

**PSMA Australia LIMITED**  
*spatially enabling the information economy*

PSMA AUSTRALIA LIMITED  
Final Project Report

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Land Tenure

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Version 1.0  
June 2008

## **I. Disclaimer**

The views and opinions presented in this report is those of the author and do not necessarily reflect those of the stakeholders of this project or those of the National Land and Water Resource Audit. The material in this report is based on sources that are believed to be reliable. Whilst every care has been taken in the preparation of the report, the author gives no warranty that the said sources are correct and accepts no responsibility for any resultant errors contained herein any damages or loss, whatsoever caused or suffered by any individual or corporation.

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### **III. Foreword**

Land Tenure has been on the table for discussion for some time within the land administration bodies in Australia and PSMA Australia. The key point has been to agree on a national classification scheme and to get a wide endorsement of the project. Several attempts have been made but for various reasons few of these have resulted in a final data set and none in a continuously maintained product.

This initiative, managed by NLWRA, has managed to achieve an agreement on a national classification in a short timeframe and with a limited budget. PSMA Australia was then able to develop a national dataset product based on this specification. We are very satisfied with the results of this project, the way it has been managed and the strong spirit of cooperation shown by all participants.

PSMA Australia Limited wants to take this opportunity to thank all the stakeholders involved in the project for the contributions made and feedback received. Further, without the help and endorsement of the project by the Directors of PSMA Australia the success of this project would not have been possible.

PSMA Australia sees this as a very interesting first step towards having a high quality, maintained national land tenure data set available for Australia.

**Dan Paul**

Chief Executive Officer  
PSMA Australia Limited



## IV. DOCUMENT CONTROL

### Version History

VERSION	DATE	AUTHOR	COMMENTS
0.1	2008-05-27	John Saldin	First draft
0.2	2008-06-04	John Saldin Gerry Stanley	Additions to the first draft regarding licensing
0.21	2008-06-06	Michael Dixon	Additions to v0.2 draft in the technical
0.3	2008-06-16	John Saldin	Amendments according to Peter Wilsons comments
1.0	2008-06-27	John Saldin Michael Dixon	Additions to the technical sections by Michael and final edits.

### Distribution

VERSION	ISSUE DATE	ISSUED TO
0.21	2008-06-13	Peter Wilson, NLWRA for comments
1.0	2008-06-27	Peter Wilson, NLWRA for distribution to stakeholders

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## **VI. Acronym List**

ABS	Australian Bureau of Statistics
ACLUMP	Australian Collaborative Land Use Mapping Program
ANZLIC	The Spatial Information Council of Australia and New Zealand
ACT	Australian Capital Territory
BoM	Bureau of Meteorology
BRS	Bureau of Rural Sciences
COAG	Council of Australian Governments
DCC	Department of Climate Change
DEWHA	Department of Environment, Water, Heritage and the Arts
DoTARS	Department of Transport and Regional Services
GA	Geoscience Australia
HDM	Harmonised Data Model (developed by ICSM)
ICSM	Intergovernmental Committee on Surveying and Mapping
ILC	Indigenous Land Corporation
ISO	International Standards Organisation
IUCN	International Union for Conservation of Nature (Classification)
NGO	Non-government organisation
NHT	Natural Heritage Trust
NLWRA	National Land and Water Resources Audit
NNTT	National Native Title Tribunal
NPIL	National Public and Indigenous Lands (Classification)
NRM	Natural Resources Management
NSW	New South Wales
NT	Northern Territory
OSDM	Office of Spatial Data Management
PSMA	PSMA Australia Limited
QLD	Queensland
SA	South Australia
TAS	Tasmania
WA	Western Australia

## 1. Executive Summary

This project was initiated by the National Land and Water Resource Audit (NLWRA) with the intention of creating a Land Tenure data set with Australia wide coverage. There are several existing Tenure data sets but they are outdated or of a low resolution.

The idea was to utilise the tenure data from the States and Territories in Australia and translate their data to a nationally agreed classification. To define this classification a workshop was held in Canberra in December 2007. The output from this workshop was a national classification scheme (Appendix A) agreed for use in this project.

Once the classification was finalised, PSMA Australia liaised with the States<sup>1</sup> to access the tenure data and to seek assistance in the translation from the states classification to the national classification. Whilst obtaining the data was, in most cases, relatively easy, considerable effort was required for the translation between State and the National classification schemes. This process was more difficult and time consuming than anticipated.

The obstacles encountered include 1) gaining access to the NSW data and 2) obtaining the data from the different states in the designated time frame. The latter of the two has been the major issue for this project. The last data reached PSMA Australia during the last weeks before the release. This is unfortunate since it decreases the quality due to the lack of time to manage and verify the translation of the data.

Overall the project must be viewed as a success. Several attempts have been made by others to create an accepted and endorsed national classification scheme for land tenure. Most<sup>2</sup> of the previous attempts have failed mostly due to the complexities surrounding the relationships between individual classification schemes and a national version and the need for broad consensus from all stakeholders for the national classification.

This nationally collated data set is a first version. A key objective is to gain feedback from the stakeholders and clients to identify the degree of alignment between the features of the national Land Tenure data set meets their requirements and needs. This analysis and market testing will, in turn, allow for the identification of further features that could be included in future builds of the data set. After a test period, a decision will be made by PSMA Australia to determine if this land tenure data set will be a regularly maintained and updated product or if the user needs suggest something else.

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<sup>1</sup> Henceforth, in the Australian government context, the word 'State' should be interpreted to also encompass Territory.

<sup>2</sup> There is several tenure datasets developed. The 1993 AUSLIG project and an internal NNTT data set both covers tenure nationally. The major issue are the development process and endorsement of the classification and the updates of the data. Also, the available datasets are not true tenure data sets, more commonly there is a mix of ownership, land use and tenure.



The final data will be managed within PSMA Australia's LYNX infrastructure. This is to verify all stakeholders' data and to keep track of who has contributed and requested the data. Once requested, the data will be delivered on a DVD.

## 1.1 Recommendations

To successfully move on from this project these are the suggested steps:

1. To collect and consider the feedback on the data;
2. Search for public funding but at the same time evaluate the market for a commercial data set;
3. Develop a model for maintenance of the data with at least annual updates;
4. Redevelop the data set based on the feedback;
5. Invest time in coordinating the translation from State to National level. There are comments already received that need to be included in the data set;
6. Refine the data model and technical production details based on user feedback.

## 1.2 Business recommendations

It is recommend that:

- this version of the National Land Tenure data *not* be considered a final product. Several areas of improvement are required and feedback is needed to get a final product of high quality;
- PSMA Australia coordinates market testing and feedback on the data set for the future development ad enhancement;
- Clarity be sought from the stakeholders and data custodians as to their willingness to fund a "free to use" or "cost of transfer" National Tenure data set managed and maintained by PSMA Australia;
- a champion for the National Land Tenure be found so that the dataset can receive continued high level support. ANZLIC (and ICSM) is the natural champion particularly if the project can be publicly funded.
- PSMA Australia would be able to continue this project on an ongoing basis providing a financially viable business model can be developed.
- The Land Tenure information be included in the PSMA Australia CadLite data set as attributes of cadastral parcels;
- if there is a future project, that updates initially will be on an annual basis; and
- a model to enrich the data is investigated.

## 1.3 Technical recommendations

- Based on the results from this project currently it is not possible to develop a single national approach to the production of a national dataset. Significant variations exist in data supplies from Jurisdictions leading to different production methods being developed for each. More work is required in trying to standardise production methodologies across each State however it is likely that the variations will continue into the future.
- For this project any interaction between the land tenure and land parcel polygons was considered sufficient for a tenure to be allocated to a parcel.



This method provides an extensive coverage however there is the capability for mismatches to be introduced during the processes. Other methods may be utilised if user feedback dictates that this method is not suitable. Ultimately once a method has been chosen it should be used consistently until a universally accepted variation is adopted.

- The production time required to repeat the production of this dataset in the future should not be underestimated. Especially if the classification scheme changes from the one used for this project. Particularly if a further level of detail was adopted (i.e. equating to a level 5 classification).
- Classes not used which may be removed, "Multiple Use Forest", this is the only NLWRA level 4 class that no Jurisdictional data was mapped into.

## 2. Project Information

<b>Project Title:</b>	Land Tenure
<b>Project Owner:</b>	Peter Wilson, NLWRA
<b>Project Funder:</b>	National Heritage Trust (NHT)
<b>Project Manager:</b>	John Saldin, PSMA Australia Limited
<b>Technical Manager:</b>	Michael Dixon, PSMA Australia Limited
<b>Data Builder:</b>	LogicaCMG
<b>Report Date:</b>	2008-06-03

### 2.1 Background

The background to this project is clearly explained in the NLWRA workshop report (Appendix B):

*“Land tenure defines a basic legal interest in a specified area of land. Individuals, government or corporations may hold tenure.*

*The States primarily carry out the administration of land tenure in Australia. Administration includes creation and updating legislative instruments such as Lands Acts and associated regulations that set out the various forms of Crown Land tenures; Land Registration Acts setting out the creation, management and rights of private tenure; and a variety of other Acts administered by Jurisdictional agencies that define a range of specific tenures, such as Reserves and impose limitations on the use of both public and private lands. There are also a range of Acts dealing with offshore tenures and rights, such as Marine Reserves. These Acts set out the scheme of management of the various tenure types and how various rights, obligations and limitations of use of land and associated resources are to be allocated and implemented. The States keep registers of the land areas held under each type of tenure they administer.*

*It is possible to find all forms of tenure created by these various legal instruments. Such lists already exist for each Jurisdiction. Tenures created by Jurisdictions have many similarities, being derived from a common source of English law applied by each of the Australian colonies when creating the scheme of Crown land administration and subsequent alienation into freehold tenure. However, the overall pattern of tenure types and the affect they can have on specific stakeholders is complex. Rights can differ in detail between Jurisdictions, even for tenure types with the same name.*

*The Commonwealth Government created tenure types that apply in the Australian Capital Territory (leasehold of Crown Land), the Northern Territory and external island territories. In the ACT and NT these tenure systems are administered by the Territory government and essentially look the same as those administered by State governments. Land owned or managed by the Commonwealth in the States*

*and whose use is administered by individual Commonwealth agencies is invariably held as a freehold title or rights over Crown Land issued by a State or Territory government.*

### **2.1.1 Current status and recent initiatives:**

*Geoscience Australia developed a land tenure classification in 1993 and a national data set. There has been no national acceptance of this tenure classification or any further activity to create a more recent data set. The National Land and Water Resource Audit (NLWRA) had initial discussions with ANZLIC regarding the development of a national data set for the Rangelands assessment, but limited resources have not allowed significant progress. Issues in the Rangelands product remain regarding the classification of tenure and its relationship to ownership and land use.*

*A number of internal land tenure products are known to exist including - states and territories; Geoscience Australia; National Native Title Tribunal (NNTT), Department of Agriculture, Fisheries and Forestry (DAFF)/ Bureau of Rural Sciences (BRS) for state of forest reporting; The Australian Collaborative Rangeland Information System (ACRIS)/Rangelands; Intergovernmental Committee on Surveying and Mapping (ICSM) and ANZLIC. This project did consider these as models for developing a nationally agreed hierarchical classification."*

### **2.1.2 What benefits will the project deliver?**

This project will assist planning of Natural Resource Management (NRM), environmental and other activities by highlighting possible limitations or obstacles to certain proposed on-ground activities or land management practice changes.

## **2.2 Use of Land Tenure data**

In the report from the workshop (Appendix B) the following is stated regarding use of Land tenure data:

*"Land tenure is one of the key underlying influences and limitations on the implementation of changes to land management and land use aimed at delivering natural resource management outcomes. A nationally consistent and readily accessible land tenure data would assist many land management decision-making processes.*

*Commonwealth agencies have found that they need access to tenure information in order to carry out some key legislative responsibilities. These responsibilities include assigning and managing Native Title, nature conservation and heritage protection, defence, disaster management and infrastructure planning. In some cases the usage of this information is for statistical purposes (such as fulfilling international reporting obligations) and in others for planning and operation of specific projects. Other national users include industries such as infrastructure management, mining and exploration and insurance.*

*Many of these needs are for studies into land use, that is the allowable use of and access to land and associated resources based on the tenure of specific land areas. Therefore, most of the compilation of multi-Jurisdictional or national data sets have focussed on land use and contain information about aspects of tenure, land use and sometimes land cover and land management practices."*



Stakeholder involvement in land tenure can be summarised in the following table:

<b>Sector</b>	<b>Organisation</b>	<b>Needs</b>	<b>Potential Role in National Project</b>
National and Commonwealth Government	ANZLIC/ICSM/P SMA	Cross Jurisdictional coordination and standards	Coordination and data compilation
	NHT/NLWRA	National consistency to assist decision making Natural resource management and environmental planning, sustainable land use and development	Sponsor for initial data set and development of a national classification scheme
	NNTT/ILC	Manage Native Title claims and determinations. Manage land records associated with Land Acquisition Fund purchases	Data compilation Data use
	DEWHA/DCC/BoM	Environmental reporting and investment decision-making	Data use Data source for some Commonwealth tenure types
	BRS	Sustainable use of public and private lands	Data use Data compilation for specific purposes and uses
	GA	Terrestrial and marine mapping Minerals and petroleum exploration	Potential data source especially offshore and marine Data use
	Defence/Attorney Generals	Disaster management and operations	Data use
	DoTARS	Transportation planning Regional grants	Data use
States and Territories	Land administration agency	Land registration and public land management	Data source Data use
	Other agencies	Land management and legislative responsibilities	Data source Data use

Regional bodies and Local Government	Catchment Management Authorities	Land and water management NRM and environmental reporting	Data use
	Local Government	Zoning and rating NRM and environmental reporting	Details of zoning and land use if needed
Commercial	Utilities	Infrastructure planning and use	Data use
	Developers	Infrastructure planning and use	
	Mining industry	Land access Infrastructure planning and use	
	Pastoral and forestry	Land management and conservation	
Community	NGOs	Land claims NRM and environmental reporting	

**Table 1: Needs amongst stakeholders for a National Land Tenure data set**

Within the private sector the use for a land tenure dataset is relatively limited, the commercial parties seems fairly happy with the information they have. If attributes like planning zones and land use is added, some commercial value can be obtained. The main use will be within different levels of government. Other areas can be market analysis and research for numerous industries where the Tenure data can be combined with demographic data. Universities might also have an interest in the data for various research projects.

### 2.3 Project scope and objectives

The scope for the Land Tenure project is to create a nationally consistent and readily accessible land tenure data to assist land management decision-making processes. The data set will be a one-off product to start with to evaluate the build and receive feedback. For the future a continuously updated data set is preferable, however, a model for this needs to be developed. This is discussed under the “Way forward” section.

## 2.4 Limitations

This project is not aiming for a maintained Land Tenure data set. The objective is to make a “one off” and to test the data set against the needs of the stakeholders<sup>3</sup>. If the data set is successful, a new project will be investigated by PSMA Australia and the stakeholders<sup>4</sup>.

The land tenure data will be based on the States tenure data. The resolution of the data will be on cadastre/land parcel level and only as good as the supplied data will allow.

The translation between the States classifications and the National classification has been made primarily by the Jurisdictions and secondary by Peter Wilson, NLWRA. All efforts have been made to ensure that the best possible translation is made; however, PSMA takes no responsibility for the translation. A reference from the National classification back to the original state classification is found within the product description.

This data set focus only on the terrestrial tenure on mainland Australia. In case of a second phase of this project, the Marine tenures will be included and considerations will be given.

## 2.5 Licensing of the data

Due to the contractual arrangements between PSMA Australia and the Data Custodians, the State and Territory Jurisdictions, a licence agreement is required for all users of the Land Tenure data. The licence agreement is of a click wrap model and has an end date of 30 June 2009.

By this time it is envisaged that if the trial dataset is successful that an additional license agreement will be available.

The license agreement allows End Users to access the trial Land Tenure dataset and CadLite dataset for the limited internal and non-commercial purposes of:

- a) Familiarisation with the trial Land Tenure dataset
- b) Assessing the quality and validity of the Land Tenure dataset
- c) Assessing the usefulness and benefits of the Land Tenure dataset
- d) Creating internal reports, draft documents, presentations or trial products to assist in assessing b) and c) above
- e) Combining the dataset with other data for assessment, presentation or reporting purposes including the creation of hardcopy reports.

The license is a ten (10) user license, where a ‘user’ is a computer either standalone or networked accessing the data. Stakeholders with a current license for CadLite can use the Land Tenure data in line with their current agreement through to 30 June 2009 or when their current license ends (whichever occurs first).

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<sup>3</sup> For a list of project stakeholders see Appendix D.

<sup>4</sup> For a definition of stakeholders in this project please see Appendix D where a table of stakeholders can be found.

### **3. Project Progress Summary**

This project was divided in four phases.

- 1) Creation of a national classification scheme
- 2) Negotiate access to data from custodians
- 3) Build of a data sample for feedback
- 4) Build of the final data set.

#### **3.1 Creation of a national classification scheme**

NLWRA has had the main responsibility for coordinating the creation of the national classification scheme. This was done by facilitating a workshop in Canberra on the 19 December 2007; see Appendix B for the report summarising this workshop. The output from the meeting was the report which includes the national classification scheme. Agreement to the classification for use in this project was achieved after several feedback loops through State Audit Advisory Council and ANZLIC members. The final report was released on 1 February 2008.

There were comments from some of the States that they had not had enough consultation and influence in the process of creating the classification. Earlier attempts, by others, in creating a national land tenure data classification have in many cases fallen over due to the issues associated with all the Jurisdictions agreeing on a national classification. In retrospect, the approach taken by this project might have been the only way of achieving success, particularly given the tight time frames related to funding restrictions.

#### **3.2 Negotiate access to data from custodians**

The second step, to liaise with the Jurisdictions to access their land tenure data, was more time consuming than planned. Access to the tenure data was attained by contacting PSMA Australia's Directors representing the States and with their help obtained a contact person for the data. Information regarding the project and a request to assist were sent out via e-mail to the PSMA Australia Directors.

In most cases the process of getting the relevant contact person and then access to the data was quick and easy, the exceptions were QLD and NSW. Some of the states e.g. TAS and ACT did not have this data readily available and as such something was built for their own purpose which could be used for this project.

QLD at first had an issue with the fact that they had not endorsed the classification scheme, this was quickly resolved. The second issue was the licensing of the data for use in the national dataset. This issue was solved after a review of the existing license agreements. No changes were needed; the data was then released after the payment of a data extraction fee.

NSW has a complex model for how the tenure data is registered. Only the "Crown land" tenure data is kept within the Department of Lands. This issue gave some fear that the data quality would not be sufficient. After some discussions access was granted to the data.

WA's land tenure data was easy to access since it is contained within the data WA supplies to PSMA for the CadLite data set. All the other States sent the data on disc to PSMA.

### 3.3 Build of a data sample for feedback

The test data was built with the data supplied from NT since this was the first data supplied and the data is of a high quality. The translation from the state classification to the national classification was made by the Jurisdiction.

Michael Dixon, PSMA Australia, built the data based on CadLite. Two basic data models were used to demonstrate options available for the delivery of the final product. Option one contained its own geometry based on the aggregation of contiguous CadLite parcels that fell into the same classification whilst option two contained a linking table joining to CadLite containing the same information.

The data provided in the sample was indicative only and intended to demonstrate how the final product might "look & feel" rather than be of production quality. The methods used in the production of the final product have been much more rigorous. The delivery format chosen for the sample dataset was merely a matter of convenience for PSMA Australia and the options and not reflective of the entire list of options available.

### 3.4 Build of the final data set

Data arrived from the Jurisdictions in various formats over a long period of time, from early/mid April until mid June. In the first instance NT was provided, subsequently followed by ACT, TAS, VIC and then WA, NSW, QLD & SA.

There were various reasons for delays which were specific to each state:

**WA** – PSMA Australia already had the data but it was difficult to determine appropriate methods to delineate sections equating to national categories.

**SA**- PSMA Australia received most of the data quite early but the last percentage was halted because the SA key resource was unavailable.

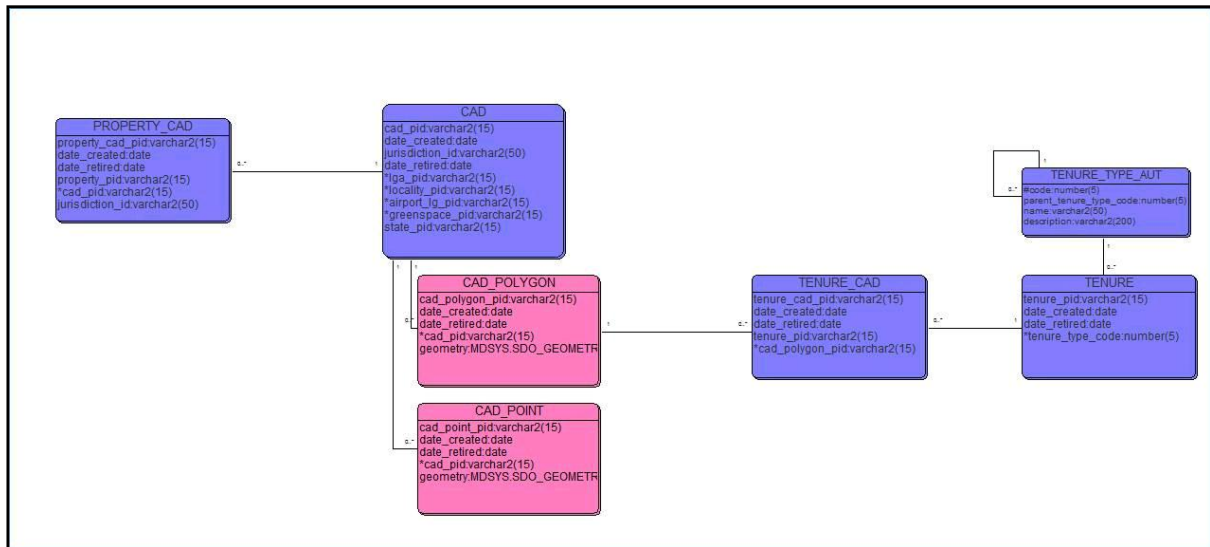
**QLD** –Licensing and communication issues had to be resolved and caused a delay.

**NSW** – After the agreement was reached for the supply of data, unforeseen issues with the Jurisdiction extraction processes caused additional delays.

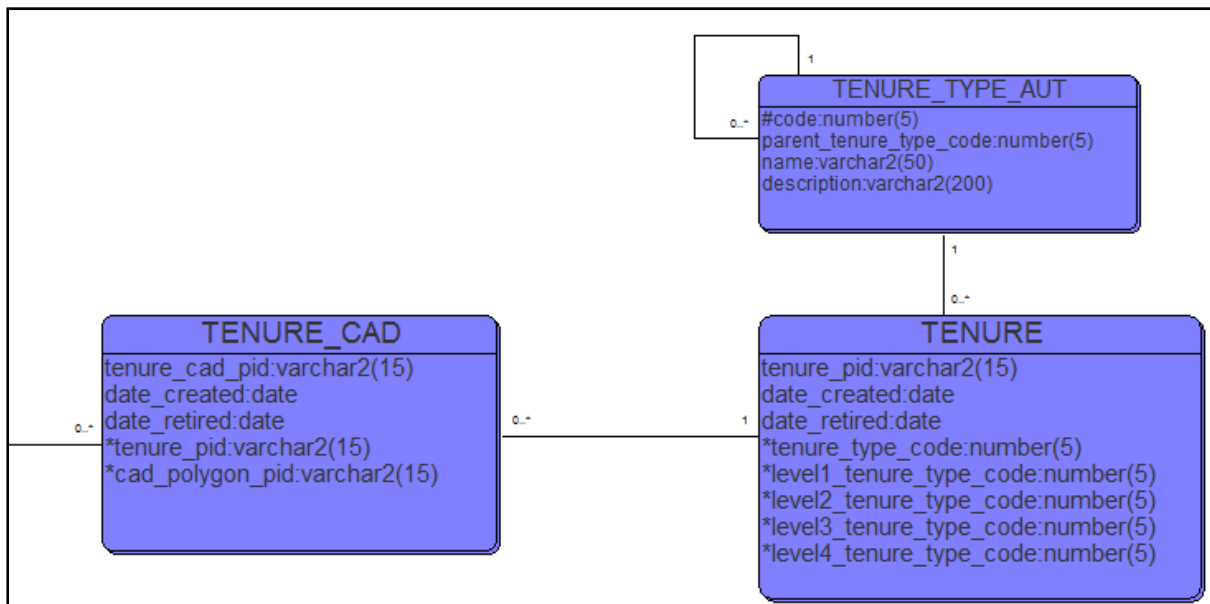
The major issue that PSMA Australia found was interpreting what the states had provided and then getting it into a condition that could be handed over to Peter Wilson (NLWRA) or back to the Jurisdictions for classification into national classification level 4. Initially it looked as though some States would only be able to provide at level 2 or 3 but with a more thorough analysis level 4 was reached in most cases.

An appropriate data model had to be created which would accommodate states that could not provide data all at the same level and minimise the amount of data transfer required during production. A few iterations of this had been created before a final model was chosen. This model is shown below in Figure 1 (note Property\_CAD, CAD, CAD\_POLYGON & CAD\_POINT are all from the CadLite data model). This data model was used by the data manager when constructing the

data before adding it into LYNX. The model will be altered slightly for the final product (Figure 2); specifically the TENURE table will include separate fields for each national classification level containing its appropriate code within the classification hierarchy which will link to the TENURE\_TYPE\_AUT table. This change was made to provide a more user friendly product which will not require the same skill level to interrogate at the various levels.



**Figure 1: Data Model, see also Appendix C for a larger picture**



**Figure 2: Land Tenure Extracts Data Model (Note: Excludes CadLite)**

Reports from the data manager indicate that processing was challenging. Additional detail on this is contained in section 3.5.4 below. Essentially for other

PSMA datasets processes can be shared across states, but for this project it has not been the case and considerable time has had to be spent developing and tweaking processes to get appropriate results. Whilst there is no question that it is possible to perform this work, the amount of time to develop the appropriate processes if this was to be developed further should not be underestimated.

Generally all Jurisdictions were helpful in supplying data and resources to assist with data mappings, the technical resources from each state were particularly useful in providing guidance when required.

#### **3.4.1 Comments about Contributor Data Supply:**

**NT** – Spatial Data was delivered within a single file that contained Jurisdiction classes from their internal systems. Data mappings were provided by the Jurisdiction. They were very helpful and quick to provide their contribution.

**ACT** – Spatial data was delivered in various files with each file consisting of all areas covered by a particular level 4 class. This product was specifically built by ACT for this project. Data contained overlaps between classes (layers).

**TAS** – Spatial data and associated attributes was delivered in a single file. Their contribution was produced in response to this project however the classes were produced for their own internal purpose and some assumptions have been made in mapping into the national scheme.

**VIC** – Developed the product in response to our data request and did all data mapping into national classification level 4. Supporting documentation and customer service were excellent.

**WA** – Data used was contained in existing supply of data used to build CadLite. Data mapping process was difficult as delineation was only possible by taking parts of strings in a field, compounded by data being stored in old system and new system formats. Again WA service was excellent. Significantly more time would need to be spent with WA if a subsequent product is to be released.

**SA** – Spatial data provided in a number of different layers. Not all CadLite parcels were covered by the source data and some data was provided at higher levels. Jurisdiction helped early on with data mappings but was unavailable at key times in the project.

**QLD** – Data arrived late in the project and consisted of a number of tables with the potential to link back to CadLite. Very little supporting information was provided by the Jurisdiction. In the end some of the records in the tables could not be matched back to CadLite and hence were not included in the final product. Further comments and inputs from the state were received late and could not be included in the final product though will help in the future if new versions are generated.

**NSW** – Data arrived at the very end of the project due to various reasons. Spatial data was provided in a series of layers which did contain a number of overlaps. Freehold information was not provided but was taken as being the remaining parcels after each class was allocated.

### **3.5 Comments on the build**

#### **3.5.1 Data translation from state level to the national scheme**

The biggest challenge of this project has been to map the state data to the national classification scheme where this was not provided by the Jurisdiction. A fair bit of work has been put in to make this translation as good as possible. All issues with the translation have been referred to Peter Wilson (NLWRA) and back to the Jurisdictions for comment and approval. Various state products were aimed more at land use rather than a strict view of land tenure. Considerable time had to be spent examining the data in some detail to determine appropriate methods for delineating data into classes that would be appropriate for this projects needs.

#### **3.5.2 Classes not used which may be removed**

The only level 4 class that has not been used is "Multiple Use Forest" which can be removed.

#### **3.5.3 Jurisdictional classes which do not fit the national classification and may require additional classes**

This project highlighted that many Jurisdictions did not have their own active land tenure products or if they did it was not using the strict definition of tenure as applied for this project. Generally all Jurisdictions are able to map their classification to level 2 in the NLWRA classification with little effort. At level 3 the breakups of leaseholds and reserves is not always straight forward and then at level 4 assumptions have had to be made when completing the data mapping process. More classes could be introduced at level 4 or below however there might be a tendency to introduce secondary interests<sup>5</sup> in addition to the primary tenure if this was the case. The danger here is that if too many classes are added you will end up with the individual state classes and not the overall "average" that this dataset will provide.

Some Jurisdictions such as NSW & QLD provided a large number of parcels allocated into classes such as permission to occupy or a particular type of license. The natural assumption was that there would be an underlying tenure for the particular parcel however this was often not the case. Supporting information such as file names in the absence of any real metadata was used to allocate the records where a decision had to be made, the veracity of the process is certain to be questioned.

#### **3.5.4 Specific rules for mapping of Jurisdictional classes to the national classification to ensure repeatability of process**

The data was presented to PSMA Australia by the Jurisdictions in one of 3 ways:

1. Spatial data containing data fields allowing the delineation of various tenure classes, geometry has not directly come from the DCDB (i.e. it is its own separate layer).

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<sup>5</sup> Secondary interests can in example reflect ownership (e.g. aboriginal lands) or land use.



2. Spatial data containing data fields allowing the delineation of various tenure classes with geometry being directly from the states' DCDB (parcel) layer.
3. Aspatial data containing data fields allowing the delineation of various tenure classes, geometry is derived via a linking data field to CadLite.

The reason that processing took such a long time was that the methods used in the production of each state were not transferable to any another state. This is not unexpected given that it is the first time processing a new dataset however the data manager indicated that this is not their experience with other PSMA Australia datasets (i.e. Transport & Topography, G-NAF).

The underlying process to create the product where spatial data was supplied consisted of a spatial operation between the supplied dataset and the May 2008 version of CadLite for each state. Whilst some states provided their cadastre (also the source file for CadLite) this spatial overlay operation still had to be utilised to account for temporal variations between the two datasets. Where only aspatial data was provided, the source data was formatted to produce a linking field to CadLite, on occasion some CadLite records could not be matched again most likely caused by temporal variations between the two products. Data for the May 2008 CadLite product was sourced from the Jurisdictions in early February 2008 where as the tenure data was sourced in May-June 2008.

For a CadLite parcel to be allocated a particular tenure, the initial intention was to apply a percentage overlap in order to eliminate poor parcel/tenure alignment and slivers. During testing, various data overlap percentages were trialled with limited success, for instance the inclusion of greater than or equal to 10 percent overlap was returning significant amounts of mismatch (i.e. low numbers of parcels were allocated a tenure) . The most complete coverage of tenure attributes to a land parcel was found to be any interaction between the two spatial objects which was the method ultimately settled on.



## 4. Milestones and timeframes

### 4.1 Project plan and delivery

Date	Description of Stage	Completion date
17/12/2007	Workshop Key Stakeholders	19/12/2007
18/02/2008	Establish National Land Tenure Classification	01/02/2008
18/02/2008	Stakeholders to receive tenure classifications from NLWRA	01/02/2008
<b>18/02/2008</b>	<b>Signed Contract</b>	
	<i>Deliverables:</i> Work plan agreed and contract signed.	12/02/2008
	<i>Achievement criteria:</i> Receipt of the Signed Contract by National Land & Water Resources Audit	
<b>1/04/2008</b>	<b>Progress Report</b>	
(8 Feb 08)	<i>Deliverables:</i> 1. Meeting between Audit and PSMA to discuss national classification and agree to specifications and detail for data set	07/02/2008
(1 Mar 08)	2. PSMA coordination with Jurisdictions for delivery of input cadastre and tenure data	21/04/2008
(1 Apr 08)	3. Sample data analysis and example data set	18/04/2008
(1 Apr 08)	4. Project progress report	01/04/2008
	<i>Achievement criteria:</i> Acceptance of the Report by National Land & Water Resources Audit	
<b>3/06/2008</b>	<b>Final Report</b>	
(23 May 08)	<i>Deliverables:</i> 1. Preliminary data set available for comment by stakeholders	13/06/2008
(3 June 08)	2. Final data set available	27/06/2008



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(3 June 08)	3. Final project report with recommendations for the national Land Tenure Classification including classes not used which may be removed, Jurisdictional classes which do not fit the national classification and may require additional classes and specific rules for mapping of Jurisdictional classes to the national classification to ensure repeatability of process	Draft: 06/06/2008 Final: 27/06/2008
	<i>Achievement criteria:</i> Acceptance of the Final Report by National Land & Water Resources Audit	

**Table 2: Project plan and delivery**

## 5. Risks / Issues

### 5.1 Risks

In the project the following risks and mitigations were identified:

**RISK 1:** That no agreement can be reached regarding the classification

**MITIGATION:** NLWRA will facilitate the process, consensus is wanted, but if needed a decision will be made without it. The idea is to have a classification ready by February independent of any objections to it.

**RESULT:** Peter Wilson did an excellent job in pushing all stakeholders to a consensus agreement on the classification scheme.

**RISK 2:** That some of the Jurisdictional data can not meet the classification model

**MITIGATION:** The build of the data set will move on with whatever data available. If there is data that can be translated to level 1 in the classification scheme, this is what will be used. Maximum effort will be put in to make the translation possible.

**RESULT:** See the discussion on the build of the data set. This was an issue. Several translations had to be made, especially in WA. Most states have the data in some form; it was just building the relationships with the key people and then acquiring the knowledge on where it was stored and how to get it out. This process took considerable time in some instances and has impacted on trying to meet the final milestones. Settling for level 2 or 3 data rather than trying to get to level 4 for most states may have made the task more straight forward but may have had a detrimental impact on the value of the final product.

**RISK 3:** That no agreement can be reached with the Jurisdictions

**MITIGATION:** The build of the data set will move on even if a few states do not agree on sharing their data. A high level of effort will be put in to ensure that all states will endorse the project. The structure of PSMA Australia with Directors from all Jurisdictions will give a good start in the negotiation process of accessing the data.

**RESULT:** NSW had some issues since there was a concern that their data would not be of high enough quality. After this had been resolved access was granted. Apart from this no significant problems were encountered.

**RISK 4:** IP; a clear statement needs to be made regarding who owns the IP and what rights the different stakeholders have.

**MITIGATION:** IP and rights are taken care of in the data licence agreements.

**RESULT:** All sorted in the Licence agreement.

**RISK 5:** Need to define the level of detail needed by the users prior to the building of the dataset.

MITIGATION: This is sorted by the stakeholder workshop held in December to agree on the classification scheme.

RESULT: Managed during the workshop.

**RISK 6:** The states fail to deliver data or deliver late.

MITIGATION: As earlier, the project moves on regardless of if all states have supplied data. If an agreement is reached to access data, highest priority will be given to have the data delivered in time. This is a major risk.

RESULT: This turned out to be the biggest risk, SA and NSW had problems delivering data for different reasons. Data from NT, ACT, TAS and QLD was delivered on time. WA data is included in the data they already supply to PSMA.

**RISK 7:** Not all Jurisdictions endorse the classification.

MITIGATION: As earlier, the project moves on regardless of if all states have endorsed the classification. The national classification is promoted as an initial version. This project aims to refine and modify the classification to give consideration to any concerns or issues that arise through this collation process.

RESULT: A discussion was held with QLD regarding their endorsement of the classification. This was quickly sorted. The overall comment was that the states had had too little influence in the creation of the classification scheme. Recommendations for further improvement and refinement of the classification are contained in this report and will be collated following the consultation after release of the national data set.

**RISK 8:** NSW data not complete.

MITIGATION: Efforts will be made to liaise with NSW and to ensure that PSMA Australia can access all data available. If there is data missing, PSMA will use the available data and map the unknown fields as good as possible.

RESULT: Different branches of NSW Dept of Lands have provided data, technical issues have restricted the amount of time PSMA Australia have had to look at it.

**RISK 9:** Different interpretations of the scheme between the States.

MITIGATION: PSMA Australia will review all the translations made by the Jurisdictions and liaise with the Jurisdiction and with Peter Wilson, (NLWRA) if any unclear interpretations are found.

RESULT: A huge effort was put in by the technical manager at PSMA Australia to ensure that all the mapping between the local and the national classification was done correctly. Quite a few questions were referred to Peter Wilson for comments and there was intense communication with the Jurisdictions to get all the mapping as logical as possible.



## 6. Deliveries of Outputs

### 6.1 Test data set and report

The test data consisted of NT tenure data and was delivered to the stakeholders on a DVD on the 17 April 2008. The Stakeholders were given two weeks to provide feedback on the data. No major issues were noted by the stakeholders, the main feedback received was:

- There were issues with that the test data was delivered in mapinfo tab files. This restricted some stakeholders from using the data.
- The necessity of a licence agreement was questioned. Also a few questions on the content and the limitations within the licence agreement were raised.
- A wish for common tenure data at the lowest level (i.e. level 4) to be aggregated into contiguous spatial objects rather than the individual land parcels.

A summary of the comments received:

**QLD:** *"NRW has no issues with the Land Tenure Sample Data Licence Agreement prepared by PSMA. The licence agreement has a completion/expiry date of 30 June 2009 and has a narrow permitted use to assess the trial Land Tenure dataset and possible trial products by a select group of end users.*

*NRW has no major concerns with the product description documentation for the National Land Tenure Classification as long as there is adequate mapping from the Jurisdiction level tenure to the National Land Tenure Classification. The aggregation of Jurisdiction land tenure types and descriptions will be approximate roll-up of the tenure types only and there should be clear labelling on any derived products to alert users. For example, any derived map based product should include in the legend of the map an outline of the actual Jurisdiction level tenure to the National Land Tenure Classification, and any digital derived products should include comprehensive metadata which clearly shows the linkage from the Jurisdiction level tenure to the National Land Tenure Classification."*

QLD has supplied an extensive list with clarifications and suggestions regarding the mapping from State to National mapping. This information will be used for the potential next step in the project.

**SA:** *"From what I can tell from the documentation and the data this seems to meet our requirements. The classifications are logical and appropriate for South Australia as far as our projects are concerned.*

*I have not been able to view the data as it is in MapInfo format and we do not have the converter for this type of data (.map). If they can supply this data in the future in shapefile format it would make this process easier. It does state in some documentation that this is possible so in the future it would be good to get the data in the ESRI shapefile format."*

**TAS:**

- *"The product description and proposed Licence Agreement seem fine.*



- *Would expect that the second sample data model would be easier for users to utilise than the first and would be the preferred way of delivering this data.*
- *No other comments."*

**Geoscience Australia:** *"I have reviewed the package and have concluded that the content is in line with the stakeholder project aim expressed at the National Land Tenure workshop held last year.*

*While it certainly has me thinking about how GA may best overlay or depict administered park boundaries and other such land "purpose" areas that don't necessarily align with cadastre or one particular tenure type, I don't have any suggestions to make at this stage on the draft Land Tenure data, other than to say that it is looking good."*

**ERIN Strategies and Spatial Information, Department of the Environment, Water, Heritage and the Arts:** *"Thank you for forwarding through the draft NT Land Tenure data for evaluation. I have made the data available to ERIN staff for the last couple of weeks and have had minimal feedback. I have had mixed feedback regarding the two different models, with some people having a preference for data being tied directly to the cadastre and others have said that dissolved boundaries are more useful. I guess it comes down the scale at which the data is being used which means that both models would be quite useful. Ideally it would be great if the tenure data could be incorporated into the PSMA CadLite data but also made available as a product based on aggregated parcels.*

*Looking more specifically at the data in Model 1 there are a number of parcels that don't have land tenure allocation against them (ie attribute of 'Null')<sup>6</sup>. Is it possible to create a category to put these under (unspecified) so that users know that it isn't a mistake in the data and the parcel has been considered.*

*The data license looks good however it only covers the use of the Sample data. Is the tenure data aimed to be released in June final or sample data? In the future what are the plans for licensing? I assume that it will sit under the CadLite agreement and/or as a separate product agreement.*

*The data documentation also looks good however it would be fantastic if the data were distributed with metadata using the ANZLIC Metadata Profile.*

*Thank you for the opportunity to comment and also your efforts in organising a nationally consistent dataset."*

**NNTT:** *"Have asked our legal folk to ascertain whether we can enter into the licensing agreement to "test" the data but in the interim have taken the opportunity to have a cursory glance!*

*In comparing the data to what we currently hold for Northern Territory – the following parcels did not have a tenure linkage – note this was only a sub-*

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<sup>6</sup> PSMA Australia comment: This issue was due to the way the test data was built. This was done in-house by PSMA and under a very tight timeframe. This is not an issue in the final data set.



*sample of an area I investigated visually by creating a thematic map and these were voids.*

*After legal get back to me I'll know what level of checking I can undertake.*

*On the question of license cost – I trust that the arrangement entered into will all at least Australian Government agencies access to the completed datasets at nil cost and minimal restrictions on use.”*

All feedback will be considered in the future development of the Land Tenure data set.

The project status report was delivered on the 1 April 2008 to NLWRA.

## **6.2 Final data set and final project report**

The final dataset will be delivered at the latest on 27<sup>th</sup> of June 2008. Delivery will be through PSMA Australia's LYNX infrastructure. To access the data existing LYNX users will be able to request the DVD, containing the data, the licence agreement and this report, by logging in to LYNX. Stakeholders without existing LYNX accounts needs to send an e-mail to [lynx@psma.com.au](mailto:lynx@psma.com.au) get a login. Once the login is received, the DVD can be requested.

On the DVD there is a click-wrap licence agreement that needs to be approved before the data can be accessed.

The other part of the delivery is this report.



## **7. Intellectual Property**

The Intellectual Property (IP) of the dataset is jointly held by the States, Territories and PSMA Australia. Each Jurisdiction retains full IP in any data contributed and PSMA Australia holds the rights in any IP that is created during the process. This model is used for a number of existing PSMA Australia datasets and is proven to work well.

The benefit to the stakeholders is that they will have free access to the Land Tenure data set.

## 8. Lessons learned

There are several lessons learned from this project; both of things well done and managed but also of problems, both expected and unexpected.

**The first lesson** was regarding the workshop and the creation of the National Classification Scheme. This process was all managed by Peter Wilson (NLWRA). Earlier attempts on creating a national classification scheme have fallen over due to the fact that there are too many stakeholders that want to have their way in forming the scheme. Another problem has been that the attempts have been on a too detailed level. This has led to unmanageable discussions on how to structure the scheme and no consensus have been achieved.

For this project emphasis was placed on reaching an agreeable level of commonality and usefulness. The workshop was held with a limited number of participants which had a need for nationally consistent data. (A list of participants is found in the workshop report, Appendix B). The first question was what the needs were and from there a scheme was developed. The limited number of participants made it possible to reach a consensus on the classification scheme. The downside was that many stakeholders, like the States felt left out of the process. However, they have later agreed to use the scheme which has made the national data set possible. It seems like a good balance between number of stakeholders involved and the level of detail was found. The key is to involve all stakeholders in the process, but to the right degree since they have different interests. The national classification is promoted as a first version and will be improved through other lessons and considerations elicited through conduct of this national collation project.

**The second lesson** is that coordination takes time. Unfortunately due to funding restrictions, the timeframe for this project was incredibly short. Even though the states had a heads up that the project was moving, it took quite a while to get access to the data and then to get the data delivered. Once the data was delivered, more time was spent on coordinating the classifications and the translations between the local and national scheme. The lesson is the more stakeholders involved, the longer time is needed for coordination. This might seem trivial but with the number of stakeholder in this project it has become an issue. Given the time limitations imposed, the results of this project should be considered an impressive result.

**The third lesson** is to have a clear definition of what needs to be delivered and what the expectations are. Not only must the deliverables and milestones be specified, but also the technical details in the delivery are required. In this project there were a few different models discussed for how to display and build the data set. The idea is to deliver a table built on CadLite, for all stakeholders to be able to use this table; they then need access to CadLite. A click-wrap agreement on each DVD will be sufficient for this solution. This is well on its way and will be finalised before the end of April. These details need to be discussed, as they were in this project, openly and clearly.



## **9. Feedback on the final data**

For this project to be of value to all the stakeholders' feedback on the data, data model and classification is needed. The uncertain future of NLWRA, which, as the organiser, is the natural centre of communication for this project, gives PSMA Australia as the second option. Other options are ANZLIC and ICSM. PSMA Australia is happy to facilitate a discussion and to coordinate all feedback in the case of NLWRA ceases to exist. A mechanism for feedback has been established and is managed through the LYNX infrastructure by the Project Manager at PSMA Australia. Feedback is needed within six months from the release of the data to allow for processing into a second phase of this project.

## 10. Way forward

Depending on the feedback received on the data there are several different options for funding and management available. To evaluate which option is the best several questions need to be answered.

Firstly the usage and quality of the data needs to be evaluated by all stakeholders. Depending on the future of NLWRA, PSMA Australia can coordinate this process.

Secondly, if NLWRA disappears, a Champion for the data needs to be found. Logically it is up to the land administration community of practice to manage and support the provision of a standardised national Land Tenure data set. This includes the funding and supply of data. Governing this is, following this logic, ANZLIC and ICSM. There is a strong need for the Land Tenure data and other attributes to be readily supplied, attached to the cadastral parcels. This is best done by the land administration bodies in Australia. This needs to be resolved for the next step in this project to take place. PSMA Australia can champion the project if a strictly commercial model is chosen.

Thirdly, with a solution to the prior steps; if the interest is significant within the stakeholder group, a financial model will be suggested to maintain, improve and continuously update the Land Tenure data. The model will be dependent on the chosen path in the second step. If no interest is shown by the land administration bodies, market size and demand outside the stakeholder group will determine the future of the National Land Tenure data set.

As for improvements, these will be based on the firstly on the needs of the stakeholders and secondly on market needs and could incorporate: historic data, time series, level of detail, additional data. There are known issues with the data, mainly deriving from the short timeframe of the project. These issues will have a high priority to be resolved.

PSMA Australia is open for different ways of funding the data set. Fundamentally it comes down to how the stakeholders want the data to be used and managed. Both a publicly funded, free to use data set as well as a cost recovery model are possible.

## 11. Recommendations

To successfully move on from this project these are the suggested steps:

1. To collect and consider the feedback on the data;
2. Search for public funding but at the same time evaluate the market for a commercial data set;
3. Develop a model for maintenance of the data with at least annual updates;
4. Redevelop the data set based on the feedback;
5. Invest time in coordinating the translation from State to National level. There are comments already received that need to be included in the data set;
6. Refine the data model and technical production details based on user feedback.

### 11.1 Business recommendations

It is recommend that:

- this version of the National Land Tenure data *not* be considered a final product. Several areas of improvement are required and feedback is needed to get a final product of high quality;
- PSMA Australia coordinates market testing and feedback on the data set for the future development ad enhancement;
- Clarity be sought from the stakeholders and data custodians as to their willingness to fund a “free to use” or “cost of transfer” National Tenure data set managed and maintained by PSMA Australia;
- a champion for the National Land Tenure be found so that the dataset can receive continued high level support. ANZLIC (and ICSM) is the natural champion particularly if the project can be publicly funded.
- PSMA Australia would be able to continue this project on an ongoing basis providing a financially viable business model can be developed.
- The Land Tenure information be included in the PSMA Australia CadLite data set as attributes of cadastral parcels;
- if there is a future project, that updates initially will be on an annual basis; and
- a model to enrich the data is investigated.

### 11.2 Technical recommendations

- Based on the results from this project currently it is not possible to develop a single national approach to the production of a national dataset. Significant variations exist in data supplies from Jurisdictions leading to different production methods being developed for each. More work is required in trying to standardise production methodologies across each State however it is likely that the variations will continue into the future.
- For this project any interaction between the land tenure and land parcel polygons was considered sufficient for a tenure to be allocated to a parcel. This method provides an extensive coverage however there is the capability



for mismatches to be introduced during the processes. Other methods may be utilised if user feedback dictates that this method is not suitable. Ultimately once a method has been chosen it should be used consistently until a universally accepted variation is adopted.

- The production time required to repeat the production of this dataset in the future should not be underestimated. Especially if the classification scheme changes from the one used for this project. Particularly if a further level of detail was adopted (i.e. equating to a level 5 classification).
- Classes not used which may be removed, "Multiple Use Forest", this is the only NLWRA level 4 class that no Jurisdictional data was mapped into.

In terms of Jurisdictional classes which do not fit the national classification and may require additional classes, this project highlighted the fact that many of the Jurisdictions did not have a tenure dataset or if they did it was not following the same strict classes that were included in the derived NLWRA scheme. The Jurisdictions were encouraged to "make it fit" where they took on the task of constructing a dataset for this project (e.g. ACT). For the remaining Jurisdictions where PSMA Australia / NLWRA assisted in completing the data mappings as much detail as possible was used in delineating the source data. The feel of the process was almost like trying to take slices from apples and make segments of oranges.

For TAS, VIC, SA, WA, NT & QLD – a combination of point on area and area on area spatial operations we used to allocate the tenure information to the parcel. An example of an area on area operation would be a spatial intersection where as point on area operations would be a centroid being contained within a polygon. For NSW – for which multiple spatial tenure files were supplied a combination of point on area and area on area spatial operations completed one at a time was used to allocate the tenure information to the parcel. For ACT – which also supplied multiple tenure files (within which there were varying degrees of overlap); the files were processed one at a time, using only an area on area comparison to allocate tenure information to the parcel.



## **12. Reference documents**

**Appendix A:** Recommended National Land Tenure Classification

**Appendix B:** National land tenure classification and data set, version 3  
(Report from Canberra workshop held on 19 December 2007)

**Appendix C:** Data Model for Land Tenure.

**Appendix D:** List of stakeholders

**Appendix A Recommended National Land Tenure Classification**

Entity	Level/Tenure Type					Links		
	Level 1	Level 2	Level 3	Level 4	Level 5-x Examples			
Cadastral Parcel	Freehold	Freehold	Freehold	Freehold	Freehold (Alienable NT)	Full list of tenure types in each Jurisdiction		
					Freehold Aboriginal (Unalienable NT)			
					Freehold Parks (NT)			
	Non-Freehold	Leasehold	Term Lease	Pastoral Term Lease	Pastoral Term Lease		Example specific purpose or use assigned by individual users	
					Special Purpose Term Lease			
					ACT Term Lease			Private Term Lease (ACT)
					Other Term Lease			Government Term Lease (ACT)
				Perpetual Lease	Pastoral Perpetual Lease			
					Special Purpose Perpetual Lease			
					Other Perpetual Lease			
				Other Lease	Other Lease			
				Reserve	Conservation Reserve			Marine Reserve
								National Park
								Other Conservation Reserve
								Water Reserve
					Mining Reserve (NB reserve not tenement)			Mining Reserve
					Forestry Reserve			Multiple Use Forest
								State Forest
								Timber Reserve
								Other Forestry Reserve
Transportation or Infrastructure Reserve	Stock Route							
	Transportation Reserve							
	Other Infrastructure Reserve							
Other Reserve	Other Reserve							
Vacant, Unallocated, Unreserved or Other Crown Land	Vacant, Unallocated, Unreserved or Other Crown Land	Vacant, Unallocated, Unreserved or Other Crown Land	Vacant, Unallocated, Unreserved or Other Crown Land					
No Data	No Data	No Data	No Data					

Appendix B: National Land Tenure Classification and Data Set

## **National Land & Water Resources Audit**

*An Initiative of the Natural Heritage Trust*

### **National Land Tenure Classification and Data Set**

**Report from Canberra Workshop**

**Held on 19 December 2007**

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## Acronym List

ACLUMP	Australian Collaborative Land Use Mapping Program
ANZLIC	The Spatial Information Council of Australia and New Zealand
ACT	Australian Capital Territory
BoM	Bureau of Meteorology
BRS	Bureau of Rural Sciences
COAG	Council of Australian Governments
DCC	Department of Climate Change
DEWHA	Department of Environment, Water, Heritage and the Arts
DoTARS	Department of Transport and Regional Services
GA	Geoscience Australia
HDM	Harmonised Data Model (developed by ICSM)
ICSM	Intergovernmental Committee on Surveying and Mapping
ILC	Indigenous Land Council
ISO	International Standards Organisation
IUCN	World Conservation Union (Classification)
NGO	Non-government organisation
NHT	Natural Heritage Trust
NLWRA	National Land and Water Resources Audit
NNTT	National Native Title Tribunal
NPIL	National Public and Indigenous Lands (Classification)
NRM	Natural resources management
NT	Northern Territory
OSDM	Office of Spatial Data Management
PSMA	PSMA Australia Ltd

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## **Background**

*Land tenure* defines a basic legal interest in a specified area of land. Individuals, government or corporations may hold tenure.

The States primarily carry out the administration of land tenure in Australia. Administration includes creation and updating legislative instruments such as Lands Acts and associated regulations that set out the various forms of Crown Land tenures; Land Registration Acts setting out the creation, management and rights of private tenure; and a variety of other Acts administered by Jurisdictional agencies that define a range of specific tenures, such as Reserves and impose limitations on the use of both public and private lands. There are also a range of Acts dealing with offshore tenures and rights, such as Marine Reserves. These Acts set out the scheme of management of the various tenure types and how various rights, obligations and limitations of use of land and associated resources are to be allocated and implemented. The States keep registers of the land areas held under each type of tenure they administer.

It is possible to find all forms of tenure created by these various legal instruments. Such lists already exist for each Jurisdiction. Tenures created by Jurisdictions have many similarities, being derived from a common source of English law applied by each of the Australian colonies when creating the scheme of Crown land administration and subsequent alienation into freehold tenure. However, the overall pattern of tenure types and the affect they can have on specific stakeholders is complex. Rights can differ in detail between Jurisdictions, even for tenure types with the same name.

The Commonwealth Government created tenure types that apply in the Australian Capital Territory (leasehold of Crown Land), the Northern Territory and external island territories. In the ACT and NT these tenure systems are administered by the Territory government and essentially look the same as those administered by State governments. Land owned or managed by the Commonwealth in the States and whose use is administered by individual Commonwealth agencies, is invariably held as a freehold title or rights over Crown Land issued by a State or Territory government.

## **Need for a National Land Tenure Data Set**

Land tenure is one of the key underlying influences and limitations on the implementation of changes to land management and land use aimed at delivering natural resource management outcomes. A nationally consistent and readily accessible land tenure data would assist many land management decision-making processes.

Commonwealth agencies have found that they need access to tenure information in order to carry out some key legislative responsibilities. These responsibilities include assigning and managing Native Title, nature conservation and heritage protection, defence, disaster management and infrastructure planning. In some cases the usage of this information is for statistical purposes (such as fulfilling international reporting obligations) and in others for planning and operation of

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specific projects. Other national users include industries such as infrastructure management, mining and exploration and insurance.

Many of these needs are for studies into land use, that is the allowable use of and access to land and associated resources based on the tenure of specific land areas. Therefore, most of the compilation of multi-Jurisdictional or national data sets have focussed on land use and contain information about aspects of tenure, land use and sometimes land cover and land management practices.

Land tenure information is contextually important to studies into land use and other operational needs. Therefore, the National Land and Water Resources Audit (NLWRA) convened a workshop in Canberra on 19 December 2007 to develop a national Land Tenure Classification and investigate the need for and means of developing a national land tenure data set, needed initially for the National Heritage Trust (NHT) but also useful in the immediate and longer term for other national users. The workshop agenda and list of participants is shown in Appendix B.

Workshop participants agreed that the focus of a national land tenure classification should be to underpin a nationally consistent land tenure data set. The classification and data set should contain the characteristics of land tenure alone and not extend into other land characteristics such as use, cover, rights, obligations and restrictions. It was felt that land tenure was fundamental and that a simple structured national classification scheme and data set was achievable. Other land characteristics, such as land use or cover, are being defined and mapped through other national processes, including the ACLUMP for land use and a land cover proposal being developed by NLWRA, GA and BRS et al.

Workshop participants agreed that land tenure information was a fundamental data set that underpinned many uses in all levels of government and in industry and the community. Key stakeholders and examples of their use of land tenure information are shown in the following table.

	<b>Organisation</b>	<b>Needs</b>	<b>Potential Role in National Project</b>
National and Commonwealth Government	ANZLIC/ICSM/P SMA		Coordination and data compilation
	NHT/NLWRA	National consistency to assist decision making Natural resource management planning, sustainable use	Sponsor for initial data set and development of a national classification scheme
	NNTT/ILC	Manage Native Title claims	Data compilation Data use

	DEWHA/DCC/ BoM	Environmental reporting	Data use Data source for some Commonwealth tenure types
	BRS	Sustainable use of public and private lands	Data use Data compilation for specific purposes and uses
	GA	Terrestrial and marine mapping Minerals and petroleum exploration	Potential data source especially offshore and marine Data use
	Defence/Attorney Generals	Disaster management and operations	Data use
	DoTARS	Transportation planning Regional grants	Data use
States and Territories	Land administration agency	Land registration and public land management	Data source Data use
	Other agencies	Land management and legislative responsibilities	Data source Data use
Regional bodies and Local Government	Catchment Management Authorities	Land and water management NRM and environmental reporting	Data use
	Local Government	Zoning and rating NRM and environmental reporting	Details of zoning and land use if needed
Commercial	Utilities	Infrastructure planning and use	Data use
	Developers	Infrastructure planning and use	
	Mining industry	Land access Infrastructure planning and use	
	Pastoral and forestry	Land management and conservation	
Community	NGOs	Land claims NRM and environmental reporting	

## Preferred Characteristics of a National Land Tenure Data Set

Workshop participants took into account known needs and existing national data sets that contained aspects of land tenure. National data sets included the Geoscience Australia Land Administration Feature Data Set comprising the 1993 and planned 2008 data set and intermediate time slices; National Forest Inventory; and data held by the National Native Title Tribunal. It was noted that all had been compiled from data provided by States at various times.

Participants provided the following key characteristics of a national data set.

Characteristic	National Data Set
Definition of tenure	Primary legal interest in land, as shown in formal registration, not including ownership, rights or use
Geographical coverage	Primary focus is onshore, then offshore islands and marine; priorities for initial coverage will be determined by available data
Tenure types	All tenure types including freehold (private) and non-freehold (public)
Spatial resolution	Individual land parcel as shown in Jurisdictional registers; recognising that some users will want sub-parcel entities for further details of rights and obligations, land management and use; other users will want to aggregate parcels to identify properties
Attribute classes	Hierarchical, classification scheme to at least four levels, able to be linked with Jurisdictional tenure types
Temporal resolution	Ideally continuous updates available online; preferably quarterly update of base national data set; some users with specialised reporting needs vary from quarterly to five years
Product	Nationally consistent data set providing the point of truth for nationally classified tenure data (pointing to State/Territory data sources); other products to be derived as users require
Sources	Primarily States and Territories plus any Commonwealth Government-specific tenures
Access arrangements	National classification scheme is public; National data set should be open access to all because it is a fundamental data set created in the public interest; may be limited by source conditions; costs imposed by sources may need to be passed on to users; derived products may be restricted to use and priced

## **Recommended National Land Tenure Classification**

Workshop participants undertook a scan of any known classification systems that could be applicable to a national land tenure classification. There is no classification system that has been adopted by the ISO. The IUCN classification for protected lands is primarily focussed on land use, not land tenure *per se*.

There are several classification schemes developed by individual Commonwealth agencies, including Geoscience Australia (National Public and Indigenous Lands NPIL), National Forest Inventory (Forest Tenure), National Native Title Tribunal (NNTT Non-freehold Tenure Classification), Intergovernmental Committee on Surveying and Mapping (ICSM Harmonised Data Model HDM) and State/Territory schemes. It was agreed that NPIL and Forest Tenure had some useful aspects, but were a hybrid of both land use and land tenure classifications. The NNTT classification is useful and is in accord with the ICSM HDM. The relationship with some State/Territory schemes had been mapped by NNTT and so was in keeping with and could be related to Jurisdictional schemes. The NNTT scheme was referred to in deriving the recommended national classification scheme, which is shown in Appendix A.

Following the workshop this report including a draft classification scheme was circulated for comment by participants and for wider consideration by Jurisdictions. A number of alterations were made to the initial classification and a final recommended national land tenure classification developed, as appears in Appendix A.

Testing of this classification scheme is proposed through a national data collation project which will highlight any significant issues or omissions. Following this testing, further recommendations for agreement and standardisation of the national land tenure classification will be made.

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## Issues and Action Arising

Issue	Resolution	Action
Sustainable access to State/Territory land tenure data	Provide for two way data flow – detailed data from Jurisdictions, nationally-classified data from national provider; shared improvement to data nationally	General issue of data access is for COAG; ANZLIC to address immediate access issues to allow national data set to be created
Access to national data set	Levels 1-4 of classification could be national “public good” data set, more detailed classification levels may be specific to user or commercial	NLWRA is facilitating the first version of the national data set, will determine access conditions
Data licensing	Use standard licence conditions where possible, using Creative Commons approach allowing for various non-commercial and commercial use	
Limit scope of national data set to land tenure classification only	More detailed data sets covering rights and obligations, purpose and use are other layers which sit over the land tenure data set	
Need to document benefits of a national data set to users	First pass of user need achieved at the workshop; there are users for at least the first four levels; need to test classification with key users	ANZLIC and Audit Advisory Council to facilitate national engagement of stakeholders; OSDM to assist with Commonwealth Government agencies
Seek support for a national data set and approval for the proposed classification	Another round of engagement with national users and Jurisdictional sources	NLWRA to prepare brief for Audit Advisory Council and ANZLIC
Who will construct and maintain the national data set	First version needed immediately for NHT, but need to consider how it will be sustainably maintained	NLWRA to have discussions with PSMA, NNTT and GA

**Appendix A Recommended National Land Tenure Classification**

Entity	Level/Tenure Type						
	Level 1	Level 2	Level 3	Level 4	Level 5-x Examples	Links	
Cadastral Parcel	Freehold	Freehold	Freehold	Freehold	Freehold (Alienable NT)	Full list of tenure types in each Jurisdiction	
					Freehold Aboriginal (Unalienable NT)		
					Freehold Parks (NT)		
	Non-Freehold	Leasehold	Term Lease	Pastoral Term Lease			
				Special Purpose Term Lease			
				ACT Term Lease			Private Term Lease (ACT)
				Other Term Lease			Government Term Lease (ACT)
				Perpetual Lease			Pastoral Perpetual Lease
							Special Purpose Perpetual Lease
			Other Perpetual Lease				
			Other Lease	Other Lease			
			Reserve	Conservation Reserve	Marine Reserve		Example specific purpose or use assigned by individual users
					National Park		
					Other Conservation Reserve		

				Water Reserve			
			Mining Reserve (NB reserve not tenement)	Mining Reserve			
			Forestry Reserve	Multiple Use Forest			
				State Forest			
				Timber Reserve			
				Other Forestry Reserve			
			Transportation or Infrastructure Reserve	Stock Route			
				Transportation Reserve			
				Other Infrastructure Reserve			
			Other Reserve	Other Reserve			
		Vacant, Unallocated, Unreserved or Other Crown Land	Vacant, Unallocated, Unreserved or Other Crown Land	Vacant, Unallocated, Unreserved or Other Crown Land			
		No Data	No Data	No Data			No Data

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## Appendix B Workshop Agenda and Participants

### National Land Tenure Classification Workshop

Wednesday 19 December, 9:30am to 4:30 pm

National Land and Water Resources Audit Office

Phoenix House, 86 Northbourne Ave, Canberra

#### The workshop aim is to:

1. Explore existing land tenure classifications and initiatives.
2. Examine the level to which the Geoscience Australia 93 classification fulfils user needs.
3. Identify issues relating to national tenure classification that require further discussion.
4. Seek initial agreement from workshop participants to a national tenure classification that we can seek further comment on and agreement to from other stakeholders.
5. Discuss the ways forward and PSMA project proposal to deliver a national land tenure data set by June 08.

#### Agenda

Time	Session	Aim	Presenter/Facilitator/Participant
9.15	<i>Coffee on arrival</i>		
9.30	Welcome and workshop opening	Set out objectives and general scope of the project; aims of the workshop	Peter Wilson
9.45	Workshop structure; introductions	Participants introduce themselves and their expectations; explain workshop structure	Paul Kelly
10.00	Scan of existing classifications, datasets and relevant initiatives	Overview of existing ALT 1993 classification and data set; other initiatives; questions and discussion	GA PSMA ICSM NNTT BRS
11.00	<i>Coffee Break</i>	<i>Informal discussion, networking</i>	

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11.30	Identify needs for a national classification and data set	Summarise existing situation; identify stakeholders and their general needs for a national classification and data set; confirm project scope	Paul Kelly/all participants
12.30	<i>Lunch Break</i>	<i>Informal discussion, networking</i>	
1.30	Form of a National Land Tenure Classification and Data Set	Assess existing classification and data sets; identify any improvements needed to meet known requirements; specify form of a national classification; general form of a nationally consistent data set	Paul Kelly/all participants
3.00	<i>Short Break</i>		
3.10	Where to from here	Identify issues; provide advice to NLWRA and PSMA on how to address stakeholder needs; recommend further steps and timeframes for the project	Paul Kelly/all participants
4.00	Summary	Final discussion, summarise priorities; support from stakeholders for the project	Paul Kelly/Peter Wilson
4.30	Close		

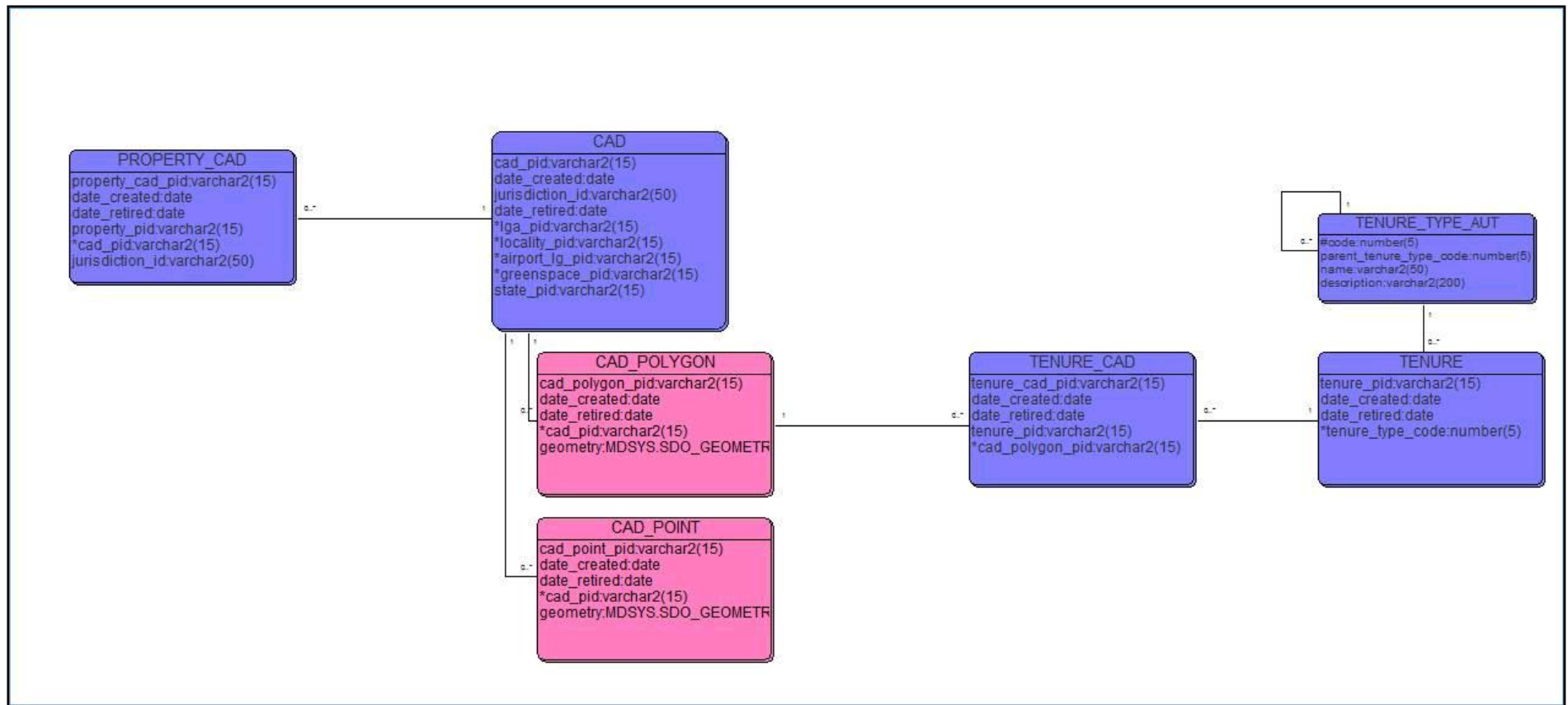
### Attendees

Name	Representing
Jeff Harris	NNTT
Bill Hirst	ACT and ICSM
Simon Costello	GA
Dave Campbell	GA
John Saldin	PSMA
Michael Dixon	PSMA
Richard Thackway	BRS
Adam Gerrand	BRS
Geoff Dunn	BRS

Rob Lesslie	BRS
Damian Woolcombe	DEWHA/ERIN
Mirko Stauffacher	DAFF/NHT
Martin Adams	DAFF
Chris Body	Standards Australia Committee IT-4 and ICSM HDM Working Group
Jenny Bone	OSDM
Peter Wilson	NLWRA
Viv Bordas	NLWRA
Paul Kelly	Facilitator

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Appendix C: Data Model for Land Tenure





## **Appendix D: List of Stakeholders**

### **Stakeholders for this project include:**

ANZLIC the Spatial Information Council

Australian Bureau of Statistics (ABS)

Department of Agriculture Fisheries and Forestry  
including:

Bureau of Rural Sciences, (BRS) AG

Department of the Environment Water Heritage and the Arts  
including:

the Environmental Resources Information Network (ERIN)  
Bureau of Meteorology, (BoM) AG

Geoscience Australia, AG

Intergovernmental Committee on Surveying and Mapping (ICSM)

Land & Water Australia (LWA),

National Heritage Trust (NHT),

National Land & Water Resources Audit (NLWRA),

National Native Title Tribunal, (NNTT) AG

Office of Spatial Data Management (OSDM)

PSMA Australia Limited

State and Territory Jurisdictions

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