Australian Legislation on Carbon Capture and Storage: A Canadian Perspective

Prepared by

Nigel Bankes
Faculty of Law
University of Calgary

Jenette Poschwatta
Canadian Institute of Resources Law

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Authors: Prof. Nigel Bankes and Jenette Poschwatta

Affiliation: Nigel Bankes is Professor and Chair of Natural Resources Law in the Faculty of Law, University of Calgary. Jenette Poschwatta is Research Associate at the Canadian Institute of Resources Law.

The Institute for Sustainable Energy,
Environment and Economy
Room 220, CCIT Bldg.
University of Calgary
2500 University Drive NW, Calgary, AB T2N 1N4
Ph. 403-220-6100; Fx. 403-220-2400; info@iseee.ca
www.iseee.ca

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EXECUTIVE SUMMARY

Introduction

Canadian jurisdictions are actively considering the need to adopt a legal and regulatory framework for carbon capture and storage (CCS). Over the last number of years the government of Australia has taken a leadership role in this area internationally. As part of this leadership role, the state and Commonwealth governments collaborated in the development and publication of a set of Regulatory Guiding Principles for CCS operations. To implement those Guidelines, the Commonwealth has long promised new legislation to deal with CCS in the offshore where the Commonwealth has clear jurisdiction. The Commonwealth government released its so called "exposure draft" of the proposed legislation on May 16, 2008. The draft legislation was accompanied by two other documents, a Regulation Impact Statement and a Readers' Guide.

The draft legislation takes the form of a comprehensive set of amendments to the Commonwealth's *Offshore Petroleum Act* and is designed to provide an enabling framework for objective-based regulation for CCS in offshore (Commonwealth) waters. Our focus in this paper is the Australian proposals but we also make some reference to other initiatives including the draft Directive tabled by the EU in January 2008 and the Interstate Oil and Gas Compact Commission's draft model legislation tabled in September 2007.

In earlier work on the legal and regulatory framework for CCS we have suggested that any such framework needs to deal with property issues, regulatory issues and liability issues.[1] The property issues include ownership of the pore space, the need for a disposition scheme to allow third parties to acquire storage rights, and surface rights questions. Pore ownership is a non-issue in the Australian offshore since there is no private ownership of petroleum or natural gas and all relevant rights are vested in the

[1] Nigel Bankes, Jenette Poschwatta and E. Mitchell Shier, "The Legal Framework for Carbon Capture and Storage in Alberta" (2008), 45 *Alta. L. Rev.* 585.

Commonwealth government. Surface rights are also irrelevant in the offshore situation. The draft legislation concentrates on the disposition scheme.

The regulatory issues include the choice of regulator (an oil and gas authority or an environmental authority), the type of regulatory approval and monitoring and verification scheme that needs to be put in place, and other miscellaneous issues such as the need to provide for third party access to CCS injection sites and facilities. The proposed legislation covers these issues although it also acknowledges the relevance and importance of other general environmental legislation.

Liability issues include Kyoto liability for emissions (in the event that storage fails), liability for harms caused to others, and liability for any necessary remedial work. There are both short-term and long-term liability concerns to consider. Short-term liability covers the period of active exploration and injection operations while long-term liability covers the extended period for which we expect carbon dioxide (CO_2) to be contained. The proposed legislation deals with both aspects but does not address liability for emissions.

The paper is divided into two Parts. Part One provides a description and analysis of the Australian proposals. Part Two offers a critique of the legislation from a Canadian perspective. Here the paper tries to identify what Canadian regulators and companies can learn from the Australian approach and where we might be more reluctant to follow.

Part I: The Australian Draft Legislation

The proposed legislation will accomplish two main objectives. First, it will provide a disposition or tenure scheme for parties to acquire the right to store GHGs in the offshore. Second, it will provide the regulatory framework for reviewing and approving CCS operations. In delivering on both of these objectives the legislation will also provide a framework for deciding upon the competing claims of petroleum operations and CCS operations. The Commonwealth legislation focuses on the development of a disposition scheme modeled on existing offshore petroleum legislation.

For a Canadian reader the closest analogy and reference point is likely the federal tenure scheme under the *Canada Petroleum Resources Act* with its three forms of tenure (exploration licence, significant discovery licence and production licence) and its two categories of discoveries (significant discoveries and commercial discoveries).

A. Tenure

The tenure scheme proposed for CCS activities is modelled on a similar scheme for petroleum tenure. The draft legislation creates three principal forms of tenure: (1) a GHG assessment permit (2) a GHG holding lease, and (3) a GHG injection licence. In addition other authorizations permit some exploratory operations on a non-exclusive basis.

The tenure scheme is underpinned by a series of prohibitions. The legislation prohibits the unauthorised exploration or injection and storage of substances in an offshore area.

The GHG Assessment Permit

The GHG assessment permit deals with the exploration phase of GHG storage development. The process begins with the Minister inviting applications for selected areas. Permits may be granted on the basis of either a work-bid or cash-bid for designated block(s). Initially permits will likely be offered on the basis of the work-bid approach.

An applicant for work-bid permit must describe the proposed work and expenditures, the technical qualifications and advice available to the applicant and its financial resources. In the case of a single applicant, the Minister has the discretion to offer the block on specified terms and conditions including security requirements. Where there are competing applications, the Minister may make the offer to the applicant that, in the Minister's opinion, is "most deserving" of the permit based on published criteria. The scheme for cash-bids tracks the above with the permit being offered to the highest bidder. Once granted, a permit is valid for six years subject to extension where the permittee

applies for a declaration of an identified GHG storage formation, a GHG holding lease or a GHG injection licence.

The GHG assessment permit grants the permittee the right within the permit area: (a) to explore for a potential GHG storage formation; (b) to explore for a potential GHG injection site; (c) to inject GHGs into a part of a geological formation for appraisal purposes; and (d) to store GHGs on an appraisal basis; (e) to inject, air, water or petroleum on an appraisal basis; (f) to store the same substances on an appraisal basis; and (g) with the written consent of the Minister recover petroleum in the permit area for appraisal purposes but such petroleum once recovered does not become the property of the permittee. Conditions attached to permits may specify the work requirements and may require the permittee to lodge security. In addition the permittee will need prior approval for any "key GHG operations".

The next phase of the process is to obtain a declaration of an "identified GHG storage formation" (discussed below). After a declaration has been obtained, the permittee has two options – to seek a GHG holding lease or a GHG injection licence. Each will be discussed in turn.

The GHG Holding Lease

The GHG holding lease is designed to protect the investor who makes the initial investment to identify a storage site but cannot secure a CO_2 source. Once a holding lease is granted, it remains in force for 5 years and can be renewed once. A special holding lease (indefinite duration) is also available to either a permittee or a lessee that is refused a GHG injection licence on the basis that operations that could be carried on under the injection licence will have a significant adverse impact on petroleum exploration or recovery operations. The special holding lease is an example of how the draft legislation seeks to balance GHG storage interests and petroleum interests.

The draft legislation confers the same rights on a holder of a GHG holding lease as are conferred on the holder of a GHG assessment permit including all exploration

rights. This gives the holder the ability to continue to explore for additional storage formations which can be declared as new identified GHG storage formation. A GHG holding lease is also subject to similar conditions as those for an assessment permit.

The GHG Injection Licence

The final stage in the tenure scheme is the GHG injection licence. An injection licence authorizes the licensee to carry out operations for the injection and permanent storage of a GHG substance in an "identified GHG storage formation" located in the licence area.

An application can be made by a holder of a GHG assessment permit or holding lease or by a holder of a petroleum production licence. An injection licence granted to the holder of a petroleum production licence is only for the injection of CO_2 that is obtained through the production of natural gas. The application must set out those matters that the licensee wants specified as conditions, e.g. the type and origin of the GHG substance which must be consistent with the "fundamental suitability determinants" of the indentified GHG storage formation. Fundamental suitability determinants are used in the determination of the spatial extent (the expected migration path or pathways of the GHG substance injected) of an eligible GHG storage formation. They include the particular GHG substance, the amount of GHG substance injected, point or points of injection, period of injection, and the effective sealing feature, attribute or mechanism that enable permanent storage. They become "locked-in" when finalized as part of a declared identified GHG storage formation. In addition, the application must be accompanied by a draft site plan for each identified GHG storage formation, the details of the proposed work and expenditure by storage formation and the technical qualifications and advice available to the applicant and its financial resources.

The GHG injection licence confers both exploration rights and storage rights. The licensee has the same exploration rights as those conferred on the assessment permittee and the holding lessee. The additional and crucial rights conferred by the licence are the

right (a) to inject a GHG substance into an identified GHG storage formation, and (b) to permanently store a GHG substance in an identified GHG storage formation.

GHG injection licences are subject to several conditions including conditions with respect to the kind and origin of GHG substance injected, the injection period, the total amount of GHG injected and the rate of injection. None of the matters specified in the injection licence can be inconsistent with the fundamental suitability determinants of the identified GHG storage formation. A GHG injection licence has an indefinite duration but is subject to termination if there are no operations to inject a GHG substance for a continuous period of five years excluding any non-production period beyond the licensee's control or when the licence is suspended under the Minister's power to protect petroleum discovered in an area,

B. Storage Formations

Running parallel with the three forms of tenure are three classifications of storage formations each associated with increased knowledge of the geological formation: (1) potential, (2) eligible or (3) identified. While a tenure holder may inject GHGs into potential and eligible formations for appraisal purposes, approval for injection for permanent storage requires that there be a declaration of an identified GHG storage site. It is the third of these classifications then that is of the greatest legal significance.

A declaration of an identified GHG storage formation is a core document that specifies the activities that can be carried out under a GHG injection licence (the activities are controlled through licence conditions that match the matters in the declaration) and the areal extent of such operations. The declaration will specify the fundamental suitability determinants and the spatial extent of the indentified GHG storage formation. Because of its role in determining allowable injection activities and the integrity of the storage system, the declaration retains its significance over the life of the CCS project. The Minister may only revoke a declaration of an identified GHG storage location, subject to consultation with the title-holder, if the Minister is satisfied the formation is no longer an eligible GHG storage formation.

C. Reconciling Petroleum and Storage Interests

The need to reconcile the potentially competing petroleum and storage interests is a significant feature of the Australian draft legislation. Essentially all of Australia's offshore potential CCS areas are subject to existing petroleum titles and a policy decision was made to give a high level of protection to holders of petroleum titles in place at the commencement of the legislation. Interests are divided into pre- and post-commencement interests. A pre-commencement petroleum title is an exploration permit, retention lease or production licence that is in force at the time when the amendments commence and the term includes any successor interest. A post-commencement petroleum title is a petroleum interest granted after the amendments commence and which is not a successor interest.

The reconciliation rules apply where there is a "significant risk of a significant adverse impact" on one of the interests by the operations of the other interest. "Significant risk" is the equivalent of a "large adverse impact on other operations" and that the risk may be taken to be a significant risk "even if the probability is low".

The overall approach is to protect pre-commencement petroleum interests and existing production licences by requiring that the holder of the petroleum tenement agree to the GHG operation in the event of significant risk. But when the competing claims do not involve pre-commencement petroleum interests or existing production licences, the draft legislation uses a public interest test to determine which claim trumps. The principal mechanisms that the legislation uses to resolve completing claims are:

(1) prior approval of key GHG operations

A GHG assessment permit or GHG holding lease does not itself authorize any particular operations so that approval is required before permittees and lessees carry out any "key GHG operations". In the case of an existing or future pre-commencement title or an existing post-commencement licence the petroleum title-holder must agree to the GHG

operation. In other cases the Minister's decision will turn on an assessment of the public interest.

(2) consideration of petroleum interests when granting a GHG injection licence

The scheme protects pre-commencement and existing production interests by insisting that they agree to the grant of an injection licence where there is an assessment of significant risk. Post-commencement petroleum interests may be sacrificed if the Minister's assessment of the public interest puts CCS ahead of the petroleum interest.

(3) consideration of GHG interests when granting a petroleum licence

If there is an existing assessment permit, holding lease, or declaration of an identified GHG storage formation, the Minister may grant a production licence if it is in the public interest. The scheme protects existing GHG injection licensees since their agreement is essential before a production licence can be granted.

(4) a scheme for the prior approval of key petroleum operations

A *petroleum* interest can become a "declared interest" as part of setting the conditions for the interest. Once this occurs, the holder of the declared interest must obtain approval before undertaking any "key petroleum operations" on a basis similar to that outlined above for key GHG operations.

(5) directions to protect petroleum interests.

The draft legislation gives the Minister the power to give a direction to a GHG licensee in order to protect geological formations containing petroleum, or petroleum discovered in areas of overlap with a pre-commencement title provided the discovery is commercially viable (or is likely to become commercially viable).

D. The Regulatory Elements of the Legislation

The Regulation Impact Statement suggests that Australia had little need to develop specific legislation for some regulatory aspects of the CCS industry such as general environmental approvals and occupational health and safety issues. The Regulation Impact Statement did however identify a need for new legislation to regulate two things: (1) the selection and approval of storage sites, and (2) site closure. The proposed legislation therefore contains provisions that address each of these issues. Both are clearly of central importance and it is therefore perhaps a little surprising that, while addressed, the relevant provisions are relatively short. Some further content as well as the reasons for this can be gleaned from the discussion of these issues in the Regulation Impact Statement but it bears emphasising that the proposals are far less detailed and far less prescriptive than those proposed by either the IOGCC or the EU.

Other regulatory issues dealt with in the legislation include third party access.

Site Plan

One risk associated with CCS is the potential for unanticipated migration of injected substances and leakage through pathways such as geological faults or improperly abandoned wells and each CCS storage site is unique. The IPCC and others have emphasised that these risks can be reduced if there is careful site selection and regulatory oversight. Consequently, the most critical element of the regulatory scheme is the approval of site plans for an injection operation. Such a site plan would have to demonstrate, to the satisfaction of the regulator, that the project will result in 'safe and secure' storage.

An applicant for a GHG injection licence must present a draft site plan. The legislation itself has little to say about the content of the site plan other than that it must set out predictions for the behaviour of the GHG substance stored in the identified GHG storage formation. The Readers' Guide suggests that the matters to be addressed by the site plan will be prescribed by regulations modeled on existing petroleum regulations and will require the applicant to address such matters as: (1) the geological attributes or features of the storage formation; (2) current and proposed injection and storage

operations; (3) the operations and techniques to be used by the licensee to monitor and verify the behaviour of the GHG over the life of the project; (4) operations management systems, including processes for identification, assessment and management of risks; and (5) predictions as to the short, medium and long-term behaviour and fate of the GHG in the identified storage formation and associated geological formation(s).

Site Closure

At some point injection and storage operations will cease and the injection licensee will need to close the site. The legislation suggests that there are six steps.

First, the injection licensee applies for a site closing certificate including a proposal for a monitoring and verification program to be conducted by the Commonwealth. An application must be accompanied by a written report that sets out the applicant's modelling of the GHG plume and an assessment of the behaviour of the plume including the expected migration pathway, the short- and long-term consequences of the migration, and the applicant's suggested approach for long-term monitoring of the plume to be undertaken by the Commonwealth once the closing certificate has been issued.

Second, the Minister may issue extensive site closing directions to the licensee. A licensee might be required to carry out remedial work (e.g. plugging abandoned wells) on the storage formation (including remedial work outside the injection licence area) in order to prevent escape of GHG substances.

Third, the Minister responds to the application by indicating that s\he is prepared to issue a site closing certificate. Other options include refusing to issue the certificate or deferring that decision. Fourth, the licensee posts security to cover the costs of monitoring and verification program and fifth, the Minister the issues the site closing certificate. A site closing certificate remains in force indefinitely and is automatically transferred with the licence. Nothing in the legislation suggests that a closing certificate eliminates future liability of the licensee. The costs that the Commonwealth incurs in

carrying out the monitoring program under the site-closing certificate are a debt due to the Commonwealth recoverable in a court of competent jurisdiction. The sixth and final step is surrender of the licence provided that the licensee has fulfilled all of its obligations including removal of property and plugging of wells**.**

Liability Related Issues

Liability can be broken down into short-term and long-term liability. In the Australian system short-term liability covers the period of active exploration and injection and the period post-injection until site closure. Long-term liability refers to liability post-closure. In earlier work we have stressed the importance of unbundling the liability issues so as to, at a minimum, separate out liability for emissions from a (failed) CSS project, liability for harm suffered by others and liability for remedial operations as well as the questions of short-term and long-term liability. There is no indication that the draft was intended to deal with liability for emissions from a (failed) CCS project. It is far more likely that this issue will be dealt with in any cap and trade legislation that the government eventually puts in place as the EU proposes in its scheme.

Short-term Liability

There is no indication that the legislation will create a special liability regime for those who suffer harm as a result of a CCS project. Liability therefore will continue to be governed by tort laws of general application.

The injection licensee will also be responsible for all of the activities associated with site closure and abandonment. This of course raises the question of whether there will be money on hand for these closure operations since by this time it can be expected that there will be no offsetting revenue stream. In the absence of offsetting revenue the traditional response of the regulator has been to demand security from the licensee\operator to cover at least anticipated abandonment\closure costs. The draft legislation is structured to allow the Minister to require an applicant to lodge security before being issued a grant of an assessment permit, holding lease or injection licence.

The liability of an operator to take remedial action is generally based on statute rather than general tort law. Examples here include the "directions" that the Minister can issue to the licensee as part of site closure. In addition, the Minister can also issue a variety of "directions" where there is a "serious situation".

Long-term Liability

The Regulation Impact Statement considered four options for long-term liability: no new regulation; new regulation under which Government explicitly assumes long-term liability; new regulation where industry is required to assume long-term liability, and; new regulation to share long-term liability between government and industry. The "no new regulation" scenario represents the status quo for petroleum which assigns liability based on general tort law. The Regulation Impact Statement reasoned that under this scenario, title-holders would not be immunized from their common law liability and that over time the risk "would, in a sense, pass to the community because project participants may cease to exist or because of some other time related factor such as availability of witnesses." The Regulation Impact Statement recommends this approach for CCS projects and as a result the draft legislation is completely silent on long-term liability. But this is a case where silence speaks volumes since silence will serve to leave liability with the licensee\operator.

Part II

The second Part of the paper offers some comments on the Australian legislation from a Canadian perspective. The comments fall into three main groups: the tenure scheme; the regulatory scheme; and liability related issues.

A. Tenure Scheme

As we have observed elsewhere, Alberta has yet to develop a tenure scheme for "disposal rights" in Crown subsurface. To the extent that the Crown authorizes subsurface disposal operations in Crown subsurface lands (such as for acid gas disposal

(AGD)) it does so using a form of letter of consent or a licence issued under the authority of s. 56 of the *Mines and Minerals Act*, rather than a formal tenure.

We think that there is a strong case for each province and the federal government (for federal lands) to develop disposition legislation for publicly owned storage rights. A more formal and competitive disposition scheme would provide security for investment and provide a level playing field for different actors to engage in CCS activities. It would also signal that storage and disposal into pore space represents an important use of a publicly owned and limited resource. This conclusion raises the question of what form such a disposition scheme should take.

The Australian approach (and the EU proposal is similar) is that each jurisdiction should use and adapt its existing petroleum legislation (whatever it may be) to fit the challenges posed by CCS. Adapting existing regulation draws on a well established framework for accessing and managing property rights, it reduces the need for entirely new schemes, it increases understanding and acceptance of the regulatory framework and it allows for integrated management of CCS with other uses (in particular petroleum).

A version of the Australian approach but adapted to Alberta's tenure regime as described in the *Petroleum and Natural Gas Tenure Regulations* might include the following: (1) industry nominations of blocks of land for bidding for CCS operations; (2) a new (single) form of tenure, a GHG storage licence with a short initial exploration term followed by an intermediate term provided the licensee meets minimum work requirement; (3) disposition of interests by way of cash bidding or work bidding but with a single bidding variable; (4) a minimum work requirement of at least one exploratory well during the initial term of the licence; and (5) by the end of the intermediate term a requirement that the licensee identify an area within the licence area that is suitable for GHG storage purposes and file an application for approval of a site plan or plans with the ERCB. Parts of the GHG licence not subject to an ERCB approved site plan would revert to the Crown.

B. The regulatory scheme

As we have seen, Australia's proposed regulatory scheme contains three main elements: (1) approval required for key GHG operations; (2) filing and approval of site plans; and (3) the site closure mechanism. The best analogies for each of these regulatory elements within Alberta's current oil and gas regulatory system would seem to be: (1) the well licensing provisions of the *Oil and Gas Conservation Act* (*OGCA*); (2) s. 39 OGCA approvals for schemes including injection schemes; and (3) approvals for non-routine abandonments. But none of these analogies is entirely appropriate and each would have shortcomings if simply re-jigged to accommodate CCS.

Areas of the Alberta regulatory approach requiring adjustment would include the following: (1) the regulatory framework should require a geological formation approach that relies on the use of a site plan; (2) well licensing provisions should include a list of factors the applicant and the regulator must address as part of an application to address broader issues of public policy such as the priority to be accorded to different resources uses; (3) unlike the details for approval for a gas storage, enhanced oil recovery (EOR) or AGD scheme, the legislation should, at a minimum, express both the objective of a site plan (assurance of safe and secure storage) and the issues and types of information that a site plan needs to address including monitoring and verification; (4) unlike current practice, no licensee should be allowed to abandon a CCS well without approval by the regulator to ensure the overall integrity of the CCS project.

It will also be necessary for Alberta to deal with the resource use conflict and priority issue as between CCS and oil and gas interests. Here Alberta should be able to draw upon experience with the gas-over-bitumen debates and as well as the regulatory rules developed by the ERCB and examined by the courts in that context.

C. Liability Issues

As we have observed elsewhere, most liability issues in Alberta's oil and gas sector are dealt with by tort laws of general application. Special rules exist for

abandonment obligations and for remedial obligations. There is no transfer of liability to the state under any of these rules and to the extent that an operator becomes defunct the costs of abandonment operations are borne by the industry financed orphan well fund (but not more general tort liabilities).

What are the implications of this and the Australian proposals for a liability scheme for CCS operations in Alberta? First, it will be hard to make the case that special rules are required for liability for harm suffered by others in the case of CCS operations if the general tort rules apply to conventional oil and gas operations. But it may be necessary to create a separate orphan fund for CCS operations. Second, it will likely be necessary to be more prescriptive about requirements for posting security given that a pure CCS scheme (as opposed to an EOR scheme) will have no offsetting production revenue. Finally, existing provisions dealing with remedial liability will likely serve as an adequate basis for CCS operations although the triggers for requiring remedial action may require some adjustment. The Australian concept of a "serious situation" is more precautionary than existing provisions in the *OGCA*.

Conclusion

The proposed Australian legislation accomplishes several things. First, it will provide a disposition or tenure scheme for parties to acquire the right to store GHGs in the offshore. Second, it provides a regulatory framework for reviewing and approving CCS operations on a case by case basis with individual site plans and closure plans. Third, the legislation provides a framework for deciding upon the competing claims of petroleum operations and storage operations. And finally, the legislation proposes to leave both short term and long term liability with the operator\licensee largely on the basis of laws of general application. While the draft is too intricate and detailed for Canadian purposes, many of the broad ideas captured by the legislation merit serious consideration as provincial legislatures seek to develop appropriate disposition, regulatory and liability regimes to accommodate CCS operations.

FULL PAPER

INTRODUCTION

Many jurisdictions in Canada are currently considering how to develop an appropriate legal and regulatory framework to accommodate carbon capture and storage (CCS). For example, the Report of the Eco Energy Task Force, *Canada's Fossil Energy Future, The Way Forward on Carbon Capture and Storage*,[2] emphasised the importance of "regulatory clarity to move the first CCS projects forward by: quickly confirming legislation and regulation related to pore-space ownership and disposition rights; clearly articulating the terms for the transfer of long-term liability from industry to government; and increasing the transparency of regulatory processes." Subsequently, Alberta established the Carbon Capture and Storage Development Council to respond to that report.[3]

Over the last number of years the government of Australia has taken a leadership role in the development of a legal and regulatory framework for CCS. This leadership role has been reflected in a variety of fora including the procedure to develop amendments to the Protocol to the London Dumping Convention[4] (to authorize CCS operations in marine areas) and the Carbon Sequestration Leadership Forum.[5] In addition, the state and Commonwealth governments collaborated in the development and publication of a set of Regulatory Guiding Principles for CCS operations.[6] These principles have been widely cited in the international literature on CCS.

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[2] (2008) online: <http://www.nrcan-rncan.gc.ca/com/resoress/publications/fosfos/fosfos-eng.pdf>.
[3] Announced April 24, 2008, online: <http://www.energy.alberta.ca/Initiatives/1438.asp>.
[4] *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972* (as amended in 2006) online: <http://www.imo.org/home.asp?topic_id=1488>. The amendments to the 1996 Protocol, which entered into force on 24 March 2006, takes a precautionary approach and prohibits the dumping of wastes at sea, except for certain substances, listed in the Annex I. Section 1.8 includes "Carbon dioxide streams from carbon dioxide capture processes for sequestration."
[5] Online: <http://www.cslforum.org/>.
[6] Ministerial Council on Mineral and Petroleum Resources, *Carbon Dioxide Capture and Geological Storage: Australian Regulatory Guiding Principles* (2005), Australian Government, Department of Resources, Energy and Tourism (hereinafter "Australian Guiding Principles"), online: <http://www.ret.gov.au/General/Resources-CCS/Pages/GHGStorageLegislation.aspx>.

To implement those Guidelines the Commonwealth has long promised new legislation to deal with CCS in the offshore where the Commonwealth has clear jurisdiction. Delayed for a number of reasons including the change of federal government in late 2007 (which led to Australia ratifying the Kyoto Protocol in time for the Bali meeting of the parties to the Protocol and the Framework Convention on Climate Change) the Commonwealth government finally released its so called "exposure draft" of the proposed legislation on May 16, 2008.

Accompanied by two other documents, a Regulation Impact Statement and a Readers' Guide, the draft legislation takes the form of a comprehensive set of amendments to the Commonwealth's *Offshore Petroleum Act 2006*.[7] The amendments (which cover some 450 pages) will result in this statute being re-branded as the *Offshore Petroleum and Greenhouse Gas Storage Act*. The draft legislation will provide an enabling framework for objective-based regulation for CCS in offshore (Commonwealth) waters.[8]

The purpose of this paper is twofold. First, it is designed to provide a description and analysis of the Australian proposals. Second it offers a critique of the legislation from a Canadian perspective. Here the paper tries to identify what Canadian regulators and companies can learn from the Australian approach and where we might be more reluctant to follow.

We have decided to prepare this paper because the Australian Regulatory Guiding Principles proved to be very influential in international discussions of CCS. This suggests that there will also be significant international interest in the proposed implementing legislation. Our focus will be the Australian proposals but we will also make some

[7] All three documents are available online: <http://www.ret.gov.au/General/Resources-CCS/Pages/GHGStorageLegislation.aspx>. Further material including a powerpoint presentation from the Department of Resources, Energy and Tourism on the draft legislation is available on the website of Primary Industries and Resources Committee of the House of Representatives, online: <http://www.aph.gov.au/house/committee/pir/exposuredraft/back/back04.pdf >. This Committee will conduct an inquiry into the draft with the intention of reporting out in August 2008.

[8] Regulation Impact Statement, *supra* note 6 at 3.

reference to other initiatives including the draft Directive tabled by the EU[9] in January 2008 and the Interstate Oil and Gas Compact Commission's draft model legislation[10] tabled in September 2007.

In our earlier writings on the legal and regulatory framework for CCS we have suggested that any such framework needs to deal with property issues, regulatory issues and liability issues.[11]

The property issues include ownership of the pore space, the need for a disposition scheme to allow third parties to acquire storage rights, and surface rights questions. Pore ownership is a non-issue in the Australian offshore since there is no private ownership of petroleum or natural gas and all relevant rights are vested in the Commonwealth government.[12] The Commonwealth legislation focuses on the development of a disposition scheme modeled on existing offshore petroleum legislation. For a Canadian reader the closest analogy and reference point is likely the federal tenure scheme under the *Canada Petroleum Resources Act*[13] with its three forms of tenure (exploration licence, significant discovery licence and production licence) and its two categories of discoveries (significant discoveries and commercial discoveries).

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[9] Proposal for a Directive of the European Parliament and of the Council on the geological storage of carbon dioxide and amending Council Directives 85/337/EEC, 96/61/EC, Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC and Regulation (EC) No 1013/2006, (hereinafter "EU Draft Directive") online: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0018:FIN:EN:PDF>.

[10] The Interstate Oil and Gas Compact Commission Task Force on Carbon Capture and Geologic Storage, *Storage of Carbon Dioxide in Geologic Structures A Legal and Regulatory Guide for States and Provinces*, (September 25, 2007) (hereinafter "IOGCC"), online <http://iogcc.publishpath.com/Websites/iogcc/PDFS/2008-CO2-Storage-Legal-and-Regulatory-Guide-for-States-Full-Report.pdf>.

[11] Nigel Bankes, Jenette Poschwatta and E. Mitchell Shier, "The Legal Framework for Carbon Capture and Storage in Alberta", (2008) 45 *Alta. L. Rev.* 585.

[12] With the exception of possible aboriginal title claims. The draft legislation itself makes very little reference to aboriginal title issues but see s. 249CZF (that the effect of a project (site closing etc) on native title is something that the Minister must have regard to when making a decision), s.249NF (indicating that operations must be carried on so as not to affect the enjoyment of native rights and title), s.316-311A (site directions to protect native title). For more general discussion see Nigel Bankes, "Aboriginal Title to Petroleum: Some Comparative Observations on the Law of Canada, Australia and the United States" (2004), 7 *Yearbook of New Zealand Jurisprudence* 111 **B** 157. Surface rights are also irrelevant in the offshore situation.

[13] R.S.C. 1985 (2d Supp.), c. 36.

The regulatory issues include the choice of regulator (an oil and gas authority or an environmental authority[14]) and the type of regulatory approval and verification and monitoring scheme that needs to be put in place. Another issue might include the need to provide for third party access to CCS injection sites and facilities. The proposed legislation covers these issues although it also acknowledges the relevance and importance of other general environmental legislation.

The liability issues include Kyoto liability for emissions (in the event that storage fails), liability for harms caused to others, and liability for any necessary remedial work. There are both short-term and long-term liability concerns to consider. We can think of the short-term as covering the period of active exploration and injection operations and the longer term covering the extended period for which we expect carbon dioxide (CO_2) to be contained. The proposed legislation deals with all of these liability issues with the exception of the liability that there might be under domestic or international emissions rules. As is the case in the EU this matter will need to be dealt with in any future Australian cap and trade or similar regime.

The paper is divided into two Parts. Part One provides a description of the Australian proposals and Part Two considers the proposals in a Canadian context. Part One proceeds as follows. The next section, section 1, provides an overview of the legislative package. A short section 2 discusses what the legislation applies to. Section 3 describes the three main forms of tenure. Section 4 mentions the three forms of storage formation specified in the legislation and their connection to the forms of tenure just discussed. Section 5 discusses the way in which the legislation proposes to reconcile competing petroleum and storage interests. Section 6 deals with the regulatory elements of the proposal (site plans and site abandonment/closure) and section 7 with some liability related issues such as bonding requirements and remedial operations. Section 8 deals with some miscellaneous issues such as third party access, and section 9 provides some conclusions for this Part of the paper.

[14] Most jurisdictions favour using an oil and gas regulator since the technologies are similar, but as the IOGCC recognizes (*supra* note 9) not all jurisdictions have oil and gas regulators.

Part Two offers some comments on the Australian legislation from a Canadian perspective. The comments fall into four main groups: the tenure scheme; the regulatory scheme; liability related issues and a final miscellaneous group of comments. The main conclusions for this part of the paper are as follows. The province would benefit from adopting an explicit disposition scheme for CCS operations. The province also needs to adopt specific rules pertaining to site approvals and site closure. The current liability rules in place for oil and gas operations will provide a useful basis for CCS operations but will need to be amended to deal with bonding issues and consideration given to the need for a separate CCS industry fund.

PART I: THE AUSTRALIAN DRAFT LEGISLATION

1.0 Overview

The proposed legislation will accomplish two main objectives. First, it will provide a disposition or tenure scheme for parties to acquire the right to store greenhouse gases (GHGs) in the offshore. Second, it will provide the regulatory framework for reviewing and approving CCS operations. In delivering on both of these objectives the legislation will also provide a framework for deciding upon the competing claims of petroleum operations and storage operations.

The tenure scheme proposed for CCS activities is modelled on similar schemes for petroleum tenure. The draft legislation creates three principal forms of tenure: (1) a GHG assessment permit; (2) a GHG holding lease; and (3) a GHG injection licence. The GHG assessment permit is a short-term exploration interest. Permits are issued based on a competitive bidding process (work-bid or cash-bid). The GHG holding lease is designed to offer some security to an explorer who has obtained a declaration of an identified GHG storage formation but who has yet to secure a source of GHGs. The GHG injection licence is the only tenure form that permits GHG injection for other than evaluative

reasons.[15] It is the functional equivalent of a production licence in a petroleum disposition scheme.

The draft legislation contains a number of safeguards to protect existing ("pre-commencement") petroleum interests (and more generally, producing interests). In particular, the legislation contemplates that the Minister will not be able to approve a GHG storage operation (including an exploratory operation) if the Minister concludes that the proposed operation may cause a significant risk of significant adverse impact on those petroleum interests in the absence of an agreement between the parties.

Running parallel with the three forms of tenure are classifications of storage formations each associated with increased knowledge of the geological formation that is proposed for injection and storage: potential, eligible or identified. While a tenure holder may inject GHGs into potential and eligible formations for appraisal purposes, approval for injection for permanent storage requires that there be a declaration of an identified GHG storage formation.

The regulatory framework is comprised of a number of elements including: (1) approval of key GHG operations, (2) recognition of the different forms of storage formation, (3) approval of site plans, and (4) approval of site closing. The regulatory approach is outcome oriented rather than prescriptive. In general it imposes a significant onus on an applicant to present the necessary data and analysis to show that it has met the statutory standards and purposes. The most critical elements of the regulatory scheme are the last two, the approval of site plans for an injection operation and site closure. An applicant for a GHG injection licence must present a draft site plan as part of its application. The legislation itself has little to say about the content of the site plan but the site plan must set out predictions for the behaviour of the GHG substance stored in the identified GHG storage formation. The Readers' Guide suggests that the matters to be

[15] Petroleum tenure holders will still be able to inject for purposes such as enhanced oil recovery.

addressed by the site plan will be prescribed by regulations modeled on existing petroleum regulations and will require the applicant to address such matters as:[16]

- the geological attributes or features of the storage formation;
- current and proposed injection and storage operations;
- the operations and techniques to be used by the licensee to monitor and verify the behaviour of the GHG over the life of the project;
- operations management systems, including processes for identification, assessment and management of risks; and
- predictions as to the short, medium and long-term behaviour and fate of the GHG in the identified storage formation and associated geological formation(s).

Consistent with an outcome oriented approach the content of the site plan must enable the Minister to reach the conclusion that the proposed operations will permanently store GHGs in the identified formation.

The legislation deals with site closure in six steps. First, the injection licensee applies for a site closing certificate including a proposal for a monitoring and verification program to be conducted by the Commonwealth. Second, the Minister may issue extensive site closing directions. Third, the Minister responds to the application by indicating that s\he is prepared to issue a site closing certificate. Other options include refusing to issue the certificate or deferring that decision (s. 249CZFA). The pre-certificate notice is the functional equivalent of an offer as used elsewhere in the statute. Fourth, the licensee posts security to cover the costs of monitoring and verification program. Fifth, the Minister issues the certificate. Sixth, the licence can be surrendered. What is particularly noticeable here is the idea that monitoring and verification is to be carried out by the Commonwealth but using funds provided by the licensee.

On the liability side of things the legislation does not deal with the liability under any cap and trade system for emissions. This will need to be addressed within such a

[16] Reader's Guide, *supra* note 6 at 6.4.

system. The legislation and the accompanying documents do make it clear that the injection licensee will be responsible for any harm suffered by others in the course of active operation. The legislation also establishes that the licensee will be responsible for and bear the costs of all of the site closure procedures including site closing directions. In addition the licensee may also be required to take further remedial action in the event of a "serious situation". On the question of long-term liability and the question of whether or not there should be an explicit transfer of responsibility the legislation itself is silent. The Regulation Impact Statement explains this silence by concluding that long-term liability should be left with the licensee.[17] This represents the default position under general tort law and therefore the silence of the legislation merely reflects that position. The legislation would only need to speak on this issue if it proposed (as does the EU proposal) a transfer of liability from the licensee to the state.

Finally, the legislation deals with some other potentially significant issues such as third party access to storage sites and facilities. The legislation does not put such a scheme in place but the provisions dealing with injection licences effectively warn applicants for licences that they may in the future be made subject to a third party access scheme.

2.0 What does the legislation apply to?

The legislation applies to "greenhouse gas substances" (s. 6[39]) and not simply CO_2. That said, the term is defined as: (1) CO_2, or (2) a prescribed gas, or (3) a mixture of the above plus incidental GHG related substances (defined in s. 15D) and detection agents. Incidental GHG-related substances would include substances incidentally derived from the source material, capture, transportation, injection or storage. A detection agent (s. 6[15]) is a substance added to the mixture to facilitate monitoring. The Readers' Guide indicates that the regulation making power to extend the list of included gases will not be used until such time as the Protocol to the London Dumping Convention is amended to

[17] Regulation Impact Statement, *supra* not 6 at 29.

permit geological storage of these other gases.[18] Until then the legislation will only authorize the injection of CO_2 since it is the only permissible GHG substance.

The legislation will only apply to offshore areas that fall within Australia's jurisdiction. For the purposes of the legislation these are areas that lie beyond three miles of the coast or appropriate baselines.

3.0 The Proposed Tenure Scheme for Greenhouse Gas Storage

The legislation creates three main tenure forms for GHG storage operations. These are: (1) a GHG assessment permit; (2) a GHG holding lease; and (3) a GHG injection licence. In addition there are also three forms of authorizations to permit other exploratory operations on a non-exclusive basis: (1) a GHG search authority; (2) a GHG special authority; and (3) a GHG research consent. The focus in this section is on the first three forms of tenure. The GHG assessment permit is a short-term exploration interest. Permits are issued based on a competitive bidding process (work-bid or cash-bid). The GHG holding lease is designed offer some security to an explorer who has obtained a declaration of an identified GHG storage formation but who has yet to identify a source of GHGs. The GHG injection licence is the only tenure form that permits GHG injection for other than evaluative reasons. It is the functional equivalent of a production licence in a petroleum disposition scheme.

The three forms of tenure need not be held sequentially. In particular, an operator might proceed directly from the GHG assessment permit to the GHG injection licence. The tenure scheme is underpinned by a series of prohibitions. The legislation prohibits the unauthorised exploration (s. 249AC) or injection and storage of substances (s. 249CC) in an offshore area.

3.1 The GHG assessment permit

[18] Readers' Guide, *supra* note 6 at 1.3 and 1.4. Section 447A of the draft legislation provides that regulations can be made to allow other gases to be injected in order to exercise Australia's rights under international law.

The GHG assessment permit deals with the exploration phase of GHG storage development. The process begins with the Minister inviting applications for selected areas. The selection of areas is based on geological potential and takes into account the impacts on the environment and other activities such as fisheries, navigation and defence. Special conditions may be included in the bidding documents.[19] Permits may be granted on the basis of either a work-bid or cash-bid for designated block(s) (ss. 249AJ–249AO and ss. 249 AP-AS).

An applicant for a work-bid permit must describe the proposed work and expenditures, the technical qualifications and advice available to the applicant and its financial resources. In the case of a single applicant the Minister may decide either to offer the block on specified terms and conditions including security requirements or decide to refuse to do so (ss. 249AK, 249JE and 249JF).

Where there are competing applications for a work-bid permit, the Minister may make the offer to the applicant that, in the Minister's opinion, is "most deserving" of the permit based on published criteria. Where the Minister concludes that two or more applicants are equally deserving, the Minister may ask applicants to provide details of proposals for additional work and expenditures and make a decision based on any revised submissions.

The scheme for cash-bids generally tracks the above with the permit being offered to the highest bidder. However, applicants must still provide information as to their technical backgrounds and financial resources and the Minister may reject applications on those grounds. Presumably it is most likely that initially permits will be offered on the basis of the work-bid approach.

An applicant accepting an offer for a permit must comply with the terms and conditions of an offer (s. 249AE) which presumably will track the elements of the bid (work program and expenditure levels). In contrast, cash-bid permits cannot include conditions requiring the permittee carry out work or prescribing an amount the permittee

[19] Regulation Impact Statement, *supra* note 6 at 12.

is required to spend on the work. Both work-bid and cash-bid permits are subject to the condition that the permittee will only carry out "key GHG operations" (a defined term, discussed below in section 5.1) with approval and that they will comply with directions from the Minister.

In addition, both types of permits may be subject to the condition that the applicant lodge security.[20] The legislation does not specify the form of the security or the circumstances in which security may be required. It is not currently the practice to request security for off-shore petroleum permits; however, the Australian experience has shown that there is a significant risk that commitments to decommission and rehabilitate sites will not be met for on-shore mining and petroleum.[21] Those industries are often required to post financial bonds or guarantees for site rehabilitation at the commencement of a project. Since CCS is a new industry with a relatively high degree of uncertainty, security may be required more often for this type of off-shore activity. Failure to lodge the required security will cause the offer to lapse (s. 249JGAA).

Once an offer is made, the Minister must grant the GHG assessment permit provided the applicant made a request within the applicable time, has lodged any required security and, in the case of a cash-bid, paid the amount specified in its bid (ss. 249AM and 249AS). Once granted, a permit is valid for six years (s. 249AH) subject to extension where the permittee applies for a declaration of an identified GHG storage formation, a GHG holding lease or a GHG injection licence (ss.249AHA and 249AI).

The assessment permit (s. 249AD) grants the permittee the right within the permit area: (a) to explore for a potential GHG storage formation; (b) to explore for a potential GHG injection site[22]; (c) to inject GHGs into a part of a geological formation for appraisal purposes; (d) to store GHGs on an appraisal basis;[23] (e) to inject, air, water or

[20] There are provisions covering additional or new security (s. 249NCA), transfers of security (s. 249NCB) and discharge of security (s. 249NCC).
[21] Regulation Impact Statement, *supra* note 6 at 29.
[22] A potential GHG injection site is defined as a suitable offshore place to make a well or wells to inject a GHG substance into a part of a geological formation, s. 15C.
[23] The draft legislation states in relation to both (c) and (d) that the well in each case must be situated in the permit area.

petroleum on an appraisal basis; (f) to store the same substances on an appraisal basis; and (g) with the written consent of the Minister, recover petroleum in the permit area for appraisal purposes where such petroleum was discovered but such petroleum once recovered does not become the property of the permittee (s. 249AD(3)).

The next phase of the process is to obtain a declaration of an identified GHG storage formation (s. 249AU).[24] After a declaration has been obtained, the permittee has two options – to seek a GHG holding lease or a GHG injection licence. Each will be discussed in turn.

3.2 The GHG holding lease

The GHG holding lease is designed to allow the holder of a GHG assessment permit (s. 249BH) who has obtained a declaration of an identified GHG storage formation wholly within the permit area, but who has yet to secure a source of GHGs for injection purposes, to hold on to the lands for a limited period of time while it tries to secure such a source.[25]

The Minister must offer a GHG holding lease to the applicant for one or more blocks within the permit or licence area for those areas for which there is a declaration of an identified GHG storage formation and where the applicant does not have a source of GHG currently available for injection but expects to be able engage in GHG injection within 15 years (ss. 249BI and 249BN). Otherwise the Minister must refuse the application (ss. 249BJ and 249BP).

For assessment permit holders the application period is 12 months from the time of a declaration of an indentified GHG storage formation (s. 249BH).[26] Once a GHG holding lease is granted, the GHG assessment permit ceases to be in force. For injection licence holders, the application period is the period of 5 years from the time the licence

[24] The declaration of an identified GHG storage formation is discussed in section 4.0 of this Part of the paper.
[25] GHG holding leases are also available to holders of GHG injection licences who do not have a source of GHGs for injection (s. 249BN).
[26] A longer period of not more than 180 days may be allowed on written application.

was granted. Once a GHG holding lease is granted, the GHG injection licence ceases to be in force (s. 249BR) and the GHG holding lessee would need to re-apply for an injection licence at an appropriate time in the future.

The legislation confers the same rights on a holder of a GHG holding lease as are conferred on the holder of a GHG assessment permit including all exploration rights (s. 249BB). This gives a holder of a GHG holding lease the ability to continue to explore for additional storage formations which can be declared as new identified GHG storage formation. A GHG holding lease is also subject to similar conditions as those for an assessment permit including requiring approval to carry out "key GHG operations", specifying the work to be done in the lease area, specifying the amount the lessee must spend in carrying out such work, requiring the lessee to comply with directions from the Minister and possibly requiring the lessee to lodge security (s. 249BC).

A GHG holding lease remains in force for 5 years and can be renewed once (ss. 249 BF and BT). If all the conditions of the lease and the legislation have been complied with, and the applicant is not in position to inject or store a GHG substance, but is likely to be able to do so within 15 years, the Minister must grant a renewal (s. 249BU).[27] If the lessee is not in full compliance the Minister has more discretion (s. 249BV) but the Minister must refuse the renewal if satisfied that the applicant actually is in a position to inject and store a GHG substance. The Minister may extend a holding lease if the lessee applies for a special GHG holding lease or a GHG injection licence (s. 249BG).

A *special GHG holding lease* is available to an applicant for a GHG injection licence (s. 249BSA) whose application is denied on the basis that there is a significant risk that the operations that could be carried on under the injection licence will have a significant adverse impact on petroleum exploration or recovery operations (as described in s. 249CI). In such a case the Minister must grant a special GHG holding lease (s. 249BSC).[28] The special GHG holding lease has an indefinite duration (s. 249BF) and the

[27] Note that the lease is in force for a maximum of 10 years although theoretically the lessee has 15 years to acquire a source of GHG.
[28] The application must be made within 90 days of rejection.

original GHG assessment permit or ordinary GHG holding lease cease to be in force when the special GHG holding lease is granted (ss. 249BSD and 249BSE).

A holder of a special GHG holding lease may be requested to apply for a GHG injection licence (s. 249BZB) within two years of the notice failing which the Minister may cancel the special holding lease.

In summary the GHG holding lease is designed to protect the investor who makes the initial investment to identify a storage site but cannot secure a CO_2 source. The risk that that such a lessee will hold the interest speculatively is reduced by the ability of the Minister to refuse to renew the lease. The special holding lease is but one example of how the legislation seeks to balance storage interests and petroleum interests.

3.3 The GHG injection licence

The final stage in the tenure scheme is the GHG injection licence. An injection licence authorizes the licensee to carry out operations for the injection and permanent storage of a GHG substance in an identified GHG storage formation located in the licence area.

The GHG injection licence confers both exploration rights and storage rights. The licensee has the same exploration rights as those conferred on the assessment permittee and the holding lessee (s. 249CD). This allows the GHG injection licensee to continue to explore for additional storage formations which can be declared as new identified GHG storage formations. The additional and crucial injection rights conferred by the legislation are the right (a) to inject a GHG substance into an identified GHG storage formation, and (b) to permanently store a GHG substance in an identified GHG storage formation.

Injection licences are subject to the condition that the licensee will not inject or permanently store a GHG substance unless: (a) the identified GHG storage formation is specified in the licence; (b) the kind of GHG substance is specified in the licence; (c) the GHG substance complies with all requirements as specified in the licence; (d) the origin(s) of the GHG substance are as specified in the licence; (e) the GHG substance is

injected during the period specified in the licence; (f) the total amount injected does not exceed the amount specified in the licence; (g) the rate of injection is as specified in the licence; and (h) where engineering enhancements are required, those engineering enhancements have been made (s. 249CE). None of the matters specified in the injection licence can be inconsistent with the "fundamental suitability determinants"[29] of the identified GHG storage formation.

Injection licences are also subject to other conditions including conditions related to lodging security (in a similar manner as for assessment permits and holding leases), and third party access (if established by regulation). The Minister may impose more conditions through a variation of the licence at any time by giving written notice.[30]

A GHG injection licence has indefinite duration (s. 249CF) but is subject to termination if there are no operations to inject a GHG substance for a continuous period of five years (s. 249CG). If during this five year period there are circumstances beyond the licensee's control or if the licence is suspended under the Minister's power to protect petroleum discovered in an area, that time is not counted in the five year period. The Minister must consult with the licensee before terminating the licence.

3.3.1 Application by a holder of a GHG assessment permit or GHG holding lease

A GHG title-holder can apply for a GHG injection licence if either a GHG assessment permit or a GHG holding lease is in force for the area and one or more identified GHG storage formations is located wholly in the title area (s. 249CH). The application must set out the items the licensee wants specified as conditions, e.g. the type and origin of the GHG substance. The requested conditions must be consistent with the fundamental suitability determinates of the indentified GHG storage formation. In addition, the application must be accompanied by a draft site plan for each identified GHG storage formation, the details of the proposed work, the expenditure by storage formation, the technical qualifications and advice available to the applicant and its

[29] This is a defined term, see note 38.
[30] The Minister may also, by written notice, may vary or revoke these additional conditions at any time.

financial resources. The regulatory issues associated with the requirements for site plans and site closure are dealt with in greater detail in section 6.0 of this Part.

The Minister must (subject to a consideration of the proposed licensed operations on petroleum interests[31]) make an offer if satisfied that the applicant will commence injection within five years, the application includes an approved site plan and the applicant has adequate technical qualifications, advice and financial resources.[32]

3.3.2 Application by a holder of a production licence

It is also possible for the holder of a production licence to apply for a GHG injection licence if there is no existing GHG title in force over the licence area (s. 249CQ). The application process is the same as for GHG title holders but the Minister has the discretion as to whether or not to grant the application (s. 249CR) and in this case all of GHG substance proposed to be injected *must be obtained as a by-product of petroleum recovery under the licence*)[33]. The grant of the injection license is again subject to a consideration of the proposed licensed operations on petroleum interests although the criteria are slightly altered.

3.3.3 Consideration of GHG licence activities on petroleum interests

Both application by the holder of a GHG tenure and the holder of a petroleum production licence are subject to consideration of the impact on petroleum interests. The test used in the legislation is whether the Minister is satisfied that there is a significant risk that any

[31] This is discussed in section 3.3.3 and in greater detail in section 5.2 of this Part.
[32] The usual precondition to posting required security applies (s. 249CJA). The underlying GHG assessment permit or GHG holding lease ceases to be in force when the injection licence is granted (s. 249CO).
[33] This suggests that this form of tenure is designed to deal with the type of project Sleipner and Snohvit encountered on the Norwegian shelf where the methane stream is contaminated with a high proportion of CO_2. It would not appear that a production licensee can use this technique to cross over from an enhanced oil recovery operation to a disposal operation, online: <http://www.statoil.com/statoilcom/SVG00990.NSF?OpenDatabase&lang=en>.

operations that may be carried out under the GHG injection licence will have a significant adverse impact on petroleum exploration or recovery operations.[34]

If the Minister is so satisfied and where there is an existing *post-commencement*[35] petroleum permit or lease or a future *post-commencement* production licence (to which an existing post-commencement permit or lease relates), and

- if the applicant is a holder of production licence, the Minister *may* offer the GHG injection licence if the Minster is satisfied the grant is in the public interest or if the petroleum title-holder has agreed in writing to the grant of the GHG injection licence;

- if the applicant is a holder of a GHG permit or lease, the Minister *must* offer the GHG injection licence if the Minster is satisfied that the grant is in the public interest.

In all other situations such as an existing or future *pre-commencement* petroleum title or an existing production licence the Minister must look at whether there is agreement by the petroleum title holder to the grant of the GHG injection licence.[36] If there is an agreement, and if the applicant is a holder of a GHG permit or lease, the Minster *must* offer the GHG injection licence. If the applicant is a holder of a production licence, the Minister has the discretion to offer the injection licence.

3.3.4 Other conditions applying to both

In both cases, a GHG injection licence can be varied at the request of the licensee at any time provided the varied matter is not inconsistent with the fundamental suitability

[34] If the applicant is the holder of a GHG permit or lease where there is a pre-commencement title in an area that contains petroleum (where the recovery meets the commercial viability test) and the Minister is satisfied that there is *no* significant risk that any operations that may be carried out under the GHG licence will have a significant adverse impact on petroleum exploration or recovery operations, the Minister must give the applicant an offer for a GHG injection licence, 249CI(1)(f) and 249(2)(f). The commercial viability test is where the recovery is currently commercially viable or likely to become commercially viable within 15 years, 249CI(5).

[35] This is a defined term. See section 5.0 of this paper for a discussion of post- and pre-commencement titles.

[36] The agreement must also comply with Part 3.6 of the *Offshore Petroleum Act* 2006 or would likely be approved under Part 3A.6. Both parts concern approval of dealings (other than a transfer of a title) such as the creation or assignment of a right or interest. This qualifier applies to all agreements under the draft legislation.

determinants of the identified GHG storage formation (s. 249CT). In that situation, the variation is at the Minister's discretion. If, however, a declaration is varied for an identified GHG storage formation, the Minister must vary the matter in the GHG injection licence to remove the inconsistency.

3.4 Conclusions

The draft legislation offers a three-tiered GHG tenure scheme modelled on the current petroleum regime. The tenure scheme is sensitive to the need to protect existing (pre-commencement) petroleum titles and that issue is explored further in section 5.0 of this Part.

4.0 Storage Formations

Running parallel with the three forms of tenure is a set of three categories of storage formations: (1) potential, (2) eligible or (3) identified. Each category is associated with the increased knowledge of the geological formation that is proposed for injection and storage. While a tenure holder may inject GHGs into potential and eligible formations for appraisal purposes, approval for injection for permanent storage requires that there be a declaration of an identified GHG storage site. It is the third of these classifications then that is of the greatest legal significance.

4.1 A potential GHG storage formation

A potential GHG storage formation is a part of a geological formation that is suitable or that may be suitable for the permanent storage of a GHG substance (s. 15A). A GHG title-holder who reasonably suspects that a geological formation could be an eligible GHG storage formation is required to notify the Minister (s. 249NA).

4.2 An eligible GHG storage formation

An eligible GHG storage formation is a part of a geological formation that is suitable, with or without engineering enhancements, for the permanent storage of a particular amount (at least 100,000 tonnes) of a particular GHG substance injected at a

particular point or points over a particular period (s. 15B). A GHG title-holder (of a permit, lease or licence) who reasonably believes that the title area contains an "eligible GHG storage formation" that is wholly situated in the title area may apply for a declaration that the formation is an identified GHG storage formation under s. 249AU.

4.3 An identified GHG storage formation

A declaration of an identified GHG storage formation is a core document that specifies the activities that can be carried out under a GHG injection licence (the activities are controlled through licence conditions that match the matters in the declaration).[37] Because of its role in determining allowable injection activities and the integrity of the storage system, the declaration retains its significance over the life of the CCS project. Under s. 249AUB, the Minister may only revoke a declaration of an identified GHG storage location, subject to consultation with the title-holder, if the Minister is satisfied the formation is no longer an eligible GHG storage formation.[38]

An application for a declaration must set out the applicant's reasons for believing the formation is an eligible GHG storage formation, the proposed spatial extent of the eligible GHG formation, the proposed fundamental suitability determinants and any other relevant matters.[39] The Minister may require the applicant provide additional information or analysis to support the application. Where the Minister is satisfied that the formation is an eligible GHG storage formation (using the fundamental suitability determinants) and that the estimate of the spatial extent is reasonable (in order to determine the size of the injection licence), the Minister *must* make the declaration sought including specifying the

[37] Reader's Guide, *supra* note 6 at 4.3. The declaration corresponds to the declaration of a petroleum location.
[38] Compare this with the *Offshore Petroleum Act* 2006, s. 110, where revocation of a location is required if the block(s) are no longer subject to an exploration permit, a retention lease or a production licence.
[39] Fundamental suitability determinants are used in the determination of the spatial extent of an eligible GHG storage formation. They include the particular GHG substance, amount of GHG substance injected, point or points of injection, period of injection, engineering enhancements (if applicable) and the effective sealing feature, attribute or mechanism that enable permanent storage (s. 15B). The spatial extent is the expected migration path or pathways of the particular amount and GHG substance injected (s. 15B) using assumptions specified in the legislation.

final fundamental suitability determinants and spatial extent of the indentified GHG storage formation.

In conclusion, the concept of an identified storage formation forms a crucial part of permitting a storage operation and in particular it controls the areal extent of any injection licence which is to be issued.

5.0 Reconciling Petroleum and Storage Interests

The need to reconcile the potentially competing petroleum and storage interests is a significant feature of the Australian legislation. The Regulation Impact Statement recognizes that essentially all of Australia's offshore potential CCS areas are subject to existing petroleum titles.[40] The Readers' Guide emphasises that there was a policy decision to give a high level of protection to pre-commencement petroleum title-holders.[41] A pre-commencement petroleum title is an exploration permit, retention lease or production licence that is in force at the time when the amendments commence including any successor interest (s. 6[62]). A post-commencement petroleum title is an exploration permit, retention lease, or production licence granted after the amendments commence and which is not a successor interest.

In addition to protecting these pre-commencement interests the legislation also provides a scheme for considering the effect of storage interests on petroleum interests and vice versa.

The principal mechanisms that the legislation adopts to meet these policy goals are as follows: (1) a scheme for the prior approval of key GHG operations; (2) consideration of petroleum interests when granting a GHG injection licence; (3) consideration of GHG interests when granting a petroleum licence; (4) a scheme for the prior approval of key petroleum operations in certain circumstances; and (5) directions to protect petroleum interests.

[40] Regulation Impact Statement, *supra* note 6 at 30.
[41] Reader's Guide, *supra* note 6 at 1.7.

5.1 Approval for Key GHG Operations

A GHG assessment permit or GHG holding lease does not in itself authorize any particular operations (ss. 249AF and 249BD). Permittees and lessees require the approval of the Minister before carrying out any key GHG operations.[42] Before granting such an approval the Minister must have regard to the impact any such key GHG operation might have on petroleum exploration or recovery operations that are being (or could be) carried out either under existing petroleum tenures or under future petroleum tenures.

Where the Minister is satisfied that there is a significant risk that a key GHG operation will have a significant adverse impact on petroleum operations under an *existing* petroleum tenure, the Minister must have regard to whether the petroleum tenure holder has agreed in writing to the GHG operations and if so the terms of such an agreement. Similarly, if the Minister is satisfied that there is a significant risk that any of the key GHG operations will have a significant adverse impact on petroleum operations under a *future* petroleum tenure (where an underlying existing tenure is in force) the Minister must have regard to whether the petroleum tenure holder has agreed in writing to the GHG operations and if so the terms of such an agreement. In these situations, the presence or absence of an agreement is not determinative and the Minister must have regard to the public interest in determining whether to grant the approval.

The rule is much harder in three cases: (1) the case of any existing pre-commencement *petroleum title*; (2) the case of an existing post-commencement *production licence*; and (3) the case of a future pre-commencement title (where there is an existing pre-commencement title in force). In such cases and where the Minister is satisfied that there is a significant risk that any of the key GHG operations will have a significant adverse impact on petroleum operations the Minister *must not* give an approval unless there is an agreement in place (that satisfies the Minister) between the

[42] A key GHG operation includes making a well, injecting or storing, on an appraisal basis, a GHG or air, petroleum or water in a geological formation, carrying out a survey, monitoring the behaviour of a substance stored in a geological formation, carrying out baseline investigations, taking samples of the seabed or subsoil of an offshore area or any operation specified in the regulations (s. 6 [44]).

petroleum title-holder and the GHG title-holder regarding the key GHG operation. In these circumstances there is no room for the Minister to make a decision based on public interest.[43]

In summary, the existence of any petroleum title will always be a relevant consideration for the Minister in deciding whether or not to authorize significant GHG activities. However, in the case of an existing or future pre-commencement title or a post-commencement licence the petroleum title-holder has an effective veto on GHG activities where the Minister is satisfied there is a significant risk of significant impact.

5.2 Consideration of petroleum interests when granting a GHG injection licence

As we have already seen the crucial tenure required before commencing commercial injection operations is the GHG injection licence. But prior to granting such a licence the Minister must once again have regard to the effect that any operation carried out under the terms of the licence would have on petroleum operations (s. 249CI and 249CR). And once again the legislative scheme accords particular protection to certain interests.

The relevant section is structured in an interesting way.[44] Rather than stating the petroleum tenure grounds on which the Minister should *reject* a GHG injection licence it stipulates the grounds on which the Minister is *obliged to grant* such a licence and then goes on to provide that if the application falls outside one of these classes of application then the Minister *must reject* the application.

The circumstances in which the Minister *must give* the applicant an offer document embrace the following situations:[45]

[43] Unless, that is, the public interest is able to inform the Minister's assessment of the adequacy or otherwise of the agreements.
[44] The criteria for decision making are slightly different, and the decision is discretionary, in the case where the applicant is a petroleum licensee, see section 3.3.2 above.
[45] Section 249CI(1) governs applications made by a permittee; subs.(2) governs applications made by a GHG holding lessee.

- where there is an existing *post-commencement* petroleum permit or lease or a future *post-commencement* production licence (to which an existing post-commencement permit or lease relates) and the Minister is satisfied that there is a significant risk that any of the operations that may be carried out under the licence will have a significant adverse impact on petroleum exploration or recovery operations *but* where, notwithstanding all of this, the Minister is satisfied that granting the GHG injection licence is in the public interest[46];

- where there is an existing *pre-commencement* petroleum title or an existing production licence (held by someone other than the applicant) and the Minister is satisfied that there is a significant risk that any of the operations that may be carried out under the licence will have a significant adverse impact on petroleum exploration or recovery operations *and* the petroleum title-holder has *agreed* in writing to the grant of the GHG injection licence[47];

- where the Minister is satisfied that there is a significant risk that any of the operations that may be carried out under the licence will have a significant adverse impact on petroleum exploration or recovery operations under an future *pre-commencement* title *and* the petroleum title-holder has *agreed* in writing to the grant of the GHG injection licence; and

- where the Minister is satisfied that the block which is the subject of the application contains petroleum *and* the area also falls within the area of a production licence or a pre-commencement interest *and* where the recovery meets the commercial viability test[48] *but* where the Minister is satisfied that there is no significant risk that any operations that may be carried out under the licence will have a significant adverse impact on petroleum exploration or recovery operations.

[46] In determining the public interest, the Minister must have regard to whether there is an agreement in place between the parties and the terms of that agreement (s. 249CI(5)) but the Minister is not limited by that agreement.
[47] The agreement must also comply with Part 3.6 of the *Offshore Petroleum Act* 2006 or would likely be approved under Part 3A.6. Both parts concern approval of dealings (other than a transfer of a title) such as the creation or assignment of a right or interest. This qualifier applies to all agreements under the draft legislation.
[48] The commercial viability test is where the recovery is currently commercially viable or likely to become commercially viable within 15 years, s. 249CI(5).

If none of these conditions can be met and the Minister is therefore not required to give the applicant an offer document for a GHG injection licence under the terms above, then Minister must refuse to grant the application (s. 249CJ).[49]

The Minister can defer the decision for a GHG injection licence in situations where an application for a post-commencement exploration permit is being considered (s. 249CJA).

In summary the scheme protects all pre-commencement interests and existing production interests by insisting that they agree to the grant of an injection licence where significant risk has been identified before the injection licence can be issued. Post-commencement petroleum interests will not be entitled to the same degree of protection if the Minister's assessment of the public interest puts CCS ahead of the petroleum interest.

5.3 Consideration of GHG interests when granting a petroleum licence

In the case where there is an application for a post-commencement production licence and the *Joint Authority*[50] is satisfied there is a significant risk that operations under that licence will have a significant adverse impact on operations that are being, or could be, carried out under a GHG assessment permit or GHG holding lease, the Joint Authority may only grant the production licence if it is satisfied that to do so is in the public interest (s. 145(d)). The same test applies where there is an identified GHG storage formation in the area of interest (under an assessment permit or holding lease) and the Joint Authority is satisfied there is a significant risk that operations under the post-commencement production licence will have a significant adverse impact on operations that could be carried out under a future GHG injection licence. If the production licence is not in the public interest (taking into account any agreement between the parties, s. 146(6)) the Joint Authority must refuse to grant the application (s. 146(4B)).

[49] Although as we have seen such a party might be able to apply for a special holding licence (s. 249BSA).
[50] The Joint Authority refers to the joint state\Commonwealth authority responsible for the administration of the offshore petroleum legislation.

The test is different in situations where there is a GHG injection licence. In that case, if the Joint Authority is satisfied there is a significant risk that operations under that licence will have a significant adverse impact on operations that are being, or could be, carried out under a GHG injection licence, the Joint Authority can only grant the production licence if the holder of the injection licence has agreed to the production licence (s. 145(e)). Otherwise, the Joint Authority must refuse to grant the production licence (s. 1464C).

Finally, the Joint Authority may defer taking action on an application for a production licence if there is a pending application for a GHG assessment permit if the production licence is a post-commencement licence and the application for the permit was first in time (s. 146A).

5.4 Approval for Key Petroleum Operations

Further protection is provided to holders of existing GHG interests in competition with certain post-commencement exploration permits, retention leases or production licences provided that the Minister has first determined that the petroleum interest is "a declared interest". Once this occurs, the holder of the petroleum interest must obtain approval before undertaking any key petroleum operations.[51]

A declaration of a petroleum interest occurs as part of setting the conditions for a petroleum exploration permit, retention lease or production licence (ss. 79, 114 and 138). If a post-commencement exploration permit is in force and the Minister is satisfied that there is a significant risk that any of the key petroleum operations that could be carried on under the permit will have a significant adverse impact on the injection or storage of a GHG substance under an existing or future GHG interest, the Minister *may* determine the permit is a declared exploration permit (s. 79B). The case is similar where a post-commencement retention lease or production licence is in force; however, in those

[51] A key petroleum operation includes making a well, injecting or storing a substance into a geological formation, carrying out a survey, monitoring the behaviour of a substance stored in a geological formation, taking samples of the seabed or subsoil of an offshore area or any operation specified in the regulations (s. 6 [45]).

situations the Minister *must* determine the lease is a declared retention lease (s. 114B) or the production licence is a declared production licence (s. 138B).

Once a petroleum interest becomes a declared interest, the holder of the interest must obtain approval prior to carrying on any key petroleum activities (ss. 79, 114 and 138). An approval allowing a key petroleum operation to proceed may include conditions that vary the petroleum permit, lease or licence. In particular, there might be a condition requiring that any or all wells be drilled so as to facilitate plugging or closing off in a way that restores or maintains the suitability of a geological formation for the permanent storage of GHGs.

Where the Minister is satisfied that there is a significant risk that a key petroleum operation will have a significant adverse impact on the injecting or storage of a GHG substance under an *existing* GHG tenure, the Minister must have regard to whether the GHG tenure holder has agreed in writing to the petroleum operations and if so the terms of such an agreement (ss. 79A, 114A and 138A). Similarly, if the Minister is satisfied that there is a significant risk that any of the key petroleum operations will have a significant adverse impact on the injecting or storage of a GHG substance under a *future* GHG tenure (where an underlying existing tenure is in force) the Minister must have regard to whether the petroleum tenure holder has agreed in writing to the GHG operations and if so the terms of such an agreement. In these situations, the presence or absence of an agreement is not determinative. The Minister must have regard to the public interest in determining whether to grant the approval.

The Minister must not grant approval for a key petroleum operation where the Minister is satisfied that there is a significant risk that any of the key petroleum operations will have a significant adverse impact on the injecting or storage of a GHG substance under an *existing* GHG injection licence unless the holder of that licence has agreed to the key petroleum operation.

The draft legislation contemplates that holders of petroleum production licences would continue to have the ability to inject methane or CO_2 in the licence area for gas

recycling or enhance petroleum recovery. In addition, the holder would continue to have the ability to dispose of methane or CO_2 stripped from the petroleum stream (s. 137(1)(c).

5.5 Directions to protect petroleum interests

The Minister has the power to give a direction in order to protect geological formations containing petroleum (s. 249CXA). The Minister may give a GHG licensee a direction to eliminate, mitigate or manage a risk if operations under the licence could have a significant adverse impact of a geological formation that contains, or is likely to contain, a petroleum pool or would otherwise compromise the exploration of any petroleum. The Minister may prohibit any act or thing either absolutely or subject to conditions. The direction must be complied with despite anything in the regulations, previous directions, the approved site plan or anything in the licence.

The Minister also has the power to protect petroleum discovered in situations where a GHG licence area overlaps, in whole or in part, with the title area of a pre-commencement title and petroleum is discovered in the area of overlap (s. 249CZC). If the discovery is commercially viable (or is likely to become commercially viable) and the Minister is satisfied that there is a significant risk the operations under the GHG injection licence will have a significant adverse impact on operations to recover the petroleum or its commercial viability (and if there is no agreement in place between the parties), the Minister must either: (a) direct the GHG injection licensee to eliminate (if practicable), mitigate, manage or remediate the risk of the operations; (b) suspend all rights under the GHG injection licence (temporarily of indefinitely); or (c) cancel the GHG injection licence.

In both of these situations, the Minister can direct an injection licensee to take action outside the injection licence area (ss. 249CXB and 249CZCA). Prior to giving such a direction, the Minister must notify any person who holds a title over the 'action area' and take into account any submissions that the person might make.

5.6 Conclusions

Since virtually all of Australia's offshore potential CCS areas are subject to existing petroleum titles, the draft legislation dedicates significant attention to creating a complex set of rules to address the potentially competing claims of petroleum interests and GHG interests. The trigger for the operation of these rules is the Minister's assessment that there is a significant risk of a significant adverse impact on one of the interests by the operations of the other interest. The overall approach is to offer firm protection for pre-commencement petroleum interests and existing production licences but to use a public interest approach for post-commencement petroleum interests and GHG interests. While agreements between the relevant parties will be taken into account in the Minister's decision-making process such agreements (if approved) will only be determinative in a smaller group of cases, largely cases involving pre-commencement petroleum interests.

6.0 The regulatory elements of the legislation

The Regulation Impact Statement suggests that Australia had little need to develop specific legislation for some regulatory aspects of the CCS industry such as general environmental approvals and occupational health and safety issues.[52] The draft therefore proceeds on the basis that these issues will be dealt with through laws of general application (such as the *Environment Protection and Biodiversity Conservation Act*[53]) or through modification of more specific rules that have been developed for the petroleum sector (such as in the OH & S (Occupational Health and Safety) area). The Regulation Impact Statement did, however, identify a need for new legislation to regulate two things: (1) the selection and approval of storage sites, and (2) site closure. The proposed legislation therefore contains provisions that address each of these issues. Both are clearly of central importance and it is therefore perhaps a little surprising that, while addressed, the relevant provisions are relatively short. Some further content as well as the reasons for this can be gleaned from the discussion of the site selection and approval issue in the Regulation Impact Statement.

6.1 Site Plan

[52] Regulation Impact Statement, *supra* note 6at 14 – 16.
[53] *Environment Protection and Biodiversity Conservation Act* 1999 (Cht.).

One risk associated with CCS is the potential for unanticipated migration of injected substances and leakage through pathways such as geological faults or improperly abandoned wells. The IPCC and others have emphasised that these risks can be reduced if there is careful site selection and regulatory oversight.[54] The Regulation Impact Statement acknowledged this and also acknowledged that there was no existing regulatory scheme in place although the approval of field development plans for petroleum activities offered a useful analogy.

The need for regulation having been established, the Regulation Impact Statement considered two options: (1) the operator submits plans for the proposed site using outcome oriented criteria, or (2) the regulator develops prescriptive management plans. The Regulation Impact Statement opted for the former largely on the basis that each CCS storage site is unique (e.g. different quantities, injection rates and geology).[55] The vehicle for this in the legislation is the "site plan".

The Regulation Impact Statement offers this description of the site plan:[56]

> Such a site plan would have to demonstrate, to the satisfaction of the regulator, that the site and its management would result in 'safe and secure' storage. The site plan would need to identify risk factors and show that risks had been reduced as low as reasonable practical [*sic*]. The regulator would then have to decide whether these risks, taking into account potential mitigation and remediation strategies, were acceptable.

Further detail is offered in the part of the Regulation Impact Statement dealing with monitoring and verification since the Regulation Impact Statement anticipates that these issues should also be addressed in the plan and for similar reasons (i.e. the site specific nature of such a program):[57]

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[54] Intergovernmental Panel on Climate Change (IPCC), *Special Report on Carbon Dioxide Capture and Storage*, Prepared by Working Group III of the Intergovernmental Panel on Climate Change, B. Metz et al., eds. (Cambridge: Cambridge University Press, 2005) at 12, also available online: <http://www.ipcc.ch/ipccreports/srccs.htm>

[55] *Supra*, note 6 at 18. Keep in mind that only 5-10 projects are expected during the next 5 years.

[56] *Ibid.* at 18.

[57] *Ibid.* at 19-20.

> Monitoring requirements will be highly dependant on site specific factors and is closely related to the detection of and reaction to any incidents that occur, and hence to mitigation and remediation actions that might be required. For these reasons, it would be most efficient if monitoring was integrated with the site plan. Specifically, the proponent could be required to propose a monitoring and verification plan that satisfied the regulator that any serious events in the reservoir would be detected in a timely manner. Timely detection of incidents is essential if any remedial or mitigation action is required.

The Readers' Guide offers further detail:[58]

> The site plan will form the basis for the day-to-day regulatory interaction between the GHG injection licensee and the regulator (the delegate of the responsible Commonwealth Minister). The site plan will keep the regulator informed, at an appropriate level of detail, of:
>
> - the geological attributes or features of the storage formation;
> - current and proposed injection and storage operations;
> - the operations and techniques to be used by the licensee to monitor and verify the behaviour of the greenhouse gas over the life of the project;
> - operations management systems, including processes for identification, assessment and management of risks; and
> - predictions as to the short, medium and long term behaviour and fate of the greenhouse gas in the identified storage formation and associated geological formation(s).

With this background we can now turn to see how the concept of the site plan is reflected in the draft legislation.

The draft defines a site plan as follows:[59]

> For the purposes of this Act, a ***site plan***, in relation to an identified greenhouse gas storage formation, is a document that:
>
> (a) relates to the identified greenhouse gas storage formation; and
>
> (b) complies with such requirements as are specified in the regulations; and
>
> (c) is divided into the following parts:
>
> (i) Part A, which sets out predictions for the behaviour of a greenhouse gas substance stored in the identified greenhouse gas storage formation;
>
> (ii) Part B, which deals with other matters.

[58] Reader's Guide, *supra* note 6 at 6.4
[59] Section 15E.

The legislation operationalizes this definition in the provisions of the draft dealing with an application for a GHG injection licence. As already noted above, an application for a GHG injection licence must, *inter alia*, be accompanied by "a draft site plan for the identified GHG formation or draft site plans for each of the identified GHG formations" (ss. 249CH(9) and 249CQ(9)).

One is then left to infer (given the outcome oriented nature of the regulation) that the site plan will then inform the Minister's judgement allowing him or her to make an offer to the applicant upon being satisfied that the applicant will be able to "permanently store the GHG substance in the identified GHG formation, or at least one of the identified GHG formations, concerned" (s. 249CI(1)(b)) The Minister must also be assured that the site plan meets the requirements of the regulations (s. 249CI(1)(h)).

Further provisions in the draft deal with subsequent amendments of site plans but perhaps more significantly the site plan can also be used to trigger or identify the need for some remedial action under s. 249CZ and subsequent sections that deal with "serious situations". One of the examples of a "serious situation" is where the injected GHG substance is behaving other than as predicted in the approved site plan or there is a risk of it doing so.

The approved site plan also serves as a crucial part of the site closing approval process as we shall see insofar as one of the grounds on which the Minister may refuse to give an operator a "pre-certificate notice" (of site closing) is the case where the Minister is not satisfied that the injected GHG substances are performing as predicted in the approved site plan (s. 249CZF(4)). In addition, s. 316-311A(2)(g) (dealing with the power of the Minister to issue site closing directions) contemplates that the Minister may give directions to the licensee requiring it to undertake activities to ensure or increase the likelihood that the injected GHG will behave as predicted in the site plan.

The procedures for actually approving a site plan are left to be further developed in the regulations (s. 249ND).[60] Somewhat surprisingly the same section also contemplates that the regulations *may* provide that a GHG injection licensee must not carry out any operations in relation to an identified storage formation unless an approved site plan is in force and the operation complies with the site plan (s. 249ND). The regulations may also require that the site plan be updated periodically especially whenever there is a material change in the level or kind of risk. Once a site plan is approved the site plan remains in force indefinitely unless withdrawn (s. 249ND).

In summary the site plan is a crucial element of the regulatory approvals that a licensee will require before commencing operations. Each site plan will be specific to a particular site but will be aimed at providing assurance that the licensee will be able to permanently dispose of GHG substances in the manner outlined in the application.

6.2 Site Closure

At some point injection and storage operations will cease and the injection licensee will need to close the site. The legislation suggests that there are 6 steps. First, the injection licensee applies for a site closing certificate including a proposal for a monitoring and verification program to be conducted by the Commonwealth. Second, the Minister may issue extensive site closing directions. Third, the Minister responds to the application by indicating that s\he is prepared to issue a site closing certificate. Other options include refusing to issue the certificate or deferring that decision (s. 249CZFA). The pre-certificate notice is the functional equivalent of an offer as used elsewhere in the statute. Fourth, the licensee posts security to cover the costs of monitoring and verification program. Fifth, the Minister issues the certificate. Sixth, the licence can be surrendered.

6.2.1 The Application

[60] The regulations relating to site plans will be modeled on existing regulations under the *Petroleum (Submerged Lands) Act 1967*/*Offshore Petroleum Act 2006* such as the *Petroleum (Submerged Lands) (Management of Safety on Offshore Facilities) Regulations 1996*, Readers' Guide, *supra* note 6 at 6.3.

The closure process begins either with a voluntary or mandatory application for a closing certificate (s. 249CZE). A mandatory application is required in two instances: (a) where operations for injection have ceased, and (b) where the GHG injection licence has been cancelled under Part 2A.11. In the first instance the licensee has 30 days to make the application (unless a longer period up to 90 days is granted) while in the second instance, the licensee has the period contained in the notice which cannot be shorter than 30 days.

An application must be accompanied by a written report that sets out the applicant's modelling of the GHG plume and an assessment of the behaviour of the plume including the expected migration pathway, the short- and long-term consequences of the migration and the applicant's suggested approach for long-term monitoring of the plume to be undertaken by the Commonwealth once the closing certificate has been issued.

6.2.2 Site Closing Directions

Once an application is received the Minister may give "site closing directions" to the licensee (s. 316-311A)[61]. These directions may be very far reaching (and expensive) and may include such things as:

- removal of equipment;
- plugging of all wells (whether drilled by the licensee or not);
- provide for the conservation and protection of natural resources;
- make good any damage to the seabed or subsoil;
- monitoring requirements;
- measures to eliminate, mitigate, manage or remediate the risk that stored substances will have a significant adverse impact on a variety of interests and values including navigation, fishing, conservation of natural resources, the environment; and

[61] The Minister may also issue such directions where the licensee has failed to make such an application but should have done so.

- measures to ensure or increase the likelihood of the plume behaving as predicted.

The Readers' Guide emphasises the potentially far-reaching nature of these orders noting that a licensee might be required:[62] "to carry out remedial work on the storage formation and the post site closing migration path, including outside the injection licence area, in order to prevent (eg) escape of GHG substances into the atmosphere or unacceptable effects on other resources. For example, an injection license might be directed to plug abandoned petroleum exploration wells, whether in the injection licence area or outside it, if modelling shows that they are in the projected migration path of the injected GHG."

6.2.3 Pre-certificate Notice

Once the licensee has met the site closing directions the Minister may give the applicant a written notice (the pre-certificate notice) stating that the Minister is prepared to issue a site closing certificate (s. 249CZF). The Minister must have regard to any significant risk that the GHG plume will have a significant adverse impact on navigation, fishing, other lawful construction or operation of a pipeline, or the enjoyment of native title rights.

The Minister may refuse an application if the Minister is satisfied that the plume is not behaving as predicted or there is a significant risk the GHG plume will have a significant adverse impact on: (a) the conservation or exploration of natural resources (offshore or elsewhere); (b) the geotechnical integrity of the geological formation or structure; (c) the environment; or (d) human health or safety. If the relevant statutory requirements or conditions (outlined in the licence or the legislation) have not been complied with, the Minister must not issue the pre-certificate notice. The Minister may defer the decision until such time as the Minister considers appropriate (s. 249CZFA).

6.2.4 Lodging Security

[62] Readers' Guide *supra* note 6 at 7.9.

A pre-certificate notice must specify a program of monitoring to be performed by the Commonwealth including an estimate of the total cost and expenses to carry out the monitoring program (s. 249CZGAA). The applicant must lodge the security (which is equivalent to the estimated costs) within 60 days (or up to 180 days upon written approval by the Minister) of receiving the notice or the application will lapse.

6.2.5 Granting the certificate

Once the security is lodged (s. 249CZA) the Minister must grant a closing certificate. A site closing certificate remains in force indefinitely (s. 249CZJ) and is automatically transferred with the licence (s. 249CZJA). There is nothing in the legislation to suggest that the issuance of a closing certificate eliminates future liability on the part of the licensee. The costs that the Commonwealth incurs in carrying out the monitoring program under the site-closing certificate are a debt due to the Commonwealth and recoverable in a court of competent jurisdiction (s. 249CZM).

6.2.6 Surrender of the licence

A GHG injection licence may be surrendered in whole or in part under Part 2A.10.[63] If the applicant has paid all fees, complied with all conditions under the licence and key parts of the legislation and regulations, removed all property, plugged or closed all wells, provided for the conservation and protection of the natural resources in the surrender area, made good any damage to the seabed or subsoil, and if the applicant holds a site closing certificate in relation to the block(s) in the surrender application, the Minister must not unreasonably refuse consent to the surrender (s. 249LB). The Minister may still give consent even if there has been non-compliance with the conditions of the licence or under the legislation or regulations.

6.3 Conclusions

Site licensing and site closure are two essential elements for a CCS regulatory scheme. Both regulatory issues are dealt with through the use of a site plan that is linked

[63] Assessment permits and GHG holding leases can only be surrendered in whole.

to the specific indentified GHG storage formation. The approach is outcome oriented in that the overall goal is to achieve 'safe and secure storage' in a formation. Site closure builds on the site plan requiring a program (and funding) for long-term monitoring and verification by the Commonwealth.

The drafters of the legislation clearly opted for an outcome oriented approach to regulation and thus the legislation offers little detailed guidance (especially with respect to the site plan). Both the EU and the IOGCC have opted for a greater degree of prescription at least as to the content of the relevant documents.[64] Both also envisage that the licensee\operator will be required to provide proposed plans for closure much earlier in the process that seems to be envisaged in the Australian draft.[65]

7.0 Liability Related Issues

Liability can be broken down into short-term and long-term liability. In the Australian system short-term liability covers the period of active exploration and injection and the period post-injection until site closure. Long-term liability refers to the liability refers to liability after this. In earlier work[66] we have stressed the importance of unbundling the liability issues so as to, at a minimum, separate out liability for emissions from a (failed) CSS project, liability for harm suffered by others and liability for remedial operations as well as the questions of short-term and long-term liability.

7.1 Liability for emissions from a (failed) CCS Project

[64] EU Draft Directive, *supra* note 8 and esp. Annex I "Criteria for the Characterisation and Assessment of Storage Sites Referred to in Article 4". IOGCC, *supra* note 9 at Appendix II: Model General Rules and Regulations, s. 4.0.
[65] EU Draft Directive, *supra* note 8. Article 7 contemplates that the applicant for a storage permit shall file a proposed provision post closure plan at the time of its application. IOGCC, *supra* note 9. Appendix II: Model General Rules and Regulations, s. 9.0 states the permit holder shall submit a plan prior to the conclusion of the operational period.
[66] Bankes, Poschwatta and Shier, *supra* note 10 at 620.

There is no indication that the draft was intended to deal with this issue. It is far more likely that this issue will be dealt with in any cap and trade legislation that the government eventually puts in place.[67]

7.2 Liability for harm suffered by others

There is no indication that the legislation will create a special liability regime for those who suffer harm as a result of the operation of a CCS project. Liability therefore will continue to be governed in large part by tort laws of general application.

7.3 Liability for abandonment/closure and the lodging of security

It is clear from what we have already said that the injection licensee will be responsible for all of the activities associated with site closure and abandonment. This of course raises the question of whether there will be money on hand for these closure operations since by this time it can be expected that there will be no offsetting revenue stream. This is a generic problem within the extractive industries mitigated somewhat where the same operator may have multiple interests in the same jurisdiction and where it may be possible to access production revenues from property A to pay for costs incurred with respect to the abandonment of property B.

In the absence of offsetting revenue the traditional response of the regulator has been to demand security from the licensee/operator to cover at least the anticipated abandonment/closure costs. The Regulation Impact Statement indicates that to this point the offshore petroleum industry has not been required to provide security for these matters. However, the Regulation Impact Statement also recognizes that with CCS operations there is an increased risk that certain works (in particular decommissioning and site rehabilitation) may not be undertaken.[68] The draft legislation is structured to allow the Minister to require an applicant to lodge security before the Minister issue an assessment permit, holding lease or injection licence (ss. 249AM, 249AS, 249BK and 249CJA). The legislation gives no directions on the discharge of security (except in cases

[67] This is the position within the proposed EU scheme. See the EU Draft Directive, *supra* note 8 at 2.
[68] Regulation Impact Statement, *supra* note 6 at 29.

of withdrawal or lapse of an application), but states this will be dealt with in the regulations (s. 249NCC).

Section 249NCA(1) provides that the Minister can require a GHG title-holder to lodge additional security within 60 days after notification. Subsection (2) allows the Minister to require new security on a title where no security was required if the Minister is satisfied that it would be appropriate in respect to the applicable statutory obligations.[69] Again the security would be due within 60 days of notice.

In addition the draft contemplates that the Minister may require additional security to cover extensive site closing directions given to the licensee (s. 316-311A) at that stage in the abandonment procedure.

7.4 Post-closure monitoring and verification

As discussed earlier, an applicant for a site-closing certificate must lodge security to cover the costs and expenses for the Commonwealth to carry out an approved program of monitoring and verification to be performed by the Commonwealth (s. 249CZGAA). If the estimate is inadequate the Commonwealth can recover any reasonable costs and expenses incurred by Commonwealth in carrying out the monitoring program under the site-closing certificate. The costs are a debt due to the Commonwealth and are recoverable in a court of competent jurisdiction (s. 249CZM). As with permits the legislation gives no directions on the discharge of security in relation to site closing certificates but states this will be dealt with in the regulations (s. 249CZJC).

7.5 Liability for remedial action ("Serious situations")

The liability of an operator to take remedial action is generally based on statute rather than general tort law. We have already seen a number of examples of this above and in particular the "directions" that the Minister can issue to the licensee as part of site closure. But in addition to these examples the legislation also adopts the concept of a

[69] Applicable statutory obligations include the conditions of the title, directions from the Minister or specified provisions of the legislation, s. 249NCA(3).

"serious situation" and provides in general terms that where a serious situation arises the Minister may require a licensee to take action to remediate the problem.

A serious situation exists if: (a) a GHG substance leaks, is leaking or there is a significant risk of leakage from an identified GHG storage formation; (b) a GHG substance leaks, is leaking or there is a significant risk of leakage during injection; (c) a GHG substance injected into an identified GHG storage formation has behaved, is behaving, or there is a significant risk it may behave, otherwise than as predicted in the approved site plan; (d) the injection or storage of a GHG substance has had, is having or there is a significant risk it will have a significant adverse impact on the geotechnical integrity of the geological formation or structure; or (e) the identified GHG storage formation is not suitable (with or without engineering enhancements) for the permanent storage of the GHG substance (s. 249CZ).

If the Minister is satisfied that a serious situation exists in relation to an identified GHG storage formation under a GHG injection licence, the Minister has extensive powers to direct the licensee to undertake activities to eliminate, mitigate, manage or remediate the serious situation including suspending or ceasing the injection or operations (s. 249CZA). A direction for a serious situation trumps and must be complied with despite anything in the regulations, previous directions, the approved site plan or anything in the licence.

7.6 Miscellaneous Liability

If a person is subject to a direction from the Minister and that person breaches the direction, the Minister may do any or all of the things required by the direction (s. 316-308). Any costs or expenses incurred by the Minister in relation to the direction are a debt due by the person in the direction to the Commonwealth and are recoverable in a court of competent jurisdiction. Conduct that breaches a direction is a strict liability offence (s. 316-307) but there are two possible defences. First, if the direction names both the registered title-holder and another person, the other person is not liable unless that person

knew or could reasonably be expected to know of the direction.[70] Second, it is a defence if the person named in the direction took all reasonable steps to comply (a due diligence defence).

7.7 Long-Term Liability

The Regulation Impact Statement considered four options for long-term liability: no new regulation; new regulation under which Government explicitly assumes long-term liability; new regulation where *industry* is required to assume long-term liability; and; new regulation to share long-term liability between government and industry.[71] The "no new regulation" scenario is the status quo for petroleum. The *Offshore Petroleum Act* does not exclude, limit or allocate common law liability for petroleum projects. The Regulation Impact Statement reasoned that under this scenario, title-holders would not be immunized from their common law liability and that over time the risk "would, in a sense, pass to the community because project participants may cease to exist or because of some other time related factor such as availability of witnesses."[72] The Regulation Impact Statement recommends adoption of this approach for CCS projects.

The Regulation Impact Statement rejected the idea that the Commonwealth should assume long-term liability since such an approach would effectively be a subsidy and it is preferable to address the need for a subsidy directly.[73] The Regulation Impact

[70] Directions can be broad. In addition to registered title-holders, they can be given to a specific class of people such as employees, other persons performing work or services for the registered title-holder or anyone in the area or anyone connected to a GHG matter (s. 316-305).
[71] Regulation Impact Statement, *supra* note 6 at 26. This would be a fund approach.
[72] *Ibid.* at 27.
[73] In this respect the position of the Commonwealth government appears to have hardened since adoption of the Australian Guiding Principles, *supra* note 5. At that time (at 41 – 46) the Australian governments appeared to be at least open to the suggestion that it might be necessary\appropriate to adopt some special rules which would see post-closure liability transfer to government. It also implies rejection of the position taken by the Australian House of Representatives Standing Committee on Science and Innovation, *Between a Rock and a Hard Place: The Science of Geosequestration*, (2007), online: <http://www.aph.gov.au/HOUSE/committee/scin/geosequestration/report/fullreport.pdf>. That report suggested a three phase approach to liability: (1) liability during injection and a period after the sole responsibility of the operator; (2) a period of shared responsibility between industry and government, and (3) a period after this in which full responsibility and liability would be transferred to government. For further discussion see the Discussion Paper issued by the Government of Victoria, *A Regulatory Framework for the Long-Term Underground Geological Storage of Carbon Dioxide in Victoria*, esp. at pp. 59 – 62, online:

Statement rejected new regulation to set up a fund to meet liability because it would pose additional costs on industrial participants and would create difficulties in determining the quantum for contributions. Finally, the Regulation Impact Statement rejected shared long-term liability because the mechanisms are unclear; it would require significant new law and could set precedents for policy in other areas.

As a result the draft legislation is completely silent on long-term liability. But the effect of that is to ensure that the default tort rules of the common law apply. The operator will be liable subject to all the usual rules including: (1) the elements of the cause of action (whether fault-based or strict liability), (2) causation, and (3) limitations rules (recalling that time only starts to run when the elements of the cause of action are complete). And if the operator is defunct the loss will fall on the person suffering harm unless government makes a policy decision at that time to step in and compensate for the loss on an *ex gratia* basis.

7.8 Conclusions

In summary, the draft legislation proposes that in general the liabilities associated with operating and closing an injection facility should be dealt with in the same way as conventional offshore oil and gas operations. The effect of this is to apply the default tort rules of the common law and impose continuing liability principally on the operator\licensee. As result the proposal will not effect an explicit transfer of liability from the operator\licensee to the government. While there may be a de facto transfer of liability in the event of defunct operator such a de facto transfer will not impose a legal duty on government to compensate those who may be harmed. It is far more likely that such a de facto transfer would be confined to taking any necessary remedial measures.

This approach differs from that proposed by both the EU and the IOGCC. Both of those proposals envisage that at some point there should be an explicit transfer of liability to government. The IOGCC, for example, proposes that liability should transfer after a

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<http://www.dpi.vic.gov.au/dpi/dpinenergy.nsf/9e58661e880ba9e44a256c640023eb2e/b82284e8643ae0bcca25741100153220/$FILE/CCS_web_version.pdf>.

period fixed by the state regulatory authority (e.g. 10 years) unless actual monitoring suggests that transfer should be delayed.[74] The EU's Draft Directive proposes that liability should transfer "if and when all available evidence indicates that the stored CO_2 will be completely contained for the indefinite future".[75]

8.0 Miscellaneous Issues

There are a variety of miscellaneous issues that require mention. These are (1) cancellation of titles; (2) remedies where applications are denied; (3) impact of operations on other parties; and (4) third party access. Each is discussed below.

8.1 Cancellation of titles

A GHG title (permit, lease or licence) can be cancelled for non-compliance with a condition of the title, a direction from the Minster, certain provisions of the legislation or if the title-holder has not paid an amount payable under the legislation (s. 249MA). A GHG lease or licence can also be cancelled if the underlying declaration for the indentified GHG storage formation is revoked.

If grounds for cancellation exist, the Minister may, by written notice, cancel the GHG title subject to consultation with the holder of the title and taking into account any action taken to remove the ground of cancellation or to prevent recurrence of similar grounds (s. 249MB).

8.2 Adverse Decisions

If the Minister refuses to issue a GHG injection licensee, or to renew or vary a GHG injection licence, the Minister must consult the affected person before making the decision (s. 249JH) and to that end must provide the affected person with reasons. The affected person has the right to make a written submission to the Minister who must take

[74] IOGCC proposal, *supra* note 9, s. 9 and definition of 'CSP Closure'.
[75] EU Draft Directive, *supra* note 8, Article 18. All proposals to transfer liability face the difficult challenge of defining the trigger for the transfer of liability. If the goal of a transfer is to provide certainty and assurance to potential private operators is to hard to imagine either of these triggers (the EU or the IOGCC) offering much comfort to an operator in the early years of large scale CCS projects.

the submission into account in making the decision. An applicant for a GHG assessment permit is not afforded the right of consultation.

8.3 Impact on other Users

As with petroleum activities, GHG operations have the potential to impact other users. A holder of a GHG permit, lease, licence, search authority, special authority or research consent must carry on activities under the respective authorization in a manner that does not interfere with navigation, fishing, conservation of the sea and seabed, the enjoyment of native title rights, or the lawful exploration for a mineral (other than petroleum) or construction/operation of a pipeline (s. 249NF). The implication of this is that the authorization issued under the draft legislation will not provide a defence to an action in tort brought by one of these listed users.

8.4 Third Party Access

There are various ways in which a CO_2 emitter may obtain access to storage\disposal sites assuming that there are sufficient and appropriate sites available. An emitter may engage in the storage activity itself. An emitter is perhaps most likely to do this if it is engaged in the oil and gas business. Second, an emitter may contract for storage\disposal services from another party or enter into a joint venture.

But it is possible that an emitter may not be able to negotiate reasonable terms. This may happen if all major emitters are required to adopt CCS technology and there is a short term shortage or if there is inadequate access to CO_2 pipeline capacity. It is conceivable therefore that government will want to require that CCS operators provide access to third parties on regulated terms.

The draft legislation addresses third party access in three scenarios. The first two deal with infrastructure and pipelines (ss. 167(4) and 181(9)). In both cases the legislation contemplates that regulations may establish a regime for third party access to services provided by means of the use of an infrastructure facility or GHG pipeline. The final provision dealing with regulated third party access concerns GHG injection licences (s.

249CE(11)). Again the draft legislation contemplates that third party access may be introduced through regulations. The access regime may cover services provided the GHG storage formation, the GHG substance or any wells, equipment, structures used in injection, processing or storing of substance before injecting.

The EU has addressed the need for a third party access regime in its Draft Directive.[76]

9.0 Conclusions

The proposed Australian legislation accomplishes several things. First, it will provide a disposition or tenure scheme for parties to acquire the right to store GHGs in the offshore. Second, it provides a regulatory framework for reviewing and approving CCS operations on a case by case basis with individual site plans and closure plans. Third, the legislation provides a framework for deciding upon the competing claims of petroleum operations and storage operations. And finally, the legislation proposes to leave both short term and long term liability with the operator\licensee largely on the basis of laws of general application.

[76] EU Draft Directive, *supra* note , Articles 20 – 21.

PART II: OBSERVATIONS FROM A CANADIAN PERSPECTIVE

In this Part of the paper we offer some comments on the Australian legislation from a Canadian perspective and especially from the perspective of Alberta. The comments fall into four main groups: the tenure scheme; the regulatory scheme; liability related issues and a final miscellaneous group of comments. But before that it may be useful to emphasise one area in which we should not expect to get much help from Australia, or even the EU and the IOGCC. This is the problem of the ownership of pore space. This is a significant issue in Canada but in many jurisdictions it is a non-issue since in those jurisdictions we can say with some certainty (both with respect to depleted reservoirs and saline formations) that pore space will be owned by the state. This is the case in the Australian offshore (and likely onshore as well) and is apparently the case in Europe. In the US, the storage right is likely vested in the surface owner.

1.0 The tenure scheme

1.1 The need for a tenure scheme?

As we have observed elsewhere, Alberta has yet to develop a tenure scheme for "disposal rights" in Crown subsurface.[77] To the extent that the Crown already authorizes subsurface disposal operations in Crown subsurface lands (such as for acid gas disposal (AGD)) it does so using a form of letter of consent or a licence issued under the authority of s. 56 of the *Mines and Minerals Act*[78] rather than a formal tenure. Such interests are issued on application following a review of the regulatory aspects of the proposal by the Energy Resources Conservation Board (ERCB).[79] This informal non-competitive arrangement stands in stark contrast to the scheme that the Crown uses to dispose of oil and gas rights.

[77] Bankes, Poschwatta and Shier, *supra* note 10 at 604.
[78] RSA 2000, c. M-17 (*MMA*).
[79] Bankes, Poschwatta and Shier, *supra* note 10 at 602.

The arguments in favour of a more formal and competitive disposition scheme include the following:

- a formal system of tenure may provide the necessary security for those contemplating investing in CCS projects[80] and may therefore facilitate financing;
- it signals a recognition that pore space for storage and disposal is a valuable use of publicly owned subsurface and ultimately a limited resource; and
- a competitive disposition system will create a level playing field and create opportunities for different actors to engage in the sector including oil and gas companies and power companies and perhaps merchant operators of storage, this may also limit the need to provide for a third party access regime.

Many jurisdictions have adopted a formal disposition scheme for natural gas storage rights and at least some seem to be moving in that direction in the context of CCS. It is clearly a central element of the Australian scheme but it is also a central part of the EU's scheme.[81] In summary we think that there is a strong case for each province and the federal government (for federal lands) to develop disposition legislation for publicly owned storage rights. This conclusion raises the question of what form such a disposition scheme should take.

1.2 Is the Australian tenure scheme a useful model?

In responding to this question there are two ways to think of the Australian proposals. One can think of it as a model for others to copy or one can think of it as simply indicative of an approach to the problem. Seen from this latter perspective the real message of the Australian approach is that each jurisdiction should use and adapt its existing petroleum legislation (whatever it may be) to fit the challenges posed by CCS. The EU Draft Directive came to the same conclusion for its member states – where

[80] For example, it may provide security during the exploration phase and offer some assurance that a licensee might be able to move from an exploration tenure to an injection tenure.
[81] EU Draft Directive, *supra* note 8 at 18-19. The right to use reservoirs and the associated pore space is a private property right in the United States, IOGCC, *supra* note 9 at 11; and a right that will generally be vested in the surface owner and not (as is likely the case in Canada in the owner of the mineral estate).

possible, existing provisions should be used to manage CCS projects.[82] It is the second approach which seems more realistic for a number of reasons. Adapting existing regulation draws on a well established framework for accessing and managing property rights, it reduces the need for new sets of regulation, it increases understanding and acceptance of the regulatory framework and it allows for integrated management of issues with other uses (in particular petroleum rights holders).

1.3 The adaptability of Alberta's tenure scheme

If Australia's petroleum legislation stands at one of the spectrum in terms of the prescription of detailed rules in the statute itself, then Alberta's tenure regime has evolved over the years to stand at the other end of the spectrum. The *MMA* provides only the barest outlines of a petroleum and natural gas tenure scheme and the details are found in the actual practices of the Department of Energy and the *Petroleum and Natural Gas Tenure Regulations*[83] and some of the more general regulations under the *MMA*.[84] Key elements of the regime include the following:

- Lands selected for bidding on the basis of industry nominations;
- Interdepartmental review of proposed nominations to identify concerns;[85]
- Key resource use conflicts identified in bidding documents.[86]

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[82] *Supra* note 8 at 2.The EU utilized existing regulation for pipelines and some environmental activities. It decided to develop a new framework for storage and management of a CCS site, *ibid.* at 5. The IOGCC came to a different conclusion (perhaps because it had to deal with the differing laws of its 30 member US states and four provinces). It concluded that while not necessary, it is advisable for states and provinces to enact a new regulatory framework governing CCS, IOGCC, *supra* note 9 at 13. But recall that the focus of the IOGCC report is regulation and not disposition of a publicly owned pore space.

[83] Alta. Reg. 263\1997.

[84] *Mines and Minerals Administration Regulation*, Alta. Reg. 262\1997.

[85] We think that the current scheme is inadequate in terms of public participation and protection of the public interest but that is not the focus of the current discussion paper. For further discussion of this point see Nickie Vlavianos, "Public Participation and the Disposition of Oil and Gas Rights in Alberta" (2007), 17 *J.E.L.P.* 205. And see Alberta Energy, Information Letter 2007-21, Crown Mineral Rights; Identification of Major Surface Concerns in Public Offering Notices, online: < http://www.energy.gov.ab.ca/>.

[86] For example, all public offerings of oil and gas rights in oil sands areas of the province contain the following statement in the offering documents:

> All land(s) is/are within an oil sands area as designated by the Alberta Energy and Utilities Board (AEUB). Solution gas is expressly excluded from the petroleum and

- Disposition of rights[87] almost exclusively by way of bonus bidding;[88]
- Increasingly there is only a single form of tenure available (the petroleum and natural gas licence[89]) covering both exploration and production phases;
- The licence provides the exclusive right to drill and the right to produce;
- Non-exclusive rights to carry out exploration short of drilling (seismic etc) authorized by way of exploration licences and permits under Part 8 of the *Mines and Minerals Act* and the relevant regulations.[90]
- Licence continuance requires the drilling of a validating well and further continuance beyond an intermediate term requires that the licensee establish to the satisfaction of the minister that the area of the licence is capable of production;[91]
- Deep rights revert to the Crown (i.e. a licence is continued only down to the horizons for which the licensee has established are capable of producing petroleum or natural gas in paying quantity); and

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> natural gas rights granted under crown agreements issued in respect of oil sands areas. Moreover, production of gas from the land(s) in this agreement may be disallowed or precluded by order of the AEUB or otherwise, on the ground that such production may detrimentally affect the recoverability of oil sands from those lands. by accepting this agreement for the petroleum and natural gas rights in these lands, the lessee/ licensee hereby acknowledges all of the above, and that production of gas from the lands in this agreement may by order of the AEUB or otherwise be precluded or disallowed, and hereby waives any recourse, action, cause of action or claim that the lessee/licensee may have against the crown in right of Alberta as a result of or in relation to its inability for any of the above reasons or for any other reason whatsoever to produce gas from the lands in this agreement. For the definition of solution gas and other relevant information, please refer to Information Letter 99-38. For current policy on natural gas production in the oil sands zones identified within oil sands areas, please refer to AEUB Interim Directive 99-01.

[87] By way of "an agreement". Agreement is a defined term in the statute and embraces a variety of tenures.

[88] *MMA* s. 16 allows for two other methods of disposition but apart from some limited examples of direct issuance to allow a lessee of private rights to make up a spacing unit there is no direct issuance. See Alberta Energy, Information Letter, 97-14, Disposition of Crown Petroleum and Natural Gas Rights, online: <http://www.energy.gov.ab.ca/> . Note as well that some have suggested that it might be possible to use the agreements contemplated by s.16 as a way of proceeding in a more ad hoc and experimental way with CCS projects in the early going. However, it would still perhaps be necessary to amend the legislation since the section uses the term "agreement in respect of a mineral".

[89] The Department still uses leases as well but the focus here will be on the licence tenure form.

[90] *Exploration Regulation*, Alta. Reg, 284\2006.

[91] Note that the key concept is "capable of production" – not actual production. There is no formal "holding tenure" in the Alberta system (and arguably not necessary given market conditions and a highly developed pipeline infrastructure). The federal scheme does have a holding tenure in the form of the significant discovery licence.

- Once the licence is continued by production it continues indefinitely by production.

It is also worth emphasising a couple of elements that we see in the Australian scheme that are missing in Alberta's scheme; but in each case we can see that element used in Canada's federal regime (the *Canada Petroleum Resources Act*[92] and the cognate east coast offshore legislation).

- Alberta does not dispose of rights on the basis of a work bidding scheme. However, such schemes are very familiar in Canada and form the dominant if not exclusive mode of disposition on federal Crown lands and on the east coast offshore. But these schemes are significantly more objective than those of the Australian proposal since they emphasise the importance of selecting the winning bidder strictly on the basis of a single bidding variable.[93]

- Alberta does not use the concept of a "declaration" of a discovery as a part of its disposition scheme. However the twin concepts of declaration of significant discovery and commercial discovery are crucial elements of the federal regime.

- As a corollary of the above Alberta also lacks the concept of a development plan which must be approved prior to commencing production. Instead, Alberta's scheme is more laissez faire and operates on the assumption that a licensee should be able to produce so long as that licensee complies with generally applicable oil and gas conservation laws. There is no requirement that a licensee of Crown petroleum rights file a pool development plan with either the Department of Energy or with the ERCB before commencing production. That said there analogies for the concept of a development plan (or a site plan in the case of CCS) in the federal scheme and other elements of the provincial scheme. For example, the Canadian federal scheme under s. 5.1 of the *Canada Oil and Gas Operations Act*[94] does require a development plan and in Alberta any of the listed activities in

[92] *Supra* note 12.
[93] The industry historically regarded the single bidding variable as an important control of ministerial discretionary powers which might otherwise have been exercised to favour certain companies and especially Crown corporations. On the other hand a more discretionary scheme does allow other factors to be taken into account such as the environmental and social record of a company. A middle way is to require all bidders to pre-qualify to determine if bidders meet certain minimum standards in terms of such items as expertise and financial resources.
[94] R.S.C. 1985, c. O-7.

s. 39 of the *Oil and Gas Conservation Act*[95] (including injection operations) also require scheme approvals

Drawing upon the Australian approach how might we adapt the Petroleum and Natural Gas Tenure Regulations for CCS projects? Some of the elements might include:

- Nomination of lands for GHG storage purposes by industry subject to review by interdepartmental committee prior to posting.
- A new single form of tenure in the form of a GHG storage licence with a short initial exploration term followed by an intermediate term provided that the licensee meets the minimum work requirements.
- Disposition by way of cash bidding or work bidding but with a single bidding variable; bidding documents would warn potential bidders to make themselves aware of existing petroleum and natural gas dispositions that might inhibit approval of any disposal project.
- A minimum work requirement of drilling at least one exploratory well during the initial term of the licence in order to identify the storage characteristics of a target formation(s).
- By the end of the intermediate term the licensee must identify an area within the GHG licence that is suitable for GHG storage purposes and file an application for approval of a site plan or plans with the ERCB. Parts of the GHG licence not subject to a site plan would revert to the Crown.
- Indefinite continuation at the end of the intermediate term for areas covered by the ERCB approved site plan.
- As with the Australian scheme the approved site plan would form the central part of the regulatory scheme.

While much of this would track the existing scheme for oil and gas interests it would differ particularly with respect to the decision on continuation and especially with respect to the area subject to continuation. In the oil and gas context, the Department of Energy is responsible for the continuation decision and the decision is made on a spacing

[95] R.S.A. 2000, c. O-6 (*OGCA*).

unit by spacing unit basis.[96] Clearly this makes little sense in the context of a CCS project for a couple of reasons. First, the area of continuation needs to be based not on the concept of a spacing unit but on the basis of modeling of the performance of the injected plume of CO_2. And second, the decision should likely be driven more by the government as regulator (the ERCB) rather than the government as owner (the Department of Energy).

1.4 Legislation or regulations and guidelines

The first thing that strikes a non-Australian reviewer of this material is its sheer size and complexity and the level of detail of many of the provisions, especially those relating to the granting of tenure. Further examination reveals that there is a lot of repetition in the drafting; for example, a number of the provisions are simply repeated, *mutatis mutandis*, for each of the different forms of tenure. Writing on the offshore petroleum legislation, Professor Daintith[97] has explained this level of detail in terms of the constitutional settlement between the states and the Commonwealth. The goal was to generate a common regime for both state-administered areas and areas that fell under Commonwealth control and as a result it was found necessary to be highly prescriptive so as to try to ensure that there was a regime that not only looked the same but would be administered in the same way.

But this does lead to the question of whether Canadian jurisdictions such as Alberta should strive to accommodate CCS as a new use of Crown subsurface with a similarly dramatic set of amendments (including a change to the title of the relevant legislation (e.g. the *Mines and Minerals and Greenhouse Gas Act*) or whether we should take a minimalist approach and, at the extreme, try and accommodate such a proposed new tenure scheme as much as possible through regulations and ERCB Directives.

[96] Or in the case of moving from the initial term to the intermediate term the spatial area continued depends upon the depth of the well(s) drilled to evaluate the licence area.
[97] Terence Daintith, *Discretion in the Administration of Offshore Oil and Gas: A Comparative Study*, (2005).

It is our view that Canadian legislatures should steer a middle course and that the core features of a CCS regime should be reflected in amendments to both disposition and regulatory legislation. For Alberta this would require amendments to the *MMA* and the *OGCA*. It will also likely be appropriate to develop a set of Greenhouse Gas Tenure Regulations.

2.0 The regulatory scheme

As we have seen, Australia's proposed regulatory scheme contains three main elements: (1) approval required for key GHG operations, (2) filing and approval of site plans, and (3) the site closure mechanism. Of the three elements the first seems principally concerned with resolving potential conflicts between petroleum and storage interests and thus the heart of the regulatory scheme is the site plan and the site closure as supplemented by environmental laws of general application.

We also noted that the legislation itself offered very little guidance as to the content of site plan and that despite the outcome oriented-nature of the regulatory approach one had to infer the outcome rather than having a clear statement of expected outcomes in the legislation. It seems surprising to us that while the legislation lavishes a lot of detail on some of the most arcane matters it does not include some of the detail from the Readers' Guide and the Regulation Impact Statement in the text of the legislation itself especially with respect to the site plan.

The best analogies for each of these regulatory elements within Alberta's current oil and gas regulatory system would seem to be: (1) well licensing, (2) s. 39 *OGCA* approvals for schemes including injection schemes, and (3) approvals for non-routine abandonments. But none of these analogies is entirely appropriate and each would have shortcoming if simply re-jigged to accommodate CCS. The most significant issues would include the following:

- The well licensing provisions of the *OGCA* are not well suited to canvassing broader issues of public policy such as the priority to be accorded to different resources uses, and in the absence of a person with standing it will be difficult to

trigger a Board review.[98] It will be necessary to address a list of factors that the applicant and Board must address as part of a well licence application for a CCS project.

- We have considerable experience in Alberta resolving conflicting claims to priority amongst resource users especially in the context of split estates (petroleum and natural gas[99]; natural gas and coal bed methane[100] and gas over bitumen[101]). We need to draw upon that wealth of experience to try and make sure that we avoid creating a new generation of conflicts. Experience surely tells us that we should try to avoid these disputes rather then spending huge resources trying to resolve them once they have arisen.

- All the detail as to scheme approvals for gas storage, enhanced oil recovery (EOR) and AGD projects is found not in s. 39 of the *OGCA* or the regulations but in the relevant ERCB Guides and Directives (principally Directive 65). We think that that is problematic in terms of transparency and accountability more generally but specifically in the context of CCS. As with the Australian legislation we think that the legislation should, at a minimum express both the objective of a site plan (assurance of permanent storage) and (perhaps here following more of the model of the EU and the IOGCC) the issues and types of information that a site plan needs to address including monitoring and verification.

- There is nothing in the *OGCA* that requires the prior approval of the Board before abandoning any licensed project. The regulations are similarly silent. All abandonment operations are to be conducted according to ERCB Directive 020: *Well Abandonment Guide*.[102] The Directive applies to all wells, including those

[98] Resource conflicts have been considered by the ERCB as part of licensing most recently and importantly in the context of coal bed methane but it is important to emphasise that that issue only came before the ERCB because coal owners argued that the gas owners could not fulfil the condition precedent for obtaining a licence (ownership of the resource in question): EUB Decision 2007-024, Bearspaw Petroleum. The Board increasingly seems to define its role as that of resolving dispute between parties rather than protecting a broader public interest. The evidence for this is principally the extraordinary number of cases that are set down for public hearing and then "settled" by agreement between the applicant and affected private party. Board "decisions" simply record this agreement, grant the application and fail to canvass the larger public policy issues.

[99] *Borys v. CPR*, [1953] AC 217 (P.C.); *Anderson v. Amoco Canada Oil and Gas*, [2004] SCJ 47.

[100] EUB Decision 2007-024, *supra* note 96.

[101] *Giant Grosmont Petroleums Ltd v. Gulf Canada Resources Ltd*, [2001] 10 WWR 99 (Alta. C.A.); *Alberta Energy Co. v. Goodwell Petroleum Corp*, [2004] WWR 116 (Alta. C.A.) Wenig, "Valuing Energy Resources: Reflections on the EUB's Decision in the Surmount "Gas Over Bitumen" Controversy" (2002) 80 Resources 1.

[102] All abandonment operations are to be conducted according to ERCB Directive 020: *Well Abandonment Guide* (7 December 2007). The Directive applies to all wells, including those involved in EOR or AGD and would apply to CCS.

involved in EOR or AGD and would apply to CCS. Under Directive 020, the licensee must determine whether the planned abandonment operation is routine or non-routine. If an abandonment operation is routine, it does not require ERCB approval prior to work starting. Non-routine operations do require prior approval but this applies on a well-by-well basis. We think that no CCS well should be allowed to be abandoned without approval by the Board to ensure the overall integrity of the CCS project.

- The regulatory framework should incorporate the use of a site plan as the basis for the day-to-day regulatory interaction between the GHG injection licensee and the regulator. A site plan would be a crucial part of monitoring activities, remedial action and site closing approval. Regulations should provide that a GHG licensee must not carry out any injection operations in relation to a CCS project unless an approved site plan is in force and the operation complies with the site plan.

In summary, the Alberta approach has many of the regulatory elements required for a CCS project as part of its regulatory approach for regulating EOR and AGD. But the current regulatory approach does not provide a clear mechanism to address the unique features of a CCS project. The site plan approach provides a clear framework but the relevant legislation could provide more details with respect to purpose and content.

The EU relies on a similar approach to Australia's use of a site plan.[103] Article 4 of the Draft Directive provides that a geological formation can only be selected as a "storage site" if there is "no significant risk of leakage, and if no significant negative environmental or health impacts are likely to occur." The suitability of a geological formation is determined though characterization and assessment pursuant to a detailed list of criteria.[104] We believe a similar approach would be a useful mechanism to address the regulatory issues with CCS. The regulatory framework needs to be responsive to the risks and uncertainties associated with CCS projects.

3.0 Liability Issues

[103] EU Draft Directive, *supra* note 8.
[104] *Ibid*., at Annex I.

As we have observed elsewhere, most liability issues in Alberta's oil and gas sector are dealt with by the laws of general application.[105] Special rules exist for abandonment obligations and for remedial obligations. There is no transfer of liability to the state under any of these rules and to the extent that an operator becomes defunct the costs of abandonment operations are borne by the industry financed orphan well fund. In summary we can say that (1) the operator\well licensee assumes principal and perpetual liability for abandonment, and (2) the industry financed orphan fund steps in when a licensee and its working interest parties are defunct. The state would only bear ultimate responsibility where the orphan fund proved to be inadequate. Generally, the ERCB does not require a well licensee to post a bond to cover anticipated abandonment costs. The exceptions would be where the licensee has insufficient coverage from production to offset the risk of failing to abandon and in the case of waste disposal operations.

What are the implications of this and the Australian proposals for a liability scheme for CCS operations in Alberta?

- It will be hard to make the case that special rules are required for liability for harm suffered by others in the case of CCS operations if the general tort rules apply to conventional oil and gas operations (including AGD). Some oil and gas operations such as sour gas drilling and production and AGD are more hazardous than CCS operations will prove to be. Australian rules and Alberta rules seem to begin from a similar starting point which is that the risks from CCS operations do not warrant a different liability scheme.

- It will likely be necessary to be more prescriptive about requirements for posting security (than with respect to conventional operations) given that a pure CCS scheme (as opposed to an EOR scheme) will have no offsetting production revenue. If regulations are designed in a purposive way a licensee should be required to post security for all of the anticipated costs of site closure and monitoring and verification. In other words it is necessary to extend the Australian proposal dealing with monitoring and verification to cover all site closure costs. There is no doubt room to think about precisely when these monies need to be advanced but it is surely too late to leave it to the time when the

[105] Bankes, Poschwatta and Shier, *supra* note 10 at 620 .

licensee is applying for site closure since by then its revenue stream has dried up. In this context it is appropriate to note that both the IGOCC proposals and the EU Draft Directive are more prescriptive on bonding and security requirements than is the Australian proposal.[106]

- Existing provisions dealing with remedial liability will likely serve as an adequate basis for CCS operations although the triggers for requiring remedial action may require some adjustment. The Australian concept of a "serious situation" is more precautionary than existing provisions in the *OGCA*.

- It will be necessary to deal with the GHG crediting consequences of the failure of a CCS project but this will likely be better dealt with in Alberta's climate change legislation than in disposition or conservation legislation.

4.0 Miscellaneous

4.1 Third Party Access

The federal and provincial governments have not legislated to require major emitters to adopt CCS. However, the increasing stringency of emission targets between now and 2020 will make it difficult for many operators especially those in the oil sands to comply without using CCS.[107] Hence, in order to stay in business some facilities will need to have access to storage operations. While the provincial government will no doubt prefer that access be obtained on market terms if possible, it may be necessary to provide regulated access. The Australian legislation takes a similar approach and in effect simply warns those thinking of investing in CCS operations that they may be subject to regulated third party access. It is worth considering what the possible models might be in Canada.[108]

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[106] EU Draft Directive, *supra* note 8 at Article 19 and IOGCC, *supra* note 9 at 29. The IOGCC recommends both an operational bond and an individual (or blanket) well bond.

[107] Nigel Bankes, "The Federal Government's Climate Change Policy and the Role of Carbon Capture and Storage" (2008) 101 *Resources* 1, online: <http://www.ucalgary.ca/~cirl/pdf/Resources101.pdf>.

[108] The EU Draft Directive also sets out a mechanism for third parties to have access to CCS operations and pipelines, *supra* note 8 at Chapter 5.

Two possible models exist for this: the utility model and the common processor\common carrier model. The utility model will involve a greater degree of regulation and would treat the storage operation as a public utility and require the utility to offer non-discriminatory service to all who were willing to pay the regulated rates. While some natural gas storage is regulated on this basis (e.g. gas storage in Ontario regulated by the Ontario Energy Board, and some of ATCO's gas storage in Alberta) full scale utility regulation would likely be a major disincentive for an oil and gas company considering investing in a CCS operation.

The common carrier\common processor model as described in the *OGCA* is a two step complaint driven model. A party who is unable to access facilities on reasonable commercial terms seeks an order from the ERCB that the pipeline or processing company be declared to be a common carrier or processor (ss. 48 and 53) with a duty of non-discrimination. Once the declaration is in place and if agreement still cannot be reached the applicant may seek regulated rates from the Alberta Utilities Commission.

There would seem to be some advantage in stipulating from the outset the basis on which storage operations may be regulated. Of the two options the complaint driven common carrier model is the more light-handed method of regulation and might therefore be preferred unless and until it is shown to be inadequate. It may be particularly appropriate to announce in advance that operators may be subject to regulated third party access if necessary given that there will likely be significant public investment in CCS infrastructure.

4.2 Adaptive Management\Learning by Doing

CCS technology is new. While we have considerable global experience with EOR and some more local experience with AGD the scale of these operation in terms of size and time is quite different. Furthermore we have much more knowledge of depleted oil and gas reservoirs that we have of saline aquifers. There are considerable uncertainties as such things as rates of injection in different rock types, performance of the injected plume and risk of leakage. We will undoubtedly gain significant knowledge from early projects

and there is general acknowledgement that the results of those early projects need to be fed back into decision-making and monitoring and verification procedures.

It will therefore be important to design a CCS regulatory framework with these ideas in mind and so it is worth considering the Australian legislation in this light by identifying the features of the legislation that create feedback loops and which may allow or facilitate adaptive management. In this context important features include:

- The outcome oriented site plan approach. This permits considerable flexibility in regulatory design for each project. A prescriptive approach would have been far less flexible.
- The legislation gives the Minister significant authority to amend licences and authorizations in light of new knowledge. For example, if the fundamental suitability determinants change, the Minister must alter the licence to remove any inconsistency. The Minister also has extensive authority to vary declarations of GHG storage formations, all GHG tenures and "declared" petroleum interests. In addition, the Minister can also vary the conditions of permits, leases and licences.

5. 0 Conclusions

In summary, the proposed Australian legislation may inform the development of a CCS regime for Alberta in several ways.

First, it suggests that it is important to build on existing regulation where possible. Second, the examples of both Australia and the EU suggest that we need to introduce a more formal, transparent and competitive disposition scheme. Third, Alberta's current legislative regime is not adequate to deal with issues of CCS site approval and closure. The regulatory framework should require a geological formation approach that relies on the use of a site plan. Fourth, it is likely necessary to be more prescriptive about requirements for posting security. Fifth, existing provisions dealing with remedial liability will likely serve as an adequate basis for CCS operations although the triggers for requiring remedial action may require some adjustment. And sixth, the Australian

proposals generally support an approach to long-term liability that in common with Alberta's current scheme leaves liability with the operator. But Alberta's scheme also provides a default liability for remedial issues where the operator is defunct, and that is the industry funded orphan fund. It would seem to be appropriate to retain this concept but to adapt it to the needs and challenges of CCS operations.