

# ASF CAVE & KARST NUMBERING CODE (2006)

Individuals and member clubs of the Australian Speleological Federation Inc have developed the karst and cave numbering system outlined below over many years. The system has become essential to the documentation of the karst heritage of Australia. The Federation has the prime responsibility to coordinate and administer the system on behalf of Australia's speleological communities as it is only appropriate national organization, who can administer the system.

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## 1. GENERAL OVERVIEW

By numbering we mean the use of an alphanumeric code which enables identification of every karst feature in Australia by a unique combination of numbers and letters; while at the same time keeping such combinations as short as is reasonably possible for economy of space and time in recording, and also to facilitate memorising them.

This Code of Practice formalises existing Australian methods and at the same time, establishes an appropriate practical and necessary limits to facilitate the systematic registration, consolidation and retrieval of cave data from throughout Australia.

In the text, which follows, the word "cave" should be taken to include any cave, karst or pseudo karst feature deemed of speleological significance such as to require its own unique number.

## 2. STABILITY

As well as being a means of avoiding the unnecessary proliferation of cave names the prime purpose of numbering is to provide identification, which is *systematic*, *unique* and *permanent*. It is these last two properties, which enable consistent unambiguous reference to any one cave in scientific or other literature over an indefinitely extended time span. The achievement of this objective requires a well-organised approach to numbering at the State level and long-term dedication from individual cave numberers.

**Rule 1**      **Once assigned, the number of a feature should never be changed.**

**Rule 2**      **Every effort should be made to allocate a number prior to publication of a feature's details.**

**No number will be allocated, nor reported on in any way until it is physically marked at the cave entrance. If this is not strictly adhered to, there is the risk of allocating a second number to the same cave, with consequent confusion in the literature and in the records.**

### 3. STRUCTURE OF NUMBER

**Rule 3** The structure of a cave number shall be as follows:

State code	Area code	Serial no.
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where

State code is 1 numeric character  
 Area code is up to 3 alphanumeric characters  
 Serial number is up to 4 numeric characters

and

No serial number repeats within its area code.  
 No area code repeats within its State code.

Comments:

1. In normal usage the cave number may be abbreviated to just the area code and serial number unless ambiguity could result.
2. The format of the serial number for temporary numbers is a special case and consists of an "X" followed by three numeric characters.

The remainder of this Section describes how each of the components of a cave number should be built up.

#### 3.1 State Code

The purpose of the State code is to identify the State where the cave is located and to permit independence between area codes in different States.

**Rule 4** The state code should be selected from the following numbers.

2	NSW and ACT	6	Western Australia
3	Victoria	7	Tasmania
4	Queensland	8	Northern Territory
5	South Australia	9	Territories and islands administrated by the Commonwealth of Australia.

#### 3.2 Area code

The purpose of the area code is to identify the area where the cave is located and to permit independence between serial numbers in different areas.

**Rule 5:** The letter(s) and/or number(s) chosen for the area code should follow the following conventions

1. Where the convention is to derive the prefix code from the area name, then the first letter of the code should correspond with the first letter of the area name. Any remaining letters should be the minimum required to make the area code unique within that state and derived from other letters within the area name.
2. Where the convention is to derive the prefix code from a source other than the area name, such as a map number or map name, then the letter(s) and/or number(s) chosen should follow a consistent pattern and reflect the order in which the letter(s) and/or number(s) appear within the original source.
3. In the second convention, individual states may chose to highlight the use of this method to determine the prefix code, by prefixing the code with the letter "Z".
4. In both conventions only the upper case of the letters are used.
5. The use of numbers or the letters I and O within the area code should be avoided to aid quick and accurate interpretation of the cave number. The use of X and Z should

**also be avoided because of their use to identify temporary numbers (Rule 14) and background areas (point 3).**

Area code examples: B for Bungonia, MC for Mole Creek, I6E Sydney General Cave Area, and Z5F Clermont.

Comments:

The determination of areas and their geographical boundaries has been largely left to each state to derive. Consequently, there is a wide variance in what constitutes an “area” and what type of cave features are documented in each area type. Basically, an area will normally fall into one of three categories - localised, large tract or background. Each state uses one or more of these area categories to document its caves. The discussion below explains these categories and the system that has been adopted in each state to number its caves.

### **3.2.1 Localised Area**

This is the type most commonly encountered: an outcrop, or series of outcrops, forms a natural grouping with a natural name and a manageable size; the area boundary is conveniently defined as the limits of that outcrop or deposit, and it is assigned an individual area code.

### **3.2.2 Large Tract Area**

Where the host rock forms a large continuous tract it may be more convenient to subdivide it into several more manageable “areas”, each with a separate area code. If so, the following should be observed

#### **Rule 6 A subdividing boundary in a large tract area should conform to the following**

- 1. It should if possible form a natural division.**
- 2. It should be clearly definable and locatable on the ground.**
- 3. Any visible feature used as a boundary should be chosen with regard for its permanence of location.**
- 4. It should not be crossed, or likely to be crossed, by any cave system.**

Comments:

1. Surface divides can be unsatisfactory boundaries in karst areas because they are not infrequently crossed by underground drainage and karst systems. However, they can be extremely useful if the surface divide boundary is well off the karst, because they are easily locatable both on maps and in the field.
2. Arbitrary straight lines on maps may be extremely difficult to locate on the ground in sparsely featured country. Local government boundaries may be useful, however in the long term they are rarely permanent; but they do have the advantage of being reasonably locatable on the ground.
3. Boundary lines which get shifted (e.g. road re-alignment) can cause anomalous cave numbers. On the other hand it is not really a serious problem if there is a small overlap in areas of poor definition, so long as each cave has a clear and permanent physical identification and its location is unambiguously recorded.
4. Rivers and streams can form good boundary lines because they are permanent, easily locatable on maps, aerial photographs or on the ground, and are rarely crossed by cave systems.

### 3.2.3 Background Area

A background area is to accommodate isolated caves, which do not fall into nor warrant their own area designation. This typically includes boulder caves, rock shelters, sea caves, lava caves and isolated karst caves.

**Rule 7** If it is decided to use background areas to number caves within a state the whole of that State should be divided into suitable background areas.

Examples

- VIC has divided the State into four natural areas defined by visible boundaries to cater for isolated caves.
- NSW groups all such caves into the respective 1:250,000 topographic map, each sheet representing one "area".
- In both WA and SA, where known surface features are virtually non-existent over large areas, a single area designation has been used to cover all caves not in existing local areas.

Comments:

1. A number of states have decided to use a topographic map series because of ease in providing "whole of state coverage" for background areas. Usually either the 1:250,000 or 1:1,000,000 topographic map series is used.

**Rule 8** If the map sheet method is used for background areas, the same map series should be used for the whole State and the particular map series chosen would be determined primarily by the suitability of its scale to the circumstances.

### 3.3 Serial Number

The purpose of the serial number is to distinguish between different caves in the one area.

**Rule 9** The allocation of serial numbers should be solely on the basis that the next cave to qualify for a number gets the next number, not on factors such as order of discovery or physical position or type of "cave".

Comments:

1. Location-derived serial numbers pre-empt any decision to suppress a cave's location, can have resolution problems with close caves and make it harder to prevent duplication. Any locating function in the cave number is best left to the area and State codes.
2. If a significant doline has a cave leading off it, it is quite permissible to allocate separate numbers to both the doline and cave(s). The same applies to other karst features.

### 3.4 Procedures Operating in Each State

An appendix to this code contains an outline of the procedures for numbering areas that are applicable in each State.

#### **4. QUALIFICATION FOR BEING NUMBERED**

In view of the importance of avoiding mistakes in numbering, certain minimum criteria should be met before a cave is numbered.

**Rule 10** Before a new number is allocated, the Cave Numberer should be satisfied that:

1. The cave does not already have a number.
2. The recorded location details are sufficient to find the cave again and to distinguish it from any nearby caves.
3. A description of the currently known extent of the cave is recorded.

**Rule 11** In all cases it is preferable that the number be marked at the cave entrance at the same time it is allocated, this is particularly so for the following cases:

1. If the cave is in featureless country where relocation could be difficult.
2. If more than one person carries out numbering in the same area.

In other cases every effort should be made to mark the cave entrance at the same time as the number is allocated, otherwise as soon as possible thereafter.

**Rule 12** No new number should be allocated, alluded to or recorded in any report by any person until confirmed by the recognised Cave Numberer or a deputy specifically appointed by him/her.

Comments:

Where possible global positioning system (GPS) coordinates of the cave should be obtained to aid in its later relocation. Where GPS coordinates are not easily obtained or can be subject to considerable error coordinates may be appropriately obtained by other methods.

The problem being avoided by Rule 12 is where somebody guesses at the next number and it gets into print, whereas the Cave Numberer may have already allocated that number to something else. The situation is virtually impossible to recover.

## 5. TEMPORARY NUMBERS

In some circumstances it may be necessary to use a temporary number to identify a cave. This may occur during the numbering process or where it is vital for conservation or protection purposes to provide a list of caves in an area. In such circumstances the following rule should be observed.

**Rule 13** If there is an extreme necessity to use some form of temporary identification in the absence of a name, a temporary number may be allocated and should conform to the following:

1. The temporary number should take the same form as a normal number except that the serial number should be taken from the series X1-X999, where the leading alphabetic X clearly distinguishes it from a normal number. Note that the total serial number is still to contain a maximum of only four characters.
2. Temporary numbers should be administered by someone other than the normal Cave Numberer for the area so that the numbers can fulfill their function as an emergency measure when the normal Numberer is temporarily unavailable.
3. A temporary number may be allocated without regard to whether the cave already has a permanent number if the existence or identity of any permanent number cannot readily be established.
4. No temporary number should be re-used in an area.
5. A cave's permanent number should be allocated at the earliest possible time, especially before the cave gets into the literature.
6. In any listing of an area's caves, all temporary numbers ever allocated should always continue to be listed, with all cancelled ones simply referring back to the relevant permanent number. Temporary numbers should therefore be used sparingly.

Comment:

The leading X in the serial number, besides identifying it as a temporary number, will also cause all temporary numbers to group together naturally after all the permanent numbers in any ordered listing of the area's caves.

As the whole point of this code is to create a unique alphanumeric number to register a cave, the use of temporary numbers is really not compatible with the basic objective of the code. The use of temporary numbers should therefore be a last resort measure and only where their use can be justified on extreme and/or important grounds.

## 6. SPECIAL CASES

### 6.1 Multi-entrance Caves

In the field it is obviously the cave entrance which is the landmark indicating the existence of an enterable cave, whether or not it is leading to the same cave as other entrances is often not obvious. It is therefore the entrance, which must be distinguished and identified by an individual number in the field. On the other hand the real object of our interest is the cave and the number of entrances it has is largely incidental. We therefore also need a definite number by which to refer to the one cave in reports and in the literature; and under which to file all information on that cave, rather than have it scattered through an indeterminate number of places.

**Rule 14** When a cave has multiple entrances, all accessible and significant entrances should be allocated separate numbers and physically identified. The numerically lowest number should be regarded as the cave number and all other numbers regarded only as entrance numbers.

Where a cluster of inter-visible entrances obviously lead into the same cave only one entrance of the cluster needs to be numbered.

### 6.2 Separate Caves Later Joining

When two caves become joined then we have a single multi-entrance cave.

**Rule 15** When independently numbered and apparently separate caves become joined, the lower number should be regarded as the cave number for the enlarged cave and the higher number should be regarded as an entrance number.

Note that no serial numbers should be cancelled or changed. All numbers should continue to appear in any cave listing, but in their new role and with the cross-referencing appropriately changed.

Comment:

In the case of an important well-known cave joining with an insignificant cave of lower number Rule 15 should still apply and the combined cave is known under the lower number. However this does not mean that the cave names should be treated likewise – obviously there may be the need to retain in some way the use of the well-known name. One obvious possibility is to extend the well-known name to cover the whole of the enlarged cave.

Where both caves carry well-known names the decisions become more difficult, however with regard to numbers, Rule 16 must still apply. The important thing is that it is now treated as one cave, not two; because of the confusion which will inevitably arise sooner or later in scientific and other recording over just where the dividing line is i.e. in which cave the observations are being taken. In some cases there will be **no** clear dividing line. One solution is to use the lower number name as the cave name and retain the other as an entrance name for the higher number; another is to convert both to entrance names and coin a new but related name for the combined cave. For further discussion, refer to the ASF cave nomenclature guidelines.

### 6.3 New Areas

**Rule 16** If further discoveries in a background area necessitate the creation of a new localized area, then the following should be observed:

1. Any already numbered caves should retain their same serial number and change only their area code. This will markedly aid continuity of reference.
2. The now cancelled serial numbers in the background area must not be reused for any other cave.

3. In any listing of the background area caves the cancelled numbers should always continue to be included but should state the cancellation and the transfer to the other area.

## 6.4 Other Special Cases

**Rule 17** If other situations arise, which have not been explicitly covered in this Code of Practice, before any proposed solution is implemented the ASF Cave and Karst Numbering Commission should be consulted to ensure that it will not cause any problems with the Australia-wide registration of cave data.

## 7. FORMAT OF NUMBER

Due to the structure of the number, it is particularly critical as to how it is written, with some methods clearer than others.

**Rule 18:** The preferred methods of representation of cave numbers under different situations are illustrated below:

<b>3B-38</b>	<b>Full number for B-38 in Victoria.</b>
<b>B-38</b>	<b>Common form of the above for normal usage.</b>
<b>B-50/56/57/105</b>	<b>Multiple entrance representation, used when it is desirable to list them all. Here cave B-50 also has entrances numbered 56, 57 and 105.</b>
<b>B-4 to 10, 27, 29</b>	<b>List of caves or features comprising B-4 to B-10 inclusive, together with B-27 and B-29.</b>

There should be a hyphen (not a dot) between the area code and serial number as shown in the first two examples. A slash as shown in the third example should be used to separate multiple-entrance serial numbers. A hyphen between serial numbers should not be used because its meaning can be ambiguous

Comments:

1. The use of a single blank between area code and serial number tends to make the number lose its unity when it is embedded in text.
2. Putting the area code and serial number hard up against each other can lead to confusion, when the area code ends with the letters I or O, or if the serial number starts with X (temporary number), and is therefore generally recommended against.

## 8. PHYSICAL PLACEMENT OF NUMBER

The physical placement of the number is often referred to as “tagging”. This is because it involves the placement of a metal “tag” with the cave’s number on or near the cave. While there is considerable variability, between the states in how “tagging” is undertaken, the following explain how the “tag” should be positioned, its form and the text it should contain.

### 8.1 Position

**Rule 19** The positioning of the number at a cave entrance should be guided by the following:

1. It should be readily found by anyone searching but not obvious to the casual passer-by.
2. It should be located where it can readily be used as a survey point, both from within the cave and on the surface.
3. It should be on solid bedrock, not a loose or separated piece (a reliable test is the sound when the rock is struck by a hammer).
4. If no bedrock is available or the tag cannot be placed where it can be read without using caving equipment it should be placed on a substantial post or equivalent installed close to the cave - e.g. on a steel star-post.
5. It should be located where it is safe from damage by ladders, belays, boots or other equipment.
6. It should be located where it is not likely to be overgrown or otherwise covered by soil, dung, etc.
7. Its final position relative to the entrance should be noted and filed in the cave records.
8. Where a feature is known to be an Aboriginal / Torres Strait Islander site or forms part of an Aboriginal / Torres Strait Islander place, the placement of a tag should conform to Rule 22.

### 8.2 Form

**Rule 20** The physical form of the cave number should be chosen taking into account the following:

1. The difficulty of finding a number on the entrance.
2. The type of rock.
3. The susceptibility of the number to vandalism.
4. The disturbance to the natural appearance of the entrance.
5. The permanence of both the number and its legibility over an indefinite period of time in the local conditions.
6. The cost, portability, reliability and ease of use of the number placement equipment.
7. Where a feature is known to be an Aboriginal / Torres Strait Islander site or forms part of an Aboriginal / Torres Strait Islander place, the form of numbering should conform to Rule 22

Comments:

Two methods which have been successful in their particular circumstances are:

1. The NSW Speleological Council’s Cave Numbering and Documentation Committee uses an aluminium plate of 30 mm<sup>2</sup> fixed to the rock with a 3 mm diameter masonry nail and stamped with the cave area’s prefix code and the cave’s serial number.
2. VSA uses a single aluminium rivet with a 6 mm diameter flat head on which is stamped the number. The rivet is the countersunk type with a shank 3 mm diameter by 9 mm long. A hole approximately 6 mm deep is drilled into the rock using a 3 mm diameter rotary masonry drill. The rivet is placed in the hole and expanded into it with a few blows of a hammer. The number is then stamped on using 3 mm letter

and number punches, the area letters on the top row and the serial number on the second row. Where improved visibility is needed, a round collar of weather resistant coloured plastic is threaded over the rivet before placement. In soft limestone, rivets up to 18 mm long are used.

Chiselling or painting are not regarded as satisfactory methods. Chiselling, because it becomes difficult to see after several years in the weather and painting because it too deteriorates in the weather. Also both are difficult to do without being unsightly and in most national parks and other conservation reserves are regarded as illegal activities.

In some states and cave areas “photo tagging” has been undertaken to provide a record of individual cave numbers to aid in later relocation and identification. While this method has lots of benefits and should be encouraged, it should not be seen as a substitute for the placement of an identifying “tag” on each numbered cave.

### **8.3 Text**

**Rule 21 The minimum text for marking a cave entrance should be both the area code and the serial number. The State code is not normally needed but can be added when desirable.**

Comment:

The area code should always be included so that in any reports by people not familiar with the numbering system unambiguous identification of the cave will still result.

## **9. ABORIGINAL & TORRES STRAIT ISLANDER CULTURAL ISSUES**

There are many caves throughout Australia which contain features that are of particular significance to Aboriginal and Torres Strait Islander People or are by themselves places of significance and importance to Aboriginal and Torres Strait Islander People. Such sites include rock art galleries, ceremonial sites and camping shelters but can also include places that form part of a clan's or tribe's dreaming track. There are specific issues that should be addressed before documenting Aboriginal and Torres Strait Islander sites or places of significance to Aboriginal and Torres Strait Islander People.

**Rule 22** Tagging - Under no circumstances should tags be nailed into the rock face at an Aboriginal / Torres Strait Islander site. Tagging should only occur at such sites under the supervision of the relevant state agency's Aboriginal / Torres Strait Islander Cultural Heritage Officer (or equivalent state agency designated officer) and then only by using silicon glue method of affixing the tag using a glue which can be removed at any later time without damage to the underlying rock face.

Under no circumstances should any other form of identification other than the use of silicon based glue tags be ever used. Chiselling or painting the number onto the rock face must never be undertaken.

**Rule 23** Notification of an Aboriginal / Torres Strait Islander Site – Aboriginal / Torres Strait Islander sites should not be widely advertised. Knowledge of their whereabouts and access details should be restricted to only genuine long-term members of a club. The relevant state agency and in particular its local Aboriginal / Torres Strait Islander Cultural Heritage Officer (or equivalent state agency designated officer) should always be informed of the location of any new site and of any planned club activities at a known Aboriginal / Torres Strait Islander site.

**Rule 24** Involvement of the Local Aboriginal / Torres Strait Islander Community – Wherever possible the involvement of members of the local Aboriginal / Torres Strait Islander Community in documentation activity at an Aboriginal / Torres Strait Islander site should be sought and encouraged.

Comment:

All states have specific laws covering the protection and conservation of Aboriginal / Torres Strait Islander sites. Activities that may harm, impair, damage, deface or degrade an Aboriginal / Torres Strait Islander site are illegal. Cavers should therefore be mindful of this when undertaking documentation activity at an Aboriginal / Torres Strait Islander site or at a place which may have significance to an Aboriginal / Torres Strait Islander community.

## 10. ADMINISTRATION

Because of its importance to documentation of caves it is imperative that the system is administered in a professional manner, so as to avoid ambiguities and ensure its long-term maintenance, security and integrity. To achieve these goals the Federation has placed the administration of the system on a national basis under the stewardship of the ASF Cave and Karst Numbering Commission. At a state level, State Cave and Karst Numbering Coordinators shall administer the system. Together the various State Cave and Karst Numbering Coordinator along with the national Convenor of the Cave and Karst Numbering Commission shall comprise the members of the Cave and Karst Numbering Commission.

**Rule 25** The Karst and Cave Numbering system, as outlined in this code, shall be administered at a national level by the Cave and Karst Numbering Commission and at a state level by the State Cave and Karst Numbering Coordinator.

Within each state there is an obligation on the member clubs to ensure the appointment of the State Cave and Karst Numbering Coordinator. The State Cave and Karst Numbering Coordinator in turn shall be responsible for the overall administration of the system, including the appointment of a cave numberer for each area.

**Rule 26** The member clubs of each State should appoint a State Cave and Karst Numbering Coordinator who will establish suitable administration and numbering arrangements for the features recorded within the State. This should include the definition of areas, the assignment of unique area codes and appointment of a specific person as Cave Numberer to each area. These arrangements and any changes to them from time to time, should be published in an established periodical with a wide circulation (such as "Caves Australia").

Where a state has a Speleological Council it shall appoint the State Cave and Karst Numbering Coordinator who will regularly report to it.

**Rule 27** Within one area, one specific person (not group) should be responsible for all number allocations.

**Rule 28** The positions of State Cave and Karst Numbering Coordinator and Cave Numberers should be stable ones, not subject to regular re-election, but subject to continued satisfactory performance.

## 11. DISPUTE RESOLUTION

One of the main objectives of this code is to clearly set out unambiguous rules to govern the numbering and tagging of cave and karst features. However, human nature being what it is, disputes may arise over a number of issues related to this code. It is therefore proposed to set up a dispute resolution process, so as to avoid conflict between individuals and/or member clubs of ASF.

**Rule 29** In the event of any dispute between individuals and/or member clubs of ASF over numbering, tagging or interpretation of this code the following dispute resolution procedures will apply:

1. In the first instance the matter will be referred to the State Cave and Karst Numbering Coordinator to adjudicate between the disputing parties.
2. Where the State Cave and Karst Numbering Coordinator is unable to achieve a satisfactory resolution between the disputing parties and/or is one of the disputing parties and/or the matter is deemed of importance at a State or National level by all concerned, the matter is to be referred to the State Speleological Council or where no State Speleological Council exists to the ASF Cave and Karst Numbering Commission for determination.
3. The State Speleological Council will, after considering representations by all disputing parties, deliver a decision on the dispute which shall be final and binding on all parties including the State Cave and Karst Numbering Coordinator.
4. The decision of the ASF Cave and Karst Numbering Commission may be referred to the ASF Executive whose decision shall be final and binding on all parties, including the State Cave and Karst Numbering Coordinator.

Comment:

1. In most instances the State Cave and Karst Numbering Coordinator should be able to resolve disputes with a minimum of fuss between the parties.
2. Only major conflicts should be referred to the State Speleological Council or the ASF Cave and Karst Numbering Commission for resolution.
3. In the final analysis, a resolution to a dispute has to be achieved.
4. It is hoped that any decision made by the State Cave and Karst Numbering Coordinator or the ASF Cave and Karst Numbering Commission takes into account all the concerns of the disputing parties and is seen to be a fair and impartial resolution to the dispute.

## APPENDIX NUMBERING PROCEDURES OPERATING IN EACH STATE AND TERRITORY:

Listed below are the specific procedures applicable in each State for numbering features:

### 1. New South Wales and the Australian Capital Territory

Within New South Wales and the Australian Capital Territory the responsibility for the administration of karst and cave numbering rests with the Convenor of the NSW Speleological Council's, Cave Number and Documentation Committee (CNDC) who by definition is also the State Cave and Karst Numbering Coordinator. Prior to 1983 this committee was known as the Cave Numbering and Nomenclature Committee. The CNDC has overseen cave numbering and documentation in NSW and the ACT since 1965. NSW and the ACT have two types of cave areas

1. Karst cave areas
2. General cave areas

Where for numbering purposes, the term "karst" is narrowly defined as referring only to landforms found in carbonate rocks. Therefore karst cave areas only record caves found in limestone, dolomite and associated carbonated rocks. Features that are found in other rock stratum such as sandstone, quartzite and basalt are numbered using a general cave area.

**Karst Cave Areas:** The CNDC has geographically defined a definitive set of karst cave areas for NSW and ACT using the following rules:

1. All of NSW has been partitioned into a set of karst regions, with the basis of the regional boundaries being surface drainage systems. The regional boundaries interlock with each other and with the State and Territory boundaries.
2. These regions are simply used as an administrative tool in organising karst cave areas. As such they have no other role in the numbering system.
3. Within each region all the karst deposits are attributed to a karst cave area, irrespective of whether an outcrop or deposit contains karst features.
4. Each karst cave area has a geographical boundary defined by surface drainage systems.
5. To ensure that any future discoveries of karst are attributed to a karst cave area, the geographical boundaries of each karst cave area in a region interlock with each other and with the region's boundaries.

Karst cave areas have either 1 or 2 alpha letters in the prefix code, which are derived from the karst cave area name using the following rules:

1. The first alpha letter in the prefix code is derived from the first letter in the karst cave area name.
2. If a second letter is used it is derived from any other letter in the karst cave area name.

For example: Jenolan "J", Wee Jasper "WJ", and Cliefden "CL"

#### Comment

Initially karst area numbering in NSW was based on small localised outcrops of limestone, such that major "limestone belts" were often divided into several karst areas. The net effect of this was to create a large number of small areas, some with only a handful of caves. As exploration has gone to the more remote parts of NSW, if this situation had been allowed to continue, the final number of karst areas could have been in the several hundreds. The above rules were developed in an attempt to avoid this "proliferation" of karst areas.

**General Cave Area:** Since early 1973 NSW and the ACT have used the numbering system developed by Toomer and Welch (1973) to number non-karst caves, where a non-karst cave is defined as a cave in a non-

carbonate rock stratum. The system known as General Cave Areas is based on using the 1:250 000 topographical map sheet series as the area boundary and covers all of NSW and the ACT.

General cave areas have 3 alphanumeric in the prefix code derived from each 1:250 000 map sheet number using the following rules:

1. The first alphanumeric in the code is derived from the second alpha letter in the map number.
2. The second alphanumeric in the code is derived from the second number in the map number
3. The third alphanumeric in the code is derived by taking the corresponding letter in the alphabet for the third number in the map number.

For example Sydney 1:250 000 map's number is SI/56-5, its prefix code is "I6E"

**Special Case:** There is also one "special case area" for caves and karst found on Lord Howe Island. In this case, both karst and non-karst caves are recorded in the same cave area. The rules for the prefix code being the same as for that of karst cave areas.

#### Comment

1. The Toomer and Welch system only covers the Australian mainland; it does not provide coverage in the case of Lord Howe Island or, for that matter, any of the other external Australian territories.
2. It is felt that separating caves on these islands into karst and non-karst cave areas is going a little overboard.
3. The compromise solution is to record both karst and non-karst in the one area for this special case.

## 2. Northern Territory

To be completed by the NT State Cave and Karst Numbering Coordinator

## 3. Queensland

To be completed by the QLD State Cave and Karst Numbering Coordinator

## 4. South Australia

To be completed by the SA State Cave and Karst Numbering Coordinator

## 5. Tasmania

To be completed by the TAS State Cave and Karst Numbering Coordinator

## 6. Victoria

To be completed by the VIC State Cave and Karst Numbering Coordinator

## 7. Western Australia

To be completed by the WA State Cave and Karst Numbering Coordinator

## 8. Territories and Islands Administered by the Commonwealth of Australia

There are a number of territories and islands administered by the Australian Government. These are:

- Australian Antarctic Territory
- Christmas Island
- Cocos (Keeling) Island
- Coral Sea Islands Territory
- Heard Island
- Macdonald Island
- **Macquarie Island**
- Norfolk Island
- Territory of Ashmore and Cartier Islands

While not all of these have karst or caves, there are some on which significant caves have been found. In these cases the following rules will apply in numbering caves.

1. Each island or territory will be considered as having only one cave area, which will be defined geographically as the island or territory and the islets immediately surrounding it.
2. The name of the cave area will be the same as the name of the island or territory.
3. All caves found on the island or territory will be included in the cave area irrespective of the rock strata they are located in.
4. The allocation of serial numbers will be solely on the basis of Rule 9 of this code.

The cave areas will have either 1 or 2 alpha letters in the prefix code, which will be derived from the cave area name using the following rules.

1. The first alpha letter in the prefix code is derived from the first letter in the cave area name.
2. If a second letter is used it is derived from any other letter in the cave area name.

The overall administration of the numbering system for these areas will be the responsibility of the Convenor of the ASF Karst and Cave Numbering Commission. The Convenor may delegate to State Cave and Karst Numbering Coordinators the responsibility for coordinating numbering on any or all of the above areas. Also as the occasion arises, the Convenor may delegate to other individuals the responsibility for the physical numbering and tagging of caves found on the islands or territories.