

THE RELEVANCE OF THE
CUJUS EST SOLUM DOCTRINE TO THE SURFACE
LANDOWNER'S CLAIMS TO NATURAL RESOURCES
LOCATED ABOVE AND BENEATH THE LAND

1. INTRODUCTION

To what extent is the surface landowner entitled to the ownership of natural resources located above and beneath the land by virtue of his fee simple estate in the land? The trite answer given by property lawyers to this question is the ancient maxim, *cujus est solum ejus est usque ad coelum et ad inferos*. Loosely translated, the maxim means that the owner of the land surface owns both the airspace above the surface stretching to the limits of the atmosphere and the soil beneath the surface down to the centre of the earth. The maxim is commonly attributed to Coke,¹ although its real origin is lost in history and may have emanated from Roman law or Jewish law.² Its earliest reference in English Law is in *Bury v Pope*³ in 1586, a case involving a claimed prescriptive easement of light.

Applied in the context of natural resources, the maxim would suggest that all resources belong to the landowner merely by virtue of his ownership of the land surface. Like most maxims, however, the *cujus est solum* doctrine is very misleading and simplistic. While the maxim correctly indicates that the ownership of land is not confined to the land surface, its accuracy beyond this is highly questionable.

Other articles have examined the application of the doctrine to the general law of real property.⁴ This article will examine more specifically its application to the laws relating to all types of natural resources. The ensuing discussion will examine from the resource perspective the accuracy and present applicability of the doctrine and related common law

* MA (Cambridge), LL.M (Osgoode Hall), PhD, LL.D (Melbourne), Barrister and Solicitor of the Supreme Courts of Victoria and Nova Scotia. Professor of Law, University of Adelaide.

1 *Salmond and Heuston on the Law of Torts* (18th edn 1981) 41; Higgins, *Elements of Torts in Australia* (1970) 117; Wright, 'Airspace Utilization on Highway Rights of Way' (1970) 55 Iowa LR 761, 782. Although Wright concedes that the origin of the maxim may be Roman or Hebraic, he states that 'the acceptance of the maxim and its effects on Anglo-American law were due entirely to the writings of Coke'. See also Butt, *Introduction to Land Law* (1980) 7.

2 McNair, *The Law of the Air* by Kerr & Evans (3rd edn 1964) 393; Wacks, 'No Castles in the Air' (1977) 93 LQR 491; Lyall, 'The Maxim *'Cujus est solum, in Scots Law'* (1978) 23 Jur Rev 147; Klein, '*Cujus est solum ejus est — quous ue tandum?*' (1959) 26 J Air Law and Commerce 237; Lashbrook, 'The *'Ad Coelum'* Maxim as applied to Aviation Law' (1946) Notre Dame Lawyer 143; Hise, 'Ownership and Sovereignty of the Air or Air Space Above Landowner's Premises with Special Reference to Aviation' (1931) 16 Iowa L Rev 169; Lloyd, *The Sources and Development of Australian Mining Law* (1966) unpublished PhD thesis (Canberra) Appendix I 'The Evolution of the principle *'cujus est solum'*'.

3 (1586) Cro Eliz 118; 78 ER 375.

4 See, eg, Butt, 'The Limits of Application of the Maxim *'cuius est solum ejus est usque ad coelum'* (1978) 52 ALJ 160; Note, 'Conveyance and Taxation of Air Rights' (1964) 64 Columbia L Rev 338; Note, 'Proprietary Interests and Proprietary Estates in Space' (1967) 42 Indiana LJ 225; Knight, '*Usque ad Coelum*' (1929) 2 ALJ 293.

principles to each of the major resources in Australia — minerals, petroleum, water and renewables. In each case, the question to be asked is: 'To what extent is it true to say that the resources lying beneath or above a landowner's land belong to him at common law by virtue of his surface ownership?' As will be shown, in many cases the ownership of natural resources is determined by State and Territory legislation enacted in all Australian jurisdictions, and the scope for the application of the *cujus est solum* doctrine specifically, and the common law generally, is limited. Nevertheless, in a significant minority of cases the doctrine still has a role to play. It is important to determine the extent of this role.

2. MINERALS

Historically, the vast majority of the cases concerning the *cujus est solum* doctrine have arisen in the context of airspace, and comparatively few have concerned the ownership of subsoil and substances beneath the earth's surface. Such authority that does exist suggests that the doctrine is of only limited application.

The first major case concerning the ownership of minerals at common law was the *Case of Mines* in 1568.⁵ This case established that all mines of gold and silver (whether situated on public or private land) belonged to the Crown together with the power to enter, dig and remove the ores and such other powers as were necessary to effect this purpose. This common law position was inherited by the Australian colonies. In *Wade v New South Wales Rutile Mining Co Pty Ltd*,⁶ Windeyer J referred obiter to 'the elementary principle that a freeholder . . . is entitled to take from his land anything that is his', and noted that 'except for those minerals which belong to the Crown, the soil and everything naturally contained therein is his'.⁷

This latter dictum suggests that all minerals other than gold and silver belong to the surface landowner and that the *cujus est solum* doctrine extends to an indefinite depth downwards to include all minerals. This commonly accepted position may not, however, be accurate. There are several relevant arguments here. First, the proposition that at common law all minerals other than gold and silver belong to the surface landowner was not actually judicially stated in the *Case of Mines*. The case merely decided that gold and silver belong to the Crown, and it does not necessarily follow that all other minerals belong to the surface landowner. Secondly, the most recent authority suggests that the *cujus est solum* doctrine has only a limited downwards application. The Privy Council stated in *Commissioner of Railways v Valuer-General*⁸ that in no previous case is there an authoritative pronouncement that 'land' means the whole of the space from the centre of the earth upwards: so sweeping, unscientific and unpractical a doctrine was unlikely to appeal to the common law mind. Thirdly, while it is true that other cases have decided that entry into the subsoil to exploit a coal-seam and an underground

5 (1568) 1 Plow 310; 75 ER 472. See also *Woolley v Attorney-General of Victoria* (1877) 2 App Cas 163; *Attorney-General v Great Cobar Copper Mining Co* (1900) 21 NSWLR 351.

6 (1969) 121 CLR 177.

7 *Ibid* 185.

8 [1974] AC 328, 351-352.

cave constitutes a trespass against the surface landowner,⁹ these cases only concern subsoil close to the surface.¹⁰ It could be argued that these cases do not extend to minerals located at a greater depth.

As the surface landowner's claim at common law to minerals rests on the *cujus est solum* doctrine, and as the scope of this doctrine appears to be doubtful, the surface landowner's common law ownership of minerals must be considered to be still unresolved, contrary to common legal understanding. Despite this fact, however, it is beyond doubt that at common law minerals are under the effective control of the landowner in that access to the resource can only be obtained by the surface landowner or by developers allowed entry onto the land with the landowner's consent. Thus, minerals may be said to be effectively, if not legally, in the ownership of the surface landowner.

The common law rules as to the ownership of minerals have always been subject to express reservation contained in the original Crown grant of the land.¹¹ Thus, in order to determine whether the owner of the land surface also owns the minerals beneath the land, it is necessary to examine the terms of the Crown grant and also any subsequent conveyance to determine whether the right to minerals has been reserved in favour of the Crown or any other party.

A more significant development was the introduction of legislation in all Australian jurisdictions in the late nineteenth century rejecting the notion of private ownership of minerals based on ownership of the land surface and instead adopting the policy of statutorily reserving all minerals from future Crown grants of land.¹² This amounted to a complete rejection of the operation of the *cujus est solum* doctrine. When first enacted, this legislation was stated to apply only to future Crown grants, so that the existing rights to minerals of private landowners were unaffected. This has produced the situation that despite a policy of reservation to the Crown, some privately owned minerals still exist in certain Australian jurisdictions.

The relevant legislative provisions differ significantly between the Australian jurisdictions. The legislation of each jurisdiction will now be discussed separately to determine the extent (if any) to which the surface landowner's claim at common law to minerals beneath his land is still recognised.¹³

9 *Bull Coal Mining Co v Osborne* [1899] AC 351; *Edwards v Sims* (1929) 24 SW 2d 619. See also *Elwes v Brigg Gas Co* (1886) 33 ChD 562.

10 See *Corbett v Hill* (1870) LR 9 Eq 671.

11 *Williamson v Wootton* (1855) 3 Drew 210; 61 ER 883. Common law has always recognised the possibility of separate ownership in the subsoil and/or any minerals beneath the surface: *Cox v Ghee* (1848) 5 CB 533; 136 ER 987; *Re Haven Gold Mining Co* (1882) 20 ChD 151.

12 The original State legislation was contained in the Crown Lands Act 1884 (NSW); Lands Act 1891 (Vic), s12; Mines Act 1891 (Vic), s3; The Mining on Private Land Act 1909 (Qld), ss6, 21A; Crown Lands Act 1888 (SA), s9; Mining Act 1904 (WA); Crown Lands Act 1905 (Tas). The modern legislation is contained in the Crown Lands Consolidation Act 1913 (NSW); Mining Act 1973 (NSW); Mines Act 1958; Mining Act 1968-1983 (Qld); Mining Act 1971 (SA); Mining Act 1978-1987 (WA); Mining Act 1911 (Tas); Crown Lands Act 1976 (Tas); Minerals (Acquisition) Act (NT).

13 See also Forbes and Lang, *Australian Mining and Petroleum Laws* (2nd ed 1987) ch 2.

(a) New South Wales

Pursuant to the Crown Lands Alienation Act 1861 (NSW), land could be purchased from the Crown either at two pounds per acre, in which case the only reservation was in favour of gold, or at one pound per acre, where all minerals were reserved. Regulations dated 13 October 1865 made pursuant to the 1861 Act permitted purchasers to convert their holdings into mineral purchases on payment of the greater amount. A general policy in favour of mineral reservation to the Crown was introduced by the Crown Lands Act 1884, which states that all grants of land issued under the Act shall contain a reservation of all minerals. The 1884 Act has since been replaced by the Crown Lands Consolidation Act 1913, which continues the policy in favour of reservation of all minerals.¹⁴ The overall position in New South Wales is that private ownership of minerals will exist if the Crown grant was dated prior to the 1884 Act and minerals were not expressly reserved prior to that date by the terms of the express grant or the 1861 statute.¹⁵

There is thus still a limited scope for the operation of the surface landowner's common law claim to minerals. Note, however, that the Mining Act 1973 imposes effective penalties against inaction on the part of the surface landowner. Although ss188(1) preserves the rights of an owner of minerals to prospect or mine minerals under the pre-1884 scheme, pursuant to ss188(2) this right is lost immediately upon an application for an authority being made in respect of that part of the land. Once there has been an application for an authority, the owner of minerals is deprived of the right to prospect or mine for any mineral, not merely the one to which the authority applies (ss188(4)). Section 77 prevents an authority from being granted over private lands containing privately owned minerals, if bona fide mining operations are being carried on by the owner of the mineral or someone with his consent.

(b) Victoria

A similar scheme of progressive reservation of minerals in favour of the Crown was applied in Victoria. However, the effect of the Mines (Amendment) Act 1983 (Vic) is that all privately owned minerals in the State reverted to the Crown on 30 October 1985. Section 291 of the Mines Act 1958 states in part:

(1) On and from the day (in this section called 'the appointed day') on which a period of twelve months from the date of commencement of this section expires, all minerals (other than gold or silver, uranium, thorium and oil shale) whether on or below the surface of land alienated from the Crown on or before 1 March 1892 are and shall be and remain the property of the Crown.

(2) Gold, silver, uranium and thorium and oil shale, whether on or below the surface of any land whatever in Victoria, whether alienated or not alienated from the Crown, and if

14 Miscellaneous provisions reserving minerals are also contained in the Western Lands Act 1901 (NSW), the Prickly-Pear Act 1924 (NSW) and the Closer Settlement Act 1904 (NSW).

15 Note that the right of conversion allowed by the 1865 Regulations survived despite the introduction of the 1884 Act and continued to apply until 1909 to minerals other than coal, and 1913 for coal. Pursuant to the Coal Acquisition Act 1981 (NSW), all coal in the State is now vested absolutely in the Crown.

alienated whenever alienated, are and shall be and remain the property of the Crown.

(3) All minerals other than minerals which are already the property of the Crown by virtue of sub-section (2) on or below the surface of land alienated from the Crown after 1 March 1892, whether before or after the commencement of this section are and shall be and remain the property of the Crown.

(4) Where a substance is declared to be a mineral for the purposes of this Act the substance shall be and remain the property of the Crown.

(5) This section has effect notwithstanding anything to the contrary in any other Act.

This 1983 Amendment thus abolishes retrospectively all private ownership of minerals previously granted under the *cujus est solum* doctrine to the surface landowner. There appear to be two exceptions to this proposition. The first exception is contained in ss293 and 293A. By s293 a person who owned private property in minerals before 14 December 1982 may apply to the Minister for a discretionary exemption from the above provisions. In exercising his discretion the Minister must consider the matters listed in ss293(3), which generally relate to prior knowledge of the mineral deposits and practical steps on the owner's behalf to exploit them. Section 293A provides for exemptions relating to land alienated from the Crown after 1 March 1892.

The second exception applies in favour of stone and similar substances subject to the Extractive Industries Act 1966. Sub-section 2(2) of this Act provides that all ownership rights in the Crown in stone as a result of earlier reservations shall henceforth vest in the landowner. Even in this situation, however, the rights of the landowner are severely fettered. The owner of land can only search or authorise others to search for stone after giving notice to the Secretary for Minerals and Energy.¹⁶ A licence cannot be granted over private land without the owner's consent,¹⁷ but no one, including the owner of the land, can carry on any extractive industry without obtaining a licence or permit.¹⁸

(c) Queensland

Sub-section 110(2) of the Mining Act 1968-1983 (Qld) states the basic rule that all minerals (except coal) are vested in the Crown except those contained in grants made under the Crown Lands Alienation Act 1860, the Crown Lands Alienation Act 1868 and the Minerals Lands Act 1870. In respect of coal, regardless of the question of ownership ss110A(1) of the Mining Act provides that only the Crown can grant a lease to mine coal.

The position in Queensland is thus similar to New South Wales in that private minerals exist in land granted by Crown grant before the introduction of the above-mentioned nineteenth-century statutes. Coal is totally within private ownership.

¹⁶ ss27(2), 33(1) and 36.

¹⁷ ss5 and 6.

¹⁸ ss35(1)(b).

(d) South Australia

Section 16 of the Mining Act 1971 (SA) states that the property in all minerals is vested in the Crown. Sub-section 19(1) provides that a person who has been divested of his property in any minerals by virtue of s16, and who had commenced mining operations, can apply to the Minister for a declaration that the mine should be a private mine. While such a declaration is current, the owner of the minerals retains his common law mining rights. Subject to this exception, however, the surface landowner retains no rights at common law to minerals beneath his land.

(e) Western Australia

Pursuant to ss9(1) of the Mining Act 1978-1987 (WA), 'all gold, silver and any other precious metal' belong to the Crown. Other minerals not alienated in fee simple prior to 1 January 1899 are Crown property. Thus, the landowner's right to minerals, based on the *cujus est solum* doctrine, still applies in respect of all nineteenth century Crown grants.

(f) Tasmania

As in Western Australia, in many instances surface landowners have rights over minerals in Tasmania.

Legislative reservation of minerals from Crown grants dated from 14 November 1893. This results from s25 of the Mining (Amendment) Act 1911 (Tas), which states *inter alia* that all minerals in lands alienated since 14 November 1893 are Crown property. Crown grants made since 1905 are also subject to the Crown Lands Act 1976 (Tas). Sub-section 16(3) reserves to the Crown all 'gold, silver, copper, tin, or other metals, ore, mineral, or other substances containing metals, or gems or precious stones, or coal or mineral oil' in any grant, deed, or transfer of any Crown land. Pursuant to ss54(1), all Crown land sold shall be deemed to have been sold as regards the surface and to a depth of 15 metres below the surface unless the Minister otherwise determines. The reservation to the Crown in the 1976 Act is copied from the terms of both the Crown Lands Act 1905 and the Crown Lands Act 1911.

(g) Australian Capital Territory

Crown grants prior to 1911 are governed by the New South Wales law as it stood at the relevant time. Since 1911, the Crown has conveyed only leasehold interests which make no mention of minerals. Thus, except in the case of pre-1911 Crown grants all minerals belong to the Crown, and surface landowners have no claim.

(h) Northern Territory

Pursuant to ss69(4) of the Northern Territory (Self-Government) Act 1978 (NT), all interests of the Commonwealth in respect of minerals in the Territory (other than prescribed substances within the meaning of the Atomic Energy Act 1953 (Cth) and its regulations) are, by force of this section, vested in the Territory. This provision impliedly repeals the Minerals (Acquisition) Act (NT), s3, which stated that all minerals were vested in the Crown in right of the Commonwealth. No rights to minerals are vested in surface landowners at common law.

(i) Summary

Despite extensive legislation in all jurisdictions, private ownership of minerals based on the *cujus est solum* doctrine still exists in certain

circumstances in all jurisdictions except the Northern Territory. Although the incidence of this occurrence is very limited in Victoria, South Australia and the Australian Capital Territory, significant private ownership of minerals presently exists at common law in New South Wales, Queensland, Western Australia and Tasmania.

3. PETROLEUM

The legal position here is much simpler than in the case of minerals. In the case of petroleum, all the Australian States and the Northern Territory have legislatively declared that petroleum *in situ* is owned without exception by the Crown, regardless of when the land containing the petroleum may have passed into private ownership by Crown grant.¹⁹ For example, s6 of the Petroleum Act 1955 (NSW) states:

'(1) Notwithstanding anything to the contrary in any Act or in any grant, lease, licence or other instrument of title or tenure or other document, all petroleum and helium existing in a natural state on or below the surface of any land in the State whether alienated from the Crown or not and, if alienated, whether the alienation took place before or after the commencement of this section, shall be and shall be deemed at all times to have been the property of the Crown. . . .

(2) All Crown grants and leases and every licence and other instrument of title or tenure under any Act relating to lands of the Crown (other than petroleum exploration licences, petroleum prospecting licences and petroleum mining leases) shall, whether granted before or after the commencement of this section, be deemed to contain a reservation to the Crown of all petroleum and helium existing in a natural state on or below the surface of the land comprised therein or demised thereby.'

The legislation in the other States differs slightly in its wording, but is to similar effect.

There is no similar legislation in the Australian Capital Territory. Private rights over petroleum may still exist in this jurisdiction in respect of pre-1911 Crown grants as the New South Wales legislation concerning petroleum was not then in force. Common law principles concerning the ownership of petroleum *in situ* are thus applicable.

Except for the Australian Capital Territory, because of this legislation vesting ownership of all petroleum *in situ* in the Crown, the *cujus est solum* doctrine does not apply as no common law mining rights are preserved. As Crommelin²⁰ notes, 'by this bold approach [the Australian States] avoided the complexity which surrounds mineral ownership in some States, while at the same time providing a clear answer to the question which has bedevilled American petroleum jurisprudence; namely, is petroleum in place capable of ownership?''²¹

19 Petroleum Act 1955 (NSW), s6; Petroleum Act 1958 (Vic), s5; Petroleum Act 1923-1986 (Qld), ss 5, 6; Petroleum Act 1940 (SA), s4; Petroleum Act 1967-1986 (WA), s9; Mining Act 1929 (Tas), s28; Petroleum (Prospecting and Mining) Act (NT), s6.

20 Crommelin, 'Resources Law and Public Policy' (1983) 15 UWAL Rev 1.

21 Ibid 4.

4. GROUNDWATER

The issue whether the surface landowner owns percolating groundwater, based on the *cujus est solum* doctrine, was litigated in the United Kingdom in the nineteenth century.²² The leading authority is *Acton v Blundell*,²³ where Tindal CJ refused to apply by analogy to groundwater the common law rule established earlier that a riparian owner must allow water to flow without sensible diminution.²⁴ The judge stated:

'The person who owns the surface may dig therein, and apply all that is there found to his own purposes at his free will and pleasure; and that if, in the exercise of such right, he intercepts or drains off the water collected from underground springs in his neighbour's well, this inconvenience to his neighbour falls within the description of *damnum absque injuria*, which cannot become the ground of an action.'²⁵

Thus, the effect of the decision is to allow the surface landowner the right of unlimited exploitation of any percolating groundwater beneath his land, regardless of its effect on adjoining landowners. The issue whether this right is fettered in any way by a requirement that the use of the water be reasonable was litigated before the House of Lords in *Chasemore v Richards*,²⁶ which held in the negative. Later cases even went so far as to hold that the use made by a surface landowner of percolating groundwater cannot be restrained even if the landowner's motive is improper or malicious.²⁷

In light of the extent of the overlying landowner's rights, the question arises whether these rights amount to ownership. The judgment of Tindal CJ in *Acton v Blundell* can be argued to support the view that the right does amount to ownership, but the prevailing view is to the contrary. Lord Wensleydale in *Chasemore v Richards* stated that it is the use of the percolating groundwater rather than the property in it which belongs to the surface landowner.²⁸ This proposition was affirmed both at first instance and by the Court of Appeal in *Ballard v Tomlinson*.²⁹

Clark summarizes the English common law position regarding the property rights of the surface landowner in respect of groundwater as follows:

'The right to appropriate and use groundwater is said to be a natural incident of the ownership of land. As the overlying landowner has no proprietary interest in the unappropriated water beneath his land, it follows that such water cannot be the subject of easement or grant; nor is it possible for a neighbour to obtain an adverse prescriptive right to have the water flow on from under one's land. Such proprietary interest as does exist in percolating groundwater is thus measured in terms of a right to appropriate that water. Once water is appropriated by the overlying owner, by seeping into his well

22 For a discussion of common law rights to groundwater, see generally Clark, *Groundwater Law and Administration in Australia* (1979).

23 (1843) 12 M. & W 324; 152 ER 1223.

24 *Mason v Hill* (1833) 5 B & Ad 1; 110 ER 692.

25 (1843) 12 M & W 324, 354; 152 ER 1223, 1235.

26 (1859) 7 HL Cas 349; 11 ER 140.

27 See, eg, *Mayor of Bradford v Pickles* [1895] AC 587.

28 (1859) 7 HL Cas 349, 385; 11 ER 140, 154.

29 (1884) 26 ChD 194 (first instance); (1885) 29 ChD 115 (CA).

or being pumped to the surface, it does become his property. Until that time, however, he has but a right of appropriation.³⁰

There is a surprising dearth of Australian cases on this subject. The earlier cases show an unwillingness to depart from English law, including the 1911 High Court decision in *Mayor of Perth v Halle*.³¹ The most recent High Court decision concerning common law rights of ownership of water is *Gartner v Kidman*.³² This case concerned percolating surface water, but the High Court made a number of general remarks which would be equally applicable to groundwater. Of particular relevance is a dictum of Dixon CJ and Windeyer J that the idea of reasonableness is basic to much of the common law and is firmly embedded in the law of nuisance, and that in respect of both what a person may do and what his neighbour may put up with, its criteria are related to the reasonable use of the lands in question.³³ Their Honours added that absolute statements such as those which appear in earlier English authorities³⁴ are no longer to be taken as conflicting with the notion of reasonableness.³⁵

There are thus grounds for concluding that in Australia the right of the surface landowner to extract groundwater is not absolute and is at least limited by the qualification that he must not exercise his rights maliciously.³⁶ Whether the courts would go further and apply a requirement of reasonable use by surface landowners in all cases is a moot point. As regards ownership rights in groundwater, the position in Australia appears identical with that in England, and property only vests in the surface landowner once water is actually appropriated.³⁷

To what extent is the issue of ownership of groundwater affected by State legislation? The groundwater legislation in New South Wales, Victoria, Queensland and Western Australia contains a provision which reads as follows:

'The right to the use and control of all groundwater shall subject to this Act and until appropriated under this or some other Act vest in the Crown and shall be exercised by the Commission in the name of and on behalf of the Crown.'³⁸

The correct interpretation of this legislation is disputed.³⁹ On one analysis the section effectively confers ownership of groundwater in the

30 Clark, above note 22 at 28.

31 (1911) 13 CLR 393. See also *Cooper v Corporation of Sydney* (1853) 1 Legge 765; *Dunn v Collins* (1867) 1 SALR 126.

32 (1962) 108 CLR 12.

33 *Ibid* 47.

34 For example, *Mayor of Bradford v Pickles* [1895] AC 587.

35 (1962) 108 CLR 12, 47.

36 In New South Wales and Tasmania this qualification is reinforced by legislation. The Water Act 1912 (NSW), s4C makes it an offence, with certain specified exceptions, to interfere with or obstruct the flow of sub-surface water. The Water Act 1957 (Tas), s99 states:

'No person may with intent merely to injure some other landowner, including any statutory authority requiring water for the purposes of its Act, draw off any underground water not flowing in a defined channel.'

37 See Clark, above n 22 at 28.

38 Water Act 1912 (NSW), s4B; Groundwater Act 1969 (Vic), s47; Water Act 1926-1987 (Qld), s4; Rights in Water and Irrigation Act 1914-1987 (WA), s26.

39 This issue is discussed in detail in Clark and Myers, 'Vesting and Divesting: The Victorian Groundwater Act 1969' (1970) 7 MULR 237.

Crown and destroys all private common law rights in the surface landowner. This was the interpretation placed on the section by the Victorian Minister for Minerals and Energy at the time of the introduction of the legislation in Victoria in 1969. In a detailed review of the groundwater legislation, however, Clark and Myers dispute this interpretation. Their contention is that the right of the Crown is limited merely to the right to use or control, and any private rights not inconsistent with superior Crown powers on these matters will continue to co-exist.⁴⁰ The authors support their contention by two separate arguments. The first argument relates to the judicial interpretation of the phrase 'the right to the use and flow and to the control . . .', which is also found in Australian State legislation regulating riparian rights in respect of surface waters.⁴¹ Although Stephen J stated in *Hanson v Grassy Gully Gold Mining Co*⁴² that the vesting of rights in the Crown impliedly divested the riparian owner of his common law rights, this conclusion was implicitly rejected by Dixon J in *H Jones and Co Pty Ltd v Kingborough Corporation*⁴³ and was expressly attacked by Fullagar J in *Thorpes Ltd v Grant Pastoral Co Pty Ltd*.⁴⁴ In the latter case his Honour stated that in his opinion the disputed phrase should be interpreted in such a way that the statute gives to the Crown new rights superior to those of the riparian owner, but that the private rights will continue to exist until the new superior Crown rights are exercised.⁴⁵ Based on this dictum, Clark and Myers conclude that private rights only abate to the extent that the exercise of statutory powers is necessarily inconsistent with them.⁴⁶

The second argument relates to the interpretation of the groundwater legislation as a whole. Referring to the terms of the Groundwater Act 1969 (Vic), the authors note the existence of s45, whereby the Minister must refuse to approve any drainage bore which will result in pollution, s69, which gives power to interfere summarily to prevent the operation of such a bore, and s77, which penalises negligent or wilful pollution. They conclude:

'If, in spite of such precautions, a landowner suffers damage from the acts of his neighbour in polluting the water, to allow him a private remedy does not seem inconsistent with either the express powers mentioned or with the general right to use and control in section 47'.⁴⁷

The likely overall conclusion is that in New South Wales, Victoria, Queensland and Western Australia, there is no Crown ownership of groundwater and that the common law rights of the surface landowner in groundwater (although not amounting to ownership) still remain in existence. The effect of this for the purposes of the present discussion is that the Crown has the effective right of control of the resource, which for all practical purposes is the equivalent of ownership. The surface landowner only owns the groundwater that he actually appropriates, and

40 Ibid 251.

41 See, eg, Rights in Water and Irrigation Act 1914-1987 (WA), s8(1).

42 (1900) 21 NSWLR 271, 275.

43 (1950) 82 CLR 282, 322.

44 (1955) 92 CLR 317.

45 Ibid 331.

46 Clark and Myers, above n 39 at 249.

47 Ibid 255.

the groundwater legislation gives the Crown the absolute right to control his extraction or to prohibit it entirely.

The groundwater legislation in South Australia and Tasmania does not confer any specific property rights in the resource in the Crown. In both these jurisdictions, however, the legislation read as a whole effectively gives the Crown the right to use and control the resource even though such a right is not expressly bestowed on the Crown. Section 48 of the Water Resources Act 1976 (SA) makes it an offence to cause, suffer or permit a well to be drilled, or related work to be carried out, without a permit, and s42 makes it an offence for any person to withdraw or take any water from a well in a Proclaimed Region unless authorised by licence under the Act or any other Act. Part III of the Groundwater Act 1985 (Tas) provides a statutory mechanism for the licensing of wells in parts of the State declared to be protected areas. A similar situation arises in the Northern Territory, where the Control of Waters Act 1979 imposes controls over bores located in areas declared to be water control districts, and authorises the Administrator-in-Council to prohibit the sinking, construction or using of a well or bore within any water control district unless a permit has first been obtained (s16B).

In the Australian Capital Territory there is no legislation regulating groundwater.⁴⁸ A similar situation arises in respect of those parts of South Australia, Tasmania and the Northern Territory which are not declared to be proclaimed regions, protected areas or water control districts (respectively). In these areas, the Crown has no right to control the resource, and such a right effectively vests in the surface landowner. Thus, the surface landowner has the power either to exploit the groundwater himself or to license others to do so, and the ownership of any water extracted will vest in him.

5. OTHER UNDERGROUND RESOURCES

Some underground resources exist which do not fall within the statutory definition of 'minerals' or 'petroleum' and do not constitute groundwater. This situation may occur for either or both of two reasons. First, the definition of 'minerals' in the mining legislation of each jurisdiction is not comprehensive. The definition differs from jurisdiction to jurisdiction. Thus, for example, the Mining Act 1978 (WA), ss8(1), excepts limestone, rock, gravel, shale, sand or clay. Specific exceptions to the definition of 'minerals' exist in the equivalent New South Wales, Victorian, Queensland, South Australian and Northern Territory legislation.⁴⁹ In some instances, the original definition of 'minerals' has been changed by legislative amendment, sometimes increasing the scope of private ownership based on the *cujus est solum* doctrine and sometimes decreasing it.

A further difficulty is that the legislative definition of 'minerals' in some jurisdictions is deliberately imprecise. Thus, for example, the Mining Act 1971 (SA), s6, defines 'minerals' as meaning, *inter alia*, 'any naturally occurring deposit of metal or metalliferous ore, precious stones, or any

48 The Water Rights Act 1902 (NSW) appears to remain in force in the ACT but does not apply to underground water.

49 Mining Act 1973 (NSW), ss6(1); Mines Act 1958 (Vic), ss3(1); Mining Act 1968-1983 (Qld), ss7(1); Mining Act 1971 (SA), s6; Mining Act 1978-1987 (WA), ss8(1); Mining Act 1929 (Tas), ss2(1); Mining Act 1980 (NT), ss4(1).

other mineral. In this situation, the meaning of 'any other mineral' has to be determined by the application of case law.⁵⁰ At common law the term 'minerals' has been said to be an indefinite term which may be given a broad or a narrow meaning based on the intention with which the word is used.⁵¹ The relevant principles extracted from the cases appear to be as follows: first, it is a question of fact in each case whether a substance is a mineral;⁵² secondly, the issue is determined by the vernacular of the mining world, the commercial world and landowners rather than by other alternative interpretations;⁵³ and thirdly, the relevant time for determining the issue is at the time the instrument was executed or the statute was enacted.⁵⁴ An illustration of a situation where the surface landowner's rights would need to be considered in this manner is geothermal resources,⁵⁵ which are only specifically included within the definition of 'minerals' in New South Wales and Tasmania.⁵⁶

Will the *cujus est solum* doctrine operate in this context to vest ownership of all underground resources not falling within the statutory definition of 'minerals' in the surface landowner? This may depend on the depth of the resource. As stated earlier,⁵⁷ such limited authority which does exist suggests that the doctrine only operates to a limited depth. If this is correct, while the ownership of substances found in shallow ground such as gravel, shale and sand may vest in the surface landowner, certain other resources, such as geothermal resources, located at a greater depth would be outside the scope of the doctrine.

If the *cujus est solum* doctrine is found to be inapplicable, it follows that the resource will constitute a *res nullius* and will vest in the ownership of the first person to reduce it into possession. In the absence of any statutory management regime, in the case of a liquid resource (such as geothermal resources), the rule of capture would operate to allow the surface owner to exploit the resource to the maximum extent possible on his land regardless of whether his operations cause the resource to be drained from underneath neighbouring land.⁵⁸

In summary, there are two possible alternative conclusions as to ownership of underground resources which are unregulated by statute or common law rules: first, the *cujus est solum* doctrine will vest the resource in the surface landowner; secondly, the resource will be *res nullius* and will only be subject to ownership when it is reduced into possession. As discussed earlier, however,⁵⁹ as a practical matter it appears that the effective result in both cases will usually be the same; even if the resource is *res nullius*, access to the resource can only be obtained

50 See Forbes and Lang, above n 13 at para 407.

51 *Lord Provost and Magistrates of Glasgow v Farie* (1888) 13 App Cas 657, 675; *NSW Associated Blue-Metal Quarries Ltd v FCT* (1955) 94 CLR 509, 524.

52 *Waring v Foden* [1932] 1 Ch 276.

53 *Hext v Gill* (1872) LR 7 Ch App 699, 719; *Lord Provost and Magistrates of Glasgow v Farie* (1888) 13 App Cas 657, 669; *Shire of Wannon v Riordan* [1955] VLR 413, 420-421

54 *Ibid.*

55 See Bradbrook, 'The Ownership of Geothermal Resources' [1987] AMPLA Yearbook 353.

56 Mining Regulations 1974 (NSW), reg 5 (3); Mining Act 1929 (Tas), ss2(1) (as amended in 1986).

57 See Division 2 of this article.

58 See generally Crommelin, 'The US Rule of Capture: Its Place in Australia' [1986] AMPLA Yearbook 264.

59 See Division 2 of this article.

by the surface landowner or by developers allowed entry onto the land with the landowner's consent. Thus, exclusive control over access to the resource is effectively, if not legally, the equivalent of ownership.

6. RENEWABLE RESOURCES⁶⁰

Renewable energy may be described as a generic term for a wide range of technologies based on converting energy derived from the sun, the wind, falling water, biomass, the waves, the tides and the earth's internal heat. Despite this wide range of options, the majority have been found to be unlikely to be commercially exploitable in Australia in the short to medium term.⁶¹ Solar energy and wind energy are the two renewable resources which have been found to have potential for making a significant contribution to Australia's energy requirements by the year 2000.⁶² Accordingly, this section of the article will be limited to a consideration of the surface landowner's claim in respect of these two resources.

The efficient and effective use of solar energy requires guaranteed access for the solar collector panels of the direct rays of the sun for a certain period of time each day. Except at midday at certain times of the year in tropical latitudes (ie the Northern Territory and the northern parts of Queensland and Western Australia), the sun is never overhead at any location. The effect of this is that sunlight will reach a solar device at an angle to the vertical, and will often have to pass through the airspace of one or more neighbouring properties. In the course of this passage, the sunlight may be blocked, either temporarily or permanently, by trees or buildings.⁶³ The extent to which a solar user has a legal remedy in nuisance against his neighbour to guarantee freedom from shading is outside the scope of the *cujus est solum* doctrine and is accordingly not discussed in this article.⁶⁴ What is of

60 For a discussion of the Australian laws relevant to renewable resources, see Bradbrook, *Solar Energy and the Law* (1984); Bradbrook, *Legal Aspects of the Practical Application of Solar Energy Technology in Australia*, NERDDC Report NERDDP/EG/85/452 (1985); Bradbrook, 'The Access of Wind to Wind Generators' [1984] *AMPLA Yearbook* 433; Preece, 'Solar Energy and the Law' (1981) 6 *Queensland Lawyer* 83.

61 Aust, Department of Resources and Energy, *Energy 2000: A National Energy Policy Review*, vol 6 'Renewable Energy' (1986).

62 'Solar energy' is a phrase which has a variety of possible meanings. In its widest sense, it encompasses all forms of energy on earth, as every source of energy is ultimately derived from the sun. Fossil fuels that we have inherited were formed millions of years ago as a result of chemical reactions stimulated by sunshine, and thus constitute stored solar energy. Hydro-electric energy is made possible by rain which is caused by heat derived from the sun. The sun's heat also creates the wind and waves necessary for wind power and wave power electricity generation by warming the atmosphere. Finally, the sun's gravitation is partially responsible for the earth's tides. In the present context, however, 'solar energy' will be given its more limited meaning commonly understood by the layperson, namely the conversion of sunlight to usable energy in order to heat and cool buildings and to generate electricity.

63 See Bradbrook, *Solar Energy and the Law* (1984) ch 2.

64 For a discussion of this issue, see eg Bradbrook, *Solar Energy and the Law* (1984) chs 3-7; Eisenstadt and Utton, 'Solar Rights and their Effect on Solar Heating and Cooling' (1976) 16 *Natural Resources J* 363; Kraemer, *Solar Law* (1978) chs 4-9; Lungren, 'Solar Entitlement: A Proposed Legislative Model' (1983) 4 *J Energy L and Policy* 171; Preece, 'Solar Energy and the Law' (1981) 6 *Queensland Lawyer* 83; Sampson and Charo, 'Access to Sunlight: Resolving Legal Issues to Encourage the Use of Solar Energy' (1986) 2 *Columbia J Env L* 417; South Australian Department of Mines and Energy, *Solar Access Legislation for South Australia — A Discussion Paper* (1982); Thomas, Miller and Robbins, *Overcoming Legal Uncertainties About Use of Solar Energy Systems* (1978).

concern, however, are cases where obstruction to sunlight may be caused by objects overhanging the boundary of the solar user's land. Does the solar user own the airspace under the *cujus est solum* doctrine and accordingly have the right to sue the neighbour in trespass?

A similar issue arises in relation to the exploitation of wind energy. Like solar devices, wind generators require uninterrupted access to the resource to be exploited (ie the natural flow of the wind) to function effectively. The adverse effect on the operation of wind generators of physical objects located upwind is considerable. The power obtained from the wind varies as the cube of its velocity. For example, the power available almost doubles if the wind velocity increases from 12 to 16 kilometres per hour, and increases by a factor of eight if the wind velocity increases from 16 to 32 kilometres per hour. Thus, the need for a wind generator to be guaranteed access to the unobstructed flow of the wind must be regarded as critical.⁶⁵ As in the case of solar access, the wind user's rights against his neighbour in nuisance to restrain interference with the direct flow of the wind by trees or buildings on neighbouring land is outside the scope of this article.⁶⁶ However, if the trees or buildings causing the obstruction overhang the boundary, does the wind user have the right to sue in trespass based on the *cujus est solum* doctrine?

Unlike the subsoil, there are numerous cases concerning the application of the *cujus est solum* doctrine to airspace. The starting point is *Pickering v Rudd*.⁶⁷ In this case, in an action for trespass, the plaintiff contended that the defendant had trespassed by nailing a board upon his house which overhung the plaintiff's garden. Lord Ellenborough held that it was not trespass to interfere with the column of air superincumbent on the garden, stating that neither was an aeronaut in a balloon liable to an action for trespass at the suit of the occupier of every field over which his balloon passes in the course of his voyage.⁶⁸ Lord Ellenborough reasoned that trespass would only arise if the land were struck.

This case was followed in *Saunders v Smith*,⁶⁹ where Shadwell V-C stated:

'Suppose a person should apply to restrain an aerial wrong, as by sailing over a person's freehold in a balloon; this surely would be too contemptible to be taken notice of.'⁷⁰

Thus, right from the outset the common law imposed limitations on the aerial extent of the *cujus est solum* doctrine. Not every infringement of airspace would constitute trespass. This theme ran through later cases.

65 See Bradbrook, 'The Access of Wind to Wind Generators' [1984] AMPLA Yearbook 433, 436.

66 For a discussion of this issue, see eg Bradbrook, 'The Access of Wind to Wind Generators' [1984] AMPLA Yearbook 433; Noun, 'Protecting Wind Access: A Preliminary Assessment', Paper presented at Energy Sources Technology Conference and Exhibition, 31 January — 3 February 1983, Houston, Texas.

67 (1815) 4 Camp 219; 171 ER 70.

68 Ibid 220-221; 70-71.

69 (1838) 2 Jur 491.

70 Ibid 492. Note that in *Kenyon v Hart* (1865) 6 B & S249; 122 ER 1188, Blackburn J, referring to Lord Ellenborough's judgment in *Pickering v Rudd*, stated that he understood and agreed with the doubt concerning whether the passage of an aeronaut in a balloon constituted trespass, though he could not understand the legal reason for it.

For example, in *Wandsworth Board of Works v United Telephone Co*,⁷¹ the issue was whether the district board of works (the owner of the street) had a right to object to telephone wires passing across the street, that is, whether the wires were a trespass to its property. Brett MR considered that 'street' must include something above the surface,⁷² but stated that he was uncertain as to the notion of ownership extending into infinity. His Lordship held that 'street' went above the surface to the height of an ordinary user of a street as a street, and that the wire (which was nine metres above the ground), in the absence of danger, was not a trespass.⁷³

Based on these and other cases,⁷⁴ the rule emerged in nineteenth-century English cases that the *cujus est solum* doctrine only operated to extend to the surface landowner ownership of the airspace above his land to a height which is requisite for the proper use and enjoyment of the land. This conclusion appears to have been adopted *a fortiori* in Australia in respect of permanent or semi-permanent, as opposed to transient, intrusions into airspace. Authority for this proposition is *Davies v Bennison*,⁷⁵ where Nicholls CJ of the Supreme Court of Tasmania held that the firing of a bullet across neighbouring land in order to kill a cat on the roof of a shed constituted trespass. His Honour stated:

'It seems an absurdity to say that if I fire at another's animal on his land, hit it, kill it, and so leave the bullet in it, I have committed no trespass, and yet, if I miss the animal and so let the bullet fall into the ground, have committed a trespass. Such distinctions have no place in the science of the Common Law.'⁷⁶

The scope of the doctrine in respect of airspace has been further examined in several decisions in recent times. Two alternative formulations of the law can be identified: a wide view, pursuant to which any permanent or semi-permanent intrusion into airspace will constitute trespass, and a narrow view, that trespass will only arise when the intrusion into airspace interferes with the ordinary use and enjoyment of the land surface.

*Kelsen v Imperial Tobacco Co (of Great Britain and Ireland) Ltd*⁷⁷ is an authority in favour of the wide view. In this case, the plaintiff sought an injunction based on a claim of trespass to airspace to require the defendant to remove an advertising sign which projected into the airspace above the plaintiff's shop. McNair J held that the plaintiff, as tenant,

71 (1884) 13 QBD 904.

72 Ibid 915.

73 Ibid 916. Bowen and Fry LJ reached the same conclusion.

74 See also *Clifton v Bury* (1887) 4 TLR 8.

75 (1927) 22 Tas LR 52.

76 Ibid 56.

77 [1957] 2 QB 334. See also *Gifford v Dent* [1926] WN 336. Note, however, that Morgan argues in the article 'The Law Relating to the Use of Remote Sensing Techniques in Mineral Exploration' (1982) 56 ALJ 30, 36, that *Kelsen's* case was decided on the basis that the defendant had deliberately exploited the airspace above the plaintiff's land and had derived a material benefit for himself by the occupation of the airspace. There is a dictum by Stamp J in *Wollerton & Wilson Ltd v Richard Costain Ltd* [1970] 1 WLR 411, 413 supporting this view.

had the right to use the airspace and that the interference by the sign constituted a trespass. His conclusion was influenced by the terms of the Civil Aviation Act 1949 (UK), ss40(1), which states:

'No action shall lie in respect of trespass or in respect of nuisance, by reason only of the flight of an aircraft over any property or height above the ground, which, having regard to wind, weather and all the circumstances of the case is reasonable.'

His Lordship reasoned that the enactment of this legislation implies that the legislature considered that the maxim applies in respect of all aircraft or else such legislation would be unnecessary. As there is legislation in the Australian States similar to the Civil Aviation Act 1949 (UK), ss40(1),⁷⁸ *Kelsen's* case and its reasoning is a highly persuasive authority in this country.

Other cases, however, adopt a different approach. The best-known case limiting the scope of the maxim is *Lord Bernstein of Leigh v Skyviews and General Ltd.*⁷⁹ In this case, the defendants had flown over the plaintiff's land and had taken an aerial photograph of it with the intention of selling it to him. The plaintiff unsuccessfully sued the defendants in trespass on the basis of his alleged unrestricted ownership of the airspace above his land. Griffith J distinguished the earlier cases in favour of the broad application of the maxim on the ground that they concerned rights in the airspace immediately adjacent to the surface of the land. His Honour rejected the claim that a landowner's rights extend to an unlimited height, and stated:

'The problem is to balance the rights of an owner to enjoy the use of his land against the rights of the general public to take advantage of all that science now offers in the use of air space. This balance is in my judgment best struck in our present society by restricting the rights of an owner in the air space above his land to such height as is necessary for the ordinary use and enjoyment of his land and the structures upon it and declaring that above that height he has no greater rights in the air space than any other member of the public.'⁸⁰

A further authority in favour of a narrow scope for the maxim is *Graham v K D Morris & Sons Pty Ltd.*⁸¹ In this case, the jib of a crane infringed the airspace of the neighbouring property at certain times when the wind blew from the north-east or the north-west. On these occasions the jib was suspended 20 metres over the neighbour's house. On these facts W B Campbell J held that there was a trespass to land. Although purporting to apply *Kelsen v Imperial Tobacco Co Ltd*, his Honour stated that the plaintiff succeeded because the defendant 'interfere[d] with that part of the airspace above her land which is requisite for the proper use and enjoyment of that land'.⁸² The Judge indicated that the proper use and enjoyment was affected inasmuch as the overhanging of the jib could

78 See, eg, Wrongs Act 1958 (Vic), s30; Damage by Aircraft Act 1952 (NSW), ss2(1); Damage by Aircraft Act 1963 (Tas), s3; Air Navigation Regulations 1920 (Cth), reg 90.

79 [1978] QB 479. Cf *Commissioner for Railways v Valuer-General* [1974] AC 328.

80 Ibid 488.

81 [1974] Qd R 1.

82 Ibid 4.

adversely affect the market value of the property. By inference the judgment suggests that there would be no trespass if the infringement of the airspace did not adversely affect the use and enjoyment of the land.

The most recent authority on this issue in *Anchor Brewhouse Developments Ltd v Berkley House (Docklands Development) Ltd*.⁸³ The issue in this case was whether trespass to airspace was committed by the boom of a crane oversailing the plaintiff's land. The defendants, although admitting that oversailing regularly occurred both when the crane was operational and when left free-swinging, denied liability on the basis that the operations complained of constituted nuisance rather than trespass and did not cause actual damage. Scott J held for the plaintiffs and granted an injunction to restrain the continuing trespass. His Lordship stated:

'A landowner is entitled, as an attribute of his ownership of the land, to place structures on his land and thereby to reduce into actual possession the air space above his land. If an adjoining owner places a structure on his (the adjoining owner's) land that overhangs his neighbour's land, he thereby takes into his possession air space to which his neighbour is entitled. That, in my judgment, is trespass. It does not depend upon any balancing of rights.'⁸⁴

This appears to represent a shift in judicial thinking from other recent authorities, and a return to the wide view of the *cujus est solum* doctrine. Scott J referred to the view in the *Bernstein* case that the critical question is whether the invasion of airspace interfered with the ordinary use and enjoyment of land, and stated that he was not satisfied that this represents a permissible application of Griffiths J's approach in *Bernstein*,⁸⁵ nor that it would be workable in practice. His Lordship then proceeded to distinguish cases of trespass to airspace caused by structures from trespass to airspace as a result of other causes. He continued:

'The difficulties posed by overflying aircraft or balloons, bullets or missiles seem to me to be wholly separate from the problem which arises where there is invasion of air space by a structure placed or standing upon the land of a neighbour. One of the characteristics of the common law of trespass is, or ought to be, certainty. The extent of proprietary rights enjoyed by landowners ought to be clear. It may be that, where aircraft or overflying missiles are concerned, certainty cannot be achieved. I do not wish to dissent at all from Griffiths J's approach to that problem in the *Bernstein* case. But certainty is capable of being achieved where invasion of air space by tower cranes, advertising signs and other structures are concerned. In my judgment, if somebody erects on his own land a structure, part of which invades the air space above the land of another, the invasion is trespass.'⁸⁶

In the light of the existing authorities, the law concerning the aerial extent of the scope of the *cujus est solum* doctrine must be considered

83 (1987) 284 EG 625.

84 *Ibid* 629.

85 [1978] QB 479.

86 (1987) 284 EG 625, 629.

to be unsettled. In the context of the present discussion, the issue whether a solar or wind user can rely on the *cujus est solum* doctrine to justify a claim in trespass in the event of an invasion of airspace may well depend on which of the alternative formulations of the law, discussed above, represents good law. If the proposition of Scott J in the *Anchor Brewhouse Developments* case that all overhanging structures automatically constitute trespass is preferred, then all infringements of a solar or wind user's airspace will automatically constitute trespass. On the other hand, if the requirement of the doctrine is that a remedy in trespass will only lie where an infringement of airspace affects the 'ordinary use and enjoyment' of the land, the issue will turn on whether the use of land for solar or wind electricity generation, or for solar and wind heating or cooling, constitutes an *ordinary* use and enjoyment. This is a moot point. If the word 'ordinary' is held to involve the criterion of reasonableness, it would be a comparatively simple task for the solar or wind user to prove that the use of solar or wind energy is a reasonable use of land. On the other hand, if 'ordinary' is tested by reference to the incidence of solar and wind energy use in the community, a different conclusion might be reached. On a state by state basis, the most recent figures for the market penetration of domestic solar water heaters, the most commonly found energy device relying on renewable resources, ranges from 17.1 per cent (in Western Australia) to 0.1 per cent (in Tasmania).⁸⁷ The use of other forms of solar devices (such as photovoltaic cells) would increase these figures significantly, but overall it would be concluded that solar and wind usage is confined to a relatively small percentage of landowners and that such usage is not yet 'ordinary' in Australia. The same argument would apply *a fortiori* in the case of wind energy.

7. CONCLUSION

The above discussion shows that the application of the *cujus est solum* doctrine to the surface landowner's claims to natural resources located above and beneath the land is characterised by uncertainty and seemingly anomalous distinctions. Although the doctrine has no application to petroleum, it still appears to apply in some instances to minerals, and also to groundwater and other underground resources. Its application to renewable resources is uncertain, in light of the judicial differences of opinion as to the application of the doctrine to the ownership of airspace.

The extensive application of the common law and the *cujus est solum* doctrine to the ownership of natural resources is perhaps surprising. In light of the increased emphasis on resource development in Australia throughout the latter part of the twentieth century, it seems strange that reliance is still placed on an ancient doctrine that was developed several centuries before resource exploitation proceeded apace.

It is not only in Australia, however, that the *cujus est solum* doctrine applies to resources law. The doctrine applies in certain situations in the resources context throughout the common law world. Thus, for example, in the absence of statutory development, the ownership of airspace issue,

⁸⁷ Andrews, *Solar Jobs in Victoria: The Economic Impact of the Solar Industry*, Victorian Solar Energy Council (1982) 15. This issue is discussed in Bradbrook, *Solar Energy and the Law* (1984) 11.

in respect of its application to solar and wind energy exploitation, would be resolved in all common law countries in the same manner as explained above in respect of Australia. In the case of the United Kingdom, although as in Australia the doctrine has been supplanted by legislation in the case of petroleum vesting ownership in the Crown,⁸⁸ the doctrine has more extensive application in respect of minerals. In that country, subject to the Crown's prerogative in respect of gold and silver⁸⁹ and legislation vesting ownership in coal in the National Coal Board,⁹⁰ the doctrine applies generally, with the result that at common law minerals in their original position have been held to be part of the land,⁹¹ and a fee simple landowner is entitled to all mines and minerals under his land.⁹²

A further illustration of the wide application of the *cujus est solum* doctrine is the United States. In that country, the doctrine applies universally to all minerals on private lands.⁹³ Prior to severance,⁹⁴ the fee simple landowner is vested with ownership of both the surface and the minerals beneath it.⁹⁵ The doctrine is also applicable in some instances in United States' petroleum law, as there is very little public ownership of petroleum.⁹⁶ This is in direct contrast to Australia, where a policy of Crown ownership of petroleum has applied since the first significant discoveries of deposits.⁹⁷ In the United States, a landowner is entitled to produce and dispose of any petroleum which he may recover from any wells upon his land, and may prohibit other persons from mining his land for the purpose of exploring for and producing petroleum.⁹⁸ As with minerals, the landowner may sever or reserve any or all of the rights, powers, privileges and immunities concerned with the petroleum.⁹⁹ The actual application of the doctrine varies from State to State according to which of three theories of ownership of petroleum is accepted by the

88 Petroleum (Production) Act 1934 (UK), s1(1).

89 *Case of Mines* (1568) 1 Plow 310; 75 ER 472; *Attorney-General v Morgan* [1891] 1 Ch 432.

90 Coal Industry Nationalisation Act 1946 (UK).

91 *Wilkinson v Proud* (1843) 11 M & W 33; 152 ER 704.

92 *Mitchell v Mosley* [1941] 1 Ch 438, 450. See Megarry and Wade, *The Law of Real Property* (5th edn 1984) 64.

93 For rights to minerals on federal or State lands, see *American Law of Mining* (2nd edn 1985, Outerbridge ed) chs 3-19, 60-73; Maley, *Mining Law* (1985).

94 Severance or mineral reservation is a legal technique whereby the owner of lands, when conveying interests in those lands to another, withholds or reserves to himself all or part of the rights to minerals therein. Before a mineral severance occurs, a conveyance of the land by general description transfers title to the underlying mineral deposits without any reference to them being made in the deed. After severance a conveyance of the surface will have no effect on the vested rights of the mineral owner, and the mineral owner, in turn, can convey all or any part of his mineral title without regard to the surface ownership. All US States except Louisiana allow possessory estates in hard mineral deposits to be separated in ownership from the surface. Whenever a mineral estate is separated in ownership from the surface or overlying strata, the mineral owner derives a right of necessity to use and damage so much of the surface as is reasonably required for the proper extraction of his deposit. See *American Law of Mining*, *ibid* 9.03(1), 82.01-82.03, 82.08.

95 *Ibid* 86.01 [2] [a] citing *Saulsberry v Maddox* 125 F 2d 531 (1926); *Kinder v La Salle County Carbon Coal Co* 301 Ill 362, 133 NE 772 (1921). See also Prosser, *Handbook of the Law of Torts* (4th edn 1971) 73.

96 See Forbes and Lang, above n 13 at 26.

97 *Ibid*.

98 Williams and Meyers, *Oil and Gas Law* (looseleaf service) para 201.

99 *Ibid*.

State courts.¹⁰⁰ This complication and division in the law has developed as a result of the migratory and fugacious nature of petroleum caused by the fact that a petroleum reservoir in its natural state is under pressure. Under the non-ownership theory, no person owns petroleum until it is produced, and any person may 'capture' it if able to do so. Ownership is derived by the first person to reduce the petroleum into possession, provided that that person does so lawfully (for example, by drilling on his land). The fact that the petroleum may have migrated from beyond the boundaries of his land is irrelevant.¹⁰¹ The qualified ownership theory does not recognise absolute ownership of petroleum *in situ* but does afford the landowner a right, which is an interest in land, to acquire absolute ownership by production. The distinction between this theory and that of non-ownership is difficult to draw. Crommelin contends that the difference lies in the nature of the rights of the landowner.¹⁰² Under the qualified ownership theory, the landowner is regarded as having a property interest in, but not ownership of, the petroleum *in situ*.¹⁰³ Finally, under the absolute ownership theory, the landowner has a fee simple estate in petroleum beneath his land by virtue of his ownership of the land surface. In contrast to solid minerals, however, a private landowner's absolute ownership of petroleum is defeasible and may be lost if it is drawn away by production on adjoining lands.¹⁰⁴

Thus, in its application to the ownership of natural resources the *cujus est solum* doctrine appears to be entrenched throughout the common law world. It is submitted that law reform is required to abolish the application of this common law doctrine to natural resources. There are two justifications for this suggestion. First, as discussed earlier in this article,¹⁰⁵ even after centuries of consideration and litigation the scope of the doctrine remains unclear. This produces uncertainty in the law. Uncertainty will inevitably deter or retard the development of natural resources and thus harm the national interest. Resources developers will not willingly enter into activities which are likely to lead to a lawsuit, which even if ultimately successful will inevitably lead to increased costs. Secondly, as natural resources law is a fast developing area of law, it must be questioned whether the common law is capable of adapting sufficiently quickly to meet the changing needs of society. In the area of property law, there are several instances in recent years where the common law has been replaced by statute law because of the perceived inability of the common law to provide a satisfactory remedy in changed circumstances.¹⁰⁶ Common law can be argued to be appropriate only for

100 For a discussion of these theories of ownership, see Crommelin, 'The US Rule of Capture: Its Place in Australia' [1986] AMPLA Yearbook 264.

101 The non-ownership theory applies in Alabama, California, Illinois, Kentucky, Louisiana, New York, Ohio and Wyoming: Williams and Meyers, above n 98 at para 203.2.

102 Crommelin, above n 100 at 266.

103 Only Oklahoma has adopted this theory.

104 Williams and Meyers (above n 98 at para 303.3) contend that a majority of States adhere to this theory: Arkansas, Colorado, Kansas, Maryland, Michigan, Mississippi, Montana, New Mexico, North Dakota, Pennsylvania, Tennessee, Texas, Washington and West Virginia.

105 See Division 6 of this article.

106 For example, the common law methods of protecting de facto partners in property disputes has been replaced by legislation in New South Wales (De Facto Relationships Act 1984 (NSW)). Similar legislation has been foreshadowed in Victoria and South Australia. In the area of landlord-tenant law, the common law has been codified in

areas of law concerning those aspects of society where the pace of change is slow.

What statutory reforms should occur in order to clarify the ownership of natural resources? Five reforms can be suggested.

1. In the case of minerals an attempt should be made to unify the law between the Australian States. There appears to be no historical or other justification for the present widespread disparity in the laws, and the existing unnecessary differences between the States merely increases the work for the legal profession and increases the costs for the developers. It is submitted that the approach adopted already in Victoria and South Australia¹⁰⁷ of vesting complete ownership of all minerals in the Crown and abolishing existing private minerals should be followed in the remaining jurisdictions. If necessary, the legislation could establish a compensation scheme, as has occurred in other natural resources legislation.¹⁰⁸

2. Consideration should be given to amending the present definition of 'minerals' in each of the State Mining Acts so as to avoid areas of uncertainty.¹⁰⁹ Thus, for example, the use of the phrase 'any other minerals' in the Mining Act 1971 (SA), s6, with the concomitant necessity of examining the meaning at common law of 'minerals' should be replaced by more specific wording.

3. Separate legislation should be considered in the case of other underground resources which fall outside the scope of the mining, petroleum or groundwater legislation. This has already occurred in respect of some resources in some jurisdictions,¹¹⁰ but much remains to be done. An illustration of an area where legislation is required is geothermal resources.¹¹¹ This is the subject of separate legislation in all common law jurisdictions overseas where the resource exists (New Zealand, British Columbia and twelve States of the United States),¹¹² but no equivalent

106 *Continued*

respect of residential tenancies in all States except Western Australia and Tasmania (Residential Tenancies Act 1987 (NSW); Residential Tenancies Act 1980 (Vic); Residential Tenancies Act 1975 (Qld); Residential Tenancies Act 1978 (SA)). Note that the Queensland Act represents only a partial codification. In recent times, the law regulating retail tenancies has also been partially codified in all States except New South Wales and Tasmania (Retail Tenancies Act 1986 (Vic); Retail Shop Leases Act 1984 (Qld); Landlord and Tenant Act 1936 (SA), Part IV (added in 1985); Commercial Tenancy (Retail Shops) Agreements Act 1985 (WA)).

107 Mines Act 1958 (Vic), s291 (as amended in 1983); Mining Act 1971 (SA), s16.

108 See, eg, Coal Acquisition Act 1981 (NSW).

109 Mining Act 1973 (NSW), ss6(1); Mines Act 1958 (Vic), ss3(1); Mining Act 1968-1983 (Qld), ss7(1); Mining Act 1971 (SA), s6; Mining Act 1978-1987 (WA), ss8(1); Mining Act 1929 (Tas), ss2(1); Mining Act 1980 (NT), ss4(1).

110 See, eg, Coal Mining Act 1973 (NSW); Coal Mining Act 1925-1974 (Qld).

111 See Bradbrook, 'The Contents of New Geothermal Legislation' (1987) 5 J Energy and Nat Res L 81; Bradbrook, 'The Ownership of Geothermal Resources' [1987] AMPLA Yearbook 353.

112 New Zealand: Geothermal Energy Act 1953; British Columbia: Geothermal Resources Act, Stats BC 1982, c 14; Alaska: Ala Stats Ann, s38.05.181; Arizona: Ariz Rev Stat Ann, ss27-651 to 27-675; California: Cal Pub Res Code, ss3700 *et seq* and ss6902 *et seq*; Hawaii: Ha Rev Stats, ss182-1 *et seq*; Idaho: Id Code ss42-4001 *et seq*; Montana: Mont Rev Codes Ann, ss81-2601 to 81-2613; Nevada: Nev Rev Stat, ss534A.010-534A.040; New Mexico: NM Stat Ann ss65-11-1 to 24; Oregon: Ore Rev Stats, ss522.010 *et seq*; Washington: Wash Rev Code Ann, ss79.76.010-79.76.990. In addition, there is US Federal legislation regulating geothermal development on federal lands: see 30 USC ss1001-1025.

legislation exists in any Australian jurisdiction.¹¹³ One of the purposes of this separate legislation would be to clarify the ownership rights in the resource and to avoid the need to place reliance on the *cujus est solum* doctrine.

4. The ownership rights in groundwater are confused in all the jurisdictions. As discussed earlier,¹⁴ the groundwater legislation in New South Wales, Victoria, Queensland and Western Australia appears to preserve the common law rights of the surface landowner in groundwater,¹⁵ although the issue whether these rights amount to ownership has not been finally determined. The nature of the Crown's rights to groundwater is also unresolved. The respective rights to groundwater of the Crown and the surface landowner is also unclear in the remaining jurisdictions.¹⁶ On any analysis, this situation is unsatisfactory. As in the case of the minerals legislation, it is recommended that the ownership rights in groundwater be clarified by legislative amendment to the groundwater legislation in each State.

5. Consideration must be given to the legal position regarding the rights of access to renewable resources. The most effective method of protecting such access would be to restrict by various possible forms of legislation the rights of neighbours to develop their land. This aspect of the law of renewable energy resources is discussed elsewhere.¹⁷ Nevertheless, the rights of access to renewable resources could be significantly assisted by the introduction of legislation designed to ensure that sunlight or wind access is not obstructed by objects overhanging the boundary of the solar or wind user's land. It is accordingly suggested that a new section be included by amendment to the general property law statute in each Australian jurisdiction¹⁸ vesting ownership in airspace up to a designated height in the surface landowner. The height should be designated at a sufficient level to include all trees and other conceivable obstructions to the flow of the wind or the direct rays of the sun. Although this reform might be argued to be unnecessary in light of the existing case law authorities on the skywards application of the *cujus est solum* doctrine, the proposed legislation would substitute certainty in the law for the existing confusion and would clarify the legal position of the users of renewable resources.

113 In New South Wales and Tasmania, geothermal resources have been included within the definition of 'minerals' by legislative amendment (Mining Regulations 1974 (NSW), reg 5(3); Mining Act 1929 (Tas), s2(1)).

114 See Division 2 of this article.

115 Water Act 1912 (NSW), s4B; Groundwater Act 1969 (Vic), s47; Water Act 1926-1987 (Qld), s4; Rights in Water and Irrigation Act 1914-1987 (WA), s26.

116 See Water Resources Act 1976 (SA), ss42, 48; Groundwater Act 1985 (Tas), Part III; Control of Waters Act (NT) s16B.

117 See, eg, Bradbrook, *Legal Aspects of the Practical Application of Solar Energy Technology in Australia*, NERDDC Report NERDDP/EG/85/452 (1985); Total Environment Centre, *Solar Access in New South Wales — Legal Report* (1982); South Australian Department of Mines and Energy, Energy in Buildings Consultative Committee, *Solar Access Legislation for South Australia* (1984).

118 Conveyancing Act 1919 (NSW); Property Law Act 1958 (Vic); Property Law Act 1974-1985 (Qld); Law of Property Act 1936 (SA); Property Law Act 1969-1985 (WA); Conveyancing and Law of Property Act 1884 (Tas); Law of Property (Miscellaneous) Provisions Ordinance 1958 (ACT)