Survey Requirements for Mining Tenures

Version 3.0

November 2011

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Document Status:

Made by the Chief Executive on 15 August 2011

Notification of the standards approved by the Minister on 25 October 2011

Takes effect on 11 November 2011

Amendment History

Showing changes since Survey Requirements for Mining Tenures Version 2.0

Section Amended	Amendment	Reason
1.2 Definitions and conventions	New standard	Definitions required to provide consistent interpretation of standards
1.3 Application of standards – area and type of survey	New standard	To meet requirement of SMIA
1.8 Merlin (also Spatial Information Enquiry)	Text modified	Reference to SIE
1.11 Survey instructions	Updates to example	
4.2 High water mark or natural boundary	Broadened to deal with other types of natural boundary	
5.9.1 Geocentric datum	Amend reference	Correct reference is AGD66
5.10 GPS	Update	Include reference to SP1
5.14 Line pegs	Text amended	Clarify intent in first paragraph
5.17 Mining claims	Text amended	Clarify intent
5.22 Priority	Text amended	Clarify intent
5.23 Reference marks	Text amended	Clarify intent
5.33 Surrenders	Text amended	Clarify intent
6.3 Access	Text added to first paragraph	Clarify requirement
6.15 Exploration permits	Reference amended	Correct reference is AGD66
6.25 Mining claims	Changed requirement for description of mining claims	
6.28 Petroleum permits, leases & licences	Reference amended	Correct reference is AGD66
7.4.5 Cadastral connections	Text added	Explanation of intent
7.4.15 Reference marks	Requirement added for connection to a permanent mark	
General	Numerous minor editorial changes have been made to the document, in addition to those identified above.	

Note to Surveyors:

This document contains the requirements for the surveying of mining tenures.

Each section of this document is identified as one of the following: ‘Standard under SMI Act’, ‘Guideline under SMI Act’ or ‘Information’. Where a heading has one of those notes under it, the note applies to the whole of the section covered by that heading. For example, chapter 5 has, on the line under the title, the words ‘Standard under SMI Act’. This note applies to the whole of chapter 5.

Table of Contents

1 General

1.1 Introduction

Information

These notes deal with the special requirements for surveying mining tenures issued or applied for under the mining and petroleum related Acts. General survey and drafting standards are the same as those for surveys under the *Land Act 1994* and the *Land Title Act 1994* and other non-mining legislation. These are found in the relevant parts of the Cadastral Survey Requirements (in this paper referred to as CSR) and are cross-referenced where appropriate.

1.2 Definitions and conventions

Standard under the SMI Act

The following definitions apply to all material (standards, guidelines and information) in this document

chief surveyor	the chief surveyor in DEEDI
CSR	Cadastral Survey Requirements, containing standards and guidelines for cadastral surveys, made by the chief executive of DERM under the SMIA
DEEDI	means the department administering mining tenure legislation, currently Department of Employment, Economic Development & Innovation
DERM	when used without qualification, means the department administering the SMIA, currently the Department of Environment and Resource Management; when used as part of a reference to a specific business unit, means the Department of Environment and Resource Management.
MRA	means the *Mineral Resources Act 1989*

SMIA or SMI Act means the *Survey and Mapping Infrastructure Act 2003*

The following conventions apply to interpretation of this document:

xxx	where a specification or an example requires the insertion of a particular number (e.g. a lot number; plan number; mining claim number) the number is represented in the specification as 'xxx'

1.3 Application of standards – area and type of survey

Standard under the SMI Act

Section 6(2) of the *Survey and Mapping Infrastructure Act 2003* requires that a survey standard must state the area and type of survey to which it applies. Each survey standard and survey guideline in this document applies to mining and petroleum tenure surveys. Unless indicated otherwise, each survey standard and survey guideline applies in the area administered by the State of Queensland.

1.4 Regions and districts

Information

A list of the three regions and nine mining districts and a map showing them can be found at:
< http://mines.industry.qld.gov.au/mining/contacts.htm >

1.5 Abbreviations for tenures and rights

Information

The list shows past and present tenures and rights most likely to be used or to be found in mining records and

plans. Those marked with an asterisk are no longer issued by DEEDI. MHLs, MHPLs, BAs, GAs, MGAs and RAs have been converted to other tenures under the *Land Act 1994*.

* AMC Alluvial Mining Claim

A to P Authority to Prospect (this is no longer used for coal & minerals but is still used for petroleum)

* BA Business Area

* CML Coal Mining Lease

* CPA Coal Prospecting Area

* DA Departmental Area

* DC Dredging Claim

* DL Dredging Lease

* EATC Extended Alluvial Tin Claim

EPC Exploration Permit for Coal

EPM Exploration Permit for Minerals

EPP Exploration Permit for Petroleum (= AtoP)

* GA Garden Area

* GML Gold Mining Lease

* GFHL Gold Field Homestead Lease

* MA Machine Area

MC Mining Claim

MDL Mineral Development Licence

* MGA Market Garden Area

* MHL Miners Homestead Lease

* MHPL Miners Homestead Perpetual Lease

ML Mining Lease

PL Petroleum Lease

PPL Pipeline Licence

* PA Prospecting Area

PP Prospecting Permit

* RA Residential Area

RA Restricted Area

* RMC Restricted Mining Claim

* RMPC Restricted Mining Purposes Claim

* R of A Right of Access

* R of W Right of Way

* SBML Special Bauxite Mining Lease

* SCML Special Coal Mining Lease

* SML Special Mining Lease

* SPMPL Special Perpetual Mining Purposes Lease

* SGC Special Gem Claim

SA Surface Area

* TA Tailings Area

* WR Water Right

1.6 Departmental administration

Information

At a local level mining tenures are administered by the relevant district mining registrar in DEEDI. However, surveys of mining tenures are administered by the chief surveyor within DEEDI[1] . Original mines survey plans are located in DERM and are imaged and made available to the public in the same manner as all other survey plans held by DERM. However, it should be noted that Mines plans are still under the control of DEEDI.

Forms necessary for *Mineral Resources Act 1989* tenure dealings, such as applications, partial surrenders and surface area additions and surrenders, are available from any mining registrar's office. They can also be found in DEEDI's website <http://mines.industry.qld.gov.au/mining/minerals-tenures.htm>

1.7 Legislation

Information

For surveyors, most contact with mining legislation will be through the *Mineral Resources Act 1989*. It is essential that a copy of this Act and the Mineral Resources Regulation 2003 are referred to in any dealings with mining tenements. Recently coal seam gas has become of some importance to surveyors; this is governed by the *Petroleum & Gas (Production & Safety) Act 2004*.

Following is a list of the Acts administered by DEEDI that are likely to be of interest to a surveyor of mining tenures. Some of them may not have any further survey work arise from their provisions but need to be known to explain past surveys of current tenures.

Alcan Queensland Pty Ltd Agreement Act 1965 (The Schedule)

Central Queensland Coal Associates Agreement Act 1968 (Parts II & III of the Schedule)

Century Zinc Project Act 1997 (section 10)

Coal Mining Act 1925

Coal Mining Safety & Health Act 1999

Commonwealth Aluminium Corporation Limited Agreement Act 1957

[1] currently in the Mapping & Survey Services unit within Statewide Services at the Landcentre in Woolloongabba

Fossicking Act 1994

Gas Act 1965

Irvinebank State Treatment Works (Sale & Operation) Act 1990

Mineral Resources Act 1989

Mount Isa Mines Limited Agreement Act 1985

Offshore Minerals Act 1998

Petroleum Act 1923

Petroleum and Gas (Production and Safety) Act 2005

Petroleum (Submerged Lands) Act 1982

Queensland Cement & Lime Company Limited Agreement Act 1977 (Parts II and VI of the Schedule)

Queensland Nickel Agreement Act 1970 (Parts II and III of the Schedule)

Thiess Peabody Coal Agreement Act 1962

In addition to these there is a large body of repealed legislation, dating back to 1857, that has governed mining surveys. Some of these Acts, such as the *Mining Act of 1898* and certain 20th century legislation, are still relevant to a number of extant mining leases. They are all important when historical issues are raised. Refer also to section 8 *Historical Information.*

1.8 Merlin (also Spatial Information Enquiry)

Information

The online version of Merlin is now called the Interactive Resource and Tenure Maps (IRTM). See: <http://www.dme.qld.gov.au/mines/tenure_maps.cfm>

For use within DEEDI, the graphical part of Merlin has been superseded by the Spatial Information Enquiry (SIE). The databases are a combination of attribute and graphical functions, which will provide information on all mining tenures relevant to:

- the existence and location of mining tenures
- land availability, subject to confirmation by survey
- processing of applications, variations, transactions and dealings (these are not in the online version)
- general enquires.

The graphics show a statewide display with a background of cadastral, topographical or geological information, or any combination of them. The cadastral information is maintained by frequent downloads from DERM's SmartMap.

As well as a plot of current mining tenures, IRTM graphics show dead mining leases back to the inception of the Department of Mines. Not all old leases have yet been plotted; about four per cent still have to be captured, mostly in North Queensland but with some scattered ones. Leases that died before 1989 are plotted as a point indicating the centroid of the lease. For a few larger leases, the whole polygon has been plotted. Leases that have died since then are shown in full. Plotting accuracy is variable. Some of the old leases are so poorly described that their position cannot be fixed with any certainty.

Mining tenure surveys are entered into DERM's Computer Inventory of Survey Plans (CISP) and copies may be obtained in the same manner as other DERM survey plans.

See also section 1.10 *Searching.*

1.9 Mining registrars and districts

Information

1.9.1 Regions

There are three regions which incorporate nine mining districts. Tenure administration in each region is supervised by a regional director.

1.9.2 Mining districts

Each district is administered by a mining registrar with special responsibilities under the *Mineral Resources Act*. The mining registrars and tenures officers handle most tenure matters of interest to surveyors. Maps of mining districts are incorporated into Merlin and can be found on the IRTM. Each district is shown on an MP plan, as provided for by schedule I of the Mineral Resources Regulation 2003. They can be downloaded by the link above in section 1.3 *Regions and districts*.

1.9.3 Mining registrar's offices

There are mining registrars offices in Brisbane, Charters Towers, Dalby, Emerald, Georgetown, Mareeba, Mount Isa, Quilpie, Rockhampton and Winton. The registrar for Georgetown is in Mareeba but there is office staff in Georgetown.

For contact information refer to: <http://mines.industry.qld.gov.au/mining/contacts.htm>.

1.10 Searching

Information

It is recommended surveyors commence their search at a district office before contacting DEEDI's mines surveyors. IRTM will show mining tenures in a locality, except for those few areas where the historical tenures layer is not complete. For mining leases, three layers should be inspected: current, dead and historical, and the number of each tenure of interest noted. Survey plans are recorded in the attribute data for current and dead leases and in the graphics layer for historical leases. Note that in each case the information may not yet be complete in the database.

A search of the Computer Inventory of Survey Plans (CISP) will give reference to mining tenure plans through their linkage to the background parcel of land.

Copies of survey plans are available through any DERM business centre and through DERM's brokers, in the same manner as other cadastral plans. Use the prefix MP with the plan number for searching.

For assistance with searches, contact DEEDI's mines surveyors[2].

1.11 Survey instructions

Information

Before commencing a survey of a mining tenure under the Mineral Resources Act, a cadastral surveyor must first obtain DEEDI's instructions on the survey. Instructions are prepared individually for each survey, though there are features common to all surveys. A file search of relevant boundary and title information is included with the instructions. This includes the application description, additions and surrenders of surface area and partial surrenders or abandonments. Following is an example of a basic survey instruction:

[2] Telephone (07) 3238 3827 or (07) 3896 3220.

'Re: Survey of mining lease******

Named *******

Mining District of *******

In response to your letter of * Date * 2003, the following instructions are issued for the survey of the above lease.

Surveys are to be effected in accordance with the provisions of the *Surveyors Act 2003*, the *Survey and Mapping Infrastructure Act 2003* and associated Regulations and Standards, the *Mineral Resources Act 1989* and the Mineral Resources Regulations 2003. Further information on standards and guidelines should be obtained from the document *Survey Requirements for Mining Tenures* which is available from the survey standards page of the website of the Department of Environment and Resource Management.

Survey

The meridian and location of the lease surveys shall be related to the boundaries of all background tenures and other nearby mining tenures involved. If the surface area straddles a background boundary, the intersections with the boundaries must be marked and the areas of severance provided.

The meridian is to be related to MGA

Where it is practicable, natural features and improvements such as creeks, tracks and fences that are intersected by the lease boundaries should be shown on the plan. The surveyor should have the applicant or the holder point out the improvements or features which fall within the definition of restricted land pursuant to section 238 of the *Mineral Resources Act 1989* and which should be excluded from the surface area by survey. If the surveyor discovers there is restricted land that existed prior to the application for the lease and it has not been listed in the application form, they should notify the applicant or lessee and the mining registrar promptly. The chief surveyor should also be advised.

The surveyor shall be responsible for the search information. They shall ensure that the application description, sketch, and details of surface area, abandonments or surrenders are obtained from the applicant or lessee and the district mining registrar's office or the mines surveyors, Mapping and Survey before commencing the survey.

Boundary considerations

Priority of application—Attention must be given to the chronological priority of all mining claims, mining leases, mineral development licences, exploration permits and applications in the locality to determine the availability of land for each tenure under survey.

Encroachment of claims—Reference should be made to items 3.4 and 5.16 in the Survey Requirements for Mining Tenures and section 53 of the *Mineral Resources Act 2003* to determine how a mining claim should be dealt with. A statement of findings in the mining registrar's office and evidence located on the ground should be included in the survey report. A copy of any relevant mining claim, application, description, or sketch should be included in the search information described at item 4.

The applicant or lessee (or authorised person) of the mining tenure or application under survey must be contacted to have them point out the datum post or commencement point and application posts. Where encroachments or disputes could arise, the surveyor must also contact all applicants or holders affected in order to identify their posts and entitlements. All landholders affected by the survey are to be contacted and made aware of the land entry and other requirements necessary to effect the survey.

The location of datum posts and application posts of the subject and adjacent leases and claims and the markings thereon are to be recorded. The marking that can be expected under the various Acts is shown at section 2.14 *Datum Post* in the Survey Requirements for Mining Tenures. Should the applicant of an adjacent claim or lease be entitled to shift their datum post under the provisions of the Mineral Resources Regulations sections 16 and 40, the surveyor should notify the district mining registrar of the claims or leases so entitled.

Evidence to support the location of the claim, lease, permit, licence or application (for example, old shafts or mine workings) should be recorded in the survey records.

Any survey of a mining claim or mining lease carried out prior to a Land Court hearing will still be subject to the Tribunal's findings.

Mining claims, mining leases, mineral development licences, exploration permits and applications are to be marked with survey posts or equivalent marks where survey posts are unable to be placed. For marking see the Survey requirements for Mining Tenures sections 5.4 Boundary Marks and 5.23 Reference Marks.

Plans

Plans are to be drawn in accordance with the requirements of the Survey Requirements for Mining Tenures.

The survey plan of a mining lease, claim or mineral development licence must show all cadastral tenures over which it sits or abuts. Where any of these background tenures are in strata, the titles that are wholly below the surface should be noted on the plan in some way. The main diagram of the plan should show titles that are at the surface of the land; any underlying titles may be shown on the main diagram as well, if it can be done clearly. Otherwise the underlying titles and depth restrictions must be shown in a statement or a table, supported by a diagram if necessary.

Field notes

The lodgement of field notes is no longer compulsory in most cases. Survey records must still be kept in the surveyor's possession as provided for in section 22 of the Survey and Mapping Infrastructure Regulation 2004. The practice of lodging field notes with a survey plan is recommended to surveyors and they are encouraged to do so when the circumstances of a survey suggest it is desirable. It will still be compulsory to lodge field notes with the survey plan if the survey includes an irregular or natural boundary, or if they are specifically required under the survey instructions.

Lodgement

Plans, survey records, report and copies of Forms 6 are to be forwarded to the Chief Surveyor, Mapping and Survey, DEEDI. There is no provision in the Mineral Resources Regulations 2003 for charging a lodgement fee.

A copy of information, other than survey plans and survey control registered in DEEDI or DERM and file searches, should be forwarded with the plan. A list of all survey plans that were used in your survey should be provided.

Special requirements

[Any requirements that are special to the particular survey will be inserted here. For example, if the survey is required by the Minister under section 407 of the *Mineral Resources Act 1989* there may be boundaries that must be pegged and not compiled even if compilation would otherwise be acceptable. A comment may be made regarding undescribed balance areas.]

Please refer to Section 6.40 of the Survey Requirements for Mining Tenures document on how to best deal with undescribed balances.

Enclosed is a copy of the application and description of MLxxx and a copy of the Certificate of Application.

Yours sincerely

2 Tenures

Information

2.1 Overview

This chapter provides a summary of some relevant parts of the *Mineral Resources Act 1989* (MRA) and other legislation, and is intended as a guide to assist surveyors who are unfamiliar with that Act to locate the relevant sections of legislation. Surveyors dealing with mining tenures must read the relevant Acts, especially the *Mineral Resources Act 1989* and the Mineral Resources Regulation 2003 and not rely on this publication alone.

2.1.1 Types of tenures

There are many earlier tenures that are no longer current, but will appear on old survey plans, charts and in files. In some cases, old mining tenures have been converted to mining leases under the *Mineral Resources Act 1989*, or they may define or limit the land available to a later tenure. If they have not been surveyed, the rules pertaining at the time of application and grant will have to be applied to decide their entitlement. See the schedule on datum posts at 2.12 *Datum post* to know what should mark a corner of an application for a mining lease. Where doubts arise, the matter should be referred to the chief surveyor for discussion and advice.

2.1.2 Application and grant

Under mining legislation it is possible for a tenure to be applied for and be granted by the Governor in Council or by the responsible minister, on a written description, with or without marking out on the ground. The description and, where made, marking have been done by the applicant or their agent, and not necessarily by a surveyor. These applications are of varying standards of measurement. A title can be created without a cadastral surveyor playing any part.

When the title requires survey, it is the cadastral surveyor's task to interpret the application, mark it on the ground and prepare a plan to support the issue of an instrument of lease or a licence. Establishing the boundaries is often a matter of carrying out a survey reinstatement without a survey to reinstate. It must be done in the light of the relevant legislation, using the application description and any ground marking placed for the application.

The distinction between an application for a tenure and a tenure itself (that is, a tenure that has been granted), such as a mining lease, must be understood. They are mutually exclusive terms and when the legislation says one of them, it does not include the other. For example, sections 6 and 16 of the Mineral Resources Regulation 2003 allow the posts that mark the land subject to an application to be moved to a new position in certain circumstances. The posts marking a granted claim or lease cannot be moved.

2.1.3 Surface areas

A mining lease may be granted with the right to occupy and use part only of the surface of the land. There may even be no surface area at all attached to a mining lease if it abuts another lease with surface area that is held by the same lessee. Surface area can be added to a mining lease and surface area, or part of it, can be surrendered from a lease. In dealing with leases it is important to distinguish between actions that affect the whole lease and those that affect the surface only. For example, a surrender of a surface area still leaves the underlying lease intact and a later application can be made to add part or all of the vacated surface back into the surface area. A surrender of the lease, or part of it, completely extinguishes the relevant part of the lease and any surface area it has. It cannot be reinstated and the balance that is left cannot have land added to it, except for surface area over the surviving part of the lease.

2.1.4 Additions to mining leases

There is no allowance in the *Mineral Resources Act 1989* to increase the area of a mining lease. Two or more leases can be consolidated into one under MRA section 299, and there can be boundary exchanges where the total area of the leases stays constant. Refer to MRA section 295(1)(b). Except for a small number of leases taken up under certain special Acts, a mining lease cannot be increased in size. Once the certificate of application has been issued, a mining lease application cannot be increased in size without returning to the beginning of the application and going through the processes again. Surface areas can be increased, but only within the confines of the lease.

However, when two or more mining leases are consolidated, if, within the area of the consolidated lease there is an

area not included in one of the leases to be consolidated, the Governor in Council may include the area in the consolidated lease. See MRA section 299(6).

2.1.5 Prerequisite tenures

Mining claims, mineral development licences and mining leases can only be granted over land for which the applicant holds a prerequisite tenure. This allows entry to the land to prospect and mark out an application. The prerequisite tenures are:

Application	**Prerequisite Tenures**	***Mineral Resources Act 1989***
Mining claim	Prospecting permit	Section 48
Mineral development licence	Exploration permit, mineral development licence	Section 179
Mining lease	Prospecting permit, exploration permit, mineral development licence	Section 232

2.2 Abandonment

Where the whole, or part, of an application is relinquished by the applicant before grant, it is described as an abandonment.

See MRA section 307 regarding the abandonment of the whole or part of a mining lease. Section 307(4) then says:

'(4) Where an application for the grant of a mining lease is abandoned in respect of part only of the land to which the application relates, the application shall be amended to show the area in respect of which the mining lease application is to remain in force in the same manner as is required for an original application and the amended application shall proceed in respect of that area in accordance with this part.'

If the datum post was placed at a corner of a part of a lease that is subsequently abandoned, so the post no longer marks a corner, then a new datum post should be placed at a corner of the balance of the lease. It is desirable that the original datum post be left in-situ at least until the land is surveyed.

There is no provision in the Act to abandon part only of a mining claim. See MRA section 159(2A) for partial abandonment of exploration permit applications and MRA section 189(2A) for partial abandonment of applications for mineral development licences.

2.3 Access

Where access to a mining lease is to be gained by way of an abutting public road, then an access description is not required, but the fact must be stated in the application. A description is required when the proposed access departs from the road before it crosses the lease boundary. It is imperative that the actual route to be used is clearly described in the application.

Acceptance of the commencement point of the access is the prerogative of the district mining registrar for mining leases and mineral development licences. See MRA sections 183(i) and 245(1)(h).

Under the *Mining Act 1968* access to a mining tenement on private land and, after 1st August 1982, access to a mining tenement on Crown land, was called 'right of way'. Prior to 1 August 1982, access to a mining tenement on Crown land was described as 'right of access'. Under the *Mineral Resources Act 1989*, all access to mining tenures is called 'access'.

See Section 6.3 for guidance on the preparation of the survey plan

2.4 Applications for tenures

2.4.1 Exploration permits

Exploration permits are described by sub-blocks but there may be irregular exclusions. See section 2.15 *Exploration permits.*

2.4.2 Mining claims

Applications for mining claims are marked out by metre high posts in a similar way to mining leases.

2.4.3 Mineral development licences

Applications for mineral development licences can only be made over a pre-requisite tenure, being an exploration permit or a previous mineral development licence held by the same owner.

There is no marking in the field for mineral development licences—they are prepared by description only. It is common for the larger mineral development licences to adopt the sub-block boundaries of an underlying exploration permit to define the land. As well as sub-blocks, mineral development licences can adopt existing cadastral boundaries, including watercourse and coastlines, and have boundaries that do not match any other tenures. All of these features may be used for the boundaries of a single mineral development licence.

It is important to realise that the licence is defined by the description. MRA section 184 requires the boundaries to be accurately measured on the ground or to be described by another method acceptable to the mining registrar. The description is based on the ground measurements but the MRA does not provide for the marking of an application on the ground. Mineral development licence boundaries that have been defined by new lines are presumed to have been measured on the ground in accordance with MRA section 184, unless a request has been made to the mining registrar for acceptance of an alternative method of description. On survey, if it is found that the description does not correctly define the land that is wanted, there is no recourse.

2.4.4 Mining leases

Part 7 of the *Mineral Resources Act 1989* deals with the application for, grant of and administration of mining leases. They can only be taken up over a pre-requisite tenure (i.e. a prospecting permit, exploration permit or mineral development licence held by the same owner).

Certificate of application—When the mining registrar is satisfied that the application is in accordance with the Act a certificate of application is issued. See MRA section 252.

Certificate of public notice—This advertises the last day for lodging objections to the application and a copy of it is given to DERM. A copy is posted at the registrar's office and the applicant must post a copy on the datum post of the land applied for. Copies are also sent to the various people and bodies affected by the application and it is published in an approved newspaper. See MRA section 252A and B.

Survey versus marking out—It is important to note the distinction between a survey and the marking out of an application. A survey is done under the *Survey and Mapping Infrastructure Act 2003*, by a cadastral surveyor endorsed under the *Surveyors Act 2003*. Marking out an application may be done by anyone appointed by the applicant. The *Mineral Resources Act 1989* requires setting out to be done by 'accurately measured distances and compass bearings on the ground or other method acceptable to the mining registrar'.

Compensation agreement—A compensation agreement must be arranged with the owners of all land subject to the surface area of a mining lease application. The agreement must be settled before the lease can be granted. See MRA section 279. Under MRA section 280, compensation may be agreed with the owner of land that is not subject to surface area.

Excluded land—There are several categories of land that are not available for grant as a mining lease. The categories include land that is:

- not in the prerequisite tenure
- for which there is no compensation agreement
- subject to a prior mining lease or application for one
- subject to a prior mining claim or application for one
- has no native title clearance.

A mining registrar may reject an application for various reasons, such as if the application is over land which is subject to another mining tenement or a prior application for a mining tenement. See MRA section 250.

Restricted land—Restricted land is land which cannot be included in the surface area of a mining lease without the approval of the landowner. It is dealt with under MRA section 238(2). As restricted land within a certain distance of specified physical features, the landowner who must give approval, may own land that is outside of the mining lease application.

Reserves—Unless the Governor in Council otherwise approves, a mining lease may only be granted over the surface of a reserve if the owner of the reserve agrees in writing. See MRA section 238(1).

2.4.5 Native title

All mining tenements must be assessed before they are granted to see if there are native title implications. A tenement cannot be granted unless native title has been extinguished or dealt with in some fashion.

2.4.6 Petroleum tenures

See Part 7 *Petroleum*.

2.5 Area (square measure)

Prospecting permits—There is no restriction on the area that may be applied for. Application is by reference to existing land parcels. Refer to MRA section 15.

Exploration permits—Unless the minister otherwise approves, exploration permits may not exceed 300 sub-blocks for an EP for coal or 100 sub-blocks for an EP for other minerals. See MRA section 127 and Section 11 of the Mineral Resources Regulation 2003. See also MRA section 126 which provides the definition of blocks and sub-blocks.

Mineral development licences—Refer to MRA section 179.

A mineral development licence must exclude land that is:

- in existing leases or claims or applications for them (MRA section 182)
- within a fossicking area (MRA section 186).

MRA Section 182 allows for a mineral development licence application covering a lease or claim, but the land will not become available until the lease or claim dies. The minister may restrict the area of a mineral development licence by granting only part of the application.

Mining claims must be rectangular in shape and more or less one hectare. A lesser area may be prescribed by regulation in a particular district. Refer to MRA section 53. Also refer to MRA section 53 for information about the action to take when a mining claim occupies more than the prescribed area.

The excess area is usually revealed by survey. A person may hold no more than two mining claims. Refer to MRA section 55. For restrictions on grants see MRA sections 391 and 391A.

When land is freed from an exploration permit, restrictions on mining leases apply for a two month period. See MRA section 239. Also, under MRA section 391(b), the Governor in Council may restrict the area of land granted for a mining tenement.

Reason should be given in an application for the area and shape of land applied for. Refer to MRA section 245.

Surface area—The area of the surface area cannot be larger than that of the mining lease.

2.6 Background tenures

The land tenures, which a mineral development licence or mining lease covers, or partly covers, must be identified at the time of application. This is needed for compensation agreements for a lease and for notices of application for a mining tenement, that have to be sent to each landowner affected.

Frequently it is not until survey that encroachment of a mining lease over a particular parcel of land is discovered. If the survey has been done before grant and a compensation agreement has not been finalised, the mining registrar and the lease applicant must be advised promptly. If a compensation agreement to include the discovered land cannot be reached, then an abandonment of relevant part of the application may have been made. If the lease has already been granted, then the land is not available to the mining lease and must be excluded on survey.

2.7 Boundary marks

Boundary marks in the context of the *Mineral Resources Act 1989* refers to the marks placed by the applicant on a mining claim or lease.

The *Mineral Resources Act 1989* points out that boundary marks shall be maintained until the land is surveyed after which only the survey marks need be maintained. See MRA sections 81(1)(l) and 90 for claims and MRA sections 274 and 276(1)(i) for mining leases. A survey should not be considered to be complete until the plan is registered, so the application posts should be maintained until then.

2.8 Claims

See 2.22 *Mining claims*.

2.9 Compensation agreements

Under MRA section 279, compensation agreements must be made with the owners of all background tenures subject to a mining lease. MRA section 85 covers the payment of compensation to the owner of land covered by a mining claim.

If there is no compensation agreement for a parcel of land, that land must be excluded from the survey of the lease or claim. The exclusion is done by truncation.

2.10 Consolidation

Two or more contiguous leases may be cancelled and a consolidated lease granted by the Governor in Council under MRA section 299. It is possible a survey will be required of a consolidated lease under MRA section 407.

If there is insufficient survey information to compile the dimensions of the new boundaries of the consolidated lease a field survey may be required. If sufficient survey information exists then a compiled plan of the new lease may be adequate.

The surveyor should be aware that gaps may occur between granted leases and which may have not been apparent before the survey was carried out. If a gap is to be included in the new lease, a fresh mining lease application will be required to cover it and consolidation cannot take place until the new application is granted. However MRA section 299(6) does enable the Governor in Council to include gaps in a consolidated title. Refer to the mining registrar before including any land that is not in the granted mining lease.

2.11 Corner information

The *Mineral Resources Act 1989* requires all mining lease and mining claim application corners to be marked with posts one metre high or the applicant must obtain the mining registrar's consent to alternative procedures. Marks other than posts may be placed in certain circumstances. See MRA sections 57, 58, 241 and 242.

2.12 Datum post

See also 5.8 *Datum posts* for surveying leases and claims and 6.13 *Datum posts* for plan drawing.

One of the application corner posts marking a claim or a lease is selected by the applicant as the datum post from which the description and any survey must commence. See MRA sections 57(4) and 241(4).

The application posts shall be maintained until survey. See MRA sections 90 and 274. After survey the survey posts and pegs shall be maintained. See MRA sections 81(1)(l) and 276(1)(i). See also section 42 of the *Survey and*

Mapping Infrastructure Act 2003.

Moving of a datum post of an application only, on survey of an abutting tenement, is allowed under sections 6 and 16 of the Mineral Resources Regulation 2003. The datum post of a granted lease cannot be moved. See 5.8 *Datum posts*. The Mining Acts of 1898 and 1968 contained similar provisions in that only an applicant for a lease and not a lessee could move the datum post. Once a lease was granted pursuant to those Acts it could not be relocated.

Unavailable land resulting from encroachment and subsequently revealed by a survey does not permit the relocation of the datum post from an encroaching position, unless sections 6 and 16 of the Mineral Resources Regulation 2003 apply. However, removal of applications posts, including the datum post, would be possible after completion of the survey under MRA sections 81(1)(l) and 276(1)(i). See also 5.25 *Removal of posts*.

The prescribed methods of placing posts for a mining lease application are in the following list in chronological order:

Marking for a mining lease application up to 31 August 1990
(Mining Acts 1898 & 1968):

<table>
<tr><td rowspan="2">Date of Application</td><td rowspan="2">Place in Act</td><td colspan="2">Datum Post</td><td colspan="2">Corner Posts</td></tr>
<tr><td>Location</td><td>Marking</td><td>Required</td><td>Marking</td></tr>
<tr><td>Up to 31/12/71</td><td>Reg 90</td><td>At corner</td><td>Initials</td><td>No</td><td>n/a</td></tr>
<tr><td>From 1/1/72</td><td rowspan="3">Reg 32</td><td rowspan="2">1 to 10 yds from corner</td><td rowspan="3">Initials, surname, date of marking</td><td rowspan="3">Yes</td><td rowspan="3">None</td></tr>
<tr><td>From 28/10/76</td></tr>
<tr><td>From 20/1/77</td><td>1 to 10m metres from corner</td></tr>
<tr><td>From 1/7/79</td><td>Sec 21(6)(c) & Reg 19(1)</td><td rowspan="2">At corner</td><td rowspan="2">Initials, surname, date of marking & ML no</td><td rowspan="2">Yes, except when no surface area on Crown land</td><td rowspan="2">Yes</td></tr>
<tr><td>From 1/8/82</td><td>Sec 21 (2AC)</td></tr>
</table>

Marking out for claims and leases from 1 September 1990
(Mineral Resources Act 1989):

<table>
<tr><td rowspan="2">Date of Application</td><td rowspan="2">Place in Act</td><td colspan="2">Datum Post</td><td colspan="2">Corner Posts</td></tr>
<tr><td>Location</td><td>Marking</td><td>Required</td><td>Marking</td></tr>
<tr><td colspan="6">Mining Claims</td></tr>
<tr><td>From 1/9/90</td><td>Sec 57, 64, 90</td><td>At corner</td><td>Initials & surname, or company name, date of marking out, claim no</td><td>Yes</td><td>Initials & surname, or company name, date of marking out, claim no</td></tr>
<tr><td colspan="6">Mining Leases</td></tr>
<tr><td>From 1/9/90</td><td>Secs 240, 241, 252B, 274</td><td>At corner</td><td>Initials & surname, or company name, date of marking out, lease no</td><td>Yes</td><td>Initials & surname, or company name, date of marking out, lease no</td></tr>
</table>

2.13 Environmental protection

The administration of environmental protection on mining tenements is shared between DEEDI's district offices and DERM. Enquiries should be directed to the relevant mining registrar in the first instance.

2.14 Exclusions

An exclusion is land that a tenement may cover, but is not available because the *Mineral Resources Act 1989* prevents it being part of the tenement or prevents its use. It reduces the area of land in an application. The available land for the mining tenement is the land remaining after the proposed application area has been reduced by exclusions.

In some of the following cases exclusion will not apply if the landowner's consent is obtained.

No Exclusion	**MRA Section**	**Grant Affected**
Reserves, buildings	19	Prospecting permit
Reserves, buildings	51(2)	Mining claim
Reserves, buildings	129	Exploration permit
Reserves, buildings	181	Mineral development licence
Reserves, buildings	238	Mining lease
Excess area	53(4)	Mining claim
Prior claim, ML, MDL	16	Prospecting permit
Prior claim, ML, MDL	51	Mining claim
Prior claim, ML, MDL	132	Exploration permit
Prior claim, ML	182	Mineral development licence
Exempt land	135	Exploration permit
Exempt land	226	Mineral development licence
Exempt land	239	Mining lease
Franchise areas		
Protected areas	3	All
Restriction on grants	391	All
Restriction on grant of ML where no surface area or adjoining ML	273	Mining lease

The relevant parts of the *Mineral Resources Act 1989* should be read when dealing with excluded land. For advice on excluded land, the mining registrar should be consulted.

2.15 Exploration permits

Coal (EPC) See Part 5 of the *Mineral Resources Act 1989*. The maximum area is 300 sub-blocks, unless otherwise approved by the minister. After grant the minister may require the holder to reduce the area to an extent that the minister considers reasonable.

Minerals (EPM) See Part 5 of the *Mineral Resources Act 1989*. Maximum area 100 sub-blocks, unless otherwise approved by the minister. See MRA section 127(4) and section 11 of the Mineral Resources Regulation 2003.

Also, unless the minister otherwise decides, the area of an EP must be reduced by 50 per cent at the end of the second year of the term and by a further 50 per cent at the end of each subsequent year. See MRA section 139.

Petroleum (AtoP, but labelled EPP in SIE and IRTM) See 7.2 *Authorities to prospect* and the *Petroleum Act 1923*.

There can be more than one exploration permit over the same ground if it is for different minerals.

2.16 Fossicking areas

Fossicking areas are created under the *Fossicking Act 1994*.

Under the *Mineral Resources Act 1989*, prospecting permits, exploration permits, mineral development licences

and mining leases cannot be granted within a fossicking area unless the application:

- for prospecting permits and exploration permits, was made but not decided before the land became a fossicking area—see MRA sections 16(2) and 137(5A) & (5B)

- for mineral development licences was made but not decided before the land became a fossicking area or is for land in an exploration permit—see MRA sections 186(5) & (6)

- for mining leases was made but not decided before the land became a fossicking area or is for land in a prospecting permit, exploration permit or mineral development licence—see MRA section 234(3).

The declaration of designated fossicking land does not affect rights already held by the holders of prospecting permits, exploration permits, mineral development licences, mining claims or mining leases. See section 42 of the *Fossicking Act 1994*. The declaration of a fossicking area does not affect rights already held by the holders of exploration permits, mineral development licences, mining claims or mining leases or applications for them without the applicant or holder's written agreement. See also section 44 of the *Fossicking Act 1994*.

Encroachments found on survey must be excluded from the tenure.

2.17 High water mark

In the past, the high water mark has been used as the boundary for mining leases. Though possible, its use as a mining title boundary would usually be avoided today. See also 4.2 *High water mark.*

2.18 Land court (replaces the Land and Resources Tribunal)

Mining lease applications are referred to the Land Court and if there are any objections to the lease, the Court conducts a hearing. Following its considerations or a hearing, the Court sends its recommendations to the minister for consideration in respect to the granting of the lease. The recommendations may affect the land granted to the lessee and thus affect any survey done prior to the Tribunal's recommendations. Any survey done before the Tribunal's hearing will still be subject to the results of the hearing. There is a similar process for mining claims, though the registrar may grant a claim without reference to the Court if there are no objections.

Leases dealt with prior to June 2000 will have been heard and recommendations made by the Warden's Court.

2.19 Licences

A licence is the right to use specified land for certain purposes. Apart from a mineral development licence, which is dealt with separately under the *Mineral Resources Act 1989*, licences are provided for in some of the special Acts, in particular the *Mount Isa Mines Agreement Act 1985* and the *Commonwealth Aluminium Corporation Agreement Act 1957*. In both cases licence areas occur within the mining lease. Licences are surveyed, and the plan drawn, in the same manner as for leases.

2.20 Mineral development licences

The purpose of a mineral development licence is to allow activities to be carried out to evaluate and prepare for the economic development of an ore body. They are covered by part 6 of the *Mineral Resources Act 1989*. The initial term is for not more than five years and a compensation agreement is not required.

Any prior mining lease or mining claim, or an application for one of them, is excluded from the mineral development licence. In certain instances, on the demise of the lease or claim, the subject land passes into the mineral development licence. See MRA section 182.

A mineral development licence excludes later applications for exploration permits for the same mineral, as well as leases and claims. Excluded land that is within the boundaries of the mineral development licence is excluded only while the lease or claim, or application for either, is alive.

Where a mining lease is granted because of an application by the holder of a mineral development licence, or with the holder's consent, the mineral development licence is reduced by omitting the land to which the mining lease

applies. See MRA section 226A.

Special attention must be paid to MRA section 226. This deals with later mining tenements that overlap a rejected mineral development licence application, an expired mineral development licence, a mineral development licence application that was abandoned or a cancelled mineral development licence. Under this section, land formerly subject to the mineral development licence is not available for any subsequent application for a prospecting permit, mining claim, exploration permit, mineral development licence or mining lease unless and until approved by the minister

The concept of 'no surface area' does not apply to mineral development licences.

2.21 Mineral selections

A mineral selection or mineral freehold is a freehold title to land with some additional rights of ownership of the minerals within the land. It is registered with other freehold titles.

The Crown's property in minerals is defined in section 8 of the *Mineral Resources Act 1989*. Note also MRA section 9 whereby the Crown has the exclusive right to grant mining leases and other mining tenements, irrespective of the ownership of the minerals. Prospecting permits, mining claims, exploration permits, mineral development licences and mining leases may be applied for and granted over mineral selections and mineral freeholds.

2.22 Mining claims

See Part 4 of the *Mineral Resources Act 1989*. Claims are issued for an initial term of five years and can only be mined with hand tools. Their area is restricted to one hectare.

They are not often surveyed and are of interest to the surveyor mainly because a claim may take priority over an abutting mining lease if an application is made for it before the lease application. Under earlier Acts, a claim took its priority from the date of marking out. Under the section 63 of the *Mineral Resources Act 1989* a mining claim now takes its priority from the date of lodgement of the application with the mining registrar.

2.23 Mining leases

Mining leases are dealt with under Part 7 of the *Mineral Resources Act 1989*. There is no restriction on area or term.

Surrender of the whole or part may be made at any time but the surrender is not effective until the minister accepts it. A mining lease may exist in strata and even be wholly underground, provided it adjoins a lease with surface area that is held by the same lessee.

When a mining lease is surveyed, it takes its priority from the date of lodgement of application with the mining registrar. Any area overlapping a prior lease or application for a lease must be excised from the subject lease. Major issues for surveyors include the application description, the datum post and compensation agreements.

Mining leases are dealt with at many places in this paper, but see especially:

2.3 *Access*
2.4 *Applications for tenures*
2.9 *Compensation agreements*
2.12 *Datum post*.

2.24 Mining registrar

The mining registrar is the key figure in the administration of mining tenements. Applications for all mining tenements are made to the mining registrar in the relevant mining district. Surrenders and partial surrenders and additions to or surrenders from surface areas of mining leases are all dealt with through the mining registrar. For a list of registrar's offices and contact details see 1.9 *Mining registrars and districts*.

2.25 Native title

A mining tenure cannot be granted unless native title has been extinguished or dealt with in the appropriate manner.

Mining lease and claim application assessments for native title are done by the mining registrar's office; mineral development licences and exploration permit assessments are done by the DERM Aboriginal and Torres Strait Islander Land Services area.

2.26 Numbering of leases

Until 1985 mining leases and claims were numbered according to the mining district in which they were situated. Some early ones were numbered within the particular mining field, which may or may not have been part of a mining district. Since the inception of the Department of Mines in 1874, there have been approximately 140 different district or field names under which mining tenures and survey plans have been registered.

A statewide numbering system, which eliminated duplicate numbers, was introduced in 1985. Numbers on the old system were converted on a district-by-district basis to the new and are not necessarily in date and time order across the state.

When dealing with a mining lease, the new number must be used at all times; it may be qualified by the statement 'Formerly ML' if it is considered necessary in special cases. In references to a tenement that died before the new system was implemented, the original district or field name and number must be used e.g. ML 1336 Gympie.

2.27 Ownership of minerals

In general, minerals are owned by the Crown. There are, however important exceptions to this rule. See MRA section 8—Crown's property in minerals, and 2.21 *Mineral selections*.

Even where the landowner holds the rights to the minerals in that land, any eligible person may apply to the State for a mining lease or other tenement to explore or extract the minerals from the land. See MRA section 9.

2.28 Petroleum tenures

The ones most likely to be of interest to surveyors are authorities to prospect (which are similar to exploration permits), petroleum leases and pipeline licences. See Chapter 7 *Petroleum*.

2.29 Posts

This term has two meanings within the context of mining tenements. The first is the use by the *Mineral Resources Act 1989* and refers to the metre high posts placed to identify the land subject to a mining claim or mining lease application. See 5.15 *Marking*.

The second meaning is the survey posts placed by a cadastral surveyor to mark the boundary of a mining lease. See also 5.15 *Marking* and 5.20 *Posts* and 1.11 *Survey instructions*.

See 2.12 *Datum post* (in the context of the tenure) and 5.8 *Datum posts* (in the context of marking out and survey).

Application posts, including datum posts, should be maintained during the term of the tenement or until the land has been surveyed. See MRA sections 81(1)(l), 90, 274 and 276(1)(i).

For comments on the removal of application posts see 5.25 *Removal of posts*.

2.30 Priority

See also 5.22 *Priority*.

The question of priority arises where mining tenements are found to overlap. This is usually discovered on survey of one or other of the tenements. Mining claims, mining leases and mineral development licences are exclusive

tenements and should not overlap. In the past there have been two tenements granted over the same land, where they were for different minerals, and it still may be possible in law to do so. However, there are practical difficulties in mining overlapping tenements and it is doubtful that an encroaching lease or claim would now be granted.

With mining leases and mining claims, if there is an encroachment, tenements take priority according to the date and time of lodgement of the application. More than one exploration permit may not be granted over the same land for the same minerals and as an EP is defined by sub-blocks any potential overlap is readily identified. If there is more than one mineral development licence application over the same land it is determined by the minister. See the following sections of the *Mineral Resources Act 1989*:

- Mining Claims section 63
- Exploration permits section 131
- Mineral development licences section 185
- Mining leases section 251
- Competing applications section 390.

See also section 80 of the Mineral Resources Regulation 2003 where an application must be endorsed with the date and time of lodgement.

2.31 Prospecting permits

Prospecting permits are dealt with under part 3 of the *Mineral Resources Act 1989*. They are one of the prerequisite tenures suitable for the granting of mining leases and are granted by the relevant mining registrar. More than one prospecting permit can be granted over the same parcel of land.

They are granted to cover an existing parcel of land and may be over more than one lot. A prospecting permit may also be granted to cover a whole mining district, which boundaries are coincident with local government boundaries. The survey implications are that a mining lease application must fall within one or more prerequisite tenures before it can be granted.

2.32 Restricted areas

Under section 391 of the *Mineral Resources Act 1989*, the Governor in Council may, by regulation, prohibit the application for or grant of mining tenements or set restrictions on their grant. An area over which these restrictions are set is known as a restricted area.

Restricted areas appear in the SIE graphics. Reference should be made to the Schedules in the Mineral Resources Regulation 2003 and subordinate legislation to the *Mineral Resources Act 1989* for descriptions of existing restricted areas. Large restricted areas may conform to the sub-block method of description.

2.33 Restricted land

Restricted land limits the grant of surface area, or the entry on to the surface land, for mining tenements. The Schedule Dictionary to the *Mineral Resources Act 1989* defines restricted land as:

Category A—land within 100 metres laterally of a permanent building used mainly as accommodation or for business purposes, or for community sporting or recreational purposes or as a place of worship.

Category B—land within 50 metres laterally of any of the following features:

(a) a principal stockyard

(b) a bore or artesian well

(c) a dam

(d) another artificial water storage connected to a water supply

(e) a cemetery or burial place.

MRA section 238 prevents the grant of surface area for a mining lease over restricted land unless the owner of the reserve or of the land consents in writing. In the case of a reserve, the Governor in Council may give the approval. In either case, consent must be given before the end of the last day for objections to the grant of the mining lease. Refer to MRA section 51(2) for claims, MRA section 129(3) for exploration permits and MRA section 181(8) for mineral development licences describing similar restrictions for those tenements. MRA section 245(1)(g) requires the applicant for a mining lease to identify in the application any improvements that create restricted land.

See also 5.27 *Restricted land* regarding surveying and 6.32 *Restricted land* regarding plan drawing.

2.34 Subleases

A sublease of the whole or part of the lease may be approved by the minister. See MRA section 300(1).

A survey of the lease or sublease may be required. See MRA section 300(7).

2.35 Surface areas

2.35.1 Definition

There is no available definition of the term ‘surface’ and there does not appear to have ever been one in the legislation. For practical purposes it is usually understood to mean the ground or the top part of the soil that meets the air. Everything below the literal surface of the ground is said to be sub-surface. For the preparation of survey plans for surface areas, see section 6 *Plans of mining tenures*.

2.35.2 Metalliferous and coal tenures

A mining lease surface area is not required to be marked for application purposes. See MRA section 240 (2). It should be marked with survey marks on survey of the lease. Refer to 5.15 *Marking*. The requirements for identifying and describing surface area in a mining lease application are set out in MRA sections 245(1)(f) and 246(c).

Note also that access to a mining lease must be to a surface area of the lease. See MRA section 246(d). Where a lease does not have any surface area, it must abut another mining lease that does have a surface area and is held by the same lessee. See MRA section 273.

With some older coal mining leases, it may not be apparent that there is a surface area. Section 28A of the *Mining Act 1968*, which was inserted in 1974, provided for mining leases issued for coal to have no more than 100 acres (later 40 hectares) of surface area in the aggregate, unless the minister otherwise approved. The area was not always surveyed and sometimes does not appear to have been defined at all. These surface areas had their origins in section 21 of the *Coal Mining Act 1925* which said the surface area of 100 acres must be surveyed. Those of these old leases that were still alive in 1990 were converted to mining leases under the *Mineral Resources Act 1989*, with their previous rights.

An application for an addition to a surface area may be made at any time. See MRA section 275. A survey may be required by the minister for an abandonment or surrender of part of the surface area of a mining lease or for an addition to the surface.

A mining claim shall include the whole of the surface of the land. See MRA section 48(2). However, MRA section 51(2) creates an exception where a mining claim overlaps restricted land.

2.35.3 Petroleum and gas

There are two Acts governing petroleum titles: the *Petroleum Act 1923* and the *Petroleum and Gas (Production and Safety) Act 2004*. See 7.3 *Petroleum leases*.

2.36 Surrenders

A total surrender may be lodged for:

- prospecting permit—MRA section 37
- mining claim—MRA section 107
- exploration permit—MRA section 161.

A total or partial surrender may be lodged for:

- mineral development licence—MRA section 210
- mining lease—MRA section 309.

Under the terms of its grant, an exploration permit may have to be reduced in area periodically. See MRA section 139. Under MRA section 140, the holder of an exploration permit may voluntarily reduce the area of the permit, effectively surrendering part of it.

A survey of the land remaining after a partial surrender of a mining tenement may be requested by the minister under MRA section 407. A plan of the survey showing the land to be surrendered and the balance area in the tenement, must then be lodged. Refer also to sections 6.27.6 *Surrender from mining lease* and 6.38 *Surrenders* for plan drawing, and section 5.33 *Surrenders* for survey.

It is very important that the distinction between a surrender from a surface area and a surrender from the lease is understood and all actions, including survey and plan drawing reflect which one is being dealt with.

2.37 Surveyor's interest in mining tenements

Section 408 of the *Mineral Resources Act 1989* prohibits a surveyor who holds an interest in a mining claim, exploration permit, mineral development licence or mining lease or an application for the grant of any of them from carrying out a survey of the land the subject thereof.

2.38 Variation

Provisions exist to amend the area of a mining claim where it is found to be excessive. See MRA section 53(4).

Under certain conditions, boundaries may be varied on a mining lease. See MRA section 295.

Access to tenures may be varied under MRA sections 125, 231 and 317.

2.39 Water rights

A water right was a right for a miner to use the surface of land for the purposes of water storage, conveyance or usage, pursuant to Part IV of the Regulations under the *Mining Act 1898*. Water rights are no longer issued by DEEDI but may be reflected in franchise agreements. It is considered that all water rights have now expired. Former water rights may have influenced the land available to some existing mining leases or surface areas.

Although the effect on mining leases and claims may be similar, a water right should not be confused with restricted land that is restricted because of a water feature. See 2.33 *Restricted land*.

3 Boundary determination

3.1 Introduction

Information

3.1.1 General

It is common for a mining tenement to be granted before it is surveyed and many are never surveyed at all. The title document, such as an instrument of lease for a mining lease, may also be issued before the land is surveyed.

If there is a later survey there is a responsibility placed on the surveyor to interpret the grant and correctly define the boundaries on the ground and on a survey plan. The boundaries of mining tenements are described in the tenement applications and depicted on DEEDI's Spatial Information Enquiry (SIE) graphical database.

With claims and leases the applicant marks out the desired ground with posts and measures the proposed new boundaries and includes a metes and bounds description in the application form. Exploration permits and mineral development licences are applied for by description only and any survey must interpret that description and reproduce it on the ground.

Refer also to chapters 2 *Tenures* and 5 *Survey and Marking*.

3.1.2 Application or granted tenement?

A surveyor can be asked to establish and define mining tenement boundaries under the *Mineral Resources Act 1989* at three stages in a mining project:

- Before the application is made—A surveyor sets out the application boundaries on behalf of the applicant and may even survey them at the same time. Boundaries are determined by the applicant's wishes, provided the land is available, and they may be varied at will before the application is lodged. Note that it is not necessary for an application for a tenement to be set out or described by a cadastral surveyor. The applicant or anyone the applicant asks is entitled to do the work.

- After the application has been made to the mining registrar and before grant—The surveyor must reconcile the written application with the information found in the field. Although the boundaries have essentially been fixed by the application description and the marking, it is still possible to vary a claim or lease on survey if it is appropriate to take advantage of sections 6 and 16 of the Mineral Resources Regulation 2003. This variation can only happen following the survey of an earlier abutting claim or lease which then itself defines part of the subject tenement's boundaries.

- Following grant of the tenement—The boundaries have been fixed by grant and must be surveyed in the position established by the grant.

3.2 Exploration permits

Standard under the SMI Act

Exploration permits are issued on the sub-block system so that each boundary sits on an even minute of latitude and longitude. Determination requires a geodetic traverse to fix the coordinates.

Some exploration permit applications have been made where there are no Indigenous Land Use Agreements in place and the applicant wished to proceed without delay. In this case it has become common to apply for whole sub-blocks but to exclude land that is subject to native title. The application is still for the relevant sub-blocks and the excluded land is referred to usually by the parcel name, not by boundary description. Any survey must identify the sub-block limits first and then reinstate the relevant parcel boundaries in the same manner as for any cadastral survey, with intersections where relevant on the sub-block boundaries.

If the cadastral boundary is a watercourse or other ambulatory boundary, accretion and erosion may have to be determined to fix the correct boundary line. Refer to CSR Part 4 Ambulatory Boundaries.

3.3 Mineral development licences

Standard under the SMI Act

There is no ground marking for a mineral development licence application, so a survey is based on the written description only. Section 184 of the *Mineral Resources Act 1989* requires the application boundaries to be described by accurately measured distances and compass bearings. That is, unless the mining registrar gives approval to an alternative method of description, the boundaries still have to be measured but no ground marks are placed. A reference point, usually a cadastral boundary corner or other survey mark, is also required in the description.

If a corner of the mineral development licence is a surveyed position shown on a registered survey plan, then the reference point and the commencement point may be the same.

If the only information given in the application is the dimensions of the boundaries and the connection from the reference point, then any survey of the application or the granted mineral development licence must first set out the connection and then the dimensions quoted. The resulting lines are the boundaries of the mineral development licence. Note that the mineral development licence must sit wholly within the exploration permit or mineral development licence, which is its prerequisite tenement. Any overlapping land must be truncated and the resulting mineral development licence boundary will coincide with the boundary of the prerequisite tenure. Similarly, any subsequent mining lease that arises out of the subject mineral development licence must sit within the licence boundaries.

If there is no meridian stated in the application, then it must be assumed to be magnetic, in accordance with section 184 of the *Mineral Resources Act 1989*, and the boundaries set out accordingly. With magnetic bearings, the safest approach usually is to set out one line only with a compass to define the meridian, and then use a theodolite or GPS. Survey plan bearings are expressed in MGA. The meridian of mineral development licence boundaries is critical. Since they are fixed by description, a small swing in a long boundary could shift parts of the mineral development licence off the desired land. This can be very expensive if mineralised land is excluded. The use of a compass over long distances may produce unusable results.

DEEDI's SIE database assumes that bearings are magnetic. If the meridian of an application is not magnetic, it should be on a recognised system such as MGA, and a conversion factor to magnetic meridian must be supplied. Preferably, the bearings should be converted to magnetic by applying a single constant to them and the correction to the datum actually used be stated. Faults or mistakes in the meridian can have a serious effect on the position of a mineral development licence.

Under section 184 of the *Mineral Resources Act 1989* the mining registrar can approve another method of description for an application. This approval can be given to boundaries produced by using surveying equipment and techniques of a higher order than a compass traverse. Examples of alternative descriptions that have been approved are:

- adopting boundaries of an exploration permit or of sub-blocks; these are based on GDA 94 coordinates and are capable of accurate definition, both on the ground and on a map
- using geographical or MGA coordinates. As above, these are capable of accurate definition
- adopting boundaries from existing registered survey plans
- a mixture of the above methods.

On survey, the reinstatement of the first two is by a geodetic connection to fix the boundary corners. Boundaries described by the third method are reinstated according to the normal principles of boundary definition.

3.4 Mining claims

Standard under the SMI Act

See section 53 of the *Mineral Resources Act 1989*. Claims are seldom surveyed nowadays. When they are surveyed they are usually done by measuring between the application posts and giving the survey plan the title 'Land Occupied as Mining Claim xxx'. If a claim is oversized, the processes of sections 53(4) to 53(6) are commenced.

If the posts indicate the claim is not oversized, the holder could elect to have the corners marked with survey pegs and a plan entitled 'Survey of mining claim xxx' produced.

As with other tenements, a claim must fit within its prerequisite tenure; in this case the prospecting permit or permits. Any overlap must be truncated and the prospecting permit boundary becomes the claim boundary too. Any unavailable land may also truncate a claim and itself become a boundary of the mining claim.

3.5 Mining leases

Standard under the SMI Act

3.5.1 Description

The datum post of a lease or application for a lease fixes the first corner. See MRA section 241(4). The basic method of defining the boundaries is then to establish the orientation using one or more of the other posts to give the best fit within the posts. The dimensions of the application are then set out, to complete the boundary definition.

This could be varied if the mining registrar has accepted an alternative method of description to measured distances and compass bearings under section 246 of the *Mineral Resources Act 1989*. In this case, the boundary determination would be according to the alternative method of description, such as reinstating a cadastral boundary, by latitude and longitude, or by location of a physical feature.

If a mining lease is granted to fit the exact boundaries of a cadastral parcel, boundary determination depends on the survey reinstatement of the particular parcel. This does not overrule, however, the importance of the datum post. See 2.12 *Datum post* and 5.8 *Datum posts*. Watercourse and sea boundaries will rely on the establishing of each boundary in the same manner as for a freehold or non-mining leasehold survey.

Note that a mining lease boundary may be governed by the alternative method of description for its prerequisite mineral development licence.

3.5.2 Limitations on area

There are three major restraints on the land available to a mining lease:

- prerequisite tenure
- compensation agreements
- excluded land.

As with claims and mineral development licences, a mining lease must fit within its prerequisite tenure. It must also be over land for which the lessee or applicant has a compensation agreement with the landowner. Excluded and unavailable land must be excised or truncated from the mining lease. In these cases, the relevant boundary must be fixed or identified according to the type of land in question. This may include determining by survey the boundaries of earlier leases, claims, mineral development licences or exploration permits, whether they had been earlier surveyed or not. Except for leases and claims affected by sections 6 and 16 of the Mineral Resources Regulation 2003, overlaps and encroachments must be truncated, producing a smaller area than would otherwise be defined.

If an encroachment over excluded land is discovered on survey, the exclusion must be surveyed out of the later tenement.

3.6 Petroleum tenures

Standard under the SMI Act

There are now two Acts governing petroleum tenures: the *Petroleum Act 1923* and the *Petroleum and Gas (Production and Safety) Act 2004*. Each of them provide for authorities to prospect, petroleum leases and pipeline licences. See 7 Petroleum below.

3.6.1 Authorities to prospect

Authorities to prospect are treated in the same way as exploration permits with block and sub-block boundaries fixed by geodetic means. If certain land is excluded from the authority the boundary of that land is determined according to its tenure type.

3.6.2 Petroleum leases

These are similar to mining leases except that there are no ground markings placed for the application. A description by sub-blocks requires geodetic connections to establish the boundaries. Description by bearings and distances only, is set out using those bearings and distances, and description by other boundaries would depend on the nature of the other boundaries. See the *Petroleum Act 1923* section 40(5) and section 7.3 *Petroleum leases* below.

3.6.3 Pipeline licences

Once the pipeline licence plans have been accepted, the boundary of a pipeline licence is that of the easements and other rights on the title underlying the pipeline licence.

Pipeline crossings over roads and rivers that are not within a title are fixed only by the centre-line of the pipe and do not have defined boundaries.

3.7 Prospecting permits

Information

Prospecting permits under the *Mineral Resources Act 1989* are described by existing cadastral parcels and cover the whole of the parcel. If the boundary of a permit became an issue, a survey would be done in the appropriate manner for the title in question.

3.8 Special acts

Information

The Acts—other than the *Mineral Resources Act 1989*, the *Petroleum Act 1923* and the *Petroleum and Gas (Production and Safety) Act 2004*—that provide for the creation of mining tenures have to be considered individually and their particular provisions for granting tenures studied. In many of them the land intended for a lease is surveyed before application, so the boundaries are determined according to the applicant's instructions to the surveyor, provided they meet the requirements of the particular Act. See the list of Acts at section 1.7 *Legislation*.

4 Ambulatory boundaries

4.1 General

Information

In general, irregular boundaries have been avoided for mining tenures. However, some mining tenures with ambulatory boundaries do exist, notably a few old coal mining leases at Ipswich. In recent years ambulatory boundaries have been created where land subject to native title, such as a boundary watercourse, is excluded from an application that covers more than one title and there is no Indigenous Land Use Agreement. This enables a tenement to be granted over the clear land whilst negotiations are proceeding for another application over the balance of the land desired.

However, it is more common to create right line boundaries outside of the ambulatory boundaries leaving as a buffer some extra land that is not in the application.

Surveyors dealing with ambulatory boundaries should refer to the CSR under section 4 Ambulatory Boundaries.

4.2 High water mark or natural boundary

Standard under the SMI Act

Using the high water mark or any other natural boundary for a mining tenement boundary is theoretically possible, but may present difficulties. If such a feature is used for a boundary description the surveyor must demonstrate how it was determined. Its use would be discouraged by most mining registrars.

There are comments on high water mark in the CSR under Section 4. Ambulatory Boundaries.

4.3 Prospecting permits

Information

Prospecting permits are taken up over existing land parcels. They are described simply by the parcel description, usually ‘lot on plan’, and they match exactly the title, whatever the boundary. They are issued for one or more months, but no longer than a year, so a meandering boundary is not an issue. Whatever is within the title is within the prospecting permit, provided there is no pre-existing mining tenement.

5 Survey and Marking

Standard under the SMI Act

5.1 General

Surveys of mining tenures are controlled by two Acts: the *Survey and Mapping Infrastructure Act 2003* and the *Mineral Resources Act 1989*. There is other mining legislation but the *Mineral Resources Act* is the one with which most surveyors will come into contact. See the list at 1.7 *Legislation*.

Where a cadastral survey is done under one of the other Acts, the standards are the same as for the Mineral Resources Act, detailed in this chapter.

5.2 Access

In general, it is not necessary to survey the access to a mining lease, mining claim or mineral development licence if it is across unallocated state land or leased land. Survey of an access may be required by the minister under section 407 of the *Mineral Resources Act 1989*. If it is needed it will be detailed in the survey instructions. Access must be surveyed where it crosses freehold land.

When surveyed, angles are marked with survey pegs. For long accesses it may be acceptable to survey and mark one side only. Any proposal to do so must be referred to the chief surveyor. Intersections of the access on cadastral boundaries must be pegged. This will require a normal reinstatement of the cadastral boundary.

Where a surveyor finds that the surveyed access deviates from the application route or where a terminal point does not fall on an acceptable access route under sect 246(d) of the *Mineral Resources Act 1989* or where access should be extended past the nominated terminal point to a more viable access, the surveyor should request further advice from the mining registrar. An application by the holder for variation of access may be required.

5.3 Boundary determination

5.3.1 Datum post

Section 241 of the *Mineral Resources Act 1989* gives the datum post a special status:

241.(4) One of the posts shall be selected to be the datum post for the purpose of the commencement of the description and from which a surveyor shall commence any survey of the land.

Section 57(4) of the *Mineral Resources Act 1989* has the same wording for mining claims.

Since the marking out of the application need not be done by a surveyor, the accuracy of the original measurement of those boundaries could be uncertain. In the assessment of a mining lease boundary, evidence to verify intention and entitlement should include the considerations listed in 5.3.2 *Evidence of boundaries* below.

5.3.2 Evidence of boundaries

The following list is not in order of priority:

- abuttals—should be included in the application description
- adjudication—i.e. a Tribunal or Court ruling
- application written description
- datum post
- other application posts
- application sketch

- the registrar's approval of an alternative method of description (section 246 of the MRA)
- areas
- availability (subject to exclusions, compensation and priority)
- exclusions (see section 2.14 Exclusions)
- metes & bounds
- statutory requirements
- monumented lines and corners
- natural features—may be possible as an alternative method of description under sections 62, 184 and 246 but would require the compliance of the mining registrar
- priority (see sections 2.30 *Priority* and 5.22 *Priority*)
- physical evidence of mining (usually only used with very old leases if other evidence is missing)
- the applicant's intention should be expressed in the description, marking and sketch of the application.

5.3.3 Marks from the application

The surveyor should have the applicant or lessee point out the datum post and other posts of the lease or claim. Adjoining lessees and applicants should be asked to do the same if encroachments are likely to exist and therefore entitlements jeopardised. The survey report should be clear on the presentation of this evidence in support of information shown on the survey plan

Applicants and lessees must maintain the marking that was done for the applications. See sections 81(1)(l), 90, 274, 276(1)(i) of the *Mineral Resources Act 1989*. If posts or marks are missing a report should be forwarded to the relevant mining registrar and to the chief surveyor.

On an application for a mining lease or mining claim, consent may be given by the mining registrar to place a datum post only. See sections 57(9) and 241(9) of the *Mineral Resources Act 1989*.

The registrar's consent is usually only given if the boundaries are inaccessible or are already marked by survey. Section 241(10) of the MRA sets out what should be done where it is impossible to insert a datum post.

5.3.4 Cadastral boundaries

An application may refer to abutting previously defined cadastral boundaries for the fixation of the lease boundaries. The surveyor could then rely on a normal 'fixed boundary' approach, provided the position of the datum post allowed this. Note the status of the datum post in section 57(4) and section 241(4) of the *Mineral Resources Act 1989*. See also 5.4.1 *Applications* above.

Where a cadastral boundary has not previously been surveyed, for example, a pastoral holding boundary, the surveyor must verify its determination with the senior surveyor of the relevant district.

Mining leases need not match background tenure cadastral boundaries unless the applicant wishes it; they can overlap part only of a parcel or include more than a single parcel. There must be compensation agreements with all landowners affected by the surface areas of a lease. If no compensation agreement is reached, the lease or claim is truncated by the boundaries of that owner's land. This will require the reinstatement of a cadastral boundary.

If mining was likely to result in subsidence of the surface of a mining lease where there is no surface area, a compensation agreement may still be reached. See section 280 of the *Mineral Resources Act 1989*.

A compensation agreement must be settled before the grant of a mining claim. See section 85 of the *Mineral Resources Act 1989*.

5.3.5 Orientation

Sections 62, 184 and 246 of the *Mineral Resources Act 1989* require application boundaries to be described by compass bearings, unless the registrar approves an alternative method. Reference should be made in the application to the origin of the meridian of an alternative method. If no meridian is stated and the registrar has not given approval to an alternative method, bearings will be assumed to be magnetic.

Fixing orientation by meridian would only be done in rare cases in a survey of a mining tenure. The evidence of the application must be assessed. The most satisfactory method is usually to use the datum post and one of the other application posts to define the orientation of the first line. Then the application dimensions are set out to fix the extent of the lease or claim. Care must be taken not to use a line that is short and which would swing the survey off the general position of the application posts.

5.3.6 Dimensions

Every case must be treated on its own merits but the surveyed dimensions of a granted lease should not exceed the dimensions in the application. If a survey reveals unavailable land, the dimensions and area would usually be less than those in the application description and the certificate of application. The area may be limited by prerequisite tenures, restricted areas, restricted land or earlier mining tenures. Apart from unavailable land, if a survey reduces the area from that shown on the application and it is not due to calculation differences, an abandonment or surrender should be lodged by the holder for the area not surveyed. The exclusion should be shown by action statement on the plan.

If a lease is designed to fit in between other leases, the description abuttals may have to be used rather than dimensions, provided it does not increase the area. In all cases, the solution must accord to the location of the datum post, unless an ungranted application takes advantage of section 6 and section 16 of the Mineral Resources Regulation 2003.

5.3.7 Moving datum post on survey of adjoining land

A lease or claim application may describe the land as adjoining an earlier unsurveyed lease or claim. If the earlier land is then surveyed, the applicant for the subject land may adjust the marking out so as to adjoin the boundary of the just surveyed land. The mining registrar must notify the applicant who then has 14 days to adjust the marking out. See also sections 6 and 16 of the Mineral Resources Regulation 2003.

It is important to understand that this provision only applies to an application, not a granted lease or claim. It may have the effect of shifting the subject application to new position, but does not allow the taking up of land that would not normally be available. See also sections 6(3)(b) and 16(3)(b) of the Mineral Resources Regulation 2003. Also, it does not allow the size of the land to be increased.

A granted tenure cannot be moved.

5.3.8 Co-ordinates

Geographical or geodetic coordinates are frequently quoted for the position of the datum post. This does not change the dominance of the position of the datum post as placed in the ground. Section 241(4) of the *Mineral Resources Act 1989* is not affected by a description by coordinates. See also 5.4.1 *Applications* above and 2.12 *Datum post*.

In some larger leases, in mineral development licences and especially in exploration permits, boundaries may be quoted as one-minute segments of lines of latitude and longitude. The determination of the boundaries devolves into a survey task, providing the datum post was correctly placed for the lease application. Where a boundary is a parallel of latitude, a mark must be placed at distances of no greater than one minute of longitude.

5.3.9 Previous descriptions

An application description may state that the new application is coincident with the position of a dead mining lease or lease application. DEEDI records may reveal valuable evidence as to the location of the new application. If the applicant intends the new application to cover a dead lease or claim, the new description should include words such

as ‘coincident with previous ML or MC’, and care should be taken with marking out to see that the application truly covers the original tenement.

This is most likely to happen when a dead lease is surrounded by land that is not available for taking up. If the datum post is not close to the corner it purports to mark, the application will be displaced and parts that overlap the dead tenure will have to be truncated.

5.3.10 Statutory considerations

Surveys may be effected under Acts other than the *Mineral Resources Act 1989* (see the list at 1.7 *Legislation*). Surveyors should refer to the particular Act where the boundaries may be prescribed. For example, section 30 of the schedule to *the Commonwealth Aluminium Corporation Pty Limited Agreement Act 1965* and section 5 of schedule 1 to the *Mount Isa Mines Limited Act 1985*.

The *Mineral Resources Act 1989* also defines areas where claims, leases and surface areas may not be granted without the consent of the owners, or sometimes of the Governor in Council. See MRA sections 51, 181(8) and 238.

5.4 Boundary marks

See 5.4.3 *Mining leases* above regarding applications and 2.7 *Boundary marks*. Where reference trees are not available, the boundary mark is to be permanently and clearly branded.

5.4.1 Applications

Until a tenement has been surveyed, the application posts and datum posts of mining claims and leases are the boundary marks.

5.4.2 Mining claims

Claims may be marked with pegs rather than survey posts. If a claim abuts a mining lease the common corners are marked with survey posts.

5.4.3 Mining leases

Survey posts must be placed at the corners of surveyed mining leases. A survey post is of square timber of at least the following dimensions: 100 mm on each side, 1000 mm long and sunk 600 mm in the ground with 400 mm above ground. The top should be tapered. Where it is physically impossible to place a survey post, an alternative or equivalent mark may be used, appropriate to the circumstances. An example of an equivalent mark would be a cairn of rocks, painted star picket in concrete or other similarly prominent and durable mark. The surveyor should show reasonable diligence in ensuring that the mark is one that is capable of lasting at least as long as a post and of being identified as a boundary mark.

The surveyor should pay heed to public safety and, in built-up areas, to the aesthetics of a locality. Alternative marks driven flush may have to be placed or, in rare instances, the corner may have to be offset with pegs along the boundary line.

5.4.4 Surface areas

Surface areas may be marked with pegs rather than survey posts, unless the corner coincides with a lease corner. In that case a survey post should be placed. Reference trees should still be taken and iron pins placed.

5.4.5 Licences (excluding mineral development licences)

Boundary corners may be marked with pegs. Iron pins and reference marks should be used in the normal manner and if the licence is not in a built up area, reference trees should be taken.

5.4.6 Other tenures

In general, mineral development licences, exploration permits, petroleum leases and authorities to prospect should be marked with survey posts. Alternative marks may be placed in suitable circumstances provided they are sunk in the ground sufficiently deep to be secure and are preferably of at least a size equivalent to a survey post and are

recognisable as a boundary mark.

5.5 Compiled plans

Plans for mining tenements compiled from prior surveys are acceptable provided the surveyor is satisfied that the lessee or applicant can identify their boundaries. But if the survey arises from a minister's requirement to survey under section 407 of the of the *Mineral Resources Act 1989*, field marking of the boundaries is usually required. In this case the surveyor should ask the chief surveyor before submitting a compiled plan.

5.6 Consolidation of leases

See 2.10 *Consolidation*

Two or more contiguous leases may be cancelled and a consolidated lease granted by the Governor in Council under section 299 of the *Mineral Resources Act 1989*. It is possible a survey will be required of a consolidated lease under section 407.

A lease may be consolidated without survey if sufficient survey information for all boundaries exists and the external boundary marks are extant. A compiled plan of the whole of the new lease may be adequate.

A field survey may be required if there is not enough survey information to compile the dimensions of the new boundaries of the consolidated lease. The boundary marking is the same as for a survey of a single lease. Internal boundaries need not be marked unless they define a gap. The boundaries will have to be compiled and shown on the plan in the first diagram, the one depicting all the original lease boundaries. See 6.10 *Consolidated leases*.

The surveyor should be aware that gaps may occur between granted leases, which may have not been apparent before the survey was carried out. If the land in a gap is wanted to be included in the new lease, a fresh mining lease application will be required to cover it and consolidation cannot take place until the new application is granted. However, section 299(6) of the *Mineral Resources Act 1989* enables the Governor in Council to include gaps in a consolidated title. Refer to the mining registrar before including any land that is not in the granted mining lease.

5.7 Corner information

As well as the normal reference marks (such as fences, trees and iron pins) the survey must locate the original lease posts placed for the application. These posts should be fixed by offsets in the same manner as fence posts, or by radiation for the longer connections, to the same accuracy as fence posts. They should be recorded in the field book or survey records for adding to the survey plan.

See also 5.8 *Datum posts* and 5.15 *Marking*.

5.8 Datum posts

Comments on the significance of the datum post are given at 2.12 *Datum post*.

Details of datum posts recorded in the field notes or survey records should show:

- location
- description of post
- markings on the post
- remarks on unusual aspects.

Moving of a datum post of an application is allowed following the survey of an adjoining lease, under sections 6 and 16 of the Mineral Resources Regulation 2003. These regulations should be read if an applicant wishes to use their provisions; also read 2.12 *Datum post* and 5.3.7 *Moving datum post on survey of adjoining land*. The plan, accompanied by a report, should show both the old and new positions of a datum post.

The datum post of a granted lease cannot be moved.

A survey shall commence at the datum post (see sections 57 and 241 of the *Mineral Resources Act 1989*), and the datum post and the other posts maintained until the completion of the survey. See MRA sections 90 and 274.

Depending upon the location of the lease it may be prudent not to disturb the application posts after survey to substantiate identification of the lease. In any case the survey is not complete until the plan is registered. Posts should not be removed before then.

5.9 Exploration permit surveys

Surveys are not normally required but may be needed for settlement of boundary disputes with adjoining claim, lease, licence and permit holders or for marking of boundaries to define land available for mining tenure applications.

The survey requires a geodetic connection to establish the corners of sub-blocks. It is usual to mark only those corners or parts of boundaries needed to satisfy the purpose of the survey.

5.9.1 Geocentric datum

Exploration permits are defined by geographic coordinates, referred to the Australian Geodetic Datum 1966 (AGD66).

5.10 GPS

When GPS is used for boundary surveys, it must be done with high precision equipment. Differential GPS is a suitable technique however it is advisable to be guided by the recommendations contained in ICSM's Special Publication No 1 (SP1) Standards and Practices for Control Surveys.
<www.icsm.gov.au/icsm/publications/index.html#surveying_sp1>

Particular notice should be taken of the recommendations for redundant observations, legal traceability and survey closure contained in Section 2.6.

All traverses must be closed.

5.11 High water mark

It is possible to have a mining tenure defined by the high water mark. In practice there would be problems with such a boundary and in most cases high water mark is avoided. See 4.2 *High water mark.*

Any survey involving high water mark must be in accordance with the CSR 4. Ambulatory Boundaries.

5.12 Identification surveys

An identification survey of a previously unsurveyed mining lease should not mark the boundaries; it should only find and identify the datum and other application posts. If boundaries are to be marked, or a difference between the positions of the posts and the dimensions in the application needs to be resolved, a full survey must be done. Reference marks may be placed on an identification survey. See also 6.17 *Identification surveys* for plans.

5.13 Licences

Under some special Acts, licences may be granted over part of a mining lease. This is commonly done under the *Commonwealth Aluminium Corporation Pty Limited Act 1957* and the *Mount Isa Mines Limited Agreement Act 1985*. The survey is carried out in the same manner as a lease survey. See 5.4.3 *Mining leases* for marking and 5.16 *Mineral development licences.*

5.14 Line pegs

Surveyors are referred to sections 10(3) and (10(4) of the Survey and Mapping Infrastructure Regulation 2004. The general rule is that line pegs should be placed. A surveyor who is marking a lease boundary should recognise

that most of the people interested in the boundary position are not surveyors, so sufficient marks should be placed to enable a person on the land to identify the boundary.

If line pegs are not placed, the surveyor should observe section 10(4) and provide written advice from the lessee or applicant that they do not require the boundary to be marked with line pegs. However, even with such written advice it is good survey practice to place a line peg along each line so it is visible from a corner mark to indicate the direction of the boundary.

If a survey is done without line pegs, it does not mean that line pegs will never be placed. Section 407 of the *Mineral Resources Act 1989* allows the minster to call for a survey or further survey of a mining tenure at any time.

5.15 Marking

In the context of the *Mineral Resources Act 1989* marking refers to the procedure for placing posts at the corners of mining claim or mining lease applications. See sections 57 and 241. It also includes marking or suitably engraving the datum post. See section 64B(2) and section 252B(1) and marking or suitably engraving the boundary posts within 7 days of the grant of a claim or lease. See section 90 and section 274.

Marking in the survey context refers to marks or pegs placed in accordance with the *Survey and Mapping Infrastructure Act 2003* and these Survey requirements for mining tenures.

Survey marking is dealt with in 5.4 *Boundary marks*.

5.16 Mineral development licences

The survey of a mineral development licence or an application for a mineral development licence is to be done to the same standards of accuracy and marking as a survey of a mining lease.

Connections to close cadastral boundaries must be made, as with mining leases. In remote areas with no close boundaries, the position of the mineral development licence may be fixed by traversing from a control station to produce coordinates. High precision GPS is preferred (see 5.10 GPS) though in some cases sub-metre differential methods may be acceptable for the connection only.

Intersections on background tenure boundaries need not be surveyed unless DEEDI's instructions require it. The survey should clearly identify which parcels are covered by the licence.

As with other mining tenement surveys, the principle of priority is of utmost importance. The first mining claim, mineral development licence or mining lease to be applied for has priority for any overlapping land. In this case the tenements are surveyed in order of date of application and the encroachments dealt with one at a time. Overlaps of mineral development licence applications on each other may have to be dealt with under section 185 of the *Mineral Resources Act 1989*, where the minister determines priority.

5.17 Mining claims

See also 2.8 *Claims*. and 6.25

Mining claims are provided for in Part 4 of the *Mineral Resources Act 1989*. They are registered by the mining registrar and generally are not surveyed, but the minister may call for a survey under section 407 of the Act, or the holder may elect to have a survey done. Claims are surveyed in a similar manner to mining leases and connections must be made to the nearest cadastral boundary and boundary intersections pegged.

Claims are usually surveyed by measuring between the application posts depicting the land occupied by the claim. Reference marks should be placed to aid any future reinstatement of the land occupied. Overlaps on earlier mining tenements must be truncated unless section 6 of the Mineral Resources Regulation 2003 applies. Offsets from the survey mark to the claim post must be taken and recorded for the plan. Survey pegs may be used to mark the corners.

5.17.1 Prescribed areas or less

Should the area not conform in shape (section 53 of the *Mineral Resources Act 1989*), the direction of the applicant

or claim holder and the mining registrar should be sought regarding the intended or permitted shape. Non-conformity of shape may be acceptable if availability is determined by adjoining areas. The registrar should be advised of any variations from the application.

5.17.2 Excess areas

Where an area is found upon survey to exceed the prescribed area, a survey sketch should be prepared describing the area as 'Survey of area occupied as mining claim' and a copy promptly forwarded to the mining registrar of the relevant district. The status of the mining claim may then be determined under section 53(4) of the *Mineral Resources Act 1989*. A copy of the survey sketch should also be forwarded to the chief surveyor.

When the excess area has been determined and the applicant has moved their posts (excluding the datum post) to the approved positions, a survey plan must be lodged showing the original mark positions as well as the final boundaries.

Excess areas disclosed by survey in adjoining claims should also be referred to the mining registrar.

A mining claim may be restricted to a smaller area than one hectare if it is prescribed by regulation under section 391 of the *Mineral Resources Act 1989*. See also section 53 (3) of the Act.

5.18 Native title

When a surveyor lodges a survey plan of a mining tenure application, an application for additional surface area, or a renewal of a tenure, the plan of survey might not be registered until it is established that native title will not impede grant of the tenure.

The surveyor should verify with the mining registrar whether a native title assessment has been carried out. The registrar can clarify the procedures required.

5.19 Permanent marks

See section 6 of the Survey and Mapping Infrastructure Regulation 2004. Surveyors should use standard 3.26 of the CSR.

5.20 Posts

Mining leases and mining claims are marked out by the applicant with metre high posts. See 2.12 *Datum post* and 2.29 *Posts*. These are to be distinguished from the survey posts placed by a cadastral surveyor on a survey of the same tenement. Both posts will exist at the time of a survey.

A surveyor dealing with a previously unsurveyed lease or claim should search for the applicant's posts as they are the primary evidence of location of the tenure.

See also:

5.2 *Access*
5.3.6 *Dimensions*
5.3.7 *Moving datum post on survey of adjoining land*
5.8 *Datum posts*
5.3 *Boundary determination*.

5.21 Prerequisite tenure

Applications for mineral development licences, mining claims and mining leases can only be made over land for which the applicant holds a prerequisite tenure, as specified in the *Mineral Resources Act 1989*. Any part of one of these tenures that occurs outside its prerequisite tenure must be truncated.

5.22 Priority

Mining claims and mining leases are surveyed according to the priority given by their date and time of lodgement

of the application in the mining registrar's office. See 2.30 *Priority*.

Mineral development licences take priority according to the minister's determination where two are made for the same land. See MRA section 185.

If a survey reveals an overlap it should be referred to the mining registrar to commence the process to obtain the minister's determination.

Exploration permits are described by sub-blocks defined by latitude and longitude (1966 datum). They can have no part sub-block overlaps because their boundary definition prevents it. An overlap may occur when the same sub-block is applied for by more than one party. The minister determines this. However excluded land may create an irregular boundary.

If several mining tenements are to be surveyed, it is best to survey them in order of application, then any encroachments will be immediately apparent.

5.23 Reference marks

Sufficient reference marks must be placed to facilitate future reinstatement of the boundaries. Refer to CSR 3.22.2 for a description of suitable reference marks.

Reference trees are of considerable value in mining tenure surveys and should be taken where possible at each corner, except in built-up areas. Shields are to be chiselled with the appropriate mining tenement description. Environmental considerations should be taken into account when deciding on the use of reference trees. Iron pins must be placed near corners or connections made to suitable alternative reference marks.

The principle of using reference trees in appropriate places, and placing iron pins, extends to all mining related cadastral surveys and includes (but is not limited to):

- surface areas
- additions to and surrenders from, the surface
- partial surrenders
- sub-leases
- licences
- exploration permits
- datum post location surveys
- claims
- fossicking areas
- restricted land
- restricted areas.

5.24 Remarking boundaries

Remarking of a surveyed boundary should be done to at least the same accuracy and standards of marking as the original survey.

Remarking an unsurveyed mining tenement boundary is usually done in response to the liability of the holder of a lease or claim to maintain their marking according to sections 81(1)(l), 90, 274 and 276(1)(i) of the *Mineral Resources Act 1989*. As such, it is an exercise in renewing or replacing the application posts in the same place as the original posts, rather than a surveying matter. The mining registrar should be notified if the posts are renewed and it is a good policy to advise the registrar if an inspection shows that the posts are extant, especially if the lease is several years old.

5.25 Removal of posts

Interference with a post, cairn of stones or other boundary marker without a reasonable excuse is an offence. Refer to section 72 of the Mineral Resources Regulation 2003.

Posts and their markings must be maintained until a lease is surveyed; see section 274 of the *Mineral Resources Act 1989*. Note that under section 244 of the Act, posts must be removed if an application is not made, is rejected or is abandoned. They must also be removed immediately before termination of a lease. See MRA section 312.

See also section 42 of the *Survey and Mapping Infrastructure Act 2003* regarding interference with a survey mark.

If a lessee appoints a surveyor to remove the posts following survey, they should not be removed until the plan is registered, to ensure that the primary evidence of the location of the lease is kept until the survey is completed.

5.26 Report

A report on the survey should accompany the survey plan at the time of lodgement. It should include comments on:

- survey reinstatement where it is not obvious
- survey irregularities
- details of boundary irregularities, including reasons for departure from applicant's description or marking and significant differences from original dimensions
- location of relevant mine workings and installations that may assist with positioning of the lease or claim
- anything else which would help expedite the registration of the plan.

5.27 Restricted land

See 2.33 *Restricted land.*

Restricted land should be identified in the field and surveyed as an exclusion from the surface of a mining lease, unless the Governor in Council or the land owner has given approval to include it in the surface. See MRA section 238. The boundaries should be dealt with in the same manner as a surface area. Restricted land boundary corners may be marked with survey pegs except where they coincide with a corner of the lease.

Restricted land must be defined and marked on survey and the surface area reduced accordingly.

Improvements that create restricted land should have been identified in the application for a mining lease. See MRA section 245(1)(g). An improvement must be located by survey and the restricted land boundaries set out at the specified distance from the improvement; the distances are set out under 'restricted land' in the Dictionary in the Schedule to the *Mineral Resources Act 1989*.

The feature causing each parcel of restricted land should be identified in the survey records or the report.

5.28 Resumption of background tenure

When a mining claim or mining lease partly sits over land that is resumed, a survey plan of the balance of the lease or claim must be lodged with the chief surveyor.

5.29 Roads affecting surface areas

Roads are treated as any other background land with respect to surface areas. Where a road crosses a surface area boundary, the intersection should be surveyed and pegged.

If a road is excluded from the surface area, it should be surveyed unless boundaries compiled from survey plans satisfy the needs of the lease and the reasons for the survey.

Roads on the lease where there is no surface area need not be surveyed. They must, however be drawn on the

survey plan as a background tenure to the lease.

See also 2.6 *Background tenures* and 6.6 *Background tenures* for title aspects.
See also 5.32 *Surface areas.*

5.30 Searches

The cadastral surveyor must ensure that all relevant details of a lease or other tenement are known so that the survey may be properly effected. The surveyor is responsible for the completeness and accuracy of the search information. A copy of all information relevant to the survey obtained outside of DEEDI should be forwarded with the survey plan.

The information that may be required is listed below. The list may not be complete in particular cases.

- application description
- application sketch or diagram
- surface area description and amendments
- abandonments and surrenders
- depth restrictions on the mining title
- SIE and Merlin print-outs—graphical and attribute data
- survey plans
- restricted areas and other special areas
- archival charts
- original field notes
- instrument of lease
- dead tenures that existed at the time of application for the subject tenure
- permanent mark search.

The surveyor's client should hold a copy of all mining title information relevant to their tenure. To assist surveyors, a file search is always included with the instructions.

5.31 Subleases

Subleases are surveyed in a similar manner to a head lease. Iron pins should be placed near corners, as well as reference trees where appropriate. The main difference in marking is that pegs may be used for the boundaries rather than survey posts. Any specific requirements will be covered in the survey instructions.

5.32 Surface areas

The intersection of a cadastral boundary with a mining lease surface area should be pegged and the allocated areas of the surface area shown on the plan. This includes intersections on easement boundaries.

The applicant or lessee must have a compensation agreement in place with the holder of each parcel of land affected by the surface area before the lease can be granted. If the survey reveals that surface area encroaches over land for which there is no compensation agreement, that part of the lease must be excised from the mining lease.

Surface area corners that are not lease boundary corners may be marked with survey pegs.

5.33 Surrenders

Partial surrenders of mining leases frequently have to be surveyed. The survey is concerned with fixing the area to be retained, but the plan must show the whole of the lease before surrender if it has not been surveyed before. The lease as granted must be defined first and the instrument of lease is drawn up on the original grant. The partial

surrender then becomes an endorsement on the instrument.

If the lease has not been surveyed before the partial surrender and the datum post is on the surrendered part, it will have to be located by survey. Any other posts relevant to fixing the lease position will also have to be picked up, whether or not they are on the area to be retained. Surrendered corners do not have to be marked but they must be capable of being correctly shown on the survey plan. If the datum post is on a corner to be retained, and sufficient information can be obtained from posts on other retained corners, the surrendered part may be compiled from the file information.

Survey plans of subsequent partial surrenders will show the area of the lease immediately before the particular surrender, with the area now remaining. This can be shown in the Schedule of Areas on the face of the plan.

Lease corners are marked with survey posts.

5.34 Survey instructions

Before commencing the survey of a tenure under the Mineral Resources Act, the surveyor should write to the chief surveyor for instructions. The instructions give any special requirements of the particular tenement and provide the relevant file searches, including a copy of the application and changes to its entitlements. Whilst the lessee or applicant should hold copies of their applications, corrections, partial surrenders and other actions affecting boundaries, the surveyor cannot always be sure of obtaining a full search.

An example of a survey instruction can be found at 1.11 *Survey instructions.*

5.35 Survey records

Survey records or field notes are no longer required to be lodged with the survey plan unless the survey is of an irregular boundary such as a watercourse. Survey records may also be called for in the instructions in particular circumstances.

They may be recorded in any recognised style providing all necessary information is clearly described. Photocopies of plans are not acceptable as survey records.

Surveyors are referred to section 22 of the Survey and Mapping Infrastructure Regulation 2004.

6 Plans of mining tenures

Standard under the SMI Act

(unless otherwise stated)

6.1 General

All surveys should be drawn on the correct Mines plan form on either A2 or A3 sizes. More than one sheet may be lodged for a survey under the one plan number; however all sheets must be the same size.

Surveys of two or more leases or tenements may be drawn on the one plan form if the parcels are connected. The boundaries need not abut, but they must be part of the same survey.

The Survey Instructions, issued for each particular survey, may have information or requirements that could affect the drawing of the plan.

The information within the windows marked with a bold outline at the foot of the plan will be completed by DEEDI.

6.2 Common plan standards

The basic principles of drafting survey plans for mining tenures are the same as those used for other cadastral survey plans. Common standards and guidelines are found in the following parts of the CSR (the guidelines apply to the mining tenure Standard 6. Plans of Mining Tenures):

Cadastral standards and guidelines which apply respectively as mining tenure standards (S) and guidelines (G) under the SMI Act:

- 3.5 Adjoining information (S)
- 9.3 Adjoining description (G)
- 3.6 Areas (S)
- 3.7 Authorisation of another surveyor (S)
- 3.9 Certification by surveyor (S)
- 3.18 Dimensions (S)
- 3.23 Meridian (S)
  - 9.19 Datum (G)
  - 9.34 Meridian (G)
- 9.6 Bearings (S)
  - 9.14 Connections to distant points (G)
  - 9.24 Fences (G)
  - 9.46 Ranged only and reads bearings (G)
- 9.15 Conversions (S)
- 9.23 Distances (S)
- 9.26 Ink (S)
- 9.30 Linework (S)
- 9.35 Metric documentation (S)
- 9.39 Original dimensions (S)
- 9.47 Roads (S)
- 9.48 Scale of plans (S)
- 9.49 Secants (S)
- 9.54 Tabulations (S)
- 9.55 Text styles (S)
- 9.57 Watercourses (S)

Cadastral standards and guidelines which apply as guidelines under mining tenure standard 6 *Plans of mining tenures*:

- 9.7 Buildings
- 9.16 Corner information
- 9.18 County boundary
- 9.21 Description of Country
- 9.22 Diagrams
- 9.29 Line pegs
- 9.41 Parish boundary
- 9.50 State boundary
- 9.51 Station numbers
- 9.52 Symbols
- 9.54 Tabulations
- 9.55 Text styles
- 9.56 Traverses
- 9.58 Watersheds (S)
- Appendix B.2 Abbreviations - Crown Tenures
- Appendix B.3 Abbreviations - State Tenures
- Appendix B.6 Commonly used plan abbreviations
- Appendix C Styles
- Appendix D Symbols

6.3 Access

See 2.3 *Access*

Access is normally not surveyed unless it is over freehold land, but may be included in the Survey Instructions or the lessee may choose to have it surveyed. If access is via an already well formed road of long standing, survey over freehold land may not be necessary. Advice from the chief surveyor should be sought in these circumstances.

When surveyed, the width of the access and measured secants must be shown on the plan. Where the access is long it may be acceptable to survey one side only but it is recommended that surveyors discuss this with the chief surveyor before proceeding. If this happens, the surveyed boundary must be shown by a full line and the opposite side in a broken line. An area of the access is not usually required.

Describe access on the face of the plan in the same manner as a road. Example:

ACCESS 20 WIDE

If access to a mining lease is surveyed the title on the survey plan should read 'ML xxx and ACCESS'. Examples:

ML 53 and ACCESS

ML s 52, 53 and ACCESS (ML53)

ACCESS (ML 53)

6.4 Areas

Areas are computed in accordance with CSR 3.6 Areas.

An area must be shown for:

- the whole of the lease
- each surface area
- each background title severance by a surface area
- any sub-leases
- any licences over the lease.

See also 6.34 *Roads*.

6.5 Assessment of plans

A survey plan of mining tenures should:

- describe the subject land unambiguously on the correct plan form
- be suitable for annexing to an instrument of lease document or other title document
- provide evidence of the marking of the boundaries.

When assessing whether the plan is suitable for registration the following factors are considered:

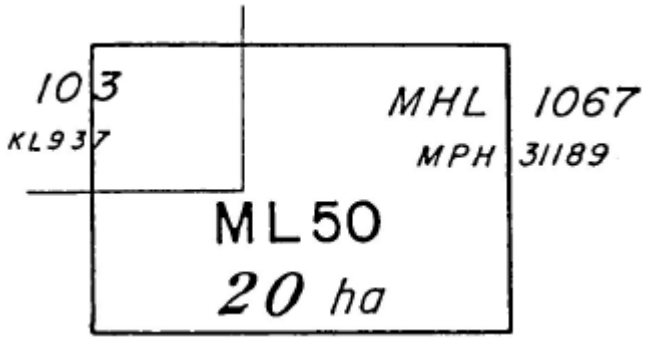
- Presentation:
  - Is it consistent with DERM and DEEDI Requirements?
  - Is the survey reinstatement correct and the information shown correctly?
  - Has the surveyor's certificate been correctly attested?
  - Have supplementary attachments to the survey report been lodged?
- Application details:
  - application description, including abuttals
  - applicant's sketch
  - certificate of application
  - if description stated as being identical to a previous lease
  - position of datum post and application posts
  - purpose the tenement was applied for
  - is surface area required?
  - areas of mining leases or applications covering background tenures
  - compensation agreements with all affected landowners
  - application amendments or abandonments
  - resumptions of background tenures

- date of receipt of application by registrar, to determine priority
- roads and reserves, whether included or excluded from the lease or surface area
- restricted land, whether included or excluded from the lease or surface area
- unavailable areas
- access
- tidal and watercourse boundaries
- recommendations of the Land and Resources Tribunal.

- For tenures already granted, the following information may also be relevant to the assessment:
  - minister's recommendation to Governor in Council for grant
  - if an instrument of lease was issued before survey
  - surrender of part of the lease or surface area
  - addition to the surface area
  - sub-leases or licences.

6.6 Background tenures

Where a mining tenure covers lands held under other tenures, all boundaries and descriptions of those lands are to be shown on the plan. The boundaries of the subject block are to be distinguished by heavier lines. Show underlying descriptions in light block as follows:



Severances, intersections and connections to background tenures are required when the lease has surface area.

All existing cadastral background information should be shown on the survey plan. Care should be taken where the background tenure has a depth restriction that is not defined by numerical description. A descriptive term such as 'to the depth of the coal seam' has sometimes been used in older leases.

When the background tenure has separate strata titles in depth, the description of the surface strata should be shown. It may be necessary to show a table listing descriptions and plan numbers of the sub-surface tenures.

See also 2.6 *Background tenures*.

6.7 Calculated lines

A line calculated between two surveyed corners may be used in some instances, such as the unsurveyed side of a long access, or with inaccessible corners. Lines with computed dimensions should be labelled 'calc' or 'calc orig' on subsequent plans.

6.8 Certificates

The surveyor should endorse the plan with the appropriate approved certificate from Forms 12, 13 and 18 under

section 65 of the *Survey and Mapping Infrastructure Act 2003*. For the forms refer to DERM's website: <http://www.derm.qld.gov.au/property/surveying/technical_standards.html>

For the certificate for petroleum well location plans see 7.4.6 *Certificate for petroleum well* location surveys.

6.9 Compiled plans

Compilation is allowed in certain cases, however the surveyor should be satisfied that the datum post is truly at the cadastral corner it purports to identify. See 5.5 *Compiled plans*.

The datum post must be shown on the plan. This will involve a field inspection and fixing the post. A measured connection or offsets to the same standard as for showing fence posts is suitable.

Where the whole plan is compiled, dimensions are not qualified by the word Orig. Station numbers or letters are shown only when required to describe specific actions such as additions to surface or partial surrenders.

If a compiled surround closes within the allowable limits of error, a calculated area should be used. If not, a compiled area is to be used and labelled where applicable 'Bal'.

6.9.1 Certificates

Compiled plans must bear the appropriate certificate from Form 18. They must also bear the following statements:

Copied and compiled from xxx (insert Plan Numbers)
in the Department of Employment, Economic Development & Innovation [or Environment & Resource Management, as needed]

and:

The datum post was found by inspection to agree with the lease application as shown hereon

.....
Cadastral Surveyor

The offsets to the datum post from the appropriate surveyed boundary corner must be shown tabulated.

Where a survey of only a small part of a large tenure is wanted, lines may be adopted from the application description for the balance. The plan may not be suitable for issue of a lease and the compiled boundaries may be subject to amendment, since availability will depend upon a field survey of the full lease or application. These lines should not be confused with calculated lines derived from survey information as described in 6.7 *Calculated lines*. See also 2.10 *Consolidation*, and 6.10 *Consolidated leases*.

6.10 Consolidated leases

Two diagrams on the plan will be required. The first diagram will disclose the position of all the leases including the gaps. The second diagram will show the exterior boundary of the consolidated lease. It may be possible to compile some boundaries, particularly the internal ones. See also 2.10 *Consolidation* and 5.6 *Consolidation of leases*.

6.11 Corner information

The usual references to iron pins, reference trees and fences are shown on the plan. It should show connections or offsets to the posts, datum posts or other marks placed for the mining tenure application.

See also:

5.7 *Corner information*
5.8 *Datum posts*
5.15 *Marking*
6.11 *Corner information*

6.12 Corrections to plans

Corrections made to plans before registration may be done by erasure and the correcting information added in black ink. If a surveyor considers that a correction should be done after registration of the plan, they should advise the chief surveyor in writing and the corrections will be done in red ink in the Landcentre plan archive.

6.13 Datum posts

The datum post is a critical mark for positioning mining leases and mining claims and must always be shown on the survey plan including compiled plans. If the datum post is missing, this must be detailed in a report lodged with the survey plan.

The datum post is shown on the plan in a schedule with the other application posts and the markings on the post must be recorded in the schedule.

See also 2.12 *Datum post* and 5.8 *Datum posts* for information on datum posts. Plans for datum post location surveys are done to the same standards as for other surveys.

6.14 Easements

No provision exists under the *Mineral Resources Act 1989* to register an easement over a mining claim or lease. An easement across a background tenure should be shown on a survey plan of a mining tenure. It should be clearly depicted whether the application includes or excludes the easement from the surface area or lease.

6.15 Exploration permits

On survey plans of an exploration permit or part of one, the datum of the coordinates should be stated on the face of the plan as follows:

Geographic Coordinates on
Australian Geodetic Datum 1966 (AGD66)

When bearings are given, both forward and reverse azimuths should be shown where applicable.

Plans of exploration permit surveys should show connections to cadastral boundaries near exploration permit corners and show comparison of meridians. Where astronomical observations are taken, a meridian table should be shown.

6.16 GPS

When GPS is used, a statement to that effect must be shown in the survey records and on the plan.

6.17 Identification surveys

The plan requirements for a boundary identification survey of all or part of any existing mining tenement are the same as the plan requirements for a survey of that tenement, except that the plan title should be headed:

IDENTIFICATION SURVEY OF

Identification survey plans must have a completed certificate. See also 5.12 *Identification surveys*.

6.18 Lapsed boundaries

Lapsed boundaries are previously cancelled boundaries or boundaries of dead leases. They are generally only shown when used for survey reinstatement.

Any measured bearings and distances are shown on face of plan. The former description of the expired lease is shown in dotted hairline.

6.19 Licences

Apart from mineral development licences under the *Mineral Resources Act 1989*, licences are provided for in some of the special Acts, in particular the *Mount Isa Mines Limited Agreement Act 1985* and the *Commonwealth Aluminium Corporation Pty Ltd Agreement Act 1957*. A licence under the special Acts is the right to use specified land within a mining lease for certain purposes. Licences are surveyed, and the plan drawn, in the same manner as for other tenures and are listed in the title block on the plan.

6.20 Locality

The locality of a tenure must be indicated on the plan. The locality box on the plan form allows for latitude and longitude of the centroid of the land. These coordinates are intended only for finding the land on a map or in a graphical database. The accuracy will depend on the available information but coordinates should not be shown to a greater accuracy than one second; ten seconds is usually sufficient. Where there is more than one sheet per plan coordinates should be shown on and for the first sheet only, which should depict an overview of the surveyed land. A locality name may be added if the surveyor chooses.

In towns and developed areas the coordinates are of reduced value. A locality name should be included here. In most instances in towns the coordinates can be dispensed with.

Petroleum well location survey plans, which show coordinates for survey points, do not need locality coordinates.

6.21 Lot on plan

Except in special circumstances, the lot on plan system is not used for mining tenement surveys. Land surveyed for mining purposes other than claims, exploration permits, mineral development licence, mining leases or restricted areas, may be allocated a lot on plan description. This is a common device for surveys under the *Mount Isa Mines Limited Agreement Act 1985* and the *Commonwealth Aluminium Corporation Pty Ltd Agreement Act 1957* where there are some hundreds of parcels surveyed for surrender from the mining lease or for other dealings, but it is not used in general.

6.22 Lodgement

Survey plans must be lodged with the chief surveyor, Mines & Energy within DEEDI[3].

6.23 Meridian

MGA azimuth should be used. See also CSR at 3.23 Meridian.

6.24 Mineral development licences

When surveyed, the plan is prepared as for mining lease requirements. The concept of surface area does not apply to a mineral development licence.

6.25 Mining claims

The description of the survey plan should read ‘Area Occupied as Mining Claim xxx’. See also 5.17 and 5.17.1 *Prescribed areas or less*.

6.26 Mining districts

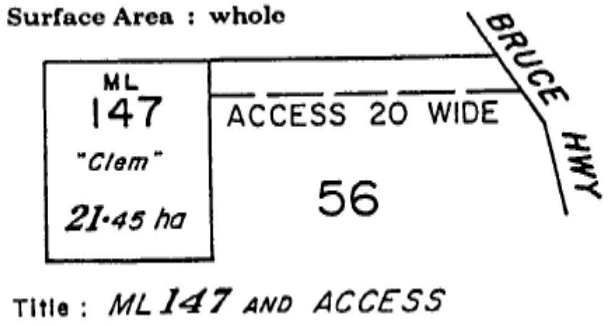
The mining district is shown in the title block of the plan. Most mining district boundaries coincide with the boundaries of local authorities.

[3] Currently located at the Landcentre in Woolloongabba. Postal address: PO Box 1475, Coorparoo DC, Queensland 4151

6.27 Mining leases

6.27.1 Overview

A plan of a mining lease must show the external boundaries of the lease, the surface area, any background tenures, and the access to the lease if it is surveyed. Where surface areas exist, severances of land parcels and connections to the background tenures are required.



See also 6.6 *Background tenures*. For details regarding access see 5.2 Access and 2.3 *Access*.

6.27.2 Surface areas

The surface area (whether whole, part, or nil) is shown on the plan by statement, but must accord with the application description. Where the surface area is over part of the lease only, the land subject to surface area is detailed on the face of the plan by surveyed lines and the station numbers listed in a statement:

Surface Area Whole

or

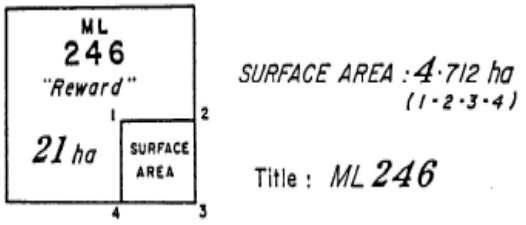
Surface Area 25.75 ha (Stn Nos to be listed)

or

Surface Area Nil

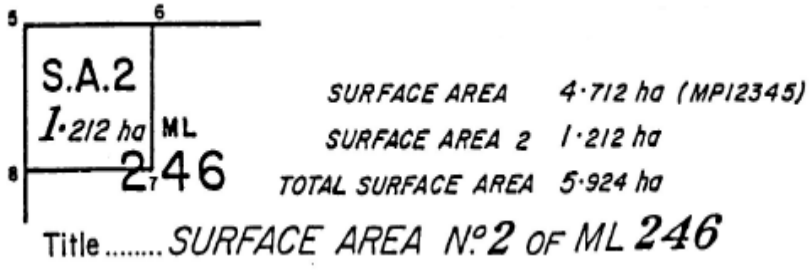
When more than one surface area is contained within the one lease, they are described as ‘Surface Area 1’, ‘Surface Area 2’, etc. An area is shown on the plan for each and an area of the total surface area is shown by statement.

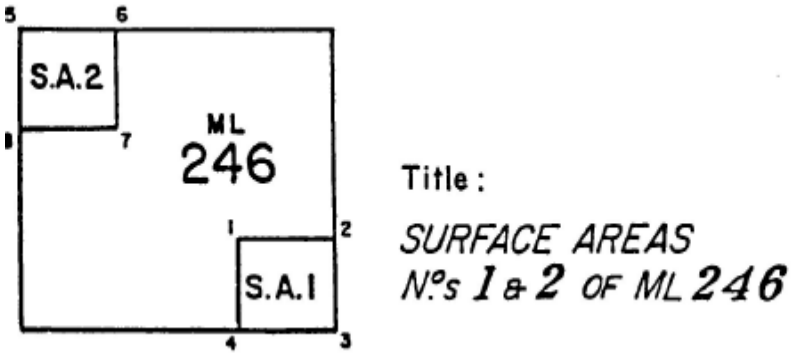
In the past, when only one surface area was taken up, it was common to describe it as ‘Surface Area’ without a number. The next area should be described as ‘Surface Area No.2’ and later ones follow consecutively. The original surface area should be left un-numbered as there will be documents in various locations describing it as ‘Surface Area’ only. Show the original surface area on the plan as follows:



It is now the practice for the mining registrar to allocate surface area numbers.

‘Surface Area’ is referred to in the title when the plan is of the surface area only.





6.27.3 Application posts (including datum post)

Show offsets or connections to application posts, including datum posts, and the markings thereon, either on the face of the plan or tabulate them.

A plan that is of the first survey of a mining lease, surveyed or compiled, must show the position of the applicant's datum post and the marking thereon, either on the face of the plan or in a table with the other posts.

6.27.4 Depth restrictions

On plans of mining leases, which are restricted in depth, the plan should be endorsed with a suitable statement, for example:

M.L. 697 exists only below the depth of 15.24 metres beneath the surface except for Lot 83 where it exists on and beneath the surface.

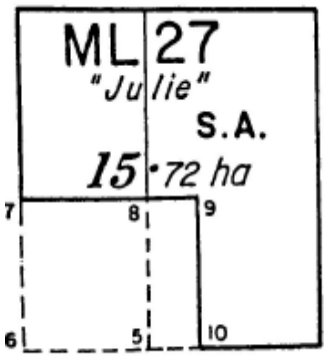
6.27.5 Name of lease

The name of the mining lease is shown within the subject block as illustrated by diagrams above and below at 6.27.2 and 6.27.6.

6.27.6 Surrender from mining lease

The plan is drawn as if the action was complete (with original dimensions and cancelled boundaries if required).

Each severance area being surrendered from the lease and surface area, as well as the total area surrendered, is to be shown by statement on the plan. The area remaining is shown on the face of the plan, in the normal manner.



AREA TO BE SURRENDERED FROM SURFACE AREA OF ML 27
(5-8-9-10) ..... 1·674 ha

AREA TO BE SURRENDERED FROM ML27
(6-7-9-10) ..... 5·023 ha

Title : ML 27
SURFACE AREA : 10·72 ha

Generally, the plan must show the whole of the original lease for the first survey of a partial surrender, and the whole of the lease area immediately before the surrender for subsequent surveys. However, in some circumstances, such as a small surrender from a large lease, it may be acceptable to show only the surrendered part on the plan.

For balance areas see CSR 3 6.2 Balance areas.

6.27.7 Datum post location surveys

Datum post location surveys are for connections to the datum post and usually one of the other application posts to enable the position of the lease to be plotted. They are not surveys of mining lease boundaries.

The plan title is: 'Survey of datum post location of MLs xxx etc'

6.28 Petroleum permits, leases & licences

Authorities to Prospect under the *Petroleum Act 1923* and the *Petroleum and Gas (Production and Safety) Act 2004* are defined by blocks and sub-blocks related to geographical coordinates on AGD66. Any survey plan should be endorsed:

Australian Geodetic Datum 1966 or AGD 66

Long lines resulting from these coordinates should have forward and reverse bearings.

Petroleum lease surveys and plans are done in a similar manner to those for mining leases. Surveyors interested in surveying petroleum leases should approach the chief surveyor for an example.

6.29 Petroleum well location surveys

Surveys of wells under both the *Petroleum Act 1923* and the *Petroleum and Gas (Production and Safety) Act 2004* are done under sections 55 and 56 of the Petroleum and Gas (Production and Safety) Regulation 2004. See 7.4.14 *Plans* for the standards and guidelines for PWL survey plans.

Examples of PWL survey plans are available from the chief surveyor (Mines).

6.30 Pipeline licences

For plans of pipeline licences, see 7.5 *Pipeline licences*.

6.31 Restricted areas

These are areas of land set apart under the *Mineral Resources Act 1989* for special purposes, usually to restrict or control certain mining activity. Restricted areas are generally are not surveyed but in some cases they are described by reference to a plan, which is usually compiled from survey plans and other data. However, they can be surveyed and when this happens, the restricted area must be shown in the same way as for mining lease requirements.

6.32 Restricted land

See also 2.33 *Restricted land* and 5.27 *Restricted land*.

Restricted land should be depicted on the plan in its relationship to the surface area and the lease boundaries in the same manner as a surface area.

It should be labelled 'Restricted land', or alternatively, the letters 'RL' may be used. If there is more than one parcel of restricted land, they should be numbered consecutively from 1.

6.33 Right of way

This was a term under the *Mining Act of 1968* and would not now be used on a survey plan. See also 6.3 *Access*

6.34 Roads

See also 5.29 *Roads affecting surface areas*.

6.34.1 Roads in mining leases

There are four methods of showing areas of dedicated roads through mining leases and other exclusions or reservations on a plan, depending upon the mining lease application.

The road may be included in the surface area of a mining lease if a compensation agreement for the road surface has been made. The area of the road within the surface must be shown by statement on the plan form. The road boundaries are shown in light lines.

The road may be excluded from the mining lease. The road boundaries then form lease boundaries and are shown in heavy lines. Full dimensions are required but no area.

The road may be excluded only from the surface area of the mining lease. The road boundaries are shown in medium lines. Full dimensions of the road are required.

The surface area is shown by statement.

Where no surface area is required for the mining lease, the area of the road is not shown, only the area of the mining lease.

In all cases the road boundaries should be plotted on the plan. See also 6.4 *Areas.*

6.35 Severances

All severances of background tenure boundaries by mining claims or mining lease surface area boundaries must be surveyed. The survey plan must show the severances with intersections on the boundaries and the areas affected. See 6.6 *Background tenures.*

6.36 Sub-leases

Sub-leases should be shown on the plan in the same manner as a head lease. For example, the boundaries are displayed in a heavy line style and boundary dimensions, areas, severances and marks placed in the ground are all shown.

6.37 Surface area

A survey plan shall show by statement the area of all background tenures covered by the surface area including reserves and roads. Intersections of surface area boundaries with all background tenure boundaries must be shown on the plan as well. See also 6.6 *Background tenures*

6.38 Surrenders

The description and action statement on the survey plan should indicate whether a partial surrender affects the lease or the surface area. It is important to verify the action with the lessee and the application for surrender, since a surrender from the surface area does not mean a surrender from the whole lease. The preparation of survey plans for surrender actions is shown at 6.27.6 *Surrender from mining lease*.

6.39 Text styles

See also CSR 9.55 Styles and Appendix C.

6.40 Undescribed balance

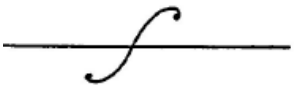
In the case of an excision from a surface area or a mining lease the balance of the parcel must be shown on the plan where possible. It may be left as an undescribed balance and omitted from the plan only with the approval of the chief surveyor (Mines). This will be dealt with in the letter of instruction (see 1.11 *Survey instructions*) on an ad hoc basis.

6.41 Vinculum

A vinculum binding severances of tenements across intervening boundaries, or over other lands, is to be shown on face of plan thus:

For subject land

For surface areas, sub-lease etc



For background descriptions underlying the subject lease and for adjoining descriptions.

7 Petroleum

7.1 The petroleum acts

Information

The *Petroleum Act 1923* is referred to in this chapter as the 1923 Act and the *Petroleum and Gas (Production and Safety) Act 2004* is referred to as the P&G Act. The Petroleum and Gas (Production and Safety) Regulation 2004 is referred to as the P&G Reg.

The 1923 Act is still in force for tenures issued under it and the P&G Act covers tenures over new ground.

Section 75 of the 1923 Act obliges the holder of a petroleum tenure to have a survey carried out by a cadastral surveyor if required by the minister. Section 558 of the P&G Act has similar provisions for petroleum authorities under that Act.

7.2 Authorities to prospect

Guideline under the SMI Act

Authorities to prospect under both Acts are similar to exploration permits for coal or minerals. They give the right to explore and drill to locate petroleum deposits before taking up a petroleum lease. An authority to prospect for petroleum is shown as 'EPP' in the IRTM databases rather than the abbreviation 'AtoP'.

Section 98 of the P&G Act provides for the area of an authority to prospect and should be referred to. The area of an authority to prospect under the 1923 Act is fixed by the minister. See also P&G Act section 18.

Authority to prospect boundaries are normally defined by latitude and longitude. Surveys of authorities to prospect are not often needed and as they are very usually large and any survey would probably only be of a particular part of a boundary. This would require a geodetic connection to put the boundary on the line of latitude or longitude. Excluded land must be surveyed according to the description of the land in the minister's determination and may be a survey of a cadastral parcel. See sections 18 and 18A of the 1923 Act and section 99 of the P&G Act.

The datum used is GDA 94.

7.3 Petroleum leases

Standard under the SMI Act

See Part 6 (sections 40 to 53) of the 1923 Act. A petroleum lease must not exceed 260 square kilometres and, unless otherwise approved by the Governor in Council, be defined by sub-blocks of one minute sides with latitude fixed by one minute chords. See 1923 Act section 40(5). There is no provision for placing ground marking for an application for a lease. Under section 40(6) the Governor in Council may approve that non-contiguous land may be included in the one petroleum lease.

See section 168 of the P&G Act regarding the area of a petroleum lease and unavailable land and section 169 for excluded land, under that Act.

Provision exists under section 40(7) of the 1923 Act for surveying a lease and section 51(1)(c) and 51(2) for surveying surface areas. The survey must be done by a cadastral surveyor.

A survey may be needed where a lease does not match a sub-block. An example is where a parcel of land is excluded from a lease by adopting other boundaries that intersect sub-block boundaries. As with authorities to prospect, excluded land must be surveyed according to the description of the land in the minister's determination and may be a survey of a cadastral parcel. Surveyed boundaries are to be marked as for mining lease boundaries. Survey plans for leases should also be presented as for mining lease surveys, on the normal mines plan forms.

Survey accuracies and plan standards are the same as for mining leases.

7.4 Petroleum well location surveys

Standard under the SMI Act

7.4.1 General

All petroleum well location (PWL) surveys are carried out under the provisions of sections 55 and 56 of the P&G Reg. This applies to surveys under the 1923 Act as well as the P&G Act. Their purpose is to define and record the position and elevation of petroleum wells. Note that sec 299(1) of the P&G Act defines coal seam gas as petroleum when it occurs naturally in association with coal or oil shale. Boreholes for coal seam gas are included in the term 'petroleum well' in this paper.

7.4.2 Accuracy

Section 55 of the P&G Reg sets the accuracy standards:

(3) The survey must—

(a) be tied as to a horizontal control point that is connected to the State control survey; and

(b) be tied as to an elevation control point that is an established benchmark or control mark related to the AHD; and

(c) be tied to 2 suitable permanent reference marks not more than 2 kilometres away from the well.

(4) The survey must achieve a level of accuracy of not less than the following class under the survey standard—

(a) for the location of the well—class C order 3; and

(b) for the elevation of the well—

(i) for differential levelling—class LD; or

(ii) for trigonometric and GPS heighting—class C.

7.4.3 Qualification to carry out PWL surveys

Under section 55 of the P&G Reg, the location and elevation of a well must be determined by survey by a person registered under the *Surveyors Act 2003* or who holds a corresponding registration as a surveyor in another state.

In cases where it is planned to connect to cadastral boundaries in the location of a petroleum well, the surveyor should be a cadastral surveyor.

7.4.4 Benchmarks

A vertical connection should be made from the well to a permanent benchmark established within two kilometres of the well. The horizontal reference marks may be used as benchmarks.

7.4.5 Cadastral connections

In the 1960s and 1970s, the location of a petroleum well was sometimes done by connection to the cadastral network and the coordinates of the well then scaled from an approved map. This is not an acceptable method of location today. If connection to a cadastral boundary is necessary, the coordinates must be obtained by measurement.

Where a petroleum well is within 200 metres of a cadastral boundary, a connection to that boundary is essential. This is to provide certainty as to which land parcel the petroleum well is in. If a well is connected to a boundary of a title registered with the registrar of titles and boundary reinstatement is necessary, the surveyor should lodge an identification survey with the senior surveyor of the relevant district.

7.4.6 Certificate for petroleum well location surveys

The certificate for petroleum well location surveys should be drafted on the face of the plan in the space reserved for certificates. A suitable form is:

---------- hereby certify that I have/the company has surveyed the location of the petroleum well as shown on this plan, that the survey was performed in accordance with the *Petroleum and Gas (Production and Safety) Act 2004* and associated Regulations and Standards and achieves the accuracies of the Standards and the survey was completed on ----------

_____ _____

Signature of Surveyor Date

7.4.7 Coordinates

Well coordinates must be on the Geocentric Datum of Australia 1994. Geographic and MGA coordinates of the well are required for all PWLs. Coordinates should be shown in accordance with the current Cadastral Survey Requirements for depiction of coordinates on plans and clearly labelled MGA94 or GDA94 as appropriate.

The coordinates of the well and reference marks are to be shown on the plan. The descriptions and values of the points from which these coordinates were derived should also be shown.

7.4.8 Documentation

Field notes are not compulsory but may be lodged. The plan should be accompanied by a report on the survey methods used.

A 'Well location reference marks sketch plan' is no longer necessary. Elevation details including the level of the well and bench marks placed are to be added to the plan. When a permanent mark is placed during the course of the survey, the surveyor must lodge a permanent mark sketch plan with the local DERM district surveyor (Form 6 under the *Survey and Mapping Infrastructure Act 2003*).

7.4.9 Elevation

The elevation of a well is to be related to the Australian Height Datum.

7.4.10 GPS

All traverses must be closed.

Single point positioning by GPS is not an acceptable method of location.

7.4.11 Meridian

MGA should be used for the meridian of connections around the well. This should be shown in the appropriate box in the plan title block. Where a cadastral connection is made, the line used for datum should be clearly labelled on the face of the plan.

7.4.12 Name of well

The name of the well is its primary identifier and it is important that it be shown correctly on all documentation.

7.4.13 Occupation and improvements

A connection to all other wells, roads, railways, fences, public utility services, buildings or structures within 200 metres of the well is required.

7.4.14 Plans

The survey must to be drawn on the standard plan form used for surveys of mining tenures. It should show all relevant horizontal and vertical location information, and include a description of the mark used for level datum and its value using a second sheet if necessary. Where a location is carried out by means of a connection to a geodetic network, it should be clearly stated whether distances are reduced to the spheroid at terrain height, or at mean sea level.

All current tenures over the land on which the well is located, must be shown on the plan. This includes cadastral information as well as any authority to prospect or petroleum lease

To show the general location of a well and to assist finding it in the field, a locality sketch should be shown on the plan. This is not necessary if connections to cadastral boundaries, occupation and other distinctive features in the vicinity sufficient to find the well are already shown.

The locality of the well should be indicated on the plan using words where possible. The locality box on the plan form is for the latitude and longitude of the centroid of mining tenures. PWL survey plans which show coordinates for wells and other surveyed points do not need to show coordinates in this box.

Surveys of two or more wells may be drawn on the one plan form.

Copies of example plans and sketches may be obtained from the chief surveyor. Plans should be lodged with the chief surveyor in Brisbane[4]

7.4.15 Reference marks

The well shall be tied for horizontal control to two suitable permanent reference marks within two kilometres of the well. One or both of these marks may be utilised as a Bench Mark for elevation control if suitable. One of these reference marks should be a Permanent Survey Mark as defined in the *Survey and Mapping Infrastructure Act 2003.*

7.4.16 Requisitions

The chief executive may require a plan be amended within a particular period to satisfy the requirements of section 53(2) of the P&G Reg, or the chief executive may reject the plan if it does not meet those requirements.

7.4.17 Time limitations

Section 55(1) of the P&G Reg requires that not later than six months after drilling starts the location and elevation of the well be surveyed. Section 56 requires that not later than three months after the completion of the survey of a well, the tenure holder shall submit to the chief executive a survey plan certified as to accuracy by the person who made the survey.

7.4.18 Well (definition)

Section 2 of the 1923 Act defines a well and Schedule 2 of the P&G Act defines a petroleum well for that Act.

7.5 Pipeline licences

Information

Pipeline licences provide for the lodgement of certain plans with the chief executive of DEEDI. This lodgement is not a survey and is not governed by the *Survey and Mapping Infrastructure Act 2003.* Any easements required for the pipeline are normal surveys of easements lodged with the registrar of titles and a copy only of the plan is lodged with the pipeline book.

The requirements for the plans to be lodged are set out in the instrument of licence for each pipeline licence. Details of typical plans are obtainable from the chief surveyor.

[4] Location Mapping and Survey Services, Mines, Podium 2, Landcentre, Main Street, Woolloongabba. Postal address PO Box 1475, Coorparoo Delivery Centre, Queensland 4151

8 Historical Information

8.1 Abbreviations

For a list of the abbreviations most frequently encountered see 1.5 *Abbreviations.* Most of the abbreviations are for past tenures but may be encountered on old charts and survey plans. Some of them refer to the original names of current tenures or tenements.

The list does not include every abbreviation and a large number of abbreviations for former mining fields, mining districts and warden's districts are not covered. Anyone requiring information about these is invited to approach the mines surveyors in DEEDI.

Refer also to 8.6 *Old tenures*.

8.2 Department names

Mining tenures are now administered by DEEDI. The department administering mining tenures has had several different names since its inception in 1874. The names are:

Department of Mines	1874 – 1989
Department of Resource Industries	1989 – 1992
Department of Minerals and Energy	1992 – 1996
Department of Mines and Energy	1996 – Feb 2001
Department of Natural Resources, Mines & Energy	2001 – 2004
Department of Natural Resources and Mines	2004 – 2006
Department of Mines and Energy	2006 – 2009
Department of Employment, Economic Development and Innovation	2009 –

The term Mines Department was commonly used before 1989, though this does not appear to have ever been the correct name.

8.3 Gold fields & mineral fields

Mineral fields dealt with all minerals other than gold. Gold fields and mineral fields were created to regulate mining over areas of known mineralisation. They only had effect over Crown land; mining on freehold land was essentially uncontrolled until the *Mining on Private Land Act of 1909*. Coal mining on freehold land that was alienated before 1 March 1910 was not regulated until 1951.

There were separate numbering systems within each field for leases for gold and for leases for other minerals.

At first, mining tenures were numbered within each field and later they were numbered within the area of each warden's jurisdiction, rather than the individual fields. However, there was a heavy overlap of the systems and the local offices were not always consistent in the choice of district or field they used to describe tenures.

8.4 Lease numbers

Mining leases, mineral leases and gold mining leases were originally numbered consecutively within the particular field or district. Each field or district commenced at number one. When referring to these early tenures it is essential to include the field or district name with the number. For leases before 1972, the type of lease is also essential as gold and mineral leases were numbered in their own series, e.g. GML2456 Charters Towers, ML103 Coen River.

In about 1988 or 1989, DEEDI adopted a statewide numbering system. Existing lease tenures were converted from

the district-based scheme to the statewide scheme. They were given four digit numbers and converted by mining districts. This meant that leases were in order of priority within a district, but a lease in one district could have a higher priority than a lower numbered abutting lease in the next district. Dead leases were not numbered again. If a current lease has a four digit number, it is an old lease that has been renumbered. Historical mining leases are those that died before the institution of the Merlin database, around 1985. These leases were given a six digit number for Merlin but still can be searched using the old warden's numbers.

At that time, the Merlin computer system was introduced batches of five digit numbers were assigned to each mining district and new applications for leases were numbered automatically by the computer. The mining district in which current leases are located can be ascertained by the number:

10000 to 19999	Charters Towers
20000 to 29999	Mareeba
30000 to 39999	Georgetown
40000 to 49999	Cairns (now part of Mareeba)
50000 to 59999	Brisbane
60000 to 69999	Quilpie
70000 to 79999	Emerald
80000 to 89999	Rockhampton
90000 to 94999	Mount Isa
95000 to 95999	Winton

8.5 Mining wardens

It was the mining warden's function to receive applications for mining claims, residence areas, business areas, market garden areas, machine areas and various other special areas. The warden assessed the applications and, if the legislation was complied with, the particular tenure was granted to the applicant. Wardens also received applications for mining leases and their preceding tenures, heard objections in the Warden's Court and made recommendation to the minister as to whether the application should be granted. They had other functions as well, both judicial and administrative.

The number of tenure types dealt with were reduced by the *Mining Act 1968* and then further still by the *Mineral Resources Act 1989*.

Before the *Mining Act of 1898*, there were two offices for administering mining on Crown land: the Mineral Lands Commissioner, from 1872 for mineral fields, and the Gold Warden from 1874 for gold fields. Prior to those offices being established, the Land Commissioner administered mining tenures on Crown land.

Until 1990 mining wardens were also the local magistrates and the warden's office was in the local courthouse. The number of wardens and their location fluctuated according to the development of new mining fields. Their districts did not always correspond with a particular mining field and could vary considerably and include more than one field.

At the date of the commencement of the *Mineral Resources Act 1989*, on 1 September 1990, the then 38 warden's offices were closed and two wardens were appointed to cover the whole of Queensland, as their only duty instead of performing as a magistrate as well. Subsequently the number of wardens was reduced to one. In 2000 the warden's functions were taken over by the Land and Resources Tribunal, except for enquiries into fatal accidents. Now the warden's position has been abolished altogether.

8.6 Old tenures

There have been approximately 240 types of tenures or rights issued under about 40 different Acts relating to mining since the 1850s. Those mining tenures that were extant on 1 September 1990 were brought under the *Mineral Resources Act 1989* and became mining leases, mining claims or exploration permits under that Act. This does not include tenures under the *Petroleum Act 1923*, which held their status under that Act.

If an old tenure was alive at the time of the application for a modern tenure it may limit the land available to the modern tenure, even if it has since died. This is because land under other leases or claims (or applications for them) is not usually available to a new application and must be excised from it. However, note that there were some cases at Ipswich where different mining leases were granted and issued over the same land for the full depth. Mining operations were controlled by the conditions of the lease. One lease was for coal and could mine up to a certain depth below the surface. The other lease was for clay and could only mine down from the surface to a certain depth. In similar circumstances today those leases would probably be issued as strata titles.

Sometimes it is possible to trace of a chain of title several leases deep and spanning decades that can affect a title issued under the current Act.

Each of the old tenures had its own rules and although many old practices have continued through to today, the relevant Act or Regulation may have to be referred to if an issue arises.

The impact of native title on mining and the demands of native title investigation have renewed the interest in early legislation and tenures.

8.6.1 Previous legislation

The expired Acts most likely to be met by a surveyor and some of the tenures created by each are:

Gold Fields Act 1874	gold mining leases
Mineral Lands Act 1872	mineral leases
Mining Act 1898	there were about 45 types of tenures or rights created under this Act, including mineral leases, gold mining leases, dredging leases, machine areas, other areas and several types of claims
Mining on Private Land Act 1909	mining tenements (as defined by the Mining Act) comprising private land
Coal Mining Act 1925	coal mining leases
Mining Act 1968	mining leases, various claim types

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8.7 Searching

There are several sources of information on old tenures that are held in the DEEDI.

8.7.1 Files

Most head office files are still held in the DEEDI. Files were also maintained by the mining warden. Some information was duplicated between head office files and the warden's files and some information was limited to the particular office. The warden's files should be held in the relevant mining registrar's office, though not all offices have complete collections. The records of mining claims held in head office are sparse. Those claim records held in head office are in the one file for each old field. Modern mining claim records are not held at all in head office—records of claims should be held in the district office.

8.7.2 Charts

DEEDI's charting is now done in the SIE (IRTM) graphical database. Early charts were often destroyed but many were sent to State Archives. Most of the later original paper charts are stored at DEEDI. Microfilm copies are used for daily work. There are few charts in existence that are older than the 1920s and in some districts the oldest are from the 1930–40s. Early practice appears to have been to destroy a chart at the time of creating its replacement. Head office charts seldom show information on claims. These were recorded on the warden's charts.

8.7.3 Register cards

The register cards for mining leases are now held by State Archives. They contain basic information about leases and can sometimes fill in gaps in information. The card system was not originally used by DEEDI, records being kept in large volumes. Register cards for mining claims, machine areas, residence areas and the like were kept by the local mining warden and may be still held in the mining registrar's office.

8.7.4 Old register volumes

A small number of these have been collected from the warden's offices and are held in Brisbane. They have not yet been collated. The remainder should be held in the registrar's office. Finding these old leather-bound volumes is very much hit and miss. Surveyors should not expect to conduct a search through this route, but rather use it in rare cases as a hopeful backup.

8.7.5 Survey plans

Except for a small number of lost plans, all plans lodged with DEEDI, or copies of them, are held by DERM on behalf of DEEDI. The series dates back to the 1860s, before the Department of Mines came into being. Duplicate plans of surveys up to 2002 are held in each registrar's office for the particular mining district. A lot of these plans were taken over from the old warden's offices, where care and maintenance was not always to cartographic standards. There are gaps in some district records. In 1985 miners homestead lease plans and other residential type tenure plans were given to DERM.

All Queensland cadastral survey plans are now in the one collection held by DERM. Mines plans have been imaged and can be accessed in the same manner as other cadastral plans. Duplicate plans are no longer being sent to the district offices.

8.7.6 Field notes

Like survey plans, the field note collection dates to the earliest departmental times. They are kept by DERM with all of the other cadastral field books and there are no duplicates in the district offices.

8.7.7 Spatial Information Enquiry database (on the internet as IRTM)

The Historical Tenures project set out to capture the entire lease tenures ever issued by DEEDI. It was about 75 per cent complete when it was halted in about 1996. The project captured leases that had died before the inception of Merlin in 1985. For most leases, only the centroid was plotted and is represented on the computer screen by a small 'M'. The position of some leases is not very accurate due to the poor descriptions of many of the old ones. The complete polygon was plotted for a few large leases. There is some attribute data attached to each lease entry. Leases that have died since 1985 are called dead leases and are shown in SIE-IRTM on a different layer, with all boundaries plotted.

8.7.8 Mining registrar's office

Formerly each office held a duplicate copy of every plan pertaining to that district. Now mines tenures plans have been imaged, the registrars have access to plans through their computer and are no longer given a plan copy for public inspection. The registrar's office should also have files for every lease, claim or other tenure administered by the office or by any of its predecessors. They should also have register cards for tenures prior to the creation of Merlin in 1989. Like the storing of survey plans, early file storage has not always been to modern standards. Very few old charts held in some registrars' offices but access to Merlin is available. Note that the version in operation at the public counters is called 'Spatial Information Enquiry' (SIE).