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PROPERTY, UNBUNDLED WATER ENTITLEMENTS, AND ANTICOMMONS TRAGEDIES: A CAUTIONARY TALE FROM AUSTRALIA

Paul Babie,^{*} Paul Leadbeter,[†] and Kyriaco Nikias[‡]

ABSTRACT

As water becomes an increasingly scarce resource, a lack of clarity in relation to its use can produce both conflict among and inefficient use by users. In order to encourage markets in water and to ensure the viability and functionality of those markets, governments in many jurisdictions have moved away from commons property as a means of water allocation, and towards systems of private property in water. In doing so, one policy and legal option is “unbundling”, which seeks carefully to define both the entitlement to water and its separation into constituent parts. Advocates claim that unbundling makes water rights easier to value, monitor, and trade. But is unbundling the most efficient means of allocating water use rights? Or might such fragmentation produce what has come to be called an “anticommons tragedy”? To answer these questions, this article contains four parts. The Introduction provides the legal background to the modern means of allocating the use of water amongst competing, or rivalrous, users. Part I considers the theoretical nature of property, and the way in which such theory might be extended to water allocation through unbundling. Part II presents unbundling as it has been implemented in the Australian state of South Australia. This allows us to assess the extent to which the stated policy rationale for unbundling—certainty and transferability of entitlements—has been achieved and the extent to which this is a desirable outcome. Our analysis can be applied to any jurisdiction, most notably the arid and semi-arid southwestern United States, considering unbundling as a legal and policy option for the allocation of water use. The Conclusion reflects upon the potential for unbundling water entitlements in arid or semi-arid environments. The South Australian experience reveals a reluctance to embrace unbundling, both on the part of the state in terms of implementing, and on the part of market actors holding existing proprietary interests in water. This reluctance ought to be viewed by other jurisdictions as a warning about the effectiveness and efficiency of unbundling. We show that unbundling efforts may not only fail to provide efficiency gains, but also, and much more worryingly, may in fact drive

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anticommons tragedies that entirely inhibit any beneficial use. We propose that our anecdotal and theoretical analysis of South Australia requires empirical research both in Australia and in other jurisdictions climatologically, hydrologically, and in underlying legal framework, similar to Australia. Such empirical research will test our conclusions in relation to South Australia, both in respect to the operation of the water market and as to the behavior of market actors.

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INTRODUCTION: WATER LAW IN ARID AND SEMI-ARID ENVIRONMENTS

The allocation of proprietary interests in scarce, fugacious natural resources bedevils most of the legal systems the world has known. In relation to petroleum resources, for instance, John Bishop Ballem, the leading Canadian authority on the subject, tells us that

[t]he petroleum and natural gas lease is a curious document. It has to be. Any legal instrument that purports to define property rights over minerals inconsiderate enough to move from one place to another, and underground at that, cannot be expected to follow the conventional form.¹

Water behaves in a very similar way to petroleum resources, both on and below the surface of land.² As such, it exhibits the same difficulties of characterizing and defining proprietary interests. Kevin Gray writes “in English law water is incapable

1. John Bishop Ballem, *The Perilous Life of an Oil and Gas Lease*, 44 CAN. BAR REV. 523, 523 (1966); see also JOHN BISHOP BALLEM, *THE OIL AND GAS LEASE IN CANADA* 3 (4th ed. 2008).

2. See KEVIN GRAY, *ELEMENTS OF LAND LAW* 25 (2nd ed. 1993).

of being owned.”³ For that reason, “[a]lthough . . . [it] can contemplate with equanimity the conveyance of an estate in thin air, it has substantially more difficulty in relation to a conveyance of water.”⁴ Joshua Getzler expands:

Flowing water cannot be possessed in a tangible fashion like land, only quasi-possessed or appropriated by user. The common-law theory of title based on a hierarchy of seisin or possession required some apparent user—a matter of evidence—in order to establish an actionable right. The requirement of established use to ground seisin was emphasized by the rise to dominance of the trespass on the case form of action, which characteristically focused on indirect or non-invasive damage. Hence water rights defended by action on the case came to appear as possessory interests based upon current usage, rather than titles or claims to a resource regardless of levels of use; and the legal system found it particularly difficult to evolve doctrines describing and balancing such use-claims. Added to this is the issue of balancing the interests of multiple yet rivalrous users: ‘Problems concerned with the sharing of water supplies and joint utilization of river systems are inherently unsuited to adjudicative solution, involving as they do a complex interplay of diverse interests’ concluded Lon Fuller in a sociological analysis of western American water law.⁵

The problem is complicated by the obvious relationship between land and the water that runs through, under, or over it. Thus, Megarry and Wade, in the leading text on English real property law, say this:

A landowner [at common law] has no property in water which either percolates through his land or flows through it in a defined channel. In the case of percolating water, at common law the landowner could draw any or all of it off without regard to the claims of neighbouring owners

In the case of water flowing through a defined channel, even at common law the riparian owner (the owner of the land through which the water flows) could not always take all the water⁶

3. *Id.* (citing *Alfred F. Beckett Ltd. v Lyons* (1967) Ch 449, 481G–482A (U.K.); *Attorney-General ex rel Yorkshire Derwent Trust Ltd. v Brotherton* (1992) 1 AC (HL) 425, 441A (Eng.); WILLIAM BLACKSTONE, *THE COMMENTARIES ON THE LAWS OF ENGLAND* 14 (1753)).

4. GRAY, *supra* note 2, at 24–25.

5. JOSHUA GETZLER, *A HISTORY OF WATER RIGHTS AT COMMON LAW* 2 (2004) (citing L. Fuller, *Irrigation and Tyranny*, 17 *STANFORD L. REV.* 1021, 1042 (1965)). *See generally id.* at 2, n.2; A. S. WISDOM, *THE LAW OF RIVERS AND WATERCOURSES* (4th ed. 1979).

6. SIR ROBERT MEGARRY & H. W. R. WADE, *THE LAW OF REAL PROPERTY* 65 (5th ed. 1984) (internal citations omitted).

Thus, the English law historically came to the conclusion that “[i]nland water (whether a river or lake) is considered to be merely ‘a species of land’, in that lawyers regard such areas of water as simply areas of ‘land covered with water.’”⁷

The experience of other jurisdictions reveals a similar development of water law so as to suit unique social and economic circumstances and physical conditions.⁸ In those parts of the world which received the common law, water law began with the English position and was adapted over time to local needs. Scott S. Slater, writes:

As our living and working environments are subject to continuous alteration by the forces of nature and humanity, there are corresponding impacts on where we find water and how we use it. Thus, it is often stated that a good water resource allocation law must be flexible and susceptible to effective conflict resolution in an evolutionary world or face being discarded as outdated. Just as frequently, it is stated that the basis of any effective water resource allocation system is the need for certainty. Simply, if there are no assurances that the rules which determine ownership, allocation, and regulation of property today will also govern conduct tomorrow, a socially unacceptable waste of economic resources will result. No certainty, no investment. No investment, no economic growth and stability. This leaves us with an interesting paradox: A good law that seeks to allocate a scarce resource must provide for change and must at the same time provide certainty.⁹

Property, both as a concept and as a legal vehicle used for the allocation of the use of scarce resources, seeks to achieve Slater’s twin objectives—certainty and adaptability—for a system of water law. As such, it underpins every method yet devised by any legal system for allocating the water resource.¹⁰ Property can ensure security of the entitlement to water, however that is defined, and good use of that resource, whatever that might mean. It can also adapt that allocation to changing circumstances, be they social, economic, political, or environmental.¹¹

7. GRAY, *supra* note 2, at 25 (citing BLACKSTONE, *supra* note 3, at 18).

8. See generally DONALD WORSTER, RIVERS OF EMPIRE: WATER, ARIDITY, AND THE GROWTH OF THE AMERICAN WEST (1985); MARC REISNER, CADILLAC DESERT: THE AMERICAN WEST AND ITS DISAPPEARING WATER 2 (1986); WATER & POWER: A CALIFORNIA HEIST (Jigsaw Productions/National Geographic Documentary Films Jan. 23, 2017).

9. See 1 SCOTT S. SLATER, CALIFORNIA WATER LAW AND POLICY § 1.02 (2017) (internal citations omitted).

10. See *id.* For the proprietary nature of Australian entitlements see *ICM Agriculture Pty Ltd v Commonwealth* (2009) 240 CLR 140, 158 (Austl.); Michael McKenzie, *Water Rights in NSW: Property Property?*, 31 SYDNEY L. REV. 443, 443-44 (2009). See generally D. E. Fisher, *Water Law, The High Court and Techniques of Judicial Reasoning*, 27 ENV’T AND PLANNING L. J. 85 (2010).

11. See Dolores Rey et al., *Role of Economic Instruments in Water Allocation Reform: Lessons from Europe*, INT’L J. OF WATER RES. DEV. 224, 224-25 (2018).

Over time, then, different legal systems developed different approaches to allocating water. Every system took as its starting point the definition of a proprietary interest in the resource.¹² The first effort at defining a proprietary water right came from English common law judges, drawing upon the Roman law legacy of rights in water.¹³ In countries tracing their modern origins to the age of English colonization, such as the United States and Australia, the common law struggled to deal with the way in which property might be held in water. The struggle focused primarily on the tension between whether a land-holder whose land abutted running water (the “riparian holder”) would have a right paramount to any other right, including prior use, and giving paramouncy to a prior user.¹⁴ Many nations ultimately settled on the system known as riparian rights, which, as we have noted, treated water flowing over land as if it were simply land. A riparian rights system provides two important rights in respect of such landholding: flow and abstraction. Megarry and Wade provide succinct summaries of the riparian rights of flow and abstraction; the former this way:

[The riparian titleholder] is entitled to the flow of water through the land unaltered in volume or quality, subject to ordinary and reasonable use by the upper riparian owners, though he has no right to object to the level of the water being lowered unless this causes damage or a nuisance. He is bound by corresponding obligations to the lower riparian owners.¹⁵

And the riparian right of abstraction as

[t]he ordinary and reasonable use which at common law a riparian owner was entitled to make of the water flowing through his land was—

- (i) the right to take and use all water necessary for ordinary purposes connected with his riparian tenement (such as for watering his cattle or for domestic purposes, or, possibly, in some manufacturing districts, for manufacturing purposes), even though this completely exhausted the stream; and
- (ii) the right to use the water for extraordinary purposes connected with his riparian tenement, provided the use was reasonable and the water was restored substantially undiminished in volume and unaltered in

12. See ALASTAIR R. LUCAS, SECURITY OF TITLE IN CANADIAN WATER RIGHTS 7 (1990); David R. Percy, *Responding to Water Scarcity in Western Canada*, 83 TEX. L. REV. 2091, 2094 (2005) [hereinafter Percy, *Water Scarcity*]; DAVID R. PERCY, THE FRAMEWORK OF WATER RIGHTS LEGISLATION IN CANADA 12-13 (1988) [hereinafter PERCY, WATER RIGHTS LEGISLATION].

13. See GETZLER, *supra* note 5, at 9. See also Joshua Getzler, *Roman Ideas of Landownership*, in LAND LAW: THEMES AND PERSPECTIVES 81, 86-87 (Susan Bright & John Dewar eds., 1998); Joshua Getzler, *Theories of Property and Economic Development*, 26 J. INTERDISCIP. HIST. 639, 651-52 (1996).

14. See Percy, *Water Scarcity*, *supra* note 12, at 2095; PERCY, WATER RIGHTS LEGISLATION, *supra* note 12, at 5-9.

15. MEGARRY & WADE, *supra* note 6, at 66 (internal citations omitted).

character. Such purposes included irrigation and (in all districts) manufacturing purposes, such as for cooling apparatus. The amount by which the flow might be diminished was a question of degree in each case.¹⁶

The riparian owner of only one bank of a non-tidal watercourse enjoyed riparian rights up to the middle of the stream.¹⁷ If the waters were tidal, the Crown or State was entitled to the foreshore (the land between the ordinary high and low water marks), negating any natural riparian rights (although even in the case of tidal waters it was possible for riparian rights to exist).¹⁸ Whatever rights to water that did exist depended, then, upon the holding of riparian land (that covered by water).¹⁹ This tied whatever rights the common law recognized in water, which was something less than a proprietary interest, to the estate or interest (ownership) in the riparian land.

Riparian rights worked well in water rich England, achieving for the most part Slater's twin objectives of certainty and adaptability.²⁰ However, the riparian rights system proved unadaptable to some of those places into which the common law flowed through the British acquisition of sovereignty. This was especially so in arid and semi-arid regions, such as the southwestern United States and most of Australia.²¹ The climatic, hydrological, and environmental similarities between the two regions mean that they are relevant comparators for the assessment of water entitlement reforms, from both a policy and a legal perspective.

California, for instance, has a "Mediterranean' climate characterized by warm, dry summers and mild winters." Most precipitation falls in the winter as rain and snow, and about 60% of it evaporates or is transpired by trees and vegetation.²² Of that left, roughly seventy-five million acre-feet per average year flows into waterways and groundwater aquifers and ultimately becomes available to use in homes, as irrigation for farmland, by industry, and in the environment.²³ This is achieved through a major system of water transfer—a massive system of dams, reservoirs,

16. *Id.*

17. *See id.* at 67 (internal citations omitted) (riparian rights accrue by virtue of holding riparian land—they are not created by grant or conveyance).

18. *Id.*

19. *Id.*

20. LUCAS, *supra* note 12, at 5-8.

21. *Id.* at 11-14; Sandford D. Clark & Ian A. Renard, *The Riparian Doctrine and Australian Legislation*, 7 MELB. U. L. REV. 475, 477-79 (1970).

22. *California Water 101*, WATER EDUC. FOUND., <https://www.watereducation.org/photo-gallery/california-water-101> (last visited May 30, 2019). *See also* CAL. DEP'T OF WATER RES., CALIFORNIA CLIMATE SCIENCE AND DATA FOR WATER RESOURCES MANAGEMENT 2-3 (2015), https://water.ca.gov/LegacyFiles/climatechange/docs/CA_Climate_Science_and_Data_Final_Release_June_2015.pdf.

23. *Id.*

aqueducts and canals—from northern California, which has 75% of California’s available water, to the south, where 80% of the urban and agricultural water demand occurs.²⁴ California’s economy of \$2.7 billion USD annually sits behind only the United States itself, China, Japan and Germany,²⁵ and it “depends [entirely] on the development and management of water.”²⁶

Similarly, the Australian state of South Australia’s climate has traditionally been described as Mediterranean, with mild, wet winters and hot, dry summers.²⁷ This description, however, is really only appropriate to the southern settled areas, those lying below the 34° latitude mark, and even then, generally only in the areas closest to the Southern Ocean and the two gulfs of St. Vincent and Spencer.²⁸ This southern area is itself subject to seasonal fluctuations in both temperature and rainfall, owing to the weather influences of the dry, desert-like continental interior to the north and the Southern Ocean to the south.²⁹

South Australia relies upon one river, the Murray, for 48.7% of its water supply.³⁰ Like California, the region depends upon large reservoirs within the major Metropolitan area of Adelaide, which contribute 44% of the water supply.³¹ Adelaide’s reservoirs are largely fed by run-off from the higher rainfall catchment of the Mount Lofty Ranges and top-up water pumped from the River Murray in drier years.³² Groundwater contributes 5.4% of the state’s water supply, largely in the rural regions, with 1.9% of supply coming from desalinated seawater.³³

In recent years, South Australia has experienced “unprecedented[ly] dry weather patterns,” likely a result of climate change.³⁴ Long periods of low rainfall have reduced flows into storages, rivers, watercourses and groundwater. “Flows into the River Murray have been at their lowest since records began, 118 years ago.”³⁵ Within the state there has been a long history of over-allocation and over-use of water from various sources.³⁶ The decline in both the quantity and quality of water

24. *Id.*

25. *California’s Economy Passes UK’s to Become World’s Fifth Biggest*, THE GUARDIAN (May 4, 2018), <https://www.theguardian.com/us-news/2018/may/04/california-economy-uk-fifth-largest>.

26. *California Water 101*, *supra* note 22.

27. TREVOR GRIFFIN & MURRAY MCCASKILL, *ATLAS OF SOUTH AUSTRALIA* 50 (1986).

28. *Id.*

29. *Id.*

30. *Water Sources*, SOUTH AUSTL. WATER CORP., <https://www.sawater.com.au/community-and-environment/our-water-and-sewerage-systems/water-sources> (last visited May 30, 2019).

31. *Id.*

32. *Id.*

33. *Id.* See *Groundwater Use*, AUSTL. GOVT. GEOSCIENCE AUSTL., <http://www.ga.gov.au/scientific-topics/water/groundwater/basics/groundwater-use> (last visited June 22, 2019).

34. GOV’T OF S. AUSTL., OFFICE FOR WATER SECURITY, *WATER FOR GOOD: A PLAN TO ENSURE OUR WATER FUTURE TO 2050* at 15 (2010).

35. *Id.*

36. *Id.*

sourced from the River Murray has further complicated the water situation for South Australia.³⁷ In both California and South Australia, the ongoing effects of climate change will only exacerbate the already limited supply of surface water.³⁸

Given the paucity of surface flowing water in both the southwestern United States and in Australia, strict adherence to riparian rights would have resulted in much land going entirely without water.³⁹ For that reason, systems of allocation which allowed water to be used on land otherwise entirely unconnected to any flowing water—non-riparian land—emerged from economic and social exigencies.⁴⁰

Despite the development of new allocation systems, disputes in both the United States and in Australia remain frequent, ranging from the nature and content of water entitlements to federalism disputes between the national and state governments. In the United States, a recently resolved conflict over control of water resources concerned the 1986 U.S.-California agreement over the Central Valley Project and State Water Projects.⁴¹ In Australia, the administration of the Murray-Darling Basin pursuant to the Murray-Darling Basin Agreement (the Australian equivalent of the 1986 U.S.-California agreement) continues to be a point of tension between the Commonwealth (federal) government and the south-eastern states (South Australia, Victoria, New South Wales, and Queensland).⁴²

37. *Id.*

38. See CAL. DEP'T OF WATER RESOURCES, *supra* note 22, at 1; GOV'T OF S. AUSTL., OFFICE FOR WATER SECURITY, *supra* note 34.

39. See LUCAS, *supra* note 12, at 1-15.

40. *Id.*

41. See, e.g., Sacramento Bee Editorial Bd., *California Water Wars Would Get Crazy Complicated if Trump Administration Dives In*, THE SACRAMENTO BEE (Aug. 31, 2018) <https://www.sacbee.com/opinion/editorials/article217621920.html>. See also Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project, U.S.-CA, Nov. 24, 1986, No. 7-07-20-W0551, <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Files/Coordinated-Agreement-between-Reclamation-and-DWR.pdf>; Press Release, Agreement Between U.S. Bureau of Reclamation and California Department of Water Resources Supported by Public Water Agencies, Westlands Water District (Dec. 12, 2018) <https://wwd.ca.gov/wp-content/uploads/2018/12/VA-Joint-Contractor-Press-Release.pdf>.

42. The state of South Australia is at the bottom of the Murray-Darling Basin, an area just over 1 million square kilometers in area with a diverse range of landscapes, ecosystems, land uses, and climates ranging from tropical north to temperate south. The River Murray, measuring 2,500 kilometers in length, is the longest river in the country and makes up a significant component of the 3,750 kilometer combined Murray-Darling river system. The Basin has, since European settlement, been the source of many disputes. A good history of the Basin and its problems can be found in DANIEL CONNELL, *WATER POLITICS IN THE MURRAY-DARLING BASIN* (2007). The Murray-Darling Basin Authority was established pursuant to the Murray-Darling Basin Agreement, which appears in *Water Act 2007* (Cth) sch 1 (Austl.). On January 23, 2018 the South Australian state government initiated a Royal Commission to investigate the operations and effectiveness of the Murray-Darling Basin system, an unusual move given only one-seventh of the basin is within the State's jurisdiction. The allocation and use of River Murray water upstream of South Australia and the perception within that state that that was having a deleterious effect on the state's water supply was a significant issue prompting the establishment

The modern disputes in California and South Australia stem from the systems of water law that replaced riparian rights in these very un-English regions. In the United States, a system known as ‘prior appropriation’ took root in the southern and western states.⁴³ Some regions adopted a hybrid of riparianism and prior appropriation.⁴⁴ Australia, along with some American states such as California,⁴⁵ established a system of “state ownership” that largely replaced riparianism.⁴⁶ These systems sought new ways to allocate the water resource. The prior appropriation system prioritized the use of water over the attachment of that use to land, while the state ownership system relied upon the state to allocate use according to need, but typically tied any allocation to an underlying estate in land.⁴⁷ Over the last twenty-five years in Australia, the original adaptation of riparian rights to the arid climate has undergone further modification, with State governments experimenting with the separation of the water allocation and use right from an underlying estate in land. While this did not change the appropriative right that resulted from earlier modifications, it did allow for the transferability of water free of an underlying interest in land.⁴⁸

The American and Australian adaptations have generally worked well. Still, the protection of an allocation in the hands of a grantee—Slater’s certainty⁴⁹—and the ability to adapt to changing circumstances, both in terms of use and in relation

of the Royal Commission. Details on the Murray-Darling Basin Commission can be found at Murray-Darling Basin Commission, <https://www.mdbrc.sa.gov.au/> (last visited July 18, 2019). And in late January 2019, a report by the Australian Productivity Commission suggested that the Murray-Darling Basin Authority should be broken up, arguing its responsibilities and powers created internal inconsistencies that were unable to be managed. See PRODUCTIVITY COMM’N, MURRAY-DARLING BASIN PLAN: FIVE-YEAR ASSESSMENT (Cth) No. 90 (Austl. 2018), <https://www.pc.gov.au/inquiries/completed/basin-plan/report/basin-plan.pdf>.

43. See DAVID H GETCHES, WATER LAW (3rd ed. 1997); *Water Law: An Overview*, THE NATIONAL AGRICULTURAL LAW CENTRE, <http://nationalaglawcenter.org/overview/water-law/> (last visited June 20, 2019); Dan Tarlock, *Prior Appropriation: Rule, Principle, or Rhetoric?*, 76 N.D. L. REV. 881 (2000).

44. See Percy, *Water Scarcity*, *supra* note 12, at 2095.

45. CAL. WATER CODE, Stats. 1943, ch. 368, § 102.

46. See *Thorpes Limited v. Grant Pastoral Company Proprietary Limited*, (1955) 92 CLR 317 (Austl.); Clark & Renard, *supra* note 21; D. Patrick James and Hubert Chanson, *One Hundred Years+ of Riparian Legislation in New South Wales*, 3 AUSTL. ENVTL. L. NEWS 39 (2000); Sandford D. Clark, *The River Murray Question: Part I – Colonial Days*, 8 MELB. U. L. REV. 11 (1971); Sandford D. Clark, *The River Murray Question: Part II – Federation, Agreement and Future Alternatives*, 8 MELB. U. L. REV. 215 (1971); Ian A Renard, *The River Murray Question: Part III – New Doctrines for Old Problems*, 8 MELB. U. L. REV. 625 (1972). The same modifications were implemented in semi-arid parts of western Canada, such as Alberta and Saskatchewan: see PERCY, WATER RIGHTS LEGISLATION, *supra* note 12.

47. See Percy, *Water Scarcity*, *supra* note 12, at 2095.

48. See PAUL T. BABIE, THE IMPLEMENTATION AND OPERATION OF TRANSFERABLE WATER ENTITLEMENT SYSTEMS IN VICTORIA AND ALBERTA (1997).

49. See Slater, *supra* note 9, for a discussion of Slater’s twin objectives of certainty and adaptability.

to the protection of the environment, continue to vex governments. It is the very nature of defining a certain and adaptable property right in a fugacious resource that causes problems. Unlike land or tangible personal property, fugacious resources such as water are difficult to “possess” in any traditional sense. The definition of a property right must depend on some other aspect, which has typically resolved itself into an allocation of a given volume of water over a given period of time.⁵⁰

The United States Court of Claims decision in *Sacramento Grazing Ass’n, Inc. v. United States*⁵¹ demonstrates not only the difficulties involved in establishing water allocations that are both certain and adaptable, but also the passions to which those difficulties can give rise. In that case, two very divergent routes were taken by groups claiming proprietary interests in water rights. One group in Oregon took up arms against the US federal government so as to vindicate their claimed rights.⁵² In a dispute focusing on protection of the environment and wildlife, armed militant ranchers protesting federal control of lands seized control of the Malheur National Wildlife Refuge.⁵³ But in New Mexico, the Sacramento Grazing Association (SGA) sought redress in the US federal courts.⁵⁴ There, Judge Braden held “that SGA established. . . a property interest, recognized by New Mexico law, to make beneficial use of stock water sources in the Sacramento Allotment of the Lincoln National Forest.”⁵⁵ That right “was abrogated by actions undertaken by the United States Forest Service (“USFS”), in violation of the Takings Clause of the Fifth Amendment to the United States Constitution.”⁵⁶

Disputes such as those in Oregon and New Mexico raise a fundamental question: is property the best way to achieve the objectives of adaptability and certainty as identified by Slater? This question takes on new significance in respect of the current vogue, both in the United States and in Australia, for the “unbundling” of entitlements to water.⁵⁷ This involves not only the separation of water allocation

50. ROBERT E. CLARK, *WATERS AND WATER RIGHTS*, VOL. 1, 287-300 (1967).

51. See *Sacramento Grazing Ass’n v. United States*, 135 Fed. Cl. 168 (2017).

52. *Id.* at 171.

53. See Cat Wise, *Cranes, Curlews, And Cows—The Delicate Debate Over Oregon’s Federal Lands*, PBS NEWS (May 24, 2016), <http://www.pbs.org/newshour/bb/cranes-curlews-and-cows-the-delicate-debate-over-oregons-federal-lands/>.

54. See Josh Buettner, *New Mexico ranchers say battle over water rights jeopardizes their livelihood*, PBS NEWS (January 4, 2019), <https://www.pbs.org/newshour/show/new-mexico-ranchers-say-battle-over-water-rights-jeopardizes-their-livelihood>; *Sacramento Grazing Ass’n v. United States*, 96 Fed. Cl. 175 (2010).

55. *Sacramento Grazing Ass’n*, 135 Fed. Cl. at 171.

56. *Id.*

57. See Michael Young, et. al., *Unbundling Water Rights: A Blueprint for Development of Robust Water Allocation Systems in the Western United States*, 15-01 NICHOLAS INST. FOR ENVTL. POL’Y SOLUTIONS 10-11 (2015).

from land, but also the further division of the allocation itself for different uses.⁵⁸ In other words, there is a further fragmentation—unbundling—of an already fragmented right. Property confers on its holder the power to choose, as mediated by the public interest, with the state taking *the* central role in determining what the public interest is and how to ensure the protection and certainty of the individual right. But the more fragmented, or unbundled the rights available in the same resource, the more difficult it becomes for any one holder of property—of choice—to make a decision about the beneficial use of that resource.

In short, government seeks to ensure a balance between private and public interest.⁵⁹ That being the case, it becomes important to consider where the state draws the line between the individual and the community and where the unbundling of water allocations allows that line to be drawn. Such line drawing requires a framework within which to consider the allocative mechanism implemented. In this article, we argue that striking that balance means considering the tension between what Garrett Hardin seminally called the tragedy of the commons and Michael Heller's ground-breaking revelation of the anticommons tragedy.⁶⁰ Somewhere between those two points one finds the optimal balance between individual and community, between aggregated and disaggregated, or unbundled rights. That is the theoretical frame that we propose to apply to a system that seeks to allocate water in pursuit of a policy of unbundled rights.

We apply this frame to a case study of the current unbundling process in the Australian state of South Australia. Still, our approach can be applied to any water law system in which unbundling has been pursued, informing the definition and allocation of a proprietary right in water. For example, California is in the process of implementing modifications to its water allocation law that would allow for a revised groundwater market.⁶¹ In doing so, it should consider the potential for an-

58. *Id.*

59. See Paul Babie, *Idea, Sovereignty, Eco-colonialism and the Future: Four Reflections on Private Property and Climate Change*, 19 GRIFFITH L. REV. 527 (2010); see also Paul Babie, *Choices that Matter: Three Propositions on the Individual, Private Property, and Anthropogenic Climate Change*, 22 COLO. J. OF INT'L ENVTL. L. AND POL'Y 323 (2011); see also Paul Babie, *Sovereignty as Governance: An Organising Theme for Australian Property Law*, 36 U. OF N.S.W. L. J. 1075 (2013); see also Paul Babie, *The Spatial: A Forgotten Dimension of Property*, 50 SAN DIEGO L. REV. 323 (2013).

60. For the tragedy of the commons, see Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 1244 (1968). And for the tragedy of the anticommons, see Michael A Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621 (1998).

61. See Dickinson Groundwater Management Act, Cal. Assemb. Bill 1739, Ch. 347 (Cal. Stat. 2014), Pavley Groundwater Management Act, Cal. S. B. 1168, Ch. 346 (Cal. Stat. 2014), and Cal. S. B. 1319, Ch. 346 (Cal. Stat. 2014), collectively known as the Sustainable Groundwater Management Act (SGMA), Cal. Water Code §10730 (2015). See also Nell Green Nylen et al., *Trading Sustainably: Critical Considerations for Local Groundwater Markets Under the Sustainable Groundwater Management Act*, WHEELER WATER INST., CTR. FOR LAW, ENERGY & THE ENV'T, U.C. BERKELEY SCH. L. (June 2017), https://www.law.berkeley.edu/wp-content/uploads/2017/06/CLEE_Trading-Sustainably_2017-06-21.pdf.

tragedies that may follow the further fragmentation of an already fragmented resource. Our assessment of South Australia demonstrates that market actors seem reluctant to take up smaller and smaller bundles of rights in relation to water. We develop, in response, a legal methodological approach for the consideration of water allocation systems in arid and semi-arid environments where the water resource is scarce and where the bundles of rights in that resource are increasingly fragmented.

The article contains three parts. Part I considers the theoretical nature of property and the way in which it might be extended to water through “unbundling” of water entitlements. Part II presents unbundling as it has been implemented in South Australia. This allows us to assess the extent to which the stated policy of certainty and transferability of entitlements said to be the product of unbundling has been achieved, and the extent to which this is a desirable outcome. The Conclusion offers some reflections on the potential for unbundling water entitlements in arid or semi-arid environments. The South Australian experience reveals a reluctance to embrace this approach, both on the part of the state in terms of implementing, and on the part of market actors holding existing proprietary interests in water. This reluctance ought to be viewed by other jurisdictions as a cautionary tale about the effectiveness or efficiency of unbundling. Indeed, what we show is that such efforts may not only fail to provide efficiency gains, but also, and much more worryingly, may drive anticommons tragedies which entirely inhibit any beneficial use. We propose that our anecdotal and theoretical analysis of South Australia requires empirical research to test our conclusions, both in respect to the operation of the water market and as to the behavior of market actors.

I. PROPERTY IN WATER

A. *Commons versus Anticommons*

A legal system might allocate the use and control of water according to one of two polar opposite forms of property: either, at one extreme, commons property, or at the other, private property. In this section we examine not only commons and private property, but also two specific difficulties that can arise from the use of one or the other. A ‘tragedy of the commons’ can result from the sole use of commons property,⁶² while a ‘tragedy of the anticommons’ can follow the extreme fragmentation of the use of a resource pursuant to private property.⁶³ We turn first to commons property.

In 1968, Garrett Hardin explored the nature of commons property which, as a matter of theoretical content, explains the absence of exclusionary rights in respect

62. Hardin, *supra* note 60, at 1244.

63. Heller, *supra* note 60, at 622.

of a given resource.⁶⁴ Instead, commons property pertains where everyone has the privilege of use and no one has the right to exclude others in relation to that resource. “People are legally free to do as they wish, and are able to do, with whatever objects (conceivably including persons) are in the [commons].”⁶⁵ The protections otherwise afforded the holders of private property are not extended, in the case of commons property, to the resource in question.⁶⁶

One rarely finds the ideal type of commons property identified by Heller in a real-world legal system.⁶⁷ Rather, the ideal type demonstrates that in the case of a true commons in any resource, where no one person has the power to exclude the use of others, the rational person concludes that it is best to make as much use of the resource as one can before it is depleted by the use of others.⁶⁸ Put another way, there is no benefit to any one person to conserve a resource in a scenario where others are making maximal use of it.⁶⁹ Thus, should too many people hold truly commons property in a scarce resource, without the power to exclude, a tragedy of the commons occurs.⁷⁰

For Hardin, “freedom in a commons brings ruin to all.”⁷¹ Hardin would subsequently write that the tragedy arises in the “unmanaged commons”—in other words, Hardin suggested that a commons may operate efficiently if some regulation is established to govern the use made by those who enjoy access to the commons—which results

because it rewards individual exploiters for making the wrong decisions—wrong for the group as a whole, and wrong for themselves, in the long run. Freedom in the commons does *not* produce a stable prosperity.⁷²

In some ways, though, what Hardin identified was nothing new. In the *Politics*, Aristotle wrote

64. Hardin, *supra* note 60, at 1244.

65. FRANK I. MICHELMAN, *Ethics, Economics, and the Law of Property*, in NOMOS XXIV: ETHICS, ECONOMICS, AND THE LAW 3, 5 (J. Rowland Pennock & John W. Chapman eds., 1982).

66. J. W. HARRIS, PROPERTY AND JUSTICE 110 (1996).

67. The “ideal-typic” and “ideal types” phraseology is coined by Michael A. Heller, *Three Faces of Private Property*, 79 OR. L. REV. 417, 418, 422, 432-433 (2000). See also Michael A. Heller, *The Boundaries of Private Property*, 108 YALE L. J. 116, 1168 n. 15 (1999).

68. Hardin, *supra* note 60, at 1244.

69. *Id.*

70. Heller, *supra* note 60, at 677 (1998) (“A tragedy of the commons can occur when too many individuals have privileges of use in a scarce resource. The tragedy is that rational individuals, acting separately, may collectively overconsume scarce resources. Each individual finds that she benefits by consumption, even though she imposes larger costs on the community.”)

71. Hardin, *supra* note 60, at 1244.

72. Garrett Hardin, *The Tragedy of the Unmanaged Commons*, 9 TRENDS IN ECOLOGY & EVOLUTION 199, 199 (1994).

[t]hat which is common to the greatest number is given the least care, for they care most for that which is their own, and less for that which is common to all, or they care just for whichever part falls on them individually. Among other reasons, they neglect it even more when they think that someone else is caring for it, as among the staff of the household, when sometimes those who give bad service are greater in number than those who do not. And further, for this reason, each citizen has a thousand sons, these not belonging to each individually, instead being the son of everyone equally, so that each is neglected with equal measure.⁷³

In this passage, as in Hardin, we see that the tragedy occurs when the subject enjoys the benefits without the burden of responsibility. Paradoxically, though a person might have an interest in maintaining the condition from which to enjoy the benefits, the burden does not fall on that person to do so. Therefore, the responsibility is fulfilled by no one.

Averting this tragedy involves ensuring that every person in the commons has something to protect. The way to do that is to confer upon each person a means of excluding others from access to and use of the resource said to belong to that person.⁷⁴ In other words, the answer is private property: the power, conferred by the state on individuals, to make use of a resource and to exclude others from that use, and to alienate that power to others at a time and in a way chosen by the holder of the original power of use and exclusion.⁷⁵

According to Hardin, the best ongoing protection for a resource involves a parcelling out of rights to that resource.⁷⁶ Fragmenting a common resource both spatially (of the resource itself) and legally (as to the rights available to it as protected by law) confers upon individuals the ability to control use and exclude others from use.⁷⁷ But is such fragmentation, both of the resource and of the power to exclude from its use, the best outcome available? Others have questioned whether the adoption of private property represents the sole method of mitigating the tragedy of the commons;⁷⁸ indeed, even Hardin himself reconsidered his confidence in private property.⁷⁹

In 1998, thirty years after Hardin's seminal work, Michael Heller suggested a "mirror image" to the tragedy of the (unregulated) commons—the tragedy of the

73. ARISTOTLE, *POLITICS* § 1261b (Kyriaco Nikias trans. 2019).

74. Hardin, *supra* note 60, at 1245.

75. *Id.*

76. *Id.*

77. See Heller, *supra* note 60, at 651, for an explanation of the spatial-legal dichotomy.

78. Lubna Hasan, *Fifty Years of Debate on Hardin's Tragedy of the Commons – A Reflection* 2, 9-10 (2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3315183 (providing a recent summary of the positions taken by those who question Hardin's approach).

79. See Hardin, *supra* note 72, at 199.

anticommons.⁸⁰ Heller's work posits a form of property known as "anticommons" and the tragedy that follows from its surfeit in a legal system. Here we briefly consider these claims in turn.

Consider first the concept of anticommons property. Walking down a post-Soviet Moscow street in the late 1990s, Heller noticed empty storefronts, explaining this outcome as the result of circumstances in which

one owner may be endowed initially with the right to sell, another to receive sale revenue, and still others to lease, receive lease revenue, occupy, and determine use. Each owner can block the others from using the space as a storefront. No one can set up shop without collecting the consent of all of the other owners.⁸¹

This represents a case of anticommons property, in which "initial endowments are created as disaggregated rights rather than as coherent bundles of rights in scarce resources In an anticommons . . . multiple owners are each endowed with the right to exclude others from a scarce resource, and no one has an effective privilege of use."⁸²

We might consider anticommons property as private property on steroids: "a property regime in which multiple owners hold effective rights of exclusion in a scarce resource,"⁸³ inhibiting effective and efficient use. The most extreme form of anticommons private property is that pertaining to pharmaceutical patents—many individual holders enjoy a right of exclusion in relation to a different component of one pharmaceutical product. The multiple rights of exclusion mean that no one patent holder can effectively and efficiently develop the pharmaceutical product, thus denying both the patent-holders of the financial benefit of the right held, and the market of a potentially beneficial medicine.⁸⁴ Yet, "for most resources that people care about, some level of use is preferable to non-use, and an anticommons regime is a threat to, rather than the epitome of, optimal use."⁸⁵ We might plot what we know about commons property, private property and anticommons property along a continuum, as seen in Figure 1.

80. Heller, *supra* note 60. Michael Heller fully developed the concept of the anticommons tragedy in MICHAEL HELLER, *THE GRIDLOCK ECONOMY: HOW TOO MUCH OWNERSHIP WRECKS MARKETS, STOPS INNOVATION, AND COSTS LIVES* (2010).

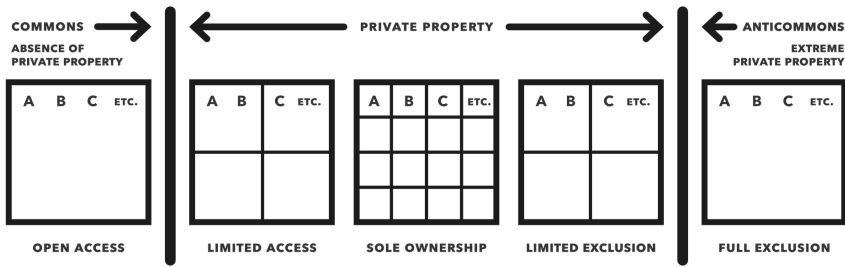
81. Heller, *supra* note 60, at 623.

82. *Id.* at 623-24.

83. *Id.* at 667 (emphasis in original removed).

84. HELLER, *supra* note 80, at 49-78.

85. Heller, *supra* note 60, at 669.

FIGURE 1. CONTINUUM OF PRIVATE PROPERTY⁸⁶

As one plots a system of property towards the anticommons end of the continuum, what one really finds is a highly fragmented system of private property rights in one resource. At this end of the continuum, what Heller calls “extreme private property” in the diagram, full exclusion refers to the fact that actor A, B, C, etc., has a full exclusionary right in relation to one discrete element of the resource symbolized by the full cell. This contrasts with the commons end of the continuum, in which the absence of private property means that each of A, B, C, etc., has no right to exclude any others entitled to make use of the commons, again represented by the full cell. When a situation at the anticommons end emerges in relation to a given resource, either as a consequence of the state creating and conferring private property, or of individuals dividing existing private property interests, the potential for what Heller calls an anticommons tragedy looms. “When there are too many owners holding rights of exclusion, the resource is prone to underuse - a *tragedy of the anticommons*.”⁸⁷ Here, then, “too many individuals have rights of exclusion in a scarce resource. The tragedy is that rational individuals, acting separately, may collectively waste the resource by underconsuming it compared with a social optimum.”⁸⁸ Moreover, and more worrying,

[o]nce anticommons property appears, neither markets nor subsequent regulation will reliably convert it into useful private property, even if the property rights are “clearly defined” and contracts are subject to the “rule of law.” Transaction costs, holdouts, and rent-seeking may prevent economically justified conversion from taking place. Over time, markets may develop formal or informal mechanisms that allow rights bundling entrepreneurs to assemble private or quasi-private property. More directly, governments can tinker with the rights regime through policy reforms to change individual incentives in favor of bundling, or they can risk the instability that comes from revoking excessive rights of exclusion. Howev-

86. Adapted from Heller, *supra* note 67, at 1167.

87. Heller, *supra* note 60, at 624 (emphasis in original).

88. *Id.* at 677.

er . . . once anticommons property has emerged, both markets and governments may fail to rebundle it into usable private property.⁸⁹

It is for this reason, Heller argues, that

[g]overnments must take care to avoid creating anticommons property accidentally when they define new property rights. One path to well-functioning private property is to convey a core bundle of rights to a single owner, rather than rights of exclusion to multiple owners. Subsequently, owners of standard bundles may fragment their ownership. Well-functioning market legal systems allow this conversion, but have numerous safeguard mechanisms to ensure that rights can be rebundled and the property can be put to use within a reasonable period. When these mechanisms fail, anticommons property can become entrenched, even in developed market economies.⁹⁰

The difficulty is that

[b]oth theorists and practitioners assume that the key to creating private property is to define rights clearly, enforce contracts predictably, and let the market sort out entitlements. The experience of anticommons property . . . suggests that the content of property bundles, and not just the clarity of property rights, matters more than we have realized. We pay a high price when we inadvertently create anticommons property.⁹¹

Heller's conclusions about anticommons property and the potential for a tragedy of underuse stand in stark contrast to the trend of Australian policy, legal, and scholarly opinion about the packaging of proprietary rights in water. The Australian objective seems to be an unbundling of property rights or entitlements to this scarce resource.⁹² This unbundling seems to be the very circumstance that will ensure not that the resource will be used efficiently, but rather that it will not be used at all. While it is uncertain that a tragedy either of the commons or of the anticommons will occur simply because either commons or anticommons property exists,⁹³ as we show in Part II, the risk of such a tragedy following the emergence of these types of property is significant, and the consequences dire.

Hardin and Heller stake out positions at either end of a very wide spectrum—they theorize two different types of property and two different types of tragedy. At Hardin's end of the spectrum we find commons property and the tragedy of the

89. *Id.* at 687-88.

90. *Id.* at 688.

91. *Id.*

92. *See infra* Section II.A (describing Australia's evolving approach to the unbundling of water rights between 2004 and 2012).

93. HELLER, *supra* note 80, at 676-78.

commons. At Heller's end, anticommons property, or more accurately, hyper-private property and the anticommons tragedy.

Of course, almost no cases of a perfect commons or of an anticommons property system will ever be found in any real-world scarce resource. As we have noted, they are ideal types. The point, though, is that a system of property or entitlement in a scarce resource will require pegging somewhere along that spectrum. Making the decision as to where to place those entitlements carries consequences for the use of that resource. That pegging is really another way of saying that a decision has to be made between prioritizing the individual—at the Heller end—and the collective or community—the Hardin end.⁹⁴ Too far towards the commons end of the spectrum and wasteful use will occur; too far towards the anticommons end and the opposite, a complete lack of any use whatsoever, follows. As we show in the next section, and in Part II, this tension is perhaps most marked in the debate over bundling or unbundling allocations in water. The question is a simple one: have governments that have engaged in unbundling achieved the correct blend of proprietary entitlements, taking account of the commons and anticommons tragedies at either end of the property continuum? Through an assessment of the legislative, policy, and anecdotal evidence, we explore the extent to which unbundling has been achieved in Australian water law, using South Australia as a case study. We then examine the extent to which this development carries with it the potential for an anticommons tragedy.

B. *Bundled versus Unbundled*

The tension between commons and anticommons property plays out in relation to the current trend away from bundled entitlements to water. As we noted in the Introduction, for the most part, government-established and enforced water-allocation systems seek to balance two competing goals. They work to separate water allocations from the necessity of owning land while avoiding commons property and its attendant difficulties.⁹⁵ Most modern water-allocation systems respond to circumstances—sometimes found in prior-appropriation systems—in which conflict among users and inefficient use by those users ensues from a lack of clarity over the rights held.⁹⁶ Governments intervene so as to encourage markets in water and to ensure the viability and functioning of those markets.⁹⁷

It comes as no surprise, then, as we have shown in Part I, that most governments move away from commons property as concerns water allocation, and towards systems of private property in water. In doing so, such water allocation systems move along the continuum outlined above towards anticommons property.

94. See Hardin, *supra* note 72, at 199; see also Heller, *supra* note 60, at 623-24.

95. See *supra* Introduction.

96. See Young, *supra* note 57, at 1.

97. See *id.* at 7.

Unbundling, as we have discussed above,⁹⁸ seeks simultaneously to define the entitlement to water and its separation into constituent parts, making it, so it is claimed, “easier to value, monitor, and trade.”⁹⁹

In an unbundled system, the component of a water right that defines the long-term interest is defined as a share. The water that is available for use within a time period (e.g., year or season) is then defined as a seasonal allocation. A share can be thought of as a perpetual entitlement to a portion of any water that is allocated for use. A seasonal allocation can be thought of as an acre foot of water available in a particular season. In an unbundled system, this acre foot can be used, traded, or, with adjustment for losses, saved for use in a subsequent season. The number of seasonal allocations a person receives is a function of the number of shares he or she holds in that particular water resource. When an allocation is made, it is recorded in a water account, but not recorded on a share certificate.¹⁰⁰

“Priority shares” within the system ensure that those who hold allocations prior to unbundling retain that priority, and “seasonal or annual allocations” are made according to the number of shares held.¹⁰¹ Thus, shares and allocation are separated, which “enables two forms of trading: (1) share trading, which facilitates efficient management of risk and investment and (2) allocation trading, which ensures that all water is put to its best economic use.”¹⁰²

A key component of an unbundled allocation of water is the absence of a 100% beneficial use requirement. Rather, a clearly-defined water right may allow a holder of an allocation to use it (either in its entirety or not), save it, or sell it, each depending upon seasonal conditions and circumstances.¹⁰³ Water resource sharing plans make clear how water is to be used, leaving little to judgement and dispute requiring judicial resolution.¹⁰⁴ Established by water boards (which remove much dispute-resolution from courts),¹⁰⁵ such plans “must address how much water must be (1) set aside for conveyance and meeting of downstream obligations, (2) allocated to shareholders, and (3) defined as flood water and, hence, not held as a right.”¹⁰⁶ In addition to this, such plans make provision for water that is to be retained in system for the environment.¹⁰⁷ Bolstering the certainty achieved by re-

98. See *supra* Section I.A.

99. Young, *supra* note 57, at 11.

100. *Id.*

101. *Id.*

102. *Id.* at 12.

103. *Id.* at 11, 16-17.

104. *Id.* at 12.

105. *Id.* at 22-23.

106. *Id.* at 13 (footnote omitted).

107. *Id.* at 19-21.

source sharing plans, a Torrens Title-like register of water entitlements allows for ease of determining the holder of relevant water entitlements, and for establishing priority amongst them and for facilitating their transfer.¹⁰⁸

The question, of course, is whether the policy of unbundling works—does it move too far along the continuum of property, thus running the risk of a tragedy of the anticommons? In partial answer to that question (partial, for reasons we will see), we turn now to the legal implementation of the theory and policy of unbundling in South Australia.

II. UNBUNDLING WATER ENTITLEMENTS IN SOUTH AUSTRALIA

The climate of the Australian continent is varied, though it is for the most part characteristically dry. Though an extensive agricultural economy developed in the colonial period, the rainfall upon which it depends can be unreliable. Droughts are frequent and severe.¹⁰⁹ The Australian condition is captured most famously in the works of the nation's foremost novelist, Patrick White. The landscape serves White as a device for exploration of the theme of reckoning with hardship, as when, gazing helplessly into the sky above her rural property, one of his characters ponders that

[t]here would be rain *perhaps*, she felt.¹¹⁰

But White's surreality has been the harsh actuality of the Australian condition for generations of agriculturalists. This is especially true of South Australia, the vast majority of which is either arid or semi-arid.¹¹¹

108. *Id.* at 13-15. Torrens title is a system of title to land by registration, whereby an estate or interest in land is created not by deed, as at common law, but through a legislatively defined process of registration. A system of title by registration, such as the Torrens title system, seeks to achieve three primary objectives: (i) establishing a register in which any person can determine the state of title to a given landholding simply by searching the register—this is known as the 'mirror principle', in the sense that the register provides an accurate 'reflection' of the state of title, (ii) drawing a 'curtain' around all prior dealings with the land, so that a person dealing in the land is bound only by those interests noted on the register at the relevant time—the 'curtain principle'—and, (iii) a state guarantee of title, such that any person who suffers loss as a consequence of reliance on the register or as a result of the operation of the register may recover that loss from the state—the 'guarantee principle'. The Torrens title system was created in South Australia in 1858 and has subsequently been adopted throughout Australia, most of Canada, and some other jurisdictions internationally, including some U.S. States. See John V. Orth & Paul T. Babie, *The Troubled Boundaries of Torrens Indefeasibility: Lessons from Australia and the United States*, 7 PROP. L. REV. 33 (Australia) (2017) (outlining systems of land title by registration, the origins of the Torrens system, and its spread to other jurisdictions).

109. *Climate Change and Drought*, CLIMATE COUNCIL (June 2018), https://www.climatecouncil.org.au/wp-content/uploads/2018/06/CC_MVSA0146-Fact-Sheet-Drought_V2-FA_High-Res_Single-Pages.pdf.

110. PATRICK WHITE, *THE TREE OF MAN* 63 (1956).

111. Trevor Griffin & Murray McCaskill (eds) *Atlas of South Australia*, South Australian Government Printing Division and Wakefield Press 1986 at 50-51.

A. Policy

The state of South Australia has the unenviable title of being the driest state on the driest inhabited continent on earth.¹¹² The latest State of Environment report for South Australia paints a bleak picture for a state that already has water scarcity issues from time to time.¹¹³ “South Australia’s surface water and groundwater resources are under pressure from agriculture, industrial use, population growth, pollution, and climate change.”¹¹⁴

Since 1990, the state has exhibited significant regional variation in rainfall trends. Winter rainfall has decreased in the state’s key southern agricultural regions by around 10–40 mm per decade, while tropically induced summer rainfall has increased in the northern pastoral regions by up to 40–60 mm per decade. Although there has been some increase in extreme rainfall events, particularly in the state’s north, annual and spring rainfall across South Australia is projected to decline by between 5–15% by 2050 (relative to the baseline period 1986–2005).¹¹⁵

There is a strong reliance on both the River Murray for industry, irrigation, and water supply to the state’s major city, Adelaide, and on groundwater supplies in the rural sector and rural towns.¹¹⁶ If the limited useable sources of water are to be available for use by both present and future generations and for environmental purposes, they must be rigorously managed with care and considerable foresight.¹¹⁷ The systems set up under the *Natural Resources Management Act 2004* (South Australia (SA)) for the licensing and approval of rights in relation to water are designed to assist with the process of ensuring both present and future generations of South Australians have access to adequate water supplies. They clearly contemplate an unbundled approach to those water rights.¹¹⁸

In 2012, the South Australian government issued its *Policy on the Implementation of Unbundling Water Rights in South Australia*, the stated purpose of which was “[t]o set out the principles and processes for determining the appropriate level and timing of unbundling of water rights for each prescribed water resource” and thus “respond to requirements for water planning under the COAG Water Reform

112. *River Murray*, GOV’T OF S. AUSTL., DEP’T FOR ENV’T AND WATER, <https://www.environment.sa.gov.au/topics/river-murray> (last visited July 19, 2019).

113. S. AUSTL. ENV’T PROTECTION AUTH., STATE OF THE ENVIRONMENT REPORT 1-52 (7th ed. 2018) <https://www.epa.sa.gov.au/soe-2018>.

114. *Id.* at 27.

115. *Id.* at 15.

116. *River Murray*, GOV’T OF S. AUSTL., DEP’T FOR ENV’T AND WATER, <https://www.environment.sa.gov.au/topics/river-murray> (last visited July 19, 2019).

117. See Intergovernmental Agreement on a National Water Initiative, ¶ 2, 2010.

118. *Natural Resources Management Act 2004* (SA). This unbundled approach was set up under Part 3 of the *Natural Resources Management Act 2004* following amendments made to that Act by the *Natural Resources Management (Water Resources and Other Matters) Amendment Act 2007*. The amendments were made, in part, to meet the State of South Australia’s obligations pursuant to the 1994 Intergovernmental Agreement on a National Water Initiative.

agenda, National Water Initiative (NWI), in particular the NWI Guidelines for Water Planning and Management, as well as the Water Resource Plan Requirements in the Basin Plan.”¹¹⁹ The first step in this process involved amendments to the *Natural Resources Management Act 2004* (SA)¹²⁰ which came into force on 1 July 2009. The Act allows for five defined water entitlements, collectively defined by the generic term, “water management authorisation:”¹²¹ (i) water access entitlements,¹²² (ii) water allocations,¹²³ (iii) delivery capacity entitlements,¹²⁴ (iv) water resource works approvals,¹²⁵ and (v) site use approvals.¹²⁶ The first three entitlements were stated to be personal property, freely transferable as such, while the latter two remained attached to land.¹²⁷

In the 2012 Policy, however, the government stated that it had been “determined that apart from regulated river systems the applicability and benefits of unbundling water rights are less obvious.”¹²⁸ The government noted that a number of questions remained about unbundling, namely

119. GOV'T OF S. AUSTL., POLICY ON THE IMPLEMENTATION OF UNBUNDLING WATER RIGHTS IN SOUTH AUSTRALIA 1 (2012), <https://www.waterconnect.sa.gov.au/Content/Publications/DEWNR/Policy%20on%20the%20Implementation%20of%20Unbundling%20Water%20Rights%20in%20South%20Australia.pdf>.

120. Pursuant to the *Natural Resources Management (Water Resources and Other Matters) Amendment Act 2007* (South Australia). See also *Natural Resources Management (General) Regulations 2005* (South Australia).

121. *Natural Resources Management Act 2004* (SA) s 3.

122. This is a water license providing an entitlement to the holder of the license to gain access to a share of water available in the consumptive pool or consumptive pools to which the license relates. See *id.* at s 146.

123. A water allocation is the amount of water that may be allocated to a particular license holder in relation to a defined water resource. See *id.* at s 152.

124. A delivery capacity entitlement is an entitlement held by a person enabling the transfer of the subject water to another under a water entitlements transfer scheme. See *id.* at s 164(k).

125. A water resource works approval is an approval for works and infrastructure related to the extraction and supply of water through bores, pumps, pipes, etc. See *id.* at s 159.

126. A site use approval is an approval specifying the purposes for which the water can be used, the place at which it can be used and the proposed extent, manner and rate of use of the water. For example, the use of water supplied for irrigation purposes may be restricted to certain types of irrigation such as drip irrigation and night watering as a water conservation measure during the summer. See *id.* at s 164(a).

127. GOV'T OF S. AUSTL., *supra* note 119, at 2. See also GOV'T OF S. AUSTL., DEP'T OF ENV'T, WATER AND NAT. RESOURCES, UNBUNDLING WATER RIGHTS - GENERAL INFORMATION (2009), <https://www.waterconnect.sa.gov.au/Content/Publications/DEWNR/Unbundling%20Water%20Rights%20FAQ.pdf> [hereinafter UNBUNDLING WATER RIGHTS - GENERAL INFORMATION].

128. GOV'T OF S. AUSTL., *supra* note 119, at 2. (“South Australia is committed to implementation of unbundling for surface water, watercourses and groundwater systems, where demonstrated to be feasible and of overall net benefit, in consultation with stakeholders on a case by case basis.”). The River Murray is just one of a number of regulated river systems across Australia. See, *River Murray*, GOV'T OF S. AUSTL., DEP'T FOR ENV'T AND WATER., <https://www.environment.sa.gov.au/topics/river-murray> (last visited July 19, 2019).

- Are there gaps in knowledge about the water resource that impact on determining consumptive pool boundaries?
- What are the required water resource management arrangements and are they better supported by unbundling water rights?
- Does unbundling streamline or complicate water resource management, water rights administration and processes for water users?
- Does unbundling facilitate water markets and water trade? This may depend on the complexity of water resource management issues, but can also depend on the maturity of the market and the level of understanding and confidence of the licensees. In addition, any assessment should consider any advantages from expediting trade.
- To what extent are other prescribed water resources within the same region unbundled?
- To what extent are inter-catchment or inter-basin water transfers occurring and what is the impact of potential different management arrangements between these catchments?
- Are there other outstanding issues that may need to be resolved prior to the introduction of unbundled water rights—such as conversion to volumetric allocations, addressing overallocation, dealing with unlicensed water use, such as stock and domestic water use, or interception and use by forestry?
- Are there intergovernmental issues that need to be considered, such as the Border Groundwater Agreement,¹²⁹ and the benefits of consistency with interstate arrangements?
- What are the current administrative practices and how will they have to change under an unbundled water rights system? Are there barriers in terms of costs, skills, IT systems, etc.?¹³⁰

For these reasons, while unbundling has occurred in the River Murray Prescribed Watercourse and the Southern Basins and Musgrave Prescribed Wells Area (see Figure 2 for the South Australian water resource management areas),¹³¹ full unbundling across the state has yet to proceed. In the following section, we consider

129. The Border Groundwater Agreement is an agreement between the Australian states of Victoria and South Australia. Along the border between the two states the only reliable source of water is groundwater. It is used for irrigation, industrial, stock and domestic supply and is the principal source of water for some of the townships in the border region. The Agreement seeks to ensure that the available groundwater is shared equitably between the two states in an area that extends for 20 kilometers on either side of the border for a distance of 450 kilometers. *Border Groundwaters Agreement - South Australia-Victoria*, GOV'T OF S. AUSTL., <https://www.environment.sa.gov.au/topics/water/resources/border-groundwaters-agreement> (last visited Nov. 19, 2019).

130. GOV'T OF S. AUSTL., *supra* note 119, at 4. See generally, UNBUNDLING WATER RIGHTS - GENERAL INFORMATION, *supra* note 127.

131. *Unbundling Water Rights*, GOV'T OF S. AUSTL., <https://www.environment.sa.gov.au/managing-natural-resources/water/planning/water-licences-and-permits/unbundling-water-rights> (last visited July 19, 2019).

the legal framework of unbundling pursuant to the *Natural Resources Management Act 2004* (SA), including subsequent amendments to the Act made in 2007 to implement the requirements of the National Water Initiative.

B. Commonwealth Impetus: National Water Initiative 2004

The allocation and regulation of water has been a problem in Australian law since the foundation of central governments after colonization.¹³² The problem of allocation is inherently one of the transferability of rights.¹³³ The Roman legacy of riparian rights in English law was wholly unsuitable for the dry continent, since it restricted the allocation of rights to water to those who held the land on which the water was located, or to which it was connected.¹³⁴ Water in Australia was not as abundant as it was in England, so the riparian doctrine created an irregular and inefficient distribution of access to the resource. It was clear from the establishment of the first farms in the colonies that water rights on the continent would have to be severed from rights in land in order to achieve an efficient allocation of the resource for agricultural use. An early attempt at centralizing the allocation of water rights is seen in the Victorian *Irrigation Act 1886* (Victoria (Vic))¹³⁵ which put rights in the use of water from a watercourse in the hands of the state, thus subordinating the rights of riparian landholders.¹³⁶

It took another century for the principle of the severance of water rights from land to be extended to water *generally*, rather than watercourses alone.¹³⁷ The first step in the reform of Australian water rights was the 1994 Council of Australian Governments ('CoAG') Water Reform Framework.¹³⁸ It was agreed by the state governments that they

would implement comprehensive systems of water allocations or entitlements backed by separation of water property rights from land title and clear specification of entitlements in terms of ownership, volume, reliability, transferability and, if appropriate, quality . . .¹³⁹

132. See Clark, *supra* note 46.

133. See BABIE, *supra* note 48.

134. On modern riparian doctrine and its history, see *supra* notes 42-46 and associated text. See also GETZLER, *supra* note 5, at 2.

135. Irrigation Act of 1886, 50 Vict. No. 898 (1886).

136. See JOHN TISDELL, JOHN WARD, AND TONY GRUDZINSKI, THE DEVELOPMENT OF WATER REFORM IN AUSTRALIA (TECHNICAL REPORT 02/5), 16 (Cooperative Research Centre for Catchment Hydrology, 2002).

137. See BABIE, *supra* note 48.

138. COUNCIL OF AUSTL. GOV'TS, WATER REFORM FRAMEWORK COMMUNIQUE 25 FEBRUARY 1994, (Environment Australia, Marine and Water Division, 2004) <http://www.ielrc.org/content/e9401.pdf>.

139. *Id.* at s 4(a).

The 1994 agreement is properly placed in the context of the liberalization of Australian macroeconomic policy in the 1980s.¹⁴⁰ The reforms having exposed domestic industry to foreign competition, the Government was concerned with making Australian production efficient enough to compete with foreign industry.¹⁴¹ It was important to achieve the allocative efficiency of business inputs.¹⁴² Water was one such input, with particular importance for agricultural production, which is by far the largest use for water in Australia.¹⁴³ The problem inherited from English law was that riparian rights created a rigid market for water (being connected with land), and so distorted the efficient allocation and use of water by irrigators and pastoralists. The economic effects put Australian production at a disadvantage. And this problem only became increasingly serious as “[m]arginally increasing costs of supply were exacerbated by an increasing demand for water resources, both in scale and diversity, particularly community demand for in-stream environmental objectives and consumer concern for improved quality of supply.”¹⁴⁴ The CoAG agreement in 1994 sought to address the situation by creating a more competitive, integrated national water market.¹⁴⁵ Thus, the creation of rights to water separated from rights to land (that is, the effective abolition of *pure* riparian doctrine) had the aim of maximising national income and welfare “within the social, physical and ecological constraints of catchments.”¹⁴⁶

In a way that neatly characterizes the relationship between the Australian states and the Federation, the Federal Government in 1995 tied the payment of transfers to the states (under the National Competition Policy) to their implementation of the principles of the CoAG agreement.¹⁴⁷ In order to fulfil their obligation (and thus to secure the competitive funding), legislative reforms were passed

140. See TISDELL, WARD AND GRUDZINSKI, *supra* note 136, at 25.

141. *Id.* at 26.

142. *See id.* at 32, 34–35.

143. *See* ALEXANDER WALTER GARDNER ET AL., WATER RESOURCES LAW, 12–16 (2nd ed. 2018).

144. TISDELL, WARD AND GRUDZINSKI, *supra* note 136, at 19 (citations omitted).

145. COUNCIL OF AUSTL. GOV'TS, *supra* note 138.

146. *Id.*, cl 5(a).

147. GARDNER ET AL., *supra* note 143, at 47–48. It is worth noting that the relationship between the states and the Federal Government in Australia is different in several ways to that in the United States of America. The difference is often characterised as one between a collaborative and complementary federation of states in Australia and “competitive federalism” in America. But the American characteristic may, in fact, better describe the Australian condition in respect of the issue of government funding. The Federal Government may often tie its promise of funding for a state to its expectation of the fulfilment of a mutual obligation, as was the case in this example. The obligation often requires the state to legislate or enforce a reform that it had been hitherto reluctant to pursue. An analogy may be made to the relationship between the central authorities of the European Union and the legislatures of its member states.

by all the states and territories by the end of the millennium.¹⁴⁸ The legislation amended the common law position such that riparian rights were subject to prescribed limitations, and created ministerial powers for the regulation and restriction of water use.

One decade later, there was a second call for reforms, prompted by the “increase in demand for water . . . [the] increased understanding of the management needs of surface and groundwater systems . . . [and] an enhanced understanding of the requirements for effective and efficient water markets.”¹⁴⁹ This culminated in the 2004 Intergovernmental Agreement on a National Water Initiative (NWI).¹⁵⁰ This agreement was not legally binding, nor were its principles enforced by the threat of withheld federal money as with the CoAG agreement a decade earlier.¹⁵¹ Yet the states did respond to it with legislative reforms, though as we shall see, they have been only partially implemented.¹⁵² The NWI adopted the principle of unbundled rights from the CoAG,¹⁵³ and elaborated on the content of water licenses and the process by which they could be traded and enforced. It called on the parties to adopt certain features of “water access entitlements,” including that they would

- (i) specify the essential characteristics of the water product;
- (ii) be exclusive;
- (iii) be able to be traded, given, bequeathed or leased;
- (iv) be able to be subdivided or amalgamated;
- (v) be mortgageable (and in this respect have similar status as freehold land when used as collateral for accessing finance);
- (vi) be enforceable and enforced; and
- (vii) be recorded in publicly-accessible reliable water registers that foster public confidence and state unambiguously who owns the entitlement, and the nature of any encumbrances on it¹⁵⁴

The NWI made it clear that any allocations of water to a water access entitlement had to be consistent with a water plan.¹⁵⁵ Clause 36 of the NWI recognizes the importance of water plans for the management of both surface and groundwater. It also highlights the important role they play in assisting governments and the

148. *Water Resources Act 1998* (ACT); *Water Management Act 2000* (NSW); *Water Act 2000* (Qld); *Water Resources Act 1997* (SA); *Water Management Act 1999* (Tas); *Rights in Water and Irrigation Amendment Act 2000* (WA). Victoria and the Northern Territory had earlier already passed their own legislation: *Water Act 1992* (NT); *Water Act 1989* (Vic).

149. Intergovernmental Agreement on a National Water Initiative, *supra* note 117, at ¶ 4.

150. *Id.*

151. On the lack of an enforcement mechanism, *see* GARDNER ET AL., *supra* note 143, at 50–52.

152. *See infra* Section II.C.

153. Intergovernmental Agreement on a National Water Initiative, *supra* note 117, at ¶ 28.

154. *Id.* at ¶ 31.

155. *Id.* at ¶ 29.

community to make water management and allocation decisions, and thereby to reach the productive environmental and social objectives. There is specific recognition of the fact that there should be separate regulatory approvals for each element of the water access arrangements in clause 30, which in turn refers to a set of “Principles for regulatory approvals for water use and works” contained in schedule D of the NWI. Those principles seek to ensure that regulatory approvals enabling water use at a particular site for a purpose are consistent with relevant water and planning legislation and policy¹⁵⁶ and water plans.¹⁵⁷ They should take into account the environmental social and economic impacts of use,¹⁵⁸ contain clear conditions,¹⁵⁹ minimize the applicant’s costs of application and compliance,¹⁶⁰ and provide avenues for appeal of decisions.¹⁶¹

In South Australia, the NWI prompted the enactment of the *Natural Resources Management Act 2004* (SA) and later amendments to the Act passed in 2007. We turn now to an analysis of those provisions.

C. State Implementation: *Natural Resources Management Act 2004*

The NWI agreement sought the establishment of “water plans,” that is, the central planning of water allocation, so that entitlements to water use would be distributed consistent with “productive, environmental and social objectives.”¹⁶² While the agreement failed to address the inherent tension between productive and environmental objectives, it sought to regulate the approval of water access entitlements, so that—in most states and territories, including South Australia¹⁶³—the entitlements must not be granted unless they are consistent with the plan.¹⁶⁴

The Government of South Australia has “prescribed” ninety per cent of water resources in the state.¹⁶⁵ Prescription allows the central planning of water allocation, and so the regulation of tradeable rights. However, the process of unbundling water rights in South Australia has yet to be completed. When the *Natural Resources Management Act 2004* (SA) (NRM) was passed, and when it was amended in

156. *Id.* at Sched. D ¶ 1(i).

157. *Id.* at Sched. D ¶ 1(ii).

158. *Id.* at Sched. D ¶ 1(iii).

159. *Id.* at Sched. D ¶ 1(iv).

160. *Id.* at Sched. D ¶ 1(v).

161. *Id.* at Sched. D ¶ 1(viii).

162. *Id.* at ¶ 36.

163. GARDNER ET AL., *supra* note 143, at 247-48.

164. In South Australia, the relevant provisions are *Natural Resources Management Act 2004* (SA) ss 124(7), 127(2).

165. S. AUSTRAL. DEP’T OF WATER, LAND, BIODIVERSITY AND CONSERVATION, SOUTH AUSTRALIA’S WATER FUTURE, 8 (2006).

2007, it was expected that all water rights would be unbundled by 2014.¹⁶⁶ In late 2017, the Productivity Commission reported that rights to surface water in South Australia—where they are separate from land, as in regulated watercourses—have so far been unbundled only in the Murray–Darling Basin.¹⁶⁷ Groundwater rights remain bundled everywhere in the state, other than in the Southern Basins and Musgrave Prescribed Wells management area on the Eyre Peninsula (see Figure 2).¹⁶⁸ The Productivity Commission reported that

South Australia is . . . updating its *Policy Statement: Implementation of Unbundling Water Rights in South Australia* to identify opportunities to ensure the implementation of unbundled water rights supports quicker, simpler and more pragmatic water allocation planning.¹⁶⁹

This policy statement has yet to be updated.¹⁷⁰ It has been suggested that the relatively limited trade in water outside the Murray–Darling Basin may be “attributed to factors such as water rights remaining bundled.”¹⁷¹ Conversely, lower pre-existing trade activity in those regions may have weakened the impetus for establishing and reforming the system of trade.

As already described, the NWI contemplated that all states would unbundle water rights.¹⁷² South Australian legislation, like that of other states, set up arrangements for the use and licensing of water with separate approvals or permits for each component.¹⁷³ The key provisions of the Act itself do not contemplate a continuation of a bundled water rights system.¹⁷⁴ However, to accommodate a system where water rights had been bundled for many years, transitional arrangements were necessary, as found in the *Natural Resources Management (Water Resources and Other Matters) Amendment Act 2007* (SA). Section 5 of that Act provides for the continuation of bundled licensing arrangements unchanged “until the minister otherwise determines.”¹⁷⁵ These provisions are elaborated and repeated in regulation 47 of the *Natural Resources Management (General) Regulations 2005*

166. S. AUSTL. OFFICE FOR WATER SECURITY, *WATER FOR GOOD: A PLAN TO ENSURE OUR WATER FUTURE TO 2050*, 169 (2010).

167. AUSTL. GOV'T PRODUCTIVITY COMM'N, *NATIONAL WATER REFORM*, 339 (2017).

168. *Id.*

169. AUSTL. GOV'T PRODUCTIVITY COMM'N, *supra* note 167, at 341.

170. The latest policy statement was issued in 2012. See S. AUSTL. DEP'T OF ENERGY, WATER AND NAT. RES., *POLICY STATEMENT ON THE IMPLEMENTATION OF UNBUNDLING WATER RIGHTS IN SOUTH AUSTRALIA* (2012).

171. D.J. McKane & I. Franssen, *An Adaptive Approach to Water Rights Reform in South Australia*, in *WATER RESOURCES MGMT.* VII 61, 65 (C.A. Brebbia ed., 2013).

172. See National Water Initiative, *supra* note 117, at ¶ 63 (demonstrating agreement between several states that provides for unbundling practices).

173. *Natural Resources Management Act 2004* (SA) s 3.

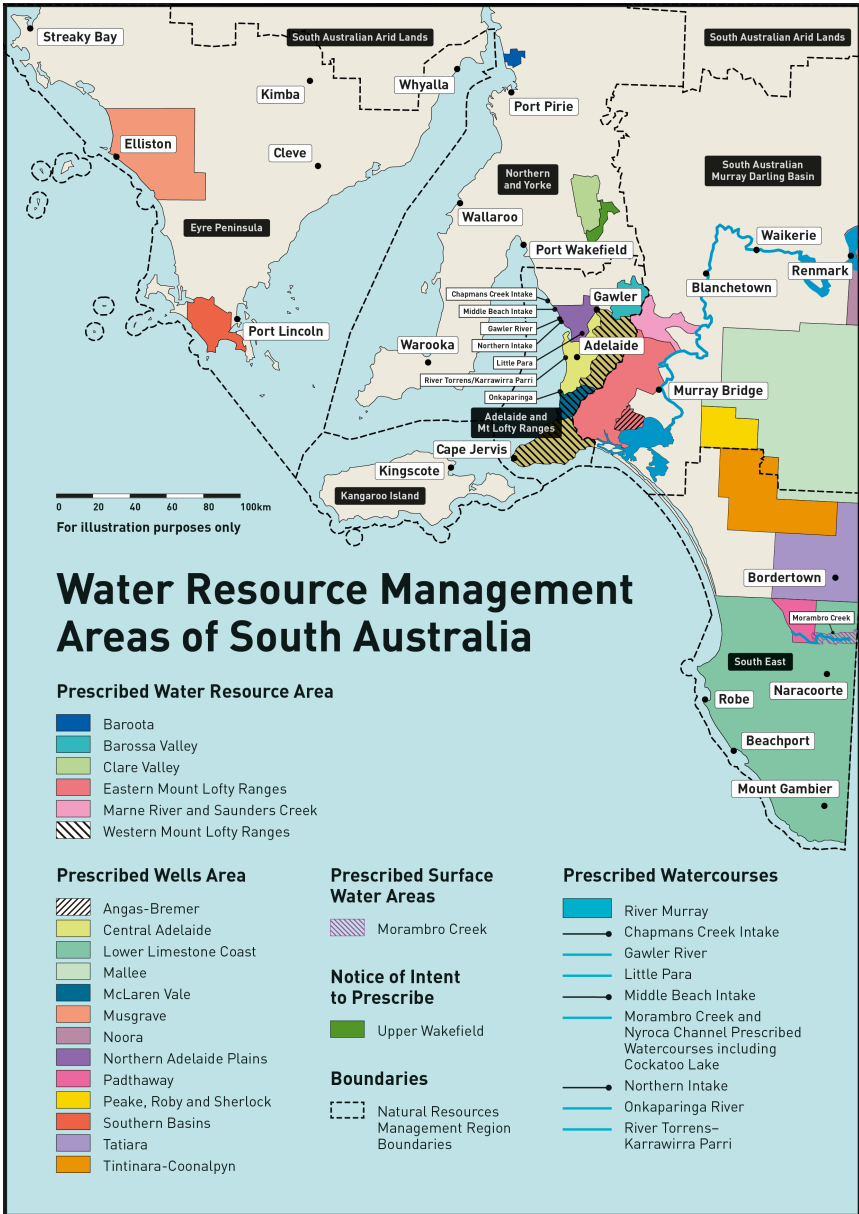
174. *Id.*

175. *Id.* at s 5(2)(a)-(b).

(SA). The regulations were meant to expire in 2016.¹⁷⁶ However, their expiration date was extended to 1 September 2019, presumably because of the slow pace at which the unbundling of water licenses had already occurred.

176. In South Australia, under the provisions of s 16(1)(g) of the *Subordinate Legislation Act 1978* (SA), regulations made after 1 January 1987 will expire after a period of 10 years. The expiry can be postponed for between 2 to 4 years: s 16C(1). The purpose of this provision is to ensure regular review and updating of delegated legislation.

FIGURE 2. WATER RESOURCE MANAGEMENT AREAS OF SOUTH AUSTRALIA 2010¹⁷⁷



177. The diagram draws upon S. AUSTL. DEP'T FOR ENV'T. AND WATER (2018). Illustration © Nigel Williams 2019 (used with permission).

The situation remains uncertain because the state Liberal government in South Australia was elected in March 2018 on a platform that included reform of the *Natural Resources Management Act 2004* (SA).¹⁷⁸ A proposal for a new *Landscapes South Australia Act* (which would repeal the *Natural Resources Management Act*) was released for public comment in July 2018.¹⁷⁹ A report following that consultation was released,¹⁸⁰ and it was anticipated that the draft bill would be put before the South Australian Parliament in 2019.¹⁸¹ It appears that the reforms will largely be to the structure and form of the administrative bodies established to manage natural resources. There is little substantive change to water management. The legislative reform therefore seems to resolve little of the uncertainty that presently exists regarding the future of the unbundling process.

D. Balance Between Bundled and Unbundled

The unbundling of water rights from land has been described as the “lynchpin of water reform.”¹⁸² Unbundling of water rights “can increase trading opportunities and thus provide water users with greater flexibility to manage their water access, use, delivery and land-holding needs.”¹⁸³ It is meant to result in more efficient water use and improve the system for water trading. However, unbundling is not without its detractors. Some see the whole process as equating to the privatization of water, which they believe is “incompatible with the protection of water as a public good.”¹⁸⁴ And concerns are particularly poignant in the agricultural sector, where users need water to irrigate a range of produce including wine, orchards and vegetables.¹⁸⁵ The real question, here, though, is whether the policy of unbundling followed in South Australia has the unintended result of producing the potential for an anticommons tragedy. Our assessment in this section of the available anecdotal evidence suggests that the risk of an anticommons tragedy is a real one.

178. *Natural Resources Management – Empowering Communities*, LIBERAL PARTY SOUTH AUSTRALIA (2018), <https://strongplan.com.au/policy/natural-resources-management/>.

179. *We’re Changing NRM in South Australia*, YOURSAY, https://yoursay.sa.gov.au/decisions/landscape-reform/consultation_process (last visited June 23, 2018).

180. BECKY HURST CONSULTING, *MANAGING OUR LANDSCAPES: CONVERSATIONS FOR CHANGE* (Oct. 26, 2018), https://www.environment.sa.gov.au/files/sharedassets/public/get_involved/managing-our-landscapes-summary.pdf.

181. GOV’T OF S. AUSTL., <https://www.environment.sa.gov.au/topics/natural-resources-management> (last visited June 6, 2019).

182. Ian Douglas, *Water Wars: The Battle Between Public and Private*, ABC NEWS OPINION (May 26, 2011), <https://www.abc.net.au/news/2011-05-26/douglaswater/2731364>.

183. AUSTL. COMPETITION AND CONSUMER COMM’N, *WATER TRADING RULES – FINAL ADVICE*, 43 (2010).

184. Douglas, *supra* note 182.

185. See BECKY HURST CONSULTING, *supra* note 180, at 57.

In the discussion paper issued with proposals for a new *Landscapes South Australia Act*, consultants noted that while water management reform was not a significant component of the first tranche of the legislative review it was nevertheless a topic that the broader community consistently raised as an issue in their submissions to the enquiry.¹⁸⁶ Water allocations, water security, water availability, and sustainable water management were issues of particular concern.¹⁸⁷ More monitoring and regulation of water use was seen as important.¹⁸⁸ Concern was expressed about unbundling as well, with one natural resources management board submitting that the requirement to unbundle water rights would lead to more complex and cumbersome water allocation plans.¹⁸⁹ The environmental NGO, Trees for Life, recommended a review of unbundling of water rights in the new legislation, arguing that “[u]nbundling can work for water assets in a large system like the Murray River but not necessarily for other systems.”¹⁹⁰ Experience may bear this out, as demonstrated by the limited implementation of unbundling over South Australia’s other water resources to date.¹⁹¹

In its policy on the implementation of unbundling water rights in South Australia, the South Australian state government outlined some of the “significant benefits” that can be created by the unbundling of water rights. They include

- Clarification of the ownership attributes of water as separate from the commitments and obligations associated with its taking and use,
- Improved ability to trade water rights both within South Australia and between South Australia and other States,
- Faster processing times that will provide greater certainty and flexibility in the management of water portfolios,
- The ability more easily to trade the seasonal volume of water independently of the ongoing water right (the water access entitlement), and
- Greater flexibility in the options for managing water including dealing with variability in a water resource.¹⁹²

To these can be added:¹⁹³

- The rules on extraction would not be directly linked to changes in entitlements or allocations, and therefore the value of the asset would

186. *See id.* at 56.

187. *See id.*

188. *See id.* at 57.

189. *Id.*

190. *Id.*

191. *Supra*, Section II.C.

192. GOV’T OF S. AUSTL., *supra* note 119, at 1.

193. Unpublished Notes of Paul Leadbeter, Member, Tatiara Water Allocation Plan Review Stakeholder Advisory Group (on file with author) (notes based on meetings of the Group during 2018).

not be affected. The asset is the entitlement to a certain amount of water. Conditions that restrict or limit its use or extraction may reduce its attraction as a tradable or transferable asset.

- Management rules that relate to each water management authorization can be better separated and dealt with in separate components of the relevant water allocation plan, which eases transferability. For example, with transfer of a bundled license, consideration has to be given to any restrictions on the water allocation imposed by conditions governing extraction of the water or its use. In an unbundled system, if someone simply purchases a water allocation, they have no inherent restriction on the extraction of that water or how or where it is used. The purchaser will need to seek his or her own water management authorizations to enable the purchaser to extract and use the water allocation they have purchased. Conditions restricting how and where water can be used, which are often attached to a bundled water license, can significantly limit the potential use of the allocation and lower its value as an asset.
- The Australian Competition and Consumer Commission in its “Final advice on water trading rules” noted another possible advantage of unbundling.¹⁹⁴ Sometimes a person may want to hold their water access right and allocation rather than use it. They may do so because they want to sell it rather than use it themselves, or they may hold it for environmental purposes. If someone has a right to use water but does not do so then the water remains in the system and potentially benefits the environment. If a person wishes to purchase a water access right and allocation and use it, they must also obtain a site use approval or water delivery right (which would not be the case in a bundled system). Arguably under the bundled system the person would find it almost impossible to enter the water market on the terms they desired because of the conditions of a site use approval, which would be attached to the license.

Although not identified in the South Australian government’s policy on unbundling, there are also some potential disadvantages of the unbundling process if taken to the full extent contemplated by the National Water Initiative and the licensing provisions in the *Natural Resources Management Act 2004* (SA). They include

- Within a prescribed water area, if there is more than one consumptive pool, no trade can occur between those pools.¹⁹⁵

194. AUSTL. COMPETITION AND CONSUMER COMM’N, *supra* note 183, at 43.

195. A water access entitlement under the *Natural Resources Management Act 2004* is an entitlement for the license holder to gain access to a share of water in a defined consumptive pool or pools: *Natural Resources Management Act 2004* (SA) s 146(2). The holder obtains a water allocation for that

- The extraction of water through the water resource works approval is not linked to the allocation. The licensee needs to be very aware of their water allocation and any limits imposed on the water resource works approval that may be difficult for them to manage at any particular site where the licensee holds more than one water resource works approval. In the case of bundling, the license makes clear the amount of water allocated to the licensee and therefore what can be extracted through the water resource works, all in the one document.¹⁹⁶
- The current bundled licensing system that operates in South Australia, with its attendant conditions and restrictions that effectively deal with the allocation, approval of extraction and water conveyance equipment, and the rules about where and how the water is to be used is understood and accepted by water users requiring some form of water management authorization.¹⁹⁷ A new unbundled system brings with it some uncertainty for water users.

The use of an unbundled system is therefore potentially costlier and administratively more burdensome than a bundled system of water rights. An individual annual fee may be charged for each water management authorization, whereas in a bundled system there is only one annual license fee.

Given the history of governmental reform throughout the 1990s and 2000s,¹⁹⁸ and the added urgency brought on by the Millennium Drought,¹⁹⁹ we argue that the real driver of pressure for unbundling of water rights was the situation in the Murray-Darling basin. If that is so, then the process has been successful to the extent that all water rights along the River Murray have been unbundled by the three key states (Victoria, New South Wales, and South Australia), permitting efficient and effective interstate trade arrangements.²⁰⁰ Water trades have continued to rise

defined pool. A holder may only transfer their allocation within the consumptive pool to which they have access. *Id.* at s 150(1).

196. *Id.* at s 159.

197. For example, see the concerns expressed by the South East Natural Resource Management Board in its submissions on the proposal to create new natural resource management legislation. BECKY HURST CONSULTING, *supra* note 180, at 57.

198. COUNCIL OF AUSTRALIAN GOVERNMENTS, *supra* note 138.

199. The Millennium Drought in Australia lasted from 2001-2009 and was arguably the longest and most severe drought since Europeans settled the continent in 1788. It affected almost all of the southern part of the Australian continent including the major cities of Melbourne and Adelaide. The state of South Australia was particularly hard hit; authorities established various measures to guarantee certainty of water supply to Adelaide, including the construction of a very expensive desalination plant. MURRAY-DARLING BASIN ROYAL COMMISSION REPORT, ROYAL COMMISSION (2019), <https://www.mdbrc.sa.gov.au/sites/default/files/murray-darling-basin-royal-commission-report.pdf?v=1548898371>.

200. McKane and Franssen, *supra* note 172, at 62.

across the country, many of them within the Murray-Darling basin, an area which covers a seventh of the Australian continent's land mass and has been described as the "breadbasket of the nation."²⁰¹ Across the Australian continent, entitlement and water allocation trade volumes in 2016–17 were 2,100 gigaliters, which was 23% higher than in 2015–16.²⁰² The total volume of surface water allocations traded during the same period was 7,000 gigaliters, which is 20% higher than the previous year.²⁰³ While much of that trade occurred within the Murray-Darling Basin region, a substantial number of trades occurred outside of the Murray-Darling Basin system in accordance with relevant State legislation.²⁰⁴ The fact that states like South Australia have not fully unbundled water rights does not appear to be preventing water trades.

As noted above, apart from the River Murray area and two prescribed wells areas in the state, no other unbundling of water resources has occurred in South Australia. This is despite statutory provisions which contemplate that unbundled water rights are the norm when any licenses involving the taking and use of water are issued, and various government policy statements to the effect that unbundling will occur and be implemented as part of the regular review of water allocation plans.²⁰⁵

Still, the separation of property rights in relation to land and water appears to have been achieved and accepted. The fact that in South Australia most water rights remain bundled does not appear to have prevented trade in water allocations and entitlements, although it remains an open question whether there would be a greater number of trades if the water licenses were split into the various constituent water management authorizations contemplated by the *Natural Resources Management Act 2004* (SA). With respect to their water entitlements, people remain able to sell, lease, bequeath, and treat as equitable those rights without much ap-

201. COMMONWEALTH OF AUSTRALIA, A NATIONAL PLAN FOR WATER SECURITY 3 (25 January 2007), <http://www.crcsi.com.au/assets/Resources/f21ceb9e-2258-4f40-9e11-50fa80ee940e.pdf>.

202. See *ABARES Australian Water Markets Reports 2016-17*, AUSTRALIAN DEPT OF AGRIC. & WATER, <http://www.agriculture.gov.au/abares/research-topics/water/aust-water-markets-reports> (last visited Mar. 15, 2018).

203. See *Water in Australia*, AUSTRALIAN BUREAU OF METEOROLOGY, <http://www.bom.gov.au/water/waterinaustralia/> (last visited June 24, 2019).

204. Each Australian state has in place a similar system for licensing and managing water use and allocation as part of the requirement to which all states and the Australian Capital Territory agreed as part of the National Water Initiative in 2004. All states exhibit similar experiences to South Australia, with entitlements to some resources being unbundled and others remaining bundled. See *Australia's Water Blueprint: National Reform Assessment 2014*, AUSTRALIAN NAT'L WATER COMM'N (Sept. 22, 2014), <http://www.agriculture.gov.au/SiteCollectionDocuments/water/nwi-assessment-2014.pdf>.

205. The *Natural Resources Management Act 2004* (SA) contemplates that Natural Resources Management Boards will review their plans on a regular basis and must review their entire regional Natural Resources Management Plan (which includes the Water Allocation Plan) at least once every 10 years. The water allocation plans reviewed to date seem to be reviewed after 10 years, not earlier. *Natural Resources Management Act 2004* (SA) s 81(4).

parent trouble.²⁰⁶ Thus, although South Australia has not fully implemented unbundling across the entire state, there is nevertheless recognized water management taking place. Trades of water are occurring, irrigators are obtaining access to water allocations for irrigation purposes, and the National Water Initiative requirements are being implemented to a reasonable extent.²⁰⁷

South Australia's dry conditions have made irrigators and industry very conscious of the regular shortages of water and the need to adopt as many water conservation measures as possible;²⁰⁸ long gone are the days of profligate and unsustainable irrigation practices.²⁰⁹ Water is an expensive and precious commodity, and the approach to its use by the South Australian irrigators in particular is by and large sensible and pragmatic. This has, in turn, influenced their approach to the trading of water entitlements. In light of the careful approach taken by South Australian irrigators, the policy and legislative approach to unbundling pursued by South Australia may go too far—it may result in an inability to make effective and efficient use of the water resource for irrigated agriculture. Or, as we have described it here, the approach taken in South Australia has the potential to create anticommons tragedies in respect to the allocation and use of water.

CONCLUSION

The South Australian experience reveals that both government policy and the market itself are driving the approach to unbundling. And as we have shown, neither those charged with implementing the law relating to unbundling, nor the market actors holding existing proprietary interests in water, are eager fully to implement unbundling, or even to implement it at all. The policy, which prompted the pursuit of water regulation reform in Australia in the mid-1990s, was aimed at improving the competitiveness of the Australian agricultural product. According to the liberal economic consensus of the time, a more efficient allocation of resources could be achieved by the creation of a freer market for inputs, in this case water. But the reluctance, which has hindered reform for the last two decades, suggests that the policy has failed to convince all stakeholders.

It seems that the reforms have done nothing to resolve the identified tension between ecological and social interests in preserving natural water sources and the economic interest in achieving their most efficient allocation for production. If anything, unbundling would tilt the balance further toward the latter. Market actors, especially those who hold rights to water that would be eroded by unbundling, are

206. BECKY HURST CONSULTING, *supra* note 180, at 56-57.

207. AUSTL. NAT'L WATER COMM'N, *supra* note 204, at 280-97.

208. *Water for Good*, GOV'T OF S. AUSTL. DEP'T OF WATER, LAND AND BIODIVERSITY CONSERVATION (2009) <https://www.environment.sa.gov.au/files/sharedassets/public/water/water-for-good-full-plan.pdf>.

209. *Id.* at 16.

unwilling to cede the economic advantage that the existing system has given them. The ecological interest will only become more urgent as the prospect of climate change—and so the harshening of dry conditions—makes water a scarcer resource. Ultimately, the balance is a question of social objectives. What is the most favored use and allocation of the scarce supply of water in Australia? What then follows is the legal mechanism to realize the objective. Without addressing the ecological/social-economic/productive tension, the legal mechanism will remain deficient.

Arguably, the process of unbundling in South Australia has never really taken off because irrigators who most need the water and the trading rights in relation to that water have been able to obtain and make use of water without too much trouble using existing bundled licenses. In short, irrigators want maximal certainty and minimal delays, costs, and administrative burden. Our anecdotal assessment reveals, however, that in South Australia there is a perception among some that the introduction of an unbundled system and the associated permits and approvals will add to administrative load, increase costs, and result in a slower transfer process.²¹⁰ Unbundling of water rights contemplates rights that are transferable,²¹¹ typically through separating those rights from underlying interests in land.²¹² It is understandable that irrigators might believe that separate permits for different uses of water will be both expensive and administratively burdensome. At present, the bundled licenses allow all administrative aspects of water use to be dealt with by way of conditions attached to the transfer of a water license. Water allocation remains subject to conditions as to its use on-site and appropriate works for extraction, conveyance, and storage. The current bundled licenses allow for assurances in relation to use and extraction to be dealt with pursuant to the *Natural Resources Management Act 2004* (SA), which requires that the transfer of a water license²¹³ and allocation²¹⁴ are both subject to the Minister's approval. As such, unless conditions on use and infrastructure are attached, the Minister will withhold consent to the transfer.

In short, our assessment suggests that the objectives of the National Water Initiative are being achieved even in the absence of full implementation of unbundled water rights, and that water users—market actors—seem to be happy with the system. We are left with a simple conclusion: why change a system that seems to be working? There are, of course, more serious reasons for asking whether unbundling will achieve the objectives claimed by its proponents. For while the failure to implement unbundling on the part of governmental actors, or to take it up on the part of market actors cannot be taken as causally related to concerns about an anticommmons tragedy, it ought at the very least to stand as a warning to those advocating

210. BECKY HURST CONSULTING, *supra* note 180, at 56.

211. Water access entitlement and water allocation. *See supra* Section II.A.

212. Water resource works approval and site use approval. *See supra* Section II.A.

213. *Natural Resources Management Act 2004* (SA) s 150(4).

214. *Id.* at s 157(2).

the full unbundling of proprietary interests in water. As Heller cautions,²¹⁵ any moves which take a system of property closer to the anticommons end of the spectrum risk even greater inefficiency in the use of the subject resource.

Our theoretical assessment of anticommons property and its potential for tragedies, when applied to the anecdotal evidence of attitudes in South Australia to unbundled water rights reveals an opposition to further unbundling. Further empirical research is needed, both of the market and of market actors, which will test the validity of the claims made by advocates of unbundling, the perceived need on the part of water users for such measures, and the potential for anticommons tragedies following from full implementation. The need for such empirical evidence is not limited to South Australia. As we suggested in the Introduction, many other jurisdictions are currently either considering or in the process of implementing some form of unbundling of water resource allocations. As the movement towards unbundling gathers pace, we are in need of empirical evidence in order to assess, as a matter of law, the effectiveness of such systems.

215. Heller, *supra* note 60, at 623-24, 677.