Landholder compensation for occupation by coal seam as projects.

Michael Fibbens. 25 May 2015

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This paper is based on research into compensation for occupation by coal seam gas (CSG) infrastructure carried out between 2011 and 2014. The research used submissions to inquiries in Australia, court judgements from NSW, Queensland and Alberta, publications relating to CSG and other documents to identify harms and to discover methods of compensating them. Key court decisions provided case studies of both the effects of CSG occupation and examples of their compensation.

Comments in this document apply to landholder compensation and valuation under the present regime in NSW where the landholder holds the surface lands but the state of NSW owns the gas resource and gas operators pay the NSW state a royalty payment (which is not presently shared with affected landholders). Access rights are assumed to be as in *Halfpenny Investments Pty Ltd V Sydney Gas Operations 2003/44* where the gas operator possesses:

> *... the right, in accordance with PEL 2, to enter and explore upon the property of Halfpenny Investments Pty Limited, without the consent of the landholder, but subject to appropriate statutory constraints and arrangements.*

Where compensation calculations are performed in this document they are intended as examples of the simple operations that are involved in assessing compensation. They are not intended as actual estimates of compensation for either the case study in question (the *Halfpenny* case) or for CSG occupation generally.

1. Executive summary

- Current access provisions remove the right to refuse occupation (as would be the case in an offer to occupy by a private lessee). The establishment of CSG wells and infrastructure interferes with the landholder's right to occupy the surface; and occupation interferes with the landholder's right to quiet enjoyment of the property through the conduct of drilling, production and maintenance activities.
- Landholders lose use of land under access tracks and hardstand for the duration of occupation (which can be for a considerable time). Because CSG infrastructure occupies part of land, some inconvenience may be imparted to the remaining property (the balance land). This may occur as a result of the physical interference by wellheads and tracks (severance), or it may occur as a result of the carrying out of works on the area occupied (injurious affection).
- The degree of impact will depend upon the character of the work and the land it occupies. There is considerable variation in land values per hectare across the state of NSW and within

well defined localities such as Menangle – Cawdor. Moreover, there is considerable variation between CSG projects. All this militates against the adoption of schemes based upon dollar rates per well, and writers on the subject of compensation (including Australian Petroleum Production and Exploration Association [APPEA], Australian Senate 2011) counsel against attempts to adopt rates per well.

- The application of "gross margins" to the calculation of compensation is inappropriate to the calculation of the land occupied in a market because direct evidence of land values is commonly available. Moreover, gross margins are manifestly inappropriate in the valuation of land in more closely settled areas due to their inability to replicate the higher values per ha.
- Non-market methods of valuation such as "relocation costs" have no place in assessing compensation for injurious affection. Instead, transactions in the property market can be analysed by the *paired sales analysis* and *multivariate techniques* described at 2.9 of this paper. Paired sales techniques are well supported by judicial comment over time (see for example *Kater v The Electricity Transmission Authority of New South Wales NSWLEC 1993;* and *Parsons v Prospect County Council, 1987, in* AIV, *30, 3 132 136).*
- "*Piecemeal*" and "*before and after*" techniques provide a practical and adaptable means by which compensation problems can be solved. There are existing examples of their application in mining and gas well applications. Particularly, the "*piecemeal"* approach can easily be adapted to the CSG compensation problem in *Halfpenny*, and uses mathematics no more complex than addition, subtraction, multiplication and division (as does the "*before and after" approach*). Both approaches are easily managed via spreadsheet applications.

1.1. The compensation problem.

The introduction of CSG activity brings about economic opportunities (Roth, 2012). This writer also recognised the potential for "*tensions between mining companies and farmers',* and noted the debate in "*both in the community and in Parliament".* Indeed, this potential has been known for some time. Amey, 2004, 385 (in a discussion of the South Australian situation) proposed that the system of granting of mining rights over freehold property owned by someone else effectively creates *equally subsisting rights in property.* He commented that as mining law has *developed it became apparent that the freehold owner was on a collision course with the miner*.

When property holdings are taken by public works (by acquisition of freehold or easements), landholders receive "just" compensation. In NSW where mining or CSG works occupy property, landholders receive something less. There is no clear right to compensation for injurious affection in NSW, and the right to recover professional costs appears limited to "*reasonable legal fees*" (2.10 below).

The problem in NSW is the legislation was enacted prior to the establishment of the CSG industry in the state, and has lagged behind the legislation of other states. A comparative study of the legislation in NSW "as made" and "in force" as at 30 April 2015 indicates that the compensation provisions of Sec 109 have (surprisingly) not been widened since inception. Queensland introduced a new compensation regime with its Queensland *Petroleum and Gas (Production and Safety) Act 2004,* and provides NSW with one example of how compensation might be achieved. Another example can be found in the *NSW Land Acquisition (Just Terms Compensation) Act 1991*.

1.2. CSG occupation

The NSW *Petroleum [Onshore] Act 1991* authorises CSG operators to enter land for the purposes specified in the legislation and to carry out improvements such as access tracks and well sites (Fibbens et al 2013).

Christensen el al, 2012 propose it is "*arguable"* the partial occupation imposed by access arrangements for CSG projects is "*… functionally similar to an easement".* For CSG occupation in NSW these are rights are conveyed by the *Petroleum [Onshore] Act 1991.* Perusal of the judgement in *Halfpenny Investments* (op cit) confirms rights acquired by gas operators are, indeed, markedly similar to easement rights. CSG operators are authorised to:

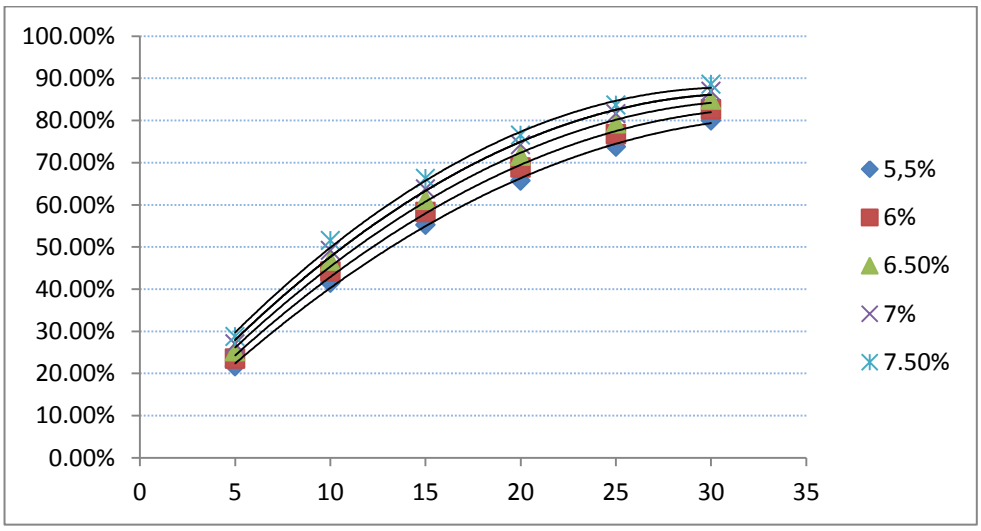
- Enter land for the purposes of the Petroleum (Onshore) Act (subject to the Act's requirements);
- Construct works comprising wellhead cage, fix drilling equipment, tanks and wells, and to construct hard-stand, settling ponds and access tracks.
- Carry out drilling, maintenance and extraction tasks.

CSG wellheads are similar in appearance to small electricity sub-stations or sewer and water pumping stations. In *Halfpenny*, ten wells and access tracks were constructed on the property.

The terms specified by the gas operators are sometimes longer than the term of commercial leases negotiated in the open market. Occupation may endure for some years (with some operators reporting 10 – 15 years and others up to 40 years). In practice, it is difficult to identify the term of occupation at the inception of the arrangement (see 1.6 below). However, occupation (even between terms of 10 and 20 years) cannot be regarded as being temporary. Figure 1 illustrates the percentage value of full freehold value represented by various terms of occupation.

Comparison of terms of occupancy with freehold interests (based on conventional valuation techniques, for instance Bell, 1999, 82, 83) indicates that occupation spanning year 1 to year 10 can be worth between 40 and 50% of full freehold value: and one spanning year 1 to year 25 worth 72% to 83% at the inception of the arrangement depending upon the interest rate used.

Figure 1.



Valuation mathematics show terms of occupation can take up a significant slice of freehold value. However, from the landholder's personal perspective, quite a lot can happen to landholder families during occupations of 10 to 25 years: children may be born (and go to school); mortgages may be entered into (and paid out) and landholders may wish to dispose their holding through retirement, or other circumstance.

1.3. What is being compensated?

Occupation under the NSW *Petroleum [Onshore] Act 1991* interferes with the "bundle of rights" of landholders in three ways.

- It removes the right to refuse occupation (as would be the case in an offer to occupy by a private lessee);
- The establishment of CSG wells and infrastructure interferes with the landholder's right to occupy the surface;
- Occupation interferes with the landholder's right to quiet enjoyment of the property through the conduct of drilling, production and maintenance activities.

Rather than being conveyed by a formal easement, rights to enter and carry out work are authorised by NSW *Petroleum [Onshore] Act 1991*. However, this difference does not lessen the degree of harm, or the need for compensation. Indeed, Michelman (1967, 1184) proposed in respect of the right to compensation:

> *The one incontestable case for compensation (short of formal expropriation) seems to occur when the government deliberately brings it about that its agents, or the public at large, "regularly" use, or "permanently" occupy, space or a thing which theretofore was understood to be under private ownership.*

At 1184 Michelman went on to say the *"obligation to pay compensation is not to be escaped by simply declining to acquire title.* Furthermore, failure to acquire a formal interest in title does not rule out the accepted methods of valuation from application in assessing compensation.

Landholders lose use of land under access tracks and hardstand for the duration of occupation (which can be for a considerable time). Because infrastructure occupies part of land, some inconvenience may be imparted to the remaining property (the balance land[1]). This may occur as a result of the physical interference by wellheads and tracks (*severance*), or it may occur as a result of the carrying out of works on the area occupied (*injurious* affection).

Severance is a term used to describe the loss in value to the balance land of a holding because of the taking of part(s). Hyam (1995) illustrated this by referring to the judgment in *Suntown Pty Ltd v Gold Coast City Council* (1979) 6 QLCR 196 the Queensland Land Appeal Court:

> *Severance damage arises from the separation or division of the claimant's land as a result of the resumption. The severance may be by way of a division of the retained land into two parts, for example, by way of a resumption for an intersecting road. It may also occur where a part only of the claimant's land is taken leaving a compact parcel. Severance damage is depreciation*

[1] The balance land is the unoccupied part of the holding; that is the total area of the property less the area of the CSG work equals the balance land.

> *in the value of the retained land resulting from its division into two or more parts, or its reduction in area and consequent loss of value for some current or higher (potential) use*", Hyam 238.

Road networks and wellheads can extend over a property (as was the case in *Halfpenny*), and this can exacerbate impacts. Additionally, wellheads are fenced, and as the court indicated in *Canadian Natural Resources Ltd v Bennett & Bennett Holdings Lt and Circle B Holdings Ltd. QBA Alberta* 2008, 18, "*...the site contains an obstruction which must now be farmed around*... Figures 2 and 3 illustrate this.

Injurious affection is the inconvenience that results from the CSG activities on the land. These include drilling, maintenance and activities such as flaring. In *Canadian Natural Resources Ltd v Bennett & Bennett Holdings Lt and Circle B Holdings Ltd. QBA Alberta* 2008, 18 the court observed that: "*Factors such as noise emanating from a well site, or the unsightly view of a well jack from the living room window, are considered compensable ..*" Evidence heard in *Sullivan (2003), 27* substantiates the nuisance that can be generated by CSG activities. "*There are daily visits by the respondents' personnel to Springton. There is constant monitoring and testing of the wells... Even when it rains and the respondents cannot reach their wells by road, the respondents' personnel arrive by helicopter."* The witness went on to observe the CSG miners were "*basically free to go wherever they please on Springton"* and they constituted "*a constant, visible interruption to what would otherwise be a peaceful rural environment".*

The comments in *Sullivan* (2003) QLRT identified a number of examples of the significance of injurious affection in compensation for CSG occupation. In commenting on the various nuisances, the court concluded:

> *... it must be accepted that the hypothetical prudent purchaser will pay less for the property for a reason no more than that people do not care to live and work in the vicinity of such works, irrespective of the other amounts of compensation paid.... A hypothetical prudent purchaser would have those fears enhanced on viewing the property for the purpose of purchase on seeing the many 'danger' and 'warning' signs ... (Sullivan, 2003, 38).*

Fig 2. Examples of the occupation and severance of land by CSG work at Menangle. Images from Google Earth.

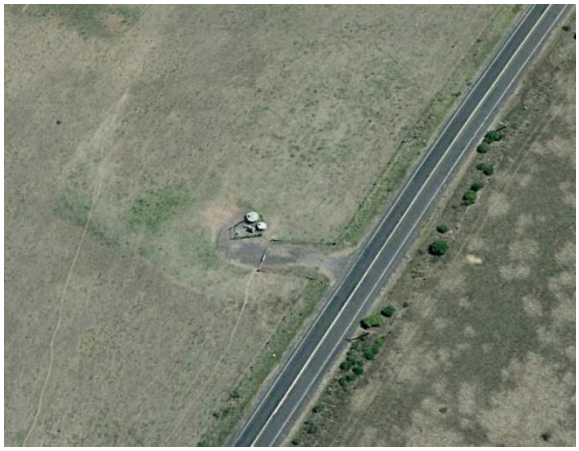


Image A. Well and short access track showing less severance than image D.

Image B. Access track along contour.

Image C. Well site and access track (which severs a thin strip along road frontage).

Image D. Access track and well head causing severance to arable land. Note small island of unploughed land outside well site.

Figure 2 shows wells and access tracks occupying different areas of land and creating varying degrees of severance depending on their design and location (together with the attributes of the affected property and farm management practices). Moreover, air photographs indicate variation in areas during workover (maintenance) operations.

Fig 3. Source: Google Earth Image, Sinclair Knight Merz 2012. 34^0 4.890' S 150^0 44.361'E

Established total wellhead site c 2007 – estimated area by scaling about 600 m^2

Site apparently undergoing maintenance c 2009 – estimated area by scaling about 4,000 m^2

Figure 3 shows an established well site with the 2007 image showing the site apparently undergoing maintenance (the area occupied increases markedly). This illustrates need for the area occupied to be specified with care (and perhaps confirmed by survey).

The degree of impact will depend upon the character of both the work and the land it occupies.

1.4. Property market characteristics and compensation valuation approaches

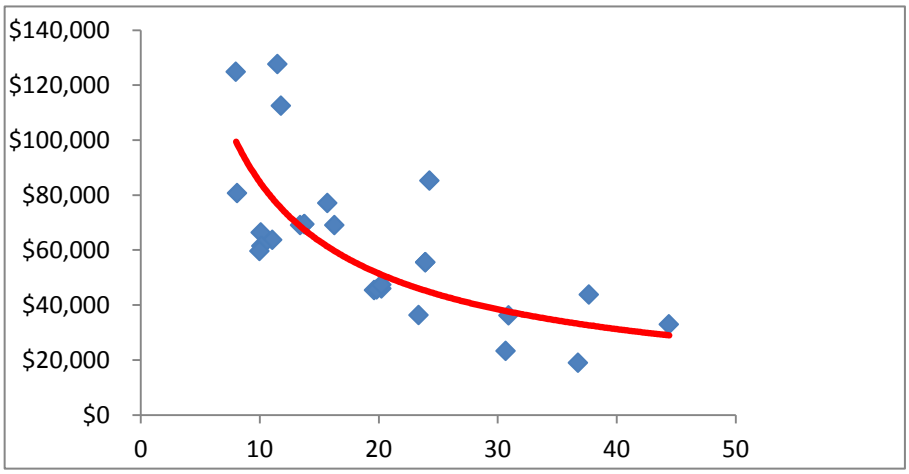
Property values fluctuate considerably across the state, and this is demonstrated by sales data cited by NSW Land and Property Information (LPI 2014) in its study into CSG and property values. This data is summarised as follows.

Table 1 Variation in Sales Transactions within districts reported by LPI (2014) for market evidence cited (total number of transactions 55.			
Land Areas	**Low (ha)**	**High (ha)**	**Average Area (ha)**
Northern Rivers – Casino N= 16	20	112	73
Gunnedah – Mullaley N =6	200	285	227
Bohena Creek N=6	100	262	190
Menangle N = 27	8	44	20
Land Values	**Low**	**High**	**Average per ha**
Northern Rivers - Casino	$3,409	$16,304	$8,329
Gunnedah - Mullaley	$3,035	$4,382	$3,758
Bohena Creek	$572	$1,200	$980
Menangle	$19,037	$127,715	$62,451

Table 1 illustrates the gulf between localities in terms of property areas and range of values. Unsurprisingly, the Menangle area on the fringe of Sydney returns the highest values (and this reflects its role in providing "lifestyle" accommodation for the Sydney market). The variability of land values across areas affected by CSG projects demonstrates the impracticality of striking a standard rate per well for disparate property markets.

Even in well-defined localities such as Menangle, values can fluctuate widely. An investigation of the characteristics reported in LPI, 2014 at Menangle and surrounding areas revealed a marked variation in property areas and value. The property areas indicate that the majority of these properties would be "lifestyle" or hobby farms rather than productive enterprises. An examination of sales evidence cited by LPI 2014 for the general Menangle area illustrates data characteristics relevant to assessment of compensation for individual holdings.

Fig 4 Analysis of Menangle and surrounding areas property sales (affected properties plus sales evidence with some small lots removed) reported by LPI 2014.



There is an imprecise inverse curvilinear relationship between property area and value per hectare (which is common for more closely settled localities, but which also applies to the areas of Casino, Gunnedah and Bohena Creek in LPI, 2014). Obviously, there are many factors apart from property area affecting value. These may include:

- The quality of the holding in terms of topography and soils;
- The mix of country and its suitability for farming, or residential, uses (for example, adequate alluvial country, but with flood free grazing, or house site);
- Water availability and quality;
- Degree of improvement (including buildings, fences and paddock structures and pastures);
- Quality of access;
- Attractiveness in terms of the amenity of the neighbourhood and views
- Subdivisional potential.

The range portrayed in Figure 4 demonstrates that (even for a locality such as Menangle) the production of a generic rate per well (noted in 5.2.2 of the IPART paper) would be problematic in the extreme. Notwithstanding that land parcels may have the same agricultural land classification (Table F2 page 60 IPART paper), they may have completely different land values due to the factors discussed in this section.

Additionally, rural land frequently provides a home for farming families (for rural "lifestyle" properties this use may comprise the dominant use of the property). Valuation techniques for rural land must take account of this function.

Moreover, characteristics of the CSG work may vary. An assessment of the area occupied by CSG works using scaled dimensions from air photographs in Menangle indicated that although fenced well areas often contain some 25 m^2 to 35m^2, a marked variation in hardstand areas existed. The variation was significantly greater for access tracks (Fibbens et al 2014). Figures 2 and 3 (above) illustrate the variations in areas and design that occur in the field.

Moreover, Gopalakrishnan and Klaibera 2013, 25 (in their study of property located near shale gas wells in North America) noted the impacts were "*... highly heterogeneous, suggesting that a one size fits all characterization of the impact of shale development on surrounding homeowners is not suitable for policy decisions.* Indeed, Australian Petroleum Production and Exploration Association (APPEA) 2011 advised, in respect of standard dollar rates per well, that due to variation in property types and in projects "*while an average amount can be produced it is misleading in that it would treat all land and petroleum activities as homogenous when there is considerable variation in reality*").

The suggestion in 5.2.2 of the IPART paper that a dollar rate per wellhead serve as a proxy for land area appears likely to benefit gas operators rather than landholders, and ignores the substantial variation in both property characteristics and well and track areas that occurs in the field. It is reasonable (for the reasons outlined in 1.6 of this paper) that landholders receive full information about the project that will occupy their land: moreover it is my direct experience (over 45 years in property) that landholders will go to great lengths to ensure they receive every dollar due to them.

1.5. Are there *traditional* methods for assessing compensation

A survey of the cases indicates NSW and mining courts in NSW have applied the following methods of assessing compensation.

- The "formula approach" (as in *Electricity Commission of NSW v Reynolds, NSW 1978* and *Australian Gaslight Company v O'Grady & Burrell NSW 1986*)[2] where compensation for land occupied is paid and nuisance during temporary occupation for exploration is assessed via a dollar rate per vehicle visit.
- Lost agistment income[3] (as in *Moolarben Coal Mines Pty Ltd and ors v Ulan Coal*, NSW, 2008, 26) is used to assess loss of the land. $50,000 compensation for severance and damages to improvements were added to assess loss under the NSW Mining Act 1992.
- A summation (or piecemeal) approach based on the area of land occupied, as in *Halfpenny* and *Morgan Mining and Industrial Group Pty Ltd v Norris, Wardens Court 1977*. This method appears similar to that disclosed in Australian Senate Questions Taken on Notice – AGL 29 August 2011, 33.
- An alternative to summation on the basis of land area is the use of a rate per well (see *Clutha Development v Yeomans 1981* and *Endeavour Coal Pty Ltd and Presquartz 2007)*. As practised, these approaches often overlook loss to the balance land.

Although a "tradition" for CSG valuation was referred to in *Halfpenny*, it should be recognised that CSG occupation is relatively new to NSW and "traditions" must necessarily be borrowed from mining occupations for exploration (which are often of short duration). In *Alcorn & Ors v Coal Mines of Australia Pty Ltd, 2009, 88,* the mining warden cited his study of the history of the use of a value per hole, or well, (dating back to 1974). The warden thought rates per well came from estimates of the value of occupied lands *"relating that back to the number of drill holes intended upon the property".* The rationale for this was proposed as *"a mining company does not know, at the*

[2] "Land occupied" appears to have been overlooked in Australian Gaslight.

[3] This approach ignored the existence of sales evidence (possibly due to disagreement between valuation witnesses). Despite the ruling in the case, the land may have had special value to Ulan Coal, and this was ignored by the approach.

time of a court hearing, the exact number of drill holes it will require to make". Thus, the use of a rate per drill hole may originate in the need for a "rule of thumb" by mining explorers.

The NSW mining and gas cases often do not have a lot to say about loss in value to the balance land via severance and injurious affection (possibly as a result of legislative provisions). Although (following expert valuation evidence) the court added $50,000 compensation for severance in *Moolarben Coal Mines Pty Ltd and ors v Ulan Coal*, NSW, 2008, in some cases where severance clearly existed no award was made. As an example, in *Newbridge Slate v Dapila Mining, 1997*. the NSW Mining Act provisions furnished access for a slate mine in five separate parcels within the affected holding of 130 ha, but compensation was awarded for only the land occupied. Severance was discussed in the NSW case of *Australian Gaslight Company v O'Grady & Burrell* NSW 1986, 17; but no compensation was awarded. Although severance would have been claimable in *Halfpenny* because of occupation by ten wells, analysis of the award shows that no compensation was awarded for this item.

However, in *Andrewartha & Ors v BHP Steel (AIS) Pty Ltd 1998* (a case that considered loss in value due to loss of amenity caused by a partial drying up of the Cataract River), the court considered a number of "*before and after*" valuations, and it awarded compensation based on those valuations

The NSW cases demonstrate there is no single "traditional" approach to assessing compensation for mining or gas projects. As occupation by CSG infrastructure creates a similar impact to that of an easement, it would seem reasonable to conclude that the traditional methods of valuation for easements have considerable utility in calculating compensation for CSG: and this is what happens in Queensland.

Queensland mining courts have noted that Australian valuation theory has a number of well-tried methods of assessment for partial occupation. In *Smith v Cameron (1986) 11 QLCR (64)* the court noted:

> *(ii) That the use of land for mining purposes is in the nature of a compulsory acquisition of land for a limited period.*
>
> *(iii) That the various principles and practices of valuation applied in determining compensation for the taking of limited rights over land for public purposes are applicable in the assessment of compensation.*
>
> *(iv) That the test in assessing compensation is the attitude of the hypothetical prudent purchaser and the extent to which in the opinion of such a person the owner's land has suffered diminution in the value of his property resulting from the mining operations on his land and the creation of the encumbrance including where appropriate severance and injurious affection damage.*

1.6. CSG occupation: a pragmatic view

In fact, the difference referred to in respect of the period of occupation (the *limited period* in *Smith*) is not the only difference applying to CSG projects.

- CSG projects may vary throughout their life (with more land being taken up during establishment and during maintenance, or"*workover*," in *Halfpenny*).

- Nuisance may vary throughout the CSG project. It may be comparatively high during construction of wells and during annual maintenance (Fibbens et al, 2014).
- Occupation for CSG differs from mining exploration (which is often, but not always, for a short term). The prime difference is that the duration of occupation is often unknown at the outset (see NSW Government *Draft Code of Practice for Coal Seam Gas Exploration*, 2012, 10).

These are attributes of the project. Clearly, if these attributes add complexity to the access arrangement, the extra costs should be met by the gas operator and not the landholder. In fact, complexity is added to both the management of the holding occupied by the CSG work and calculation of compensation for occupation by CSG wells. This is especially so during development (where the CSG development takes up more land during construction and less land after establishment). In the interests of rigorous property management, a prudent landholder would require a specification of the areas to be occupied, and the duration of occupation (including temporary occupation). Likewise, a clear specification of these issues would underpin estimates of compensation. Although the use of "drill holes" might be good enough to underpin very short occupations, a more exacting standard will probably be required for occupations in excess of six months. In the interests of landholders, attempts to compensate on the basis of a dollar rate per well should be resisted.

CSG infrastructure comprises access tracks, hard stand, well heads, settling ponds, buried pipes and other plant. The extractive industry established on land can cause considerable nuisance through severance (figures 2 and 3) and injurious affection. Compensation can be expected to vary according to the attributes of the work and the property. They will probably (but not certainly – see discussion on "stigma" at 2.5 below) be endured only for the term of occupation (rather than in perpetuity), but this is easily allowed for. Just one adjustment to the approach in the *Halfpenny* compensation award is required. This is the conversion of capital value to a rent value noted in Tables three to six below.

1.7. Valuation theory and its application to CSG

There is a well-established valuation theory for the acquisition of part of holdings in Australia. Qualified valuers (who have completed a formal course of study and met certain professional requirements) usually carry out valuations for compensation purposes. The current theory has evolved to deal with acquisitions of such things as roads, sewer and water facilities and electricity infrastructure. Four major texts on the law of compulsory acquisition and its practice exist. Moreover, a wealth of discussion papers has appeared in the professional journals. Courts have scrutinised valuation theory over considerable time, and judgements form an essential part of the body of knowledge (providing a wealth of examples of the circumstances of acquisitions and the means used to compensate landholders). This theory has a part to play in assessing compensation for CSG occupation.

The court in *Smith v Cameron (1986)* went on to proclaim, "*That each case will depend on its own facts and circumstances but either the "before and after" method of valuation or piecemeal assessment is open to the valuer*". *Wills v Minerva Coal Pty Ltd QLC/1998* further discussed the applicable methods of valuation in a mining context. These approaches have their basis in "direct comparison" (Rost and Collins, 1990, 495-497), a method described by Jacobs, 1010, 19.70 as "*the pre-eminent approach to valuation*", and Brown, 2009, 4.11 considers this established beyond doubt:

Hyam, 2009 endorses this. The "*before and after*" and "*piecemeal*" approaches are recognised by the valuation literature as having utility in compensating landholders for partial taking. Importantly, there are examples of the application of traditional methods of valuation in mining acquisitions.

There is no need to invent methods to compensate landholders. As pointed out in the Queensland cases cited, the "*before and after*" and "*piecemeal*" methods of valuation have considerable efficacy in dealing with compensation for partial occupation. Queensland and Albertan court decisions provide a number of examples of the calculation of landholder compensation in the context of mining and gas occupation.

Table 2. Before and after and piecemeal approaches summarised.		
The before and after approach.		
Step 1.	Valuation before acquisition of part.	Sales evidence supporting "before value".
Step 2	Valuation taking account of holding after partial acquisition.	Sales evidence supporting "after value".
Step 3	"After" value is subtracted from before value.	
Result	Difference is compensation for land occupied, severance and injurious affection. But disturbance costs (valuation and legal fees etc.) have to be added as a fourth step.	
Mining and gas examples of the before and after approach. *Sullivan and Sullivan v Oil Company of Australia Limited and Santos Petroleum Operations Pty Ltd, [2003] QLRT 2.* *Wills v Minerva Coal Pty Ltd QLC/1998/149*.		

Table 2 (cont) The piecemeal approach to valuation.		
Step 1.	Valuation of land occupied.	Evidence of land values on a hectare or square metre basis from sales.
Step 2	Find loss in value of "*balance land"*	Evidence of diminution from sales evidence.
Step 3	Calculate loss for the balance land.	
Step 4	Disturbance costs	Allow at cost/
Step 5.	Value of land occupied is added to loss in value to balance land and disturbance items to find total compensation.	
Mining and gas examples of the piecemeal approach. *Halfpenny Investments Pty Ltd V Sydney Gas Operations 2003/44* provides an example of piecemeal which is incomplete. There was no allowance for severance (which is compensable under sec 109) or injurious affection (which is currently not in sec 109). *Zimmerebner v Hawkins and Anor (1999) 20 QLCR 71* applies piecemeal.		
For CSG occupation, there is a final step for both approaches. Having found the capital value of land taken and diminution to the balance land the assessor calculates a rent value using the percentage return applicable to the property in question.		

The existing theory of compensation for "partial taking" in property valuation is robust: and it has been subject to close scrutiny in a wide range of valuation circumstances. The Queensland cases cited in this paper demonstrate that it can be readily adapted to CSG occupation (which is for a term rather than perpetuity). It is supported by valuation approaches elsewhere.

The "*four heads*" approach forms one of the pillars of the Albertan compensation system, and is a form of the "*piecemeal*" approach. The approach sets out a framework for compensation based on the land occupied, inconvenience and nuisance and adverse effect (Barton 1998). The Albertan "surface rights" cases pertaining to the occupation of land by wells and pipelines yield a number of explicit valuation compensation calculations that are useful in a NSW context. Particularly, these assist in structuring payments for the establishment and operational years of gas projects (see comments in 2.12 below).

A second Albertan approach, the "*pattern of dealings*", utilizes settled deals between gas companies and landholders (and is a form of *direct comparison* valuation). On occasions, the "*four heads*" approach is informed by data derived from the "*pattern of dealings*". However, it is important to note the Albertan courts have insisted that settled transactions are comparable both in respect of the work and the property (Barton op cit). The "*pattern of dealings*" approach would be difficult to implement in the current NSW environment (where deals struck with landholders are subject to

"confidentiality" restraints and where a degree of secrecy surrounds CSG compensation deals). The Australian Senate (2011) in its interim report observed:

> *... confidentiality agreements were perceived as offering an advantage to the gas companies in that they prevented unified action by landholders to ensure that all agreements were in similar form and that compensation payments were soundly based and included similar levels of compensation for similar types of landholding.*

If compensation deals were made available this would provide a foundation for a system similar to the Albertan "pattern of dealings" in NSW.

The starting point in providing affected landholders with fair compensation is the prescription of a set of compensation provisions that stipulate the matters that are compensable. This would include the heads of:

- Loss of land occupied;
- Severance damage;
- Injurious affection;
- Disturbance costs.

Having in mind that these provisions have remained virtually unchanged since 1991, the requirement for reform is critical.

Queensland introduced a new compensation regime with its Queensland *Petroleum and Gas (Production and Safety) Act 2004*, and provides NSW with one example of how compensation might be achieved. NSW could also calculate compensation under the *NSW Land Acquisition (Just Terms-Compensation) Act 1991*. The legislative specification of "*just terms*" compensation for CSG occupation should provide a solid foundation for the assessment of individual claims (which, based on my own research, would be likely to be wide ranging in nature).

2. Responses to the IPART questions.

The following feedback is based on the information contained in section one of this paper. Responses are limited to compensation for occupation by CSG projects.

The values used in the examples in tables (which are based on the court decision in *Halfpenny)* in this section are hypothetical and are solely for illustrating the simplicity of valuation calculations. They do not represent "actual" values or compensation amounts.

2.1. Transparency, adaptability and practicability

> Item 1 Do you agree with our proposed principles of transparency, adaptability and practicability to guide our recommendations for this review? Are there other principles that we should apply in making our recommendations?

The prime principle of compensation should be that landholders are compensated "fairly" (see discussion in Brown, 2009, 3.1 and 3.2). In the case of CSG, "fair" compensation, would reimburse that landholder for all losses resulting from the occupation (including both loss of utility and loss of amenity to the balance land) and would include all disturbance costs. Of course, any betterment to property (for example provision of access to land hitherto inaccessible) would offset compensation. Methods of assessing compensation that address impacts on the balance land (such as "*before and after*" and "*piecemeal"* approaches) would facilitate "fair" compensation. However, methods that consider only the attributes of the work (for instance value per well) would not be capable of assessing fair compensation because they do not address loss of amenity or utility to the balance land.

To be "adaptable", approaches to valuation would have to consider land values relevant to the locality and property in question (see 1.4 above). Moreover, to be adaptable a compensation scheme should address the key variations that occur in CSG projects. These include:

- Area of land taken up by wells, hardstand, dams and access tracks;
- Number of wells and their location;
- Other CSG improvements constructed and their location;
- Extra land taken up during establishment and maintenance operations, and the duration of occupation.

The degree of negative affect will, as indicated by APPEA (response to questions on notice to the Australian Senate 2011), depend upon the scope and character of both the CSG work and the property it occupies.

At 1.3 above, Figures 2 and 3 illustrate the variations that can occur in the field. "Practicality" should not be attempted via inappropriate generalisations such as a value per well. Such approaches ignore variations in affected properties and CSG works: and, accordingly, fail the test of "adaptability". They are inappropriate from the points of view of the management of landholdings and calculation of fair compensation. It would be grossly unfair of NSW to convey rights of access to gas operators over the land of others and then go on to stipulate a method of valuation that did not

deal squarely with the issue of loss in value to the balance land. Practicality can be achieved through use of the *"piecemeal*" and "*before and after*" approaches.

2.2 The four key steps in the IPART approach.

> Item 2. Do you agree with the four key steps in our proposed approach for this review (identify impacts, estimate compensation for these impacts, estimate benefit payments and make recommendations)? If not, what are your concerns?

As noted by the court in the Queensland mining case of *Peabody West Burton Pty Ltd & Ors v Mason & Ors [2012] QLC 23*, the first step in assessing compensation is identifying the harms suffered by landholders. The list of harms (or potential harms) provides a foundation for formulating a compensation scheme. However, because of the variations in land values and CSG schemes, it **will not be** possible to "estimate compensation impacts" **that would apply to all properties in all localities** (see 1.4 of this paper).

2.3 The heads of compensation and other potential impacts.

> Item 3. Do you agree with our preliminary view on the relevant heads of compensation for hosting CSG exploration and production (value of land occupied and loss due to severance, injurious affection and disturbance)? Are there other temporary impacts of CSG exploration and production?

The heads of compensation "*land occupied*; *severance* and *injurious affection"* are well documented in the valuation literature. However, CSG occupation brings about a highly unusual form of "tenancy" where the landholder presently has no legal right to refuse access; where the land is occupied by an extractive industry and where the actual term of the arrangement is unknown. The arrangement would be one that would be extremely unattractive to prudent landholders. Because of this, some allowance for "blot" could be considered (even though there is no actual blot on title). One solution might be to pay the 10% (solatium like) payment for *the compulsory nature of action taken* noted by Richardson and Compton (2010, 73) contained in (s 284 (4) of the *Queensland Mineral Resources Act (1989).*

Additionally, where (as was the case in *Halfpenny*) a property is subjected to occupation by multiple wells, landholders could be empowered to request the total acquisition of the property holder under "*just terms*" like conditions. Indeed, Australia Pacific LNG/Origin. *(Australian Senate Inquiry into the Murray Darling System, Questions on notice 9 September 11, 10)* indicated their policy allowed acquisition of whole property that was affected in a major way.

2.4 Provision for special value

Item 4 Should we consider any 'special value' of land and 'loss of opportunity to make planned improvements on the land' in recommending compensation for CSG exploration and production?

Existing valuation theory recognises special value (see Rost and Collins 1999, 557). It was discussed in *Moolarben Coal Mines Pty Ltd , Sojitz Moolarben Resources Pty Ltd, Kores Australian Coal Pty Ltd v Ulan Coal*, 2008), but was not compensated in that case. Existing and proposed CSG gas fields are located in disparate areas. In view of this, legislation should specify clear support for "special value" so that the item may be claimed where applicable. Adoption of the compensation provisions of *the NSW Land Acquisition (Just Terms- Compensation) Act 1991* would safeguard inclusion of this item.

2.5 Potential permanent impacts

Item 5. Are there any permanent impacts on the market value of land arising from hosting gas exploration and production that we should consider?

The valuation theory for compensating compulsory acquisition recognises potential loss in value for "stigma" or "fear" factor (Jacobs, 2010, 18.180). It is a part of "injurious affection". CSG works involve drilling (which has the potential to interfere with underground water, a resource frequently relied upon by landholders), and there are concerns regarding contamination. However, some writers (see for example Siemens, 2003, 123) report that stigma declines over time (especially post clean-up). Whilst there is no current evidence of the existence of stigma, it is nevertheless something that must be kept in mind. This item would normally be classified as injurious affection.

Adoption of the compensation provisions of the *NSW Land Acquisition (Just Terms- Compensation) Act 1991* would ensure inclusion of this item.

2.6 Broadening of the legislative provisions for compensation

Item 6. Do you agree with our preliminary view that NSW legislative provisions for landholder compensation for gas exploration and production should be broadened? If so, how? If not, why?

Plainly, the compensation provisions of the NSW Petroleum (Onshore) Act need to be widened. White (1999), in his comparative study of Australian legislation, criticised both the NSW Mining and

NSW Petroleum Acts as providing the narrowest rights to "compensable loss". Moreover, the compensation awarded *to Halfpenny Investments* is an exemplar of the shortcomings of both the current legislation and the method applied by the court (which made no allowance for loss in value to the "balance land"). The right to loss in value to balance land through the carrying out of works (the injurious affection) needs to be specified as compensable, and the right to reimbursement for professional fees needs to be widened (see 2.10 below).

The Queensland *Petroleum and Gas (Production and Safety) Act 2004* widened the potential for compensation by replacing the Queensland *Petroleum Act 1923* (which had similar compensation provisions to the NSW Petroleum (Onshore) Act 1991 in 2004). The legislation now provides at 532 (4) for (*a), (ii) diminution of its value; (iii) diminution of the use made or that may be made of the land or any improvement on it.* (Scarr, 2004, 57) indicated that this terminology includes loss in value to the balance lands.

NSW has two options:

- It could adopt legislation similar to the compensation provisions of the Queensland *Petroleum and Gas (Production and Safety) Act 2004* or
- The Petroleum (Onshore) Act 1991 could be amended to stipulate that compensation should be payable under the compensation provisions of the NSW *Land Acquisition (Just Terms Compensation) Act 1991,* and both acts would need to make it clear that compensation may take the form of an upfront payment and annual rent. Provision for further compensation upon variation of the project would have to be incorporated.

2.7 Parties to whom compensation is payable

Item 7. Should compensation should be limited to landholders who host CSG activities and their neighbours who are directly affected? If not, why? 25

From a "compensation theory" perspective, in ordinary public acquisition of property for works such as roads, water and sewer works and electricity infrastructure, compensation is usually only payable where landholder's rights are interfered with (usually through a taking of a freehold or easement interest). However, some landholder groups have complained about industrialisation of the landscape. It is possible that the amenity of areas could decline in the minds of the hypothetically prudent purchaser due to the presence of gas fields. Perhaps a sharing of royalty payments could address this issue.

2.8 Gross margin and market rental approaches.

Item 8. Are gross margin and market rental approaches appropriate for estimating compensation for the value of land occupied? Are there other approaches that we should consider?

Item 5.2.1 of the IPART issues paper nominates gross margins as a potential means of assessing compensation. These are not "*appropriate for estimating compensation for the value of land occupied*".

Land use classifications are made available by NSW Agriculture (see Hulme et al Agfact 25, 2002). It should be noted (Hulme et al, 6) that the classifications are principally a planning tool. Land values within the individual classifications might fluctuate significantly across different localities (as indicated in 1.4 above). As an example, class two alluvial flat might be expected to have a different value per hectare in the Menangle area to land of the same class in the Casino area.

Moreover, "gross margins" are primarily a budgeting tool for farmers (Grains Research and Development Corporation, 2012). They may vary markedly due to variation in inputs and conditions (idem) and publications of "gross margins" often contain provisos (for example "*This budget should be used as a GUIDE ONLY and should be changed by the grower to take account of movements in crop and input prices, changes in seasonal conditions and individual farm characteristics"* NSW Primary Industry,2012-2013).

Although techniques utilising "gross margins" are popular with some agricultural consultants, they have significant problems in the valuation of compensation for partial occupation, which are summarised as follows.

- The use of a "gross margins" approach ignores the residential function of property which (even large holdings) is clearly present (see comments by the court in the *Kater* case where the affected property contained 1,027.35 ha).
- The use of "gross margins" for assessing compensation for lifestyle and hobby farm property owned for its residential amenity is manifestly inappropriate. Menangle, Hunter Valley, Gloucester and Casino (all areas that have been subject to CSG activity) are prime examples of areas that contain hobby farms. Farm productivity would not be an important consideration in the mind of the "prudent" purchaser. Instead, access, local amenity, views and physical characteristics are significant property attributes for this class of property.
- "Gross margin" techniques require estimates to be made of income (or extracted from government publications) and capitalised at a given rate of return. Valuation techniques based on income for rural land in Australia have long been the subject of misgivings, as Rost and Collins, 1990, 283 observed "*... as a result, levels of market value are difficult to reconcile with prudent estimates of prospective estimates of net earnings".* The techniques do not have a base in the property market (Baxter and Cohen 2009, 236 report that value per hectare is used in sales analysis for rural holdings).

- Estimates of "gross margins" rest upon estimates of carrying capacity or productivity. There is frequently debate about the carrying capacity of rural holdings, but land areas can be measured. Calculations of this nature rely totally upon the identification of both a rate of interest and term, and are highly sensitive to fluctuations in these.
- Even at very low rates of income capitalization, values resulting from income approaches do not approach those achieved in the market in more closely settled areas (and their application in higher valued areas would produce alarming results).

Although "gross margins" approaches may be used to test validity of farm decisions (for example to lease rural property), Davies et al (DPI 2007) propose the main method of assessing a rural rent is to find a percentage of value per hectare. However, for some highly productive farms, income approaches may be relevant. Where this is the case, valuations would best be based upon actual production figures rather than generalised estimates.

Surprisingly, the IPART discussion encompasses a consideration of the use of values "per well" (a course of action that is discouraged by researchers and industry bodies; and brought into question by information relating to gas field layout). Indeed, the suggestion that a rate per well be used to simplify calculations for landholders appears contrary to the IPART principle of "adaptability". Section 1.4 (above) outlines the problems inherent with this approach.

As noted in the Queensland cases cited in 1.5 and 1.7 above, the existing theory of valuation for compulsory acquisition is adequate to deal with partial acquisition for mining acquisitions (including CSG) for a wide range of property types (including those to be found in Menangle, the Hunter Valley, Liverpool Plains, Gloucester and Northern Rivers). It is likely that the "*before and after*" and "*piecemeal*" methods of valuation would be of utility in assessing compensation. However, for some property types, hypothetical development and income capitalisation might be appropriate (for example, property with subdivisional potential or used for intensive production).

2.8.1 The rental approach as in *Halfpenny*.

The approach taken in the *Halfpenny* case was a basic summation (or piecemeal approach) which assigned a value to the land occupied and converted this to a rent. It cites relevant areas and a value per hectare of $25,000 (which would now be out of date). The areas and rate per hectare disclosed in the judgement are used in Table 3 and those following. The calculation was thus:

Table 3. Piecemeal approach as in *Halfpenny.* Land occupied by operation wells. Areas and value per ha (based upon the judgement in 2003).		
Area of work m^2	**Value Per ha**	**Value per m^2**
16,740	$25,000	$2.50
Capital Value Land Occupied	16,740* $2.50 = **$41,850**	
Rent Value Land Occupied	**Capital Value $41,850**	* **8%** = **$3,348.00** * **7%** = **$2,929.50** * **6%** = **$2,511.00**

The approach could be easily adapted to include loss for severance (currently included as a compensable item in sec 109) and injurious affection (not included as being compensable in sec 109). Tables 4 to 7 of this paper illustrate the additional steps.

2.9 The issue of severance

> Item 9 Do you agree with our preliminary view that because severance is site specific and highly variable, providing benchmark compensation would be of limited use to landholders? If not, how should we estimate and structure compensation for severance?

As demonstrated by Table 1 and figure 4 of this document, value of the "land occupied" can be highly variable. This is the case also for severance (discussed in 1.3 of this paper).

As noted in part one of this paper, valuation of severance damage is accomplished by either the "*before and after*" or "*piecemeal*" methods of valuation. *Kater v The Electricity Transmission Authority of New South Wales NSWLEC 1993* provides an example of the calculation of severance via the "*piecemeal"* method (though it combines an allowance for severance and injurious affection). Using the figures from the Halfpenny compensation award an example is as follows.

Table 4. Severance calculation using areas etc from *Halfpenny and a hypothetical rate of diminution*. Base operational year.			
Note that the percentage diminutions cited in the calculations that follow are "hypothetical", and demonstrate a technique. They are not examples of actual compensation figures.			
Area of holding ha 229.5 ha	**Area of work ha** 1.67 ha	**Area of balance land** 227.83 ha	**Value Per ha $25,000** **Value per m^2 $2.50**
Capital Value Land Occupied	**Hypothetical Percentage diminution capital value 5%**		**Rent for severance**
227.83 * $25,000 = $5,695,750	$5,695,750 * 5% = $284,788		* **8%** = **$22,783.00** * **7%** = **$19,935.00** * **6%** = **$17,087.00**

However, this example assumes severance damage to apply equally to the whole property, and this might not be the case. In *Kater* the court applied different rates of diminution to different parts of the holding. In *Longeranong Pty Ltd v Electricity Trust of South Australia 1992* the court pointed out some parts of a holding might not be subject to any adverse effect.

2.10 The non-applicability of "non-market" approaches for injurious affection.

> Item 10 Do you agree with non-market valuation and relocation cost approaches for estimating compensation for injurious affection? Are there other approaches that we should consider?

I do not agree with this statement. Non-market and relocation cost methods are approaches intended (as the title of their text implies) by Sinden and Worrell, 1977 to apply to situations where there is no direct market evidence.

The IPART statement at 5.4.1 "*There are generally no market values attached to impacts such as nuisance from noise and dust and loss of visual amenity*" overlooks the existing valuation theory relating to the derivation of values for diminution in value. Whilst there is no direct market for the impacts, it is possible to assess the value attributed to the impacts via multivariate techniques and "paired sales analysis" using property sales information (both methods are referred to in LPI, 2014). Much of the research that is reported in the journals uses multivariate analysis.

Researchers have applied statistical techniques to the problem of determining effects of a range of property phenomena (Jackson, 2003, 3110). Studies often take the form of multiple regression analysis (MRA), and use a number of independent variables (for example lot characteristics, land area, distance and exposure to the nuisance in question) in attempts to quantify effects. However,

these techniques require a lot of data and detailed information about key property characteristics (Boxall et al, 2005). The Boxall study indicated that proximity to gas wells negatively impacted property by 4 to 8%, but this affect increased for "sour gas" wells. Research has also been done in the United States (where landholders often receive the advantage of payment for the resource). Gopalakrishnan and Klaibera, *2013, 4* reported a decrease in values for occupied property of 21.7%. Moreover, Muehlenbachs et al 2013, 29 reported a 26% loss (prior to adjustment for lease and royalty income) for property occupied by wells. These rates are in line with earlier US findings, which indicate a rate of diminution of 22% (BBC Research & Consulting, 2001, 1).

LPI, 2014 elected to use the established technique of "paired sales analysis" (although their report document does not identify actual "pairs" or details of analysis). API, 2007, 18 explains how sales evidence is analysed to reveal the size of negative impacts. The results of sales analysis are used in both the "*before and after*" and *"piecemeal"* approaches. The application of these approaches is clearly enunciated in the cases (see for instance detailed discussion in *Parsons v Prospect County Council 1987, in* AIV, *30, 3 132 136* and *Kater 1993* op cit).

Moreover, the IPART proposal of "relocation cost approaches" appears problematic from a philosophical standpoint. How could removal of a landholder (even a notional removal) from a land holding they own actually compensate them for the intrusion and nuisance? However, it is conceivable that removal costs might be claimed as a disturbance item (see discussion in *Australian Gaslight Company v O'Grady & Burrell* NSW 1986 where temporary removal costs of a farm manager was sought, but denied by the court).

The *Kater* and *Parsons* cases indicate compensation for injurious affection is usually assessed by "*before and after*" and "*piecemeal"* approaches (both of which have a firm foundation in the property market), and courts proclaim these approaches as having application in assessing loss in value to the balance land for mining (including gas) acquisitions (see 1.5 and 1.7 above). There are a number of explicit examples of the *before and after* and *piecemeal* approaches (nominated in Table 2 above) in mining and gas applications.

As noted above, the *Kater* case provides a good example of the use of the *"piecemeal*" approach. The court used a percentage factor to find the diminution in value of the balance land. Varying rates of diminution were used for parts of the property (including two dwellings and the balance land). Using the figures in *Halfpenny* the calculation for injurious affection damage, (at a theoretical rate of 10% diminution) might appear thus.

Table 5. Injurious affection calculation using areas etc from *Halfpenny and a hypothetical rate of diminution.* Base operational year.			
Note that the percentage diminutions cited in the calculations that follow are "hypothetical", and demonstrate a technique. They are not examples of actual compensation figures.			
Area of holding ha 229.5 ha	**Area of work ha** 1.67 ha	**Area of balance land** 227.83 ha	**Value Per ha $25,000** **Value per m^2 $2.50**
Capital Value Land Occupied	**Hypothetical percentage diminution capital value** **10%**	**Rent for injurious affection**.	
227.83 * $25,000 = $5,695,750	$5,695,750 *10% = $569,575	* **8%** = **$45,566** *** 7% = $39,870** *** 6% = $34,175**	

Once again, this assumes that the elected percentage diminution applies to all of the balance land of the holding at the same rate. This might not be the case. Table 6 demonstrates the assessment of severance and injurious affection as a single item.

Table 6. Severance and injurious affection compensation consolidated calculation using areas etc from *Halfpenny and a hypothetical rate of diminution…* Base operational year.			
Note that the percentage diminutions cited in the calculations that follow are "hypothetical", and demonstrate a technique. Calculations are not examples of actual compensation figures.			
Area of holding ha 229.5 ha	**Area of work ha** 1.67 ha	**Area of balance land** 227.83 ha	**Value Per ha $25,000** **Value per m^2 $2.50**
Capital Value Land Occupied	**Percentage diminution capital value** **15%**		**Rent for severance and injurious affection**
227.83 * $25,000 = $5,695,750	$5,695,750 *15% = $854,363		* **8%** = **$68,349** *** 7% = 59,805** *** 6% = $51,262**

The following consolidation summarises the hypothetical compensation award.

Table 7. Base operational year. Notional compensation award. Consolidation of results.				
Note that the calculations that follow are "hypothetical", and demonstrate a technique. They are not examples of actual compensation figures.				
		8%	**7%**	**6%**
Land Occupied		**$3,348.00**	**$2,929.50**	**$2,511.00**
Severance (table 4)		**$22,783.00**	**$19,935.00**	**$17,087.50**
Injurious affect (table 5)		**$45,566.00**	**$39,870**	**$34,175**
Total		**$71,697.00**	**$62,734.50**	**$53,773.50**
Land Occupied (table 3)		**$3,348.00**	**$2,929.50**	**$2,511.00**
Severance and Injurious affect (Table 6)		**$68,349.00**	**$59,805.00**	**$51,262.00**
Total		**$71,697.00**	**$62,734.50**	**$53,773.50**

Most importantly, the *Sullivan* case is an important example of the need for explicit legislative authority for awards of compensation for injurious affection. At the time of the case (and prior to the enactment of the 2004 legislation), the Queensland legislation had similar provisions to those of NSW. On appeal, the court overturned the award for injurious affection. NSW needs to provide a clear right for compensation for injurious affection in cases where gas and mining infrastructure occupies part of a holding.

2.11 Disturbance

> Item 11 Do you agree with our proposed approaches for estimating compensation, or passing through costs, for disturbance? Are there other approaches that we should consider?

I am unsure of what is meant by "*passing through costs*" however, at 109 the NSW *Petroleum [Onshore] Act 1991* makes provision for "disturbance like" items in

> ((*a) by damage to the surface of land, and damage to the crops, trees, grasses or other vegetation on land, or damage to buildings and improvements on land, being damage which has been caused by or which may arise from prospecting or petroleum mining operations, and*

(e) by destruction or loss of, or injury to, or disturbance of, or interference with, stock on land, and

(f) by damage consequential on any matter referred to in paragraphs (a)–(e).

These items appear to provide a wide right to general damages including compensation for broken fences and gates and dead stock. However, the overriding principle of compensation is to *adequately compensate dispossessed owners for any loss that has been suffered* (Fricke 1982, 206).

The problem is the NSW *Petroleum (Onshore) Act 1991* at 69D (2A) appears to limit compensation for professional costs to "*the reasonable legal costs of the landholder in obtaining initial advice about the making of the arrangement*." The Australian Law Reform Commission 1980, 122 (10.2.2) suggested that compensation should encompass "*economic losses which result naturally, reasonably and directly from acquisition*" and in the context of CSG landholder's might incur a range of costs. These might comprise:

- Legal fees;
- Valuation fees;
- Survey costs (to assess and confirm areas occupied);
- Accounting costs;
- Fees to farming advisers.

Moreover, landholders would be entitled to payment for their own time in negotiating and supervising access (see discussion in *Australian Gaslight Company v O'Grady & Burrell,* 1986). Some farm operations (for example harvest) might be disrupted by CSG, and this may lead to loss. Accordingly, legal definitions of the entitlement need to be specified with care. Adoption of the compensation provisions of the *NSW Land Acquisition (Just Terms Compensation)* Act 1991 might facilitate this task.

2.12 Conclusion

There is a demonstrated need to widen the legislative provisions for compensating CSG occupation. The specification of comprehensive compensation terms would provide landholders with a guarantee of fairness and a basis for assessing offers from gas operators. The compensation payable under this sort of scheme would provide a foundation whereby landholders could evaluate harms and weigh offers made by gas operators.

A comprehensive compensation scheme would include:

- Fair payment for all land occupied (with all areas under hard stand or reserved for the gas operators purpose compensated for);
- Full right to loss in value to balance land;
- Recompense of all professional costs incurred in negotiations.

Clearly, it is a relatively simple matter to adjust the *Halfpenny* compensation award to include damage to the balance land. The approach outlined in tables three to six above is well suited to spread sheet based techniques no more complicated than addition and subtraction and multiplication and division (and one has been developed as part of this research). . Thus, whilst it may impossible

to estimate one rate of compensation for all property, it is relatively easy to construct a flexible model.

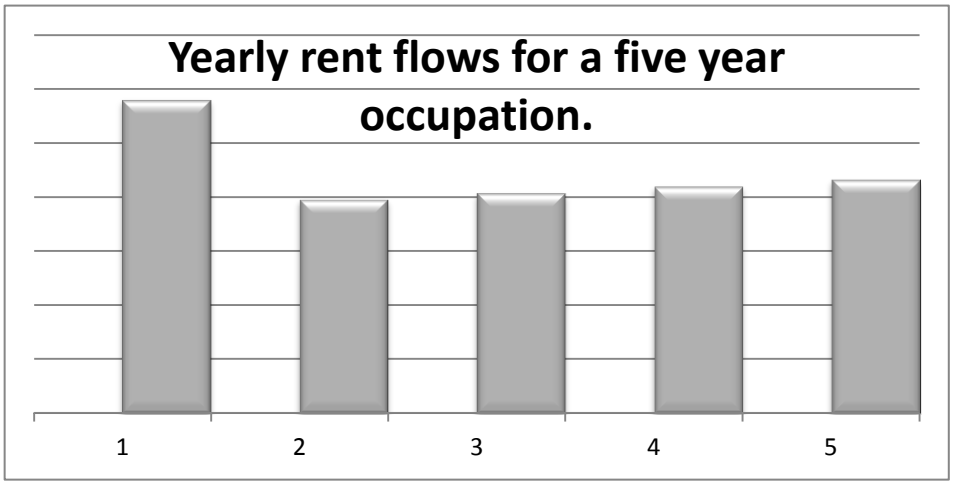
Enbridge Pipelines (Athabasca) Inc., Operator, and John Karpetz & Ors, 2008, 11 provides a specification of the way in which compensation can be structured:

> *Since the landowner's rights are taken for an indefinite period of time and the landowner must co-exist with the company, the only fair way to compensate the landowners is by a method of ongoing compensation which is reviewable at regular intervals to take into account changing circumstances over time.*

Compensation for the first year includes recompense for the larger areas occupied during establishment plus a larger allowance for loss of amenity (disturbance and injurious affection) occasioned during construction. Annual rent would be paid in advance. Rent for successive years would be based upon the smaller area of operational wells (with due allowance for extra areas for maintenance). Disturbance items (fees and physical damages) would be payable in the year in which they were incurred.

This would result in a lease arrangement similar to a commercial lease structure (used also for Crown land leases in NSW) where the rent for successive years is escalated according to a set formula (perhaps fixed escalation of CPI adjustment). Rent could be adjusted to market value every four or five years. The arrangement appears thus:

Figure 5.



2.13 Implementation

The establishment of a public record of transactions would provide an important database of information, and might lead to establishment of a system similar to the Albertan "pattern of dealings". Moreover, this could also provide information relating to the quantum of compensation for well sites and tracks, and for diminution to balance land.

The most pressing requirement is the specification of a modern (post CSG introduction) compensation regime that incorporates compensation for:

- Value of the land occupied;
- Severance;
- Injurious affection;
- Disturbance.

It is hoped that this paper contributes to the search for a fair compensation scheme for landholders in NSW. In NSW this is well overdue.

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