enumerated in the Act seem generally to involve efforts by the transporting defendant to avoid significant increases in consumptive use levels in the subbasin. *See supra* note 69 and accompanying text. Restricting consumptive use and maintaining return flows are two sides of the same coin. The Act's mitigation provision, therefore, is consistent with the view that legal liability be based upon impairment of return flows.

Strangely, the fourth listed mitigation measure is phrased in terms of benefiting broad geographical areas (the AMA or subbasin) and the general category of landowners therein, but not necessarily benefiting the aggrieved plaintiff directly.

82. If these wells were located within the city's service area, the city's right to pump groundwater would arise under § 45-492. That section does not limit cities in the amount they may withdraw "for the benefit of landowners and residents" within their service areas.

If these wells were located outside the city's service area, the city could pump for transportation to its customers only if it acquired grandfathered rights. ARIZ. REV. STAT. § 45-491. Since in the hypothetical the water had previously been used for irrigation, the city would probably acquire irrigation grandfathered rights which would then be converted to non-irrigation use. These rights are called Type 1 non-irrigation grandfathered rights. ARIZ. REV. STAT. § 45-472(F). *See supra* note 58. Trans-subbasin transportation of up to three acre feet per retired acre per year is permitted without liability. ARIZ. REV. STAT. § 45-542(C). For purposes of the hypothetical, assume that, if the city is pumping pursuant to Type 1 rights, it is transporting more than the statutory maximum and that potential liability therefore exists.

83. This concept of compensable injury is closely analagous to the prior appropriation rule governing surface water rights which protects even junior downstream users in the continued availability of return flows. F. TRELEASE, WATER LAW 209 (1979).

Under these facts, it is unlikely that plaintiff's damages claim against the city can succeed. The obstacle lies in proving the second element of compensable injury: that the city's elimination of historic return flows has caused the harm to plaintiff's wells. If the interference is instead the result of the steep "cone of depression"[84] created by the city's more powerful pumps, plaintiff will not have suffered injury that is compensable under the Act.[85]

3. *Transporter Does Not Displace an Overlying User*

Changing the hypothetical facts again, suppose that instead of acquiring wells previously used for irrigation, the city drills new wells on land adjacent to plaintiff. Here the city does not displace other pumps or eliminate established return flows. Still, plaintiff's wells are impaired by the city's pumping activity because they are hydrologically connected to the city wells.[86] As in the preceding hypothetical, plaintiff cannot recover damages from the city. The second element of compensable injury is lacking: that is, proof that the operability of plaintiff's wells is hydrologically dependent upon return flows which have been eliminated by the city's conduct.

C. *In Support of the Proposed Definition*

The definition of compensable injury herein advanced requires plaintiff to demonstrate by the weight of hydrological opinion that the loss of operability of his wells (or other immediately experienced harm) resulted from the transporting defendant's impairment or elimination of preexisting return flows. This is likely to be a difficult burden to meet and damages recoveries by plaintiffs under the Act will be correspondingly few.

From the irrigator's point of view, the suggested concept of compensable injury probably appears too narrowly confined. But from the broader perspective, the definition is commended by several considerations. First, it is consistent with the Act's major impetus and purpose—to reorder use priorities in the state and to take from the agricultural interests the power to make major allocation decisions. Second, the notion of compensability

84. Pumping in a well lowers the water level in the well and creates a gradient causing additional water to flow by gravity toward the well. This gradient appears as an inverted cone around the pumping well and is called the "cone of depression." When the cones of depression of two wells overlap, there is interference in the operation of the well within the powerful pump. Crosby, *supra* note 77, at 47.

85. The constitutionality of this interpretation of the damages provision of the Act is beyond dispute since the Arizona Supreme Court's decision in Town of Chino Valley v. City of Prescott, 131 Ariz. 78, 638 P.2d 1324 (1981), *appeal dismissed*, 457 U.S. 1101 (1982). Plaintiff overlying users claimed that the Act's allowance of intra-subbasin transportation of groundwater without damages or injunction effected a taking of property in violation of the federal and state constitutions. The court sustained the Act against plaintiffs' challenge in an opinion which stands as a notable feat of judicial terpsichore. Notwithstanding its repeated expressions in earlier opinions that overlying users have constitutionally protectable property rights in groundwater, the court in *Chino Valley* announced: "[W]e . . . hold that there is no right of ownership of groundwater in Arizona prior to its capture and withdrawal from the common supply and that the right of the owner of the overlying land is simply to the usufruct of the water." *Id.* at 82, 639 P.2d at 1328.

86. *Supra* note 84.

is fair, in that it is tied to those external effects which are uniquely attributable to transporting pumpers. At the same time, it affords a measure of relief to irrigation users actually injured by those impacts. Finally, the definition is precise and comprehensive enough (disregarding the expectable conflict in expert hydrological opinion) to be usefully applied by judges, juries and litigants.

Of course, resolving the substantive issue of how injury is defined under the Act in turn raises questions about how injury is proved and compensation measured. While these questions are beyond the limits of this Article, they will have to be worked through as the proffered notion of injury is applied in litigation.

IV. CONCLUSION

The Arizona Supreme Court awarded injunctive relief to petitioning farmers against cities and mines prohibiting them from pumping groundwater for transportation and distant use. In effect, the court empowered the agricultural interests to determine critical issues of resource allocation and to control the rate at which the scarce supply would be depleted.

The 1980 Arizona Groundwater Management Act withdrew the primacy formerly accorded to agriculture and reordered groundwater use priorities. Now groundwater can be transported for use within the subbasin from which it is withdrawn without liability for injunction or damages. Transportation beyond subbasin boundaries is subject to damages, but injunction is no longer an available remedy.

The Act provides that damages will be awarded for "injury" or "impairment of supply," but does not define these terms. This Article advocates a narrowly drawn definition of the injury which is compensable by transporting groundwater pumpers under the Act. Damages should be awarded to landowner plaintiffs only where they show: (i) that they have suffered some actual, individually felt harm and (ii) that the injury resulted from the defendants' impairment or elimination of preexisting return flows. This conception of transporters' liability—like many important aspects of the Act itself—repudiates the unsatisfactory supreme court precedent which assigned liability not on the basis of reasoned considerations of public policy, or even logic, but on an unstated and undefended preferment of agricultural interests over the competing claims of industry and the suppliers of municipal users.