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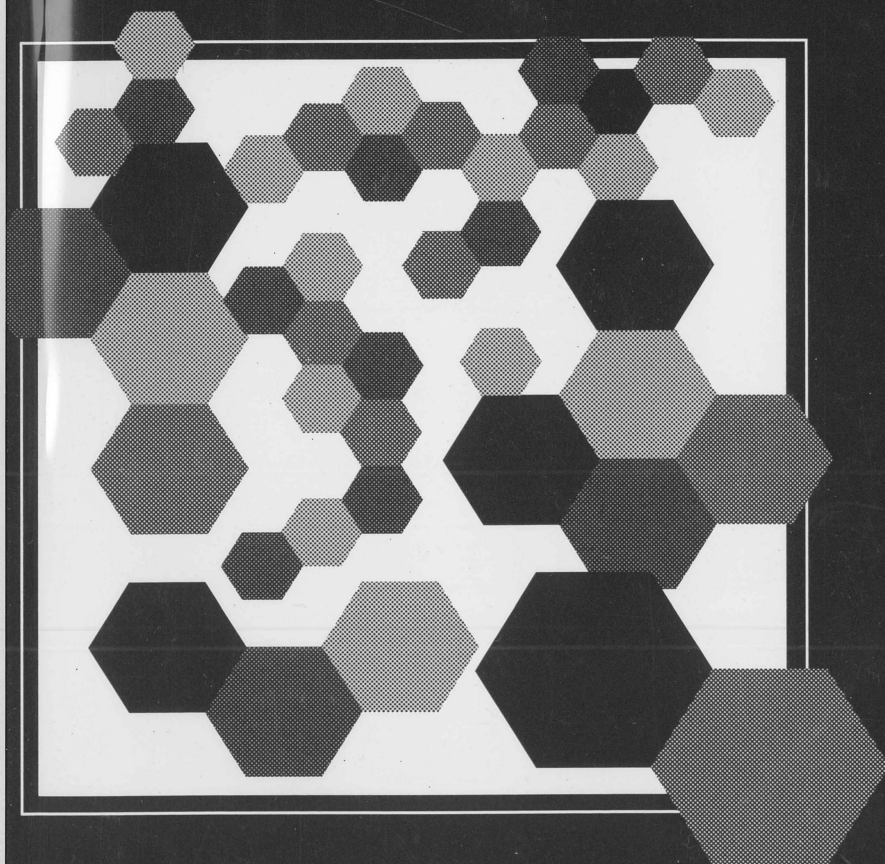
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McARTHUR BASIN AND MURPHY INLIER ROCKCHEM DATA SET DOCUMENTATION

RECORD 1992/37



by K.A.Plumb, L.A.I. Wyborn and R.J. Ryburn

Bureau of Mineral Resources, Geology and Geophysics

1992/37

c. 4

**McArthur Basin and Murphy
Inlier
Rockchem Data Set
Documentation**

Record 1992/37

**K.A. Plumb, L.A.I. Wyborn
and R.J. Ryburn**

Minerals and Land Use Program



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DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

Minister: The Hon. Alan Griffiths

Secretary: G.L. Miller

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

Executive Director: R.W.R. Rutland AO

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ABSTRACT

ROCKCHEM is the whole rock geochemical data storage system of the BMR's Minerals and Land Use Program, and utilises the relational database management system ORACLE. This data set contains 607 analyses (both major and trace elements) from the McArthur Basin and Murphy Inlier. Most samples are located by AMG grid references and/or decimal latitude and longitude. This record describes tables used in ROCKCHEM, defines the fields used within these tables, and gives a short description of the data. Also listed are references to the main scientific reports generated from the data.

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ROCKCHEM SAMPLES

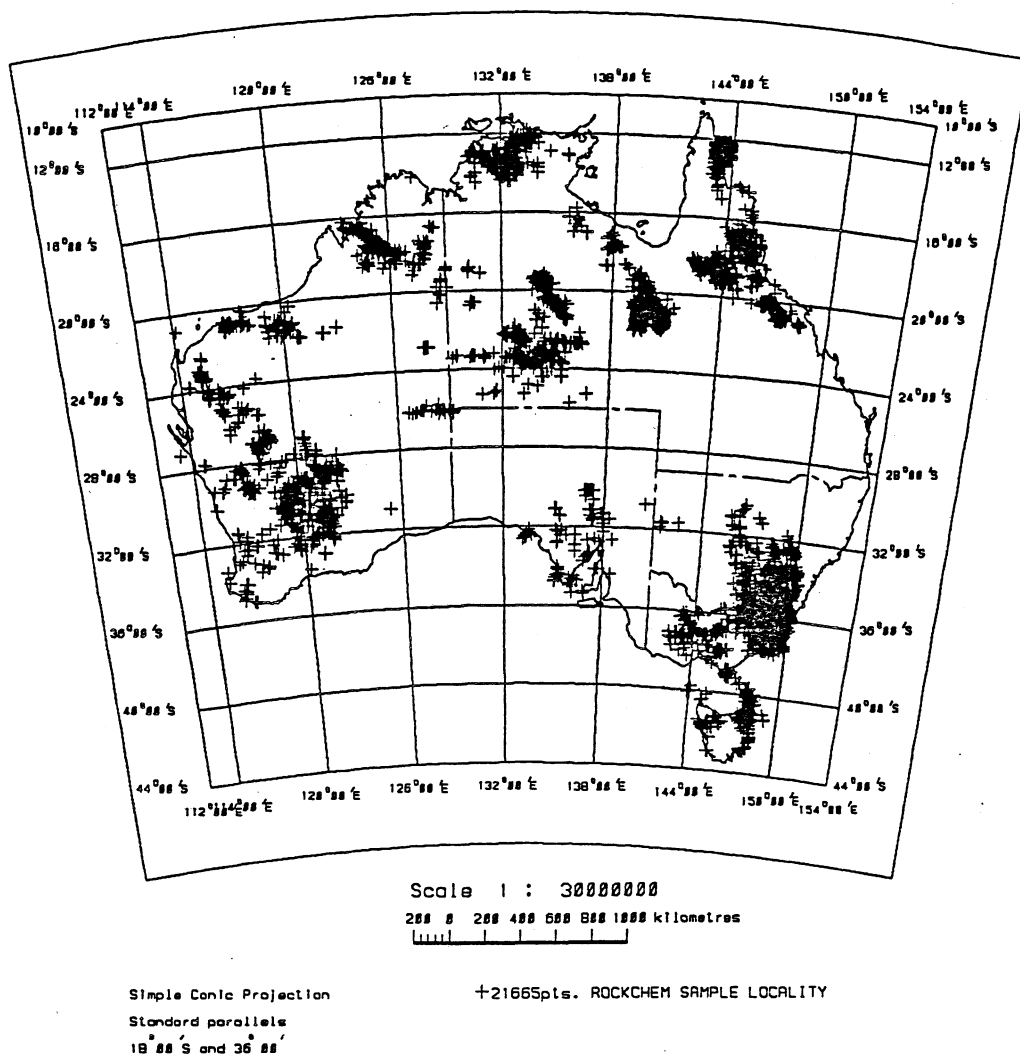


Figure 1. Distribution of ROCKCHEM samples in Australia.

1. INTRODUCTION

ROCKCHEM is the whole-rock geochemical data storage system of the Minerals and Land Use Program of the BMR Geology and Geophysics, Australia. It is based on the commercial relational database management system ORACLE. The complete database contains approximately 21665 analyses from Australia (see Figure 1), Antarctica and Papua New Guinea and can be divided into either regional or thematic datasets. The data are currently subdivided into the data sets as listed in Table 1.

Subset	Areas Covered	No. of Analyses	Coordinator
Regional Databases			
Antarctica	Antarctica	1318	J.W. Sheraton
Arunta	Arunta Block	1793	R.G. Warren,
Lachlan	Lachlan Fold Belt NE Tasmania NW Tasmania	1149 300 40	D. Wyborn
McArthur	McArthur Basin Murphy Inlier	533 74	K. Plumb, L. Wyborn
Mount Isa	Mount Isa Inlier	2296	L. Wyborn
New Guinea	New Guinea Manus Island New Georgia	1000	R.W. Johnson
NE Queensland	Georgetown Inlier NE Queensland	1940	D.E. Mackenzie
Pilbara	Pilbara Block	1386	A.Y. Glikson
Pine Creek	Pine Creek Inlier	2056	L. Wyborn
South Australian Proterozoic	Stuart Shelf, Adelaide Geosyncline	232	J. Knutson
Tennant Creek	Tennant Creek Inlier Davenport Province.	1431 170	L. Wyborn
West Australian Proterozoic	Capricorn Province Granites Tanami Block Halls Creek Block	227 56 164	L. Wyborn
Yilgarn	Yilgarn Block	2274	J.W. Sheraton
Thematic Databases			
Alkaline	Kimberlites Alkaline Rocks	557 277	A.L. Jaques

Table 1. List of Data Sets in ROCKCHEM.

2. THE MCARTHUR BASIN AND MURPHY INLIER DATA SETS

This ROCKCHEM data set is a release of approximately 607 analyses from the McArthur Basin and Murphy Inlier. Figure 2 shows the distribution of the analyses within the region. Appendix 1 contains listings of the individual components of the data set.

MCARTHUR & MURPHY PROVINCES

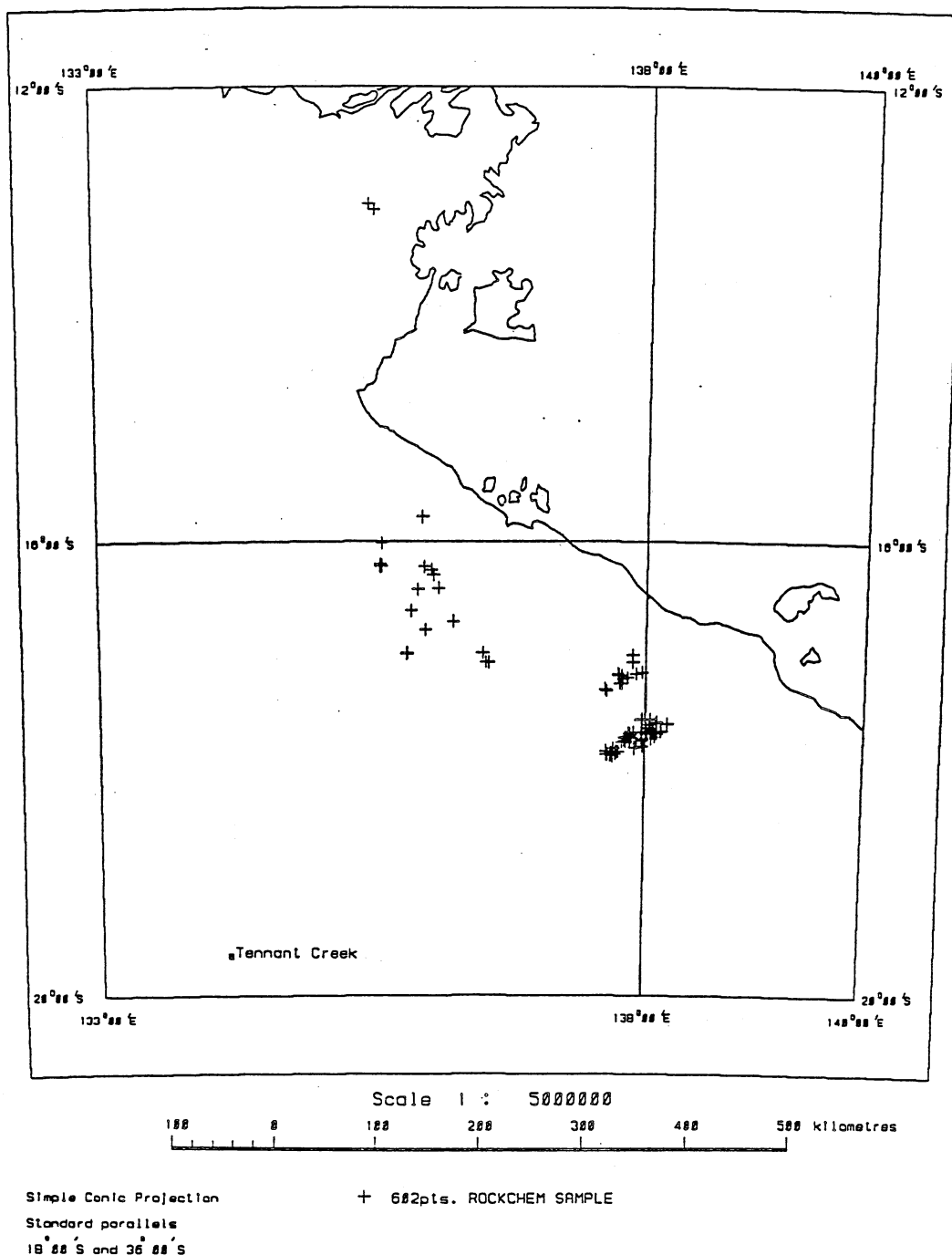


Figure 2. ROCKCHEM samples from the McArthur Basin and Murphy Inlier.

McArthur Basin Database

Database type:

regional

General Selection Criteria:

Field = regiono *Entry* = 22

Data description:

The McArthur Basin database comprises:

- 488 analyses of sedimentary rocks from the Batten Subgroup, McArthur Group - a mixed volcanoclastic-carbonate assemblage deposited in hypersaline rift lakes during a period of active extension, and subjected to widespread pervasive diagenesis and evaporite precipitation. Samples were collected during 1982-1983 from a number of company diamond drill cores - Amoco 82-5, 82-6 and 82-7; AO Leila Yard 1, Berjaya 3 and Bing Bong; and Amoco Minerals Mantangula 78-1 and 79-3 - as part of a sedimentological study of the Batten Subgroup.
- 26 samples of igneous rocks from a study of the copper-bearing breccia pipes in the Redbank area by Knutson and others (1979)
- miscellaneous samples of igneous rocks from the Tawallah Group

Future work:

Work will continue on related sequences in Arnhem Land during 1992 to 1995 as part of the combined BMR/Northern Territory Geological Survey (NTGS) National Geoscience Mapping Accord Arnhem Land Project. Provided reasonable outcrop can be located, the aim is to collect representative geochemical samples of both fresh, altered and weathered samples of most units in the area including granites, felsic and mafic volcanics and metamorphic rocks.

Bibliography:

- Jackson, M.J., Muir, M.D., and Plumb, K.A., 1987. Geology of the southern McArthur Basin, Northern Territory. *Bureau of Mineral Resources, Geology and Geophysics, Australia, Bulletin* 220.
- Knutson, J., Ferguson, J., Roberts, W.M.B., Donnelly, T.H., and Lambert, I.B., 1979. Petrogenesis of the copper-bearing breccia pipes, Redbank, Northern Territory, Australia. *Economic Geology*, 74, 814-826.
- Plumb, K.A., 1986a. Batten Subgroup, McArthur Basin - modern analogues for an evolving ancient lake. *Geological Society of Australia, Abstracts*, 15, 159-160.



- Plumb, K.A., 1986b. Batten Subgroup, McArthur Basin - evolution of a 1650 Ma-old lake complex. *12th International Sedimentological Congress, Canberra, Abstracts*, p244.
- Plumb, K.A., 1989. Geochemical interpretation of a mid- Proterozoic rift succession, McArthur Basin, northern Australia. *28th International Geological Congress, Washington, Abstracts*, 2, p.617.
- Plumb, K.A., Ahmad, M., and Wygralak, A.S., 1990. Mid-Proterozoic basins of the North Australian Craton - regional geology. In Hughes, F., (editor), *Geology of the Mineral Deposits of Australia and Papua New Guinea. Australasian Institute of Mining and Metallurgy, Monograph 14*, 881-902.

Murphy Inlier database

Database type:

regional

General Selection Criteria:

Field = regiono *Entry* = 58

Data Description:

The database comprises 74 analyses of predominantly felsic igneous rocks from the Clifffdale Volcanics and the Nicholson Granite Complex collected as part of the regional mapping program of the Seigal and Hedleys Creek 1:100 000 Sheet areas (Sweet and others, 1981a, 1981b). More detailed descriptions of the samples are contained in Mitchell (1976) and Gardner (1978).

Future work:

No further work is planned in this region in the immediate future.

Bibliography:

- Gardner, C.M., 1978. Precambrian geology of the Westmoreland region, Northern Australia, Part 111 - Nicholson Granite Complex and Murphy Metamorphics. *Bureau of Mineral Resources, Geology and Geophysics, Australia, Record*, 1978/32.
- Mitchell, J.E., 1976. Precambrian geology of the Westmoreland region, Northern Australia, Part 11 - Clifffdale Volcanics. *Bureau of Mineral Resources, Geology and Geophysics, Australia, Record*, 1976/34.
- Sweet, I.P., Mock, C.M., and Mitchell, J.E., 1981a. Seigal, Northern Territory and Hedleys Creek, Queensland. *Bureau of Mineral Resources, Geology and Geophysics, Australia, 1:100 000 Geological Map commentary*.

Sweet, I.P., Mock, C.M., and Mitchell, J.E., 1981b. Chemical analyses from the Seigal and Hedleys Creek 1:100 000 Sheet areas, Northern Territory and Queensland. *Bureau of Mineral Resources, Geology and Geophysics, Australia, Report, 226.*

3. STRUCTURE OF ROCKCHEM DATA SETS

The Rockchem database contains seven main tables of data and eleven associated 'authority' tables. The names of the tables are as follows and full definitions are listed in Appendix 2.

Table Name	Contents
Main Tables	
SAMPLES	Samples and their locations and provenance
SAMPLESPLITS	Sample splits and their storage
MAJORS	Major element analyses in weight percentages of oxides
TRACES	Trace element analyses in parts per million
PPB	Trace element analyses in parts per billion
ROCKPROPS	Density and magnetic rock properties
REFERENCES	Bibliographic references
Authority tables	
ORIGINATORS	List of valid contributors
COUNTRIES	List of valid countries
STATES	List of valid Australian States
REGIONS	List of valid regions
HMAPS	List of valid 1:100 000 maps
ROCKTYPES	List of valid rock types
STOREBOXES	List of valid boxes in BMR Museum
SOURCES	List of valid analytical laboratories
METHODS	List of valid analytical methods
MAXNOS	Table for highest index number in the database

The fields in the main tables are described in section 4. The authority tables are described in section 5. They generally consist of a number and a text field. For example, the REGIONS table consists of a region number and a region name (see Appendix 2). The region names in this table are unique. Each region appears once, and only once, in this table, and nowhere else in the database. The SAMPLES table refers ('relates') to the region name via its associated number.

4. DESCRIPTION OF THE MAIN TABLES

4.1 THE SAMPLES TABLE

This table contains information about samples and their provenance. The Samples Block contains the following relational fields - ORIGINATORS, ROCKTYPES,

COUNTRIES, STATES, REGIONS, HMAPS, and REFERENCES (up to 5 different references can be entered for each sample). With each authority field, there is an associated table containing the value pointed to by a number or in the case of COUNTRIES, a 3-letter mnemonic. The number (or mnemonic) is the only information stored in the SAMPLES table, the values are stored separately in the relevant authority table.

All fields are either mandatory or optional. All BMR users must enter the mandatory fields before the geochemical data can be entered.

Description of Fields:

Origno - Mandatory relational field of 5 digits. The originator is represented by a number and the full name is recorded in the relational 'ORIGINATORS' table. The originator is generally the person or organization that collects the sample and/or submits it for laboratory work. The main purpose of this field is to ensure a unique combination of originator and sample number.

Sample Number - Mandatory field of 16 characters. Any combination of letters and numbers may be entered, provided that it is unique to the originator. All BMR samples should have registered 8 digit numbers, which should be unique. The first two digits in the BMR sample number refer to the year in which the sample was collected, the next two digits refer to a region in Australia (e.g. Arunta, Pine Creek), and the remaining four numbers are used by individuals belonging to that project at their discretion.

Field Number - Optional field of 16 characters. This field is designed to accommodate any alternative numbering systems that might apply to a sample or group of samples. For example, some samples are given field numbers that differ from the final registered numbers.

Group or Batholith - Optional field of 64 characters, giving the name of the stratigraphic group or igneous batholith from which the sample was collected.

Subgroup or Suite - Optional field of 64 characters, giving the name of the stratigraphic subgroup or igneous suite pertaining to the sample.

Stratigraphic Formation - Optional field of 64 characters, giving the relevant stratigraphic unit at formation level.

Stratigraphic Member - Optional field of 64 characters for the name of a stratigraphic member, if appropriate.

Stratigraphic Height - Optional number field with up to two decimal places. Designed for samples from measured stratigraphic sections.

Map Symbol - Optional field of 10 characters: the letter symbol used on 1:100 000 or 1:250 000 geological maps for the rock unit from which the sample was collected.

Rock Type - Mandatory relational field of 5 digits. See the description of the authority tables for the list of 18 permissible rock types, 1 being 'unknown'.

Lithology - Optional field of 64 characters for a full lithological description.

Grouping - Optional field of 22 characters to allow the user to supply other divisions for samples, for example, the alteration zones of an ore body.

Age - Optional field of 64 characters for the geological age, e.g., late Ordovician. If known, the absolute age is included in brackets, e.g., early Proterozoic (1860 Ma).

References - 5 optional relational numeric fields of 5 digits each. The full reference is listed in the REFERENCES table.

Country - Mandatory relational field of 3 capital letters. The default value is 'AUS'.

State - Relational field of 3 capital letters, mandatory if country is Australia. Only the standard capital letter abbreviations for Australian states can be entered in this field, and it cannot be used for other countries.

Region - Mandatory relational field of 5 digits. Only those regions in the REGIONS table may be entered. A region is a recognised geological province or area such as the Lachlan Fold Belt, Mount Isa Inlier, or Carnarvon Basin. As regions may overlap one another, the region that is entered is dependent on the purpose for which the sample was collected.

Geographic Area - Optional 64 character field for the name of the geographic area (e.g., valley, plain, mountain range) from which the sample comes. Examples are 'Newcastle Range' and 'Tuggeranong Valley'. Another purpose for which this field is used is for subprovinces of major regions (e.g., the Leichhardt River Fault Trough of the Mount Isa Inlier).

Locality - Optional 64 character field for a description of the sample site to aid in its relocation in the field. For example, '5.5km NW of Brown's Bore, on east bank of dry creek'.

1:100 000 Map - Relational field of 4 digits, mandatory if country is Australia. The number supplied must identify one of the standard series 1:100 000 maps in the HMAPS table. In insert or update mode, the name may be entered and the number retrieved automatically. Only the map number is stored in the SAMPLES table.

Grid Reference - Field of 6 digits, mandatory if 1:100 000 map name is given. The 6 digit reference required is that described on the face of Australian 1:100 000 maps. The grid reference given must be metric and on the Australian National Spheroid.

Decimal Latitude - Field of 8 digits, mandatory if sample is not from Australia. Up to 6 digits may follow the decimal point. For most samples this field has been entered using a BMR program called 'GetLat', which calculates latitudes and longitudes from the 1:100 000 maps and metric grid references.

North or South - Single character field, 'S' by default. Only 'N' or 'S' may be entered.

Decimal Longitude - Field of 9 digits, 7 of which may follow the decimal point. Otherwise as for latitude.

East or West - Single character field 'E' by default. Only 'E' or 'W' may be entered. Make sure this field is correctly filled in for samples from outside Australia (e.g. Antarctica). It must be given as 'W' for latitudes measured west of the Greenwich Meridian.

Drill Hole - Optional field of 22 characters. If the sample is from a drill hole, its name, or some other identification, is required.

Depth in Metres - Optional field of 10 characters. The depth of the sample from within the drill hole. A character field is used here to enable depth ranges to be entered, e.g., '112- 115' - as some samples are collected from finite depth intervals.

Other Data - Optional field of 64 characters. May be used for any data not covered by the above fields that the originator feels are relevant.

Entry Date - Invisible date field. This field automatically assumes the date that the sample data is inserted into the SAMPLES table via the form.

4.2 THE SAMPLE SPLITS TABLE

This table indicates the sample type (whole rock geochemistry, geochronology, thin section, hand specimen etc.) and the number of the box that the sample is stored in within the BMR museum.

Description of Fields:

Origno - Mandatory relational field of 5 digits. The originator is represented by a number and the full name is recorded in the relational 'Originator Table'. The originator is generally the person or organization that collects the sample and/or submits it for laboratory work. The main purpose of this field is to ensure a unique combination of originator and sample number.

Sample Number - Mandatory field of 16 characters. Any combination of letters and numbers may be entered, provided that it is unique to the originator. All BMR samples should have registered 8 digit numbers, which should be unique. The first two digits in the BMR sample number refer to the year in which the sample was collected, the next two digits refer to a region in Australia (e.g. Arunta, Pine Creek), and the remaining four numbers are used by individuals belonging to that project at their discretion.

Sample Type - Mandatory relational field of 5 digits. The sample type entered must be one of those in the SAMPLETYPES table, e.g., 'whole-rock analysis' or 'geochronology'.

Storebox - Optional numeric field of up to 5 digits. This number must correspond to a Storebox number already in the STOREBOXES table. Although most existing samples do not yet have a storebox number, it is a requirement for all new samples housed in the BMR museum to have a storebox number.

4.3 THE MAJORS TABLE

The majors table contains all of the major element data with all values expressed as weight percentages of oxides.

Description of Fields:

Sample Number - Mandatory field of 16 characters. Any combination of letters and numbers may be entered, provided that it is unique to the originator. All BMR samples should have registered 8 digit numbers, which should be unique. The first two digits in the BMR sample number refer to the year in which the sample was collected, the next two digits refer to a region in Australia (e.g. Arunta, Pine Creek), and the remaining four numbers are used by individuals belonging to that project at their discretion.

Analysis Number - Mandatory field of up to 5 digits. Primary key field assigned by the system; it cannot be inserted or updated. It may be used to query the tables.

Origno - Mandatory relational field of 5 digits. The originator is represented by a number and the full name is recorded in the relational 'Originator Table'. The originator is generally the person or organization that collects the sample and/or submits it for laboratory work. The main purpose of this field is to ensure a unique combination of originator and sample number.

Source Number - Mandatory relational field of up to 5 digits. The 'source' of an analysis is normally the laboratory that performed the analysis or the person or organization that provided the data (e.g., BMR, BMR restricted, BHP, B.W. Chappell). The SOURCES table contains the authority list of all sources.

Method Number - Mandatory relational field of up to 5 digits describing the method by which the laboratory analysis was performed. The details of the analytical techniques used are in the METHODS table.

Major Elements - Optional numeric fields of up to 4 digits, two after the decimal point. Automatically right justified. Detection limit values are entered as negative numbers and it is impossible to enter '<' or 'n.d.'.

***Fe₂O₃** - This field is reserved for total iron as Fe₂O₃. It should be entered only for analyses in which the oxidation state of iron has not been determined. Where this field is entered, the fields for FeO and Fe₂O₃ should be left empty.

Rest - Trace elements are converted to oxide percent, summed and then added to the total.

Total - Optional numeric field of up to 5 digits. This is for an entered total.

Calculated Total - The value in this field is automatically calculated from the data in the major element fields. It cannot be entered and is not a database field. Except where detection limit values are involved, this field provides a check on the entered total; the two should coincide. Because detection limit values are entered as negative numbers, they are subtracted from the calculated total.

4.4 THE TRACES TABLE

This table includes all trace elements in ppm.

Description of Fields:

Sample Number - Mandatory field of 16 characters. Any combination of letters and numbers may be entered, provided that it is unique to the originator. All BMR samples should have registered 8 digit numbers, which should be unique. The first two digits in the BMR sample number refer to the year in which the sample was collected, the next two digits refer to a region in Australia (e.g. Arunta, Pine Creek), and the remaining four numbers are used by individuals belonging to that project at their discretion.

Analysis Number - Mandatory field of up to 5 digits. Primary key field assigned by the system; it cannot be inserted or updated. It may be used to query the tables.

Origno - Mandatory relational field of 5 digits. The originator is represented by a number and the full name is recorded in the relational 'Originator Table'. The originator is generally the person or organization that collects the sample and/or submits it for laboratory work. The main purpose of this field is to ensure a unique combination of originator and sample number.

Source Number - Mandatory relational field of up to 5 digits. The 'source' of an analysis is normally the laboratory that performed the analysis or the person or organization that provided the data (e.g., BMR, BMR restricted, BHP, B.W. Chappell). The SOURCES table contains the authority list of all sources.

Method Number - Mandatory relational field of up to 5 digits describing the method by which the laboratory analysis was performed. The details of the analytical techniques used are in the METHODS table.

Trace Elements - Optional numeric fields of up to 8 digits, two of which may be after a decimal point. The fields are automatically right justified and as is the case for major elements, a negative entry signifies a detection-limit value.

4.5 THE PPB (parts per billion) TABLE

This table includes all trace elements in ppb.

Description of Fields:

Sample Number - Mandatory field of 16 characters. Any combination of letters and numbers may be entered, provided that it is unique to the originator. All BMR samples should have registered 8 digit numbers, which should be unique. The first two digits in the BMR sample number refer to the year in which the sample was collected, the next two digits refer to a region in Australia (e.g. Arunta, Pine Creek), and the remaining four numbers are used by individuals belonging to that project at their discretion.

Analysis Number - Mandatory field of up to 5 digits. Primary key field assigned by the system; it cannot be inserted or updated. It may be used to query the tables.

Origno - Mandatory relational field of 5 digits. The originator is represented by a number and the full name is recorded in the relational 'Originator Table'. The originator is generally the person or organization that collects the sample and/or submits it for laboratory work. The main purpose of this field is to ensure a unique combination of originator and sample number.

Source Number - Mandatory relational field of up to 5 digits. The 'source' of an analysis is normally the laboratory that performed the analysis or the person or organization that provided the data (e.g., BMR, BMR restricted, BHP, B.W. Chappell). The SOURCES table contains the authority list of all sources.

Method Number - Mandatory relational field of up to 5 digits describing the method by which the laboratory analysis was performed. The details of the analytical techniques used are in the METHODS table.

Trace Elements - Optional numeric fields of up to 8 digits, 3 of which may be after a decimal point. The fields are automatically right justified and as is the case for major and trace elements, a negative entry signifies a detection-limit value.

4.6 THE REFERENCES TABLE

The bibliographic References Form accesses the REFERENCES table. The authors and year fields are spanned by a concatenated unique index. This means that no two references can have the same values in the author(s) and year fields.

Description of Fields:

Reference Number - Mandatory field of up to 5 digits. A monotonically increasing primary key field assigned by the system. The reference number in the fields in the samples table refer to this field.

Other ID - Optional field of up to 16 characters. Any other identifying sequence that the user may care to apply.

Username - Mandatory field of up to 16 characters.

Authors - Mandatory field of up to 128 characters.

Year - Mandatory field of up to 16 characters.

Title - Optional field of up to 240 characters.

Source - Optional field of up to 240 characters - the journal name, volume and page numbers.

5. DESCRIPTION OF AUTHORITY TABLES

5.1 THE 1:100 000 MAPS FORM

The 1:100 000 maps form table has the underlying HMAPS table as an important table in its own right.

Description of Fields:

100K Map Number - The unique four digit number for any 1:100 000 map sheet from Australia.

1M Map ID - The 1:1 000 000 map sheet in which the 1:100 000 sheet lies. This is identified by two capital letters followed by two numbers, e.g., 'SF54'. The two digits are the UTM zone, which is needed to convert metric references to latitude and longitude.

250K Map Number - Up to 2 digits identifying the 1:250 000 map sheet from the 16 within each 1:1 000 000 map area. The full 1:250 000 map ID is obtained by joining the 1:1 000 000 map ID to this number, e.g., SF54-12, which is the Winton 1:250 000 map sheet, in Queensland. Note that the 1:250 000 map sheets in Tasmania are the theoretical ones, not the shifted ones actually published.

100K Map Name - Up to 22 upper case characters for the name of the 1:100 000 map sheet identified by the 100K Map Number. There are many offshore sheets which are named 'UNNAMED'.

100K Map NW Corner Lat. & Long. - The decimal latitude and longitude of the northwest corner of the 1:100 000 map sheet. It is possible, using a single SQL*Plus command, to make use of this field to select a 1:100 000 map name for any given latitude and longitude.

100K Map AMG Ref. SW Corner Easting and Northing - The metric easting and northing of the southwest corner of the 1:100 000 map sheet. These values are necessary to convert a 6-digit grid reference obtained from a 1:100 000 map to the full Australian Map Grid metres east and metres north.

5.2 COUNTRIES TABLE

This table is for recognised countries. All have an associated ID.

ID	Country
AUS	Australia
PNG	Papua-New Guinea
SI	Solomon Islands
ANT	Antarctica
UK	United Kingdom
SEA	International Waters

5.3 STATES TABLE

This table is for the states of Australia only and all have a set ID.

ID	STATE
???	unknown
ACT	Australian Capital Territory
NSW	New South Wales
NT	Northern Territory
QLD	Queensland
SA	South Australia
TAS	Tasmania
VIC	Victoria
WA	Western Australia

5.4 ORIGINATORS TABLE

This table refers to the collector of the sample in the field. With some BMR authors, it is possible to refer to original sample note books which are stored within BMR so as to obtain more precise location and/or technical descriptions of any samples that are of interest.

The following list gives the key for the entries in this authority table.

ORIGNO	ORIGINATOR
1	unknown
2	Blake, D.H.
3	Branch, C.D.
4	Bultitude, R.J.
5	Gardner, C.
6	Croxford, W.
7	Cruikshank, B.I.
8	Hoatson, D.M.
10	Dallwitz, W.B.
11	Derrick, G.M.
12	Duff, B.
13	Ellis, D.J.
14	England, R.N.

15	Ewers, G.R.
16	Warren, R.G.
17	Glikson, A.Y.
18	Tanaka, H.
19	Hill, R.M.
20	Holmes, R.D.
21	Hutton, L.J.
22	Lambert, I.
23	Knutson, J.
24	Jaques, A.L.
25	Chapple, K.
27	Lewis, J.D.
28	Etheridge, M.
29	Mackenzie, D.E.
30	McNaughton, N.
31	Mitchell, J.M.
32	Mock, C.M.
33	Higgins, N.C.
34	Oversby, B.S.
35	Cook, P.
36	Stuart-Smith, P.G.
37	Page, R.W.
38	Plumb, K.A.
39	Valenta, R.
40	Needham, R.S.
41	Santul, J.
42	Sheraton, J.W.
43	Smith, S.E.
44	Tunks, A.
45	Wallace, D.A.
46	Willmott, W.F.
47	Wilson, I.H.
48	Withnall, I.W.
49	Wyborn, D.
50	Wyborn, L.A.I.
51	Bain, J.H.C.
52	Johnson, R.W.
53	Williams, P.R.
54	Miller, A.
55	Bettenay, L.
56	Black, L.P.
57	Pederson, C.P.
58	Ferguson, J.
59	Hegge, M.R.
60	Wilkes, P.G.
61	Roberts, W.M.B.
62	Walpole, B.
63	Joplin, G.
64	Crick, I.
65	Hills, J.
66	Rhodes, J.
67	Smart, P.
68	Sweet, I.P.
69	Shaw, R.D.
70	Stewart, A.J.
71	Wyche, S.
72	Watchman, A.
73	Stuart, J.E.
74	Stratton, J.

75	Duggan, M.B.
76	Yeates, A.N.
77	ANU RSES
78	Allen, A.R.
79	Bofinger, V.M.
80	Gee, R.D.
81	De Laeter, J.R.
82	Cooper, J.A.
83	Williams, S.J.
84	Windrim, D.P.
85	Gray, C.M.
86	Ludwig, K.R.
87	Currie, K.L.
88	Chin, R.J.
89	Mortimer, G.E.
90	Marjoribanks, R.W.
91	Webb, A.W.
92	Langworthy, A.P.
93	SADME
94	Jagodzinski, E.A.
95	Compston, W.
96	Freeman, M.J.
97	Offe, L.A.
98	Bagas, L.
99	Joklik, G.F.
100	Korsch, R.
101	Dobos, S.K.
102	Foden, J.D.
103	Roarty, M.J.
104	Pidgeon, R.T.
105	W.A. Geological Survey
106	Southgate, P.N.
107	Kralik, M.
108	Richards, J.R.
109	McDougall, I.
110	Turek, A.
111	Collins, W.J.
112	Kinny, P.D.
113	Heinrich, C.A.
114	Hill, R.I.
115	Henderson, G.A.M.
116	Johnston, C.
117	Richards, D.
118	Bailey, J.
119	Blewett, R.S.
120	Chappell, B.W.C.
121	Adams, C.J.
122	Turner, N.J.
123	Perason, P.J.
124	Rao, C.P.
125	McCulloch, M.T.
126	Vanderhor, F.
127	Rattenbury, M.S.
128	Young, D.N.
129	Arriens, P.A.
130	Grew, E.S.
131	Shibata, K.
132	Barton, J.M.
133	Sandiford, M.

134	Edgoose, C.
135	O'Beirne, W.
136	Wakelin-King, G.
137	Cassidy, K.F.
138	Ogasawara, M.
139	Fletcher, I.R.
140	Perring, C.S.
142	Compston, D.M.
143	Maas, R.
145	CSIRO-Yilgarn data
146	Netherway, N.M.
147	Price, R.
149	Giles, C.W.
150	Tyler, I. M.
151	Griffin, T. J.
152	Ojala, J.
153	Taylor, W.R.
154	Connors, K.A.
155	Hancock, S.L.
156	Pieters, P.E.
157	Creaser, R.A.
158	Whalen, J.B.
159	Hamlyn, P.R.
160	Hine, R.
161	Mason, D.R.
162	Kjolle, I.
163	Lanyon, R.
164	Trail, D.S.
165	Johnson, J.P.
166	Knight, J.
167	Gunther, M.
168	Rienks, I.P.
170	Champion, D.
171	Zhao, J.-X.

5.5 REGIONS TABLE

The following list of regions was initially compiled from all the existing databases. However, for the purpose of database management, only a select number of major regions are now used for the Australian section of this data set. Those that have been used with the regional databases are marked * in the list below. Most of those Australian regions listed below are now entered in the field "Geogarea"; Antarctic regions used are marked +.

REGIONO	REGION
1	unknown
2	Adelaide Fold Belt
3	Albany-Fraser Province
4	Arunta Block *
5	Bunger Hills +
6	Cape York Peninsula
7	Carnarvon Basin
8	Commonwealth Bay +
9	Cummins Range
10	Davenport Province *
11	Denman Glacier +

12	East Kimberley
13	Enderby Land +
14	Gawler Craton
15	George V Land +
16	Georgetown Inlier
17	Halls Creek Inlier *
18	Kemp Land +
19	Lachlan Fold Belt *
20	Lawn Hill Platform
21	Mawson Coast +
22	McArthur Basin *
23	Mount Isa Inlier *
24	Northern Prince Charles Mountains +
25	NE Queensland *
26	NE Tasmania
27	NW Tasmania
29	North Victoria Land +
30	North Kimberley
31	Pilbara Block *
32	Pine Creek Inlier *
33	Prydz Bay Coast +
34	Southern Prince Charles Mountains +
35	Stuart Shelf *
36	Granites-Tanami Block *
37	Tasman Fold Belt
38	Tasmania
39	Tennant Creek *
40	Turee Creek
41	Tuross
42	Vestfold Hills +
43	West Kimberley
44	Wilhelm II Land +
45	Wilkes Land +
46	Willyama Block
47	Yilgarn Block *
48	Hammersley Basin
49	SE Tasmania
50	SW Tasmania
51	New Georgia Island
52	Eastern Goldfields
53	Capricorn Orogen *
54	Ashburton Trough
55	Gascoyne Province
56	Glengarry Sub-basin
57	Earaheedy Sub-basin
58	Murphy Tectonic Ridge *
59	South Nicholson Basin
60	Westmoreland Region
61	New England Fold Belt
62	Sydney Basin
63	Admiralty Islands
64	Birrindudu Basin
65	Bangemall Basin
66	Musgrave Block
67	Paterson Province
68	Amadeus Basin
69	Ammaroodinna Inlier
70	Peake Denison Inlier
72	Georgina Basin

73	Curnamona Inlier
74	Carpentaria Province
75	Northampton Block
76	Houghton Inlier
77	Bougainville
78	Tabar-Feni
79	New Britain
80	St. Andrews Strait
81	Fly Highlands
82	Manus Basin
83	Eastern Papua
84	Officer Basin
85	Woodlark Basin
86	Princess Elizabeth Land
87	MacRoberston Land
88	Dronning Maud Land
89	Rabaul
90	North Coast New Guinea
91	Perth Basin
92	Arnhem Block
93	Mullingarra Block
94	Leeuwin Block
95	South Victoria Land

5.6 ROCK TYPES TABLE

This table provides a coarse subdivision of samples based on broad rocktypes. It was initiated primarily for database management and block retrieval, and for future online extraction of data. This table can be used, for example, to extract all mafic extrusive rocks from the database or all alkaline rocks. The following gives a list of the 18 permitted rock types:

ROCKNO	ROCKTYPE
1	unknown
2	felsic intrusive
3	intermediate intrusive
4	mafic intrusive
5	felsic extrusive
6	intermediate extrusive
7	mafic extrusive
8	ultramafite
9	alkaline igneous
10	clastic sediment
11	chemical sediment
12	metabasite
13	felsic gneiss
14	metasediment
15	metasomatite
16	ore
17	regolith
18	mixed clastic/chemical sediment

5.7 SAMPLE TYPES TABLE

This table gives an indication of the nature of work that has been carried out on each individual sample.

SAMPLETYPENO	SAMPLETYPE
1	unknown
2	whole-rock geochemistry
3	geochronology
4	hand specimen
5	thin section
6	geochronology K-Ar
7	geochronology Ar-Ar
8	geochronology Rb-Sr
9	geochronology Sm-Nd
10	geochronology U-Pb minerals
11	geochronology U-Pb SHRIMP
12	geochronology Pb-Pb
13	geochronology Pb-Pb ores
14	geochronology Lu-Hf
15	geochronology Re-Os
16	geochronology fission-track
17	geophysical properties
18	geochemical rock chip samples

5.8 SOURCES TABLE

This table gives the laboratory or organisation which analysed the sample.

SOURCENO	SOURCE
1	unknown
3	ANU
4	Adelaide University
5	AMDEL
6	BMR
7	BMR restricted
8	CSIRO/BMR
9	Macquarie University
10	Melbourne University
11	NTGS (AMDEL)
12	Western Australian Government Chemical Laboratories
13	University of Western Australia
14	University of Queensland
15	James Cook University of North Queensland
16	Tasmanian Department of Mines
17	University of Tasmania
18	Queensland Department of Mines
19	BGR (Bundesanstalt für Geowissenschaften und Rohstoffe)
20	Labtech Pty. Ltd., WAIT, WA Govt. Chem. Lab., Perth.
21	Institute for Petrology, Copenhagen University, Denmark.
23	ANALABS
24	BMR/CRAE-T.Stachel
25	University of Canterbury New Zealand
26	University of California
27	CSIRO Division of Exploration Geoscience, Floreat Park, WA

5.9 METHODS TABLE

This table describes the analytical methods used in deriving the analyses.

METHODNO	METHOD
1	unknown
2	XRF (Norrish & Hutton, 1969); FeO Vol.; LOI Grav.
3	XRF (Norrish & Hutton, 1969); FeO Vol.; H ₂ O+, H ₂ O-, & CO ₂ Grav.
4	XRF (Norrish & Chappell, 1977); Ag, Be, Co, Li by AAS
5	XRF (Norrish & Chappell, 1977); Ag, Be, Co, Cu, Li, Ni, Zn by AAS
6	XRF (Norrish & Hutton, 1969); FeO, H ₂ O(total), CO ₂ by AMDEL
7	XRF (Norrish Chappell 1967); Li Be Cr Co Ni Cu Zn Sn AAS F AMDEL
8	Rb, Sr by XRF (Norrish & Chappell, 1967); Ni, Co, V by AAS
9	XRF (Norrish & Chappell, 1977); FeO vol.; LOI grav.
10	XRF (N & C, 1977); REE Hf Ta Cr Sc Sb Cs INA; Th U Gamma spectrm
11	XRF (N & C, 1977); REE Hf Ta Sb Cs INAA; U delayed neutron count
12	XRF (Norrish & Chappell, 1977).
13	XRF (Norrish & Chappell, 1977); Co CuNi Pb Zn by optical emission spectroscopy
14	ICP,AES Inductively Coupled Plasma, Atomic Emission Spectrometry
15	XRF (N & C, 1977) at ANU; Na, K by AAS (JCUNQ).
16	XRF(N&C 1977) UQ; REE Th U Pb Hf Ba Cs Sn Mo Nb Y Bi W MS7 RSES.
17	AMDL 'wet' chem. +/- XRF (N & H, 1969)?
18	Tas. Dept. Mines Assay Labs Launceston: "classical methods".
19	J. Klominsky & D.I. Groves: X-ray spectrography.
20	XRF (Norrish & Chappell, 1977); REE,Sc,Hf,Th,U INAA
21	XRF (N & C, 1977); REE ion-exchange/XRF (Robinson & others,1986)
22	AMACHEM Nickel sulfide assay- neutron activation.
23	XRF (Norrish & Hutton, 1969) on 1:1 purified silica mix
24	AAS
25	ANALABS: fire assay, Pb collection, carbon rod finish (30g samp)
26	ANALABS: fire assay fusion, AAS finish (30g sample)
27	ANALABS: combination of methodno = 25 (Pd & Pt) and 26 (Au)
28	RNAA from Melbourne University
29	ANALABS: fire assay, lead collection; ICP-MS finish
30	Direct-reading optical spectrograph (DROS), BMR.
31	XRF (Norrish & Hutton, 1969), LOI Grav. by University of WA
32	GSWA Government Chemical Laboratories.
33	Isotope dilution mass spectrometry, Sun & Nesbitt (1978)
34	XRF Nesbitt & Stanley (1980); traces
35	XRF (Nesbitt, et al, 1976); traces, by pressed powders
36	XRF (Norrish & Hutton, 1969, Norrish & Chappell, 1977) at ANU; FeO, H ₂ O+, H ₂ O-, CO ₂ gravimetrically, La-Tb by INAA WA (O'Beirne, 1968)
37	Wet chemistry by University of WA (O'Beirne, 1968)
38	XRF (Mo,Sr,Rb,Pb,As,Zn,Cu,Ni,Cr), AAS (Li),(UWA : O'Beirne, 1968)

APPENDIX 1a. Listings of the components of the McArthur Basin Data Set.

A1a.1 Samples assigned to Stratigraphic Groups

STRATGROUP	COUNT (*)
unassigned	33
McArthur Group	474
Nathan Group	12
Tawallah Group	14

A1a.2 Samples assigned to Subgroups

SUBGROUP	COUNT (*)
unassigned	59
Batten Subgroup	457
Umbolooga Subgroup	17

A1a.3 Samples assigned to Stratigraphic Units

STRATUNIT	COUNT (*)
Balbirini Dolomite	12
Barney Creek Formation	5
Fagan Volcanics	2
Gold Creek Volcanics	15
Hobblechain Rhyolite	2
Looking Glass Formation	10
Lynott Formation	350
Lynott Formation?	12
Masterton Formation	1
Packsaddle Microgranite	2
Redbank Formation	3
Reward Dolomite	12
Scrutton Volcanics	3
Seigal Volcanics	1
Settlement Creek Volcanics	16
Stretton Formation	6
Wollogorang Formation	1
Yalco Formation	79
unnamed dyke	1

A1a.4 Samples assigned to Stratigraphic Members

STRATMEMBER	COUNT (*)
unassigned	171
Caranbirini Member	129
Donnegan Member	24
Hot Spring Member	197

Smythe Sandstone Member

12

A1a.5 Samples assigned by Rocktype

<u>ROCKNO</u>	<u>ROCKTYPE</u>	<u>COUNT (*)</u>
-	1 unknown	5
	2 felsic intrusive	2
	3 intermediate intrusive	3
	4 mafic intrusive	4
	5 felsic extrusive	7
	7 mafic extrusive	15
	9 alkaline igneous	7
	10 clastic sediment	16
	18 mixed clastic/chemical sediment	474

A1a.6 Samples assigned by Chronological Age

<u>AGE</u>	<u>COUNT (*)</u>
unassigned	27
early Proterozoic	18
early Proterozoic (~1650-1700 Ma)	486
early Proterozoic (~1850 Ma)	2

A1a.7 Samples assigned by Geographic Area

<u>GEOGAREA</u>	<u>COUNT (*)</u>
unassigned	513
Batten Trough	1
Central Arnhem Land	1
Walker Fault Trough	1
Wearyan Shelf	17

A1a.8 Samples assigned by 1:100 000 Map Sheet Areas

<u>MAPNAME</u>	<u>MAPNO</u>	<u>COUNT (*)</u>
BATTEN	6065	169
BORROLOOLA	6165	91
FLEMING	5971	1
FOELSCHE	6264	1
GLYDE	6164	106
KOOLATONG	6071	1
MALLAPUNYAH	6064	121
SURPRISE CREEK	6263	2
TAWALLAH RANGE	6066	12
WOLLOGORANG	6463	26

A1a.9 Samples assigned to Drillholes

<u>DRILLHOLE</u>	<u>COUNT (*)</u>
unassigned	38

Amoco82-5	146
Amoco82-6	106
Amoco82-7	28
Berjaya 3	13
Bingbong2	12
DDH 1	2
DDH 13	1
DDH 3	2
DDH NWR 5003	1
DDH RO21	1
DDH RO30	2
Leila Yd 1	91
Mant78-1	68
Mant79-3	22

Appendix 1b. Listings of the components of the Murphy Inlier Data Set.

A1b.1 Samples assigned to Stratigraphic Groups

STRATGROUP	COUNT (*)
unassigned	74

A1b.2 Samples assigned to Subgroups

SUBGROUP	COUNT (*)
unassigned	67

A1b.3 Samples assigned to Stratigraphic Units

STRATUNIT	COUNT (*)
Cliffdale Volcanics	42
Nicholson Granite Complex	29
unnamed dolerite dyke	3

A1b.4 Samples assigned to Stratigraphic Members

STRATMEMBER	COUNT (*)
unassigned	67
Billicumidjii Rhyolite Member	7

A1b.5 Samples assigned by Rocktype

ROCKNO	ROCK	COUNT (*)
-	2 felsic intrusive	27
	4 mafic intrusive	3
	5 felsic extrusive	40
	6 intermediate extrusive	2
	15 metasomatite	2

A1b.6 Samples assigned by Chronological Age

AGE	COUNT (*)
Proterozoic	2
early Proterozoic	72

A1b.7 Samples assigned by Geographic Area

<u>GEOGAREA</u>	<u>COUNT (*)</u>
unassigned	74

A1b.8 Samples assigned to 1:100 000 Map Sheet Areas

<u>MAPNAME</u>	<u>MAPNO</u>	<u>COUNT (*)</u>
HEDLEYS CREEK	6562	25
SEIGAL	6462	47

A1b.9 Samples assigned to Drillholes

<u>DRILLHOLE</u>	<u>COUNT (*)</u>
unassigned	74

Appendix 2. Rockchem Database Definitions

A2.1 Samples Table Description:

CREATE SPACE DEFINITION SPACE_GCSAMPLES

DATAPAGES (INITIAL 2000,
INCREMENT 500,
MAXEXTENTS 9999,
PCTFREE 25)

INDEXPAGES (INITIAL 200,
INCREMENT 100,
MAXEXTENTS 9999)

PARTITION C;

CREATE TABLE SAMPLES (

ORIGNO	NUMBER	(5,0)	NOT NULL,
SAMPNO	CHAR	(16)	NOT NULL,
FIELDNO	CHAR	(16),	
STRATGROUP	CHAR	(64),	
SUBGROUP	CHAR	(64),	
STRATUNIT	CHAR	(64),	
STRATMEMBER	CHAR	(64),	
STRATHEIGHT	NUMBER	(8,2),	
MAPSYMBOL	CHAR	(10),	
ROCKNO	NUMBER	(5,0),	
LITHOLOGY	CHAR	(64),	
GROUPING	CHAR	(22),	
AGE	CHAR	(64),	
REFNO1	NUMBER	(5,0),	
REFNO2	NUMBER	(5,0),	
REFNO3	NUMBER	(5,0),	
REFNO4	NUMBER	(5,0),	
REFNO5	NUMBER	(5,0),	
COUNTRYID	CHAR	(22),	
STATE	CHAR	(10),	
REGIONO	NUMBER	(5,0),	
GEOGAREA	CHAR	(64),	
LOCALITY	CHAR	(64),	
MAPNO	NUMBER	(5,0),	
AIRPHOTO	CHAR	(22),	
GRIDREF	CHAR	(10),	
DLAT	NUMBER	(8,6),	
NS	CHAR	(1),	
DLONG	NUMBER	(9,6),	
EW	CHAR	(1),	
DRILLHOLE	CHAR	(22),	
DEPTH	CHAR	(10),	
OTHERDATA	CHAR	(64),	
ENTRYDATE	DATE)

SPACE SPACE_GCSAMPLES;

```

CREATE UNIQUE INDEX ORIGSAMP ON SAMPLES ( ORIGNO, SAMPNO );
CREATE          INDEX SAMPLENO ON SAMPLES ( SAMPNO );
CREATE          INDEX REGIONS ON SAMPLES ( REGIONO );
CREATE          INDEX HMAPS ON SAMPLES ( MAPNAME );

```

A2.2 Samplesplits Table Description:

```

CREATE SPACE DEFINITION SPACE_GCSPLITS
  DATAPAGES    (  INITIAL      500,
                  INCREMENT    250,
                  MAXEXTENTS   9999,
                  PCTFREE      25    )
  INDEXPAGES    (  INITIAL      150,
                  INCREMENT    100,
                  MAXEXTENTS   9999  )

  PARTITION C;

CREATE TABLE SAMPLES (
  ORIGNO          NUMBER          (5,0)          NOT NULL,
  SAMPNO          CHAR            (16)           NOT NULL,
  SAMPTYPENO      NUMBER          (5,0)           NOT NULL,
  STOREBOXNO      NUMBER          (5,0)           )
SPACE SPACE_GCSPLITS;

CREATE INDEX SAMPORIG ON SAMPLESPLITS ( ORIGNO, SAMPLENO ) ;
CREATE INDEX SPLITYPE ON SAMPLESPLITS ( SAMPTYPENO ) ;

```

A2.3 Majors Table Description:

```

CREATE SPACE DEFINITION SPACE_GCMAJORS
  DATAPAGES    (  INITIAL      1000,
                  INCREMENT    400,
                  MAXEXTENTS   9999,
                  PCTFREE      10    )
  INDEXPAGES    (  INITIAL      200,
                  INCREMENT    100,
                  MAXEXTENTS   9999  )

  PARTITION C;

CREATE TABLE MAJORS (
  ORIGNO          NUMBER          (5,0)          NOT NULL,
  SAMPNO          CHAR            (16)           NOT NULL,
  ANALNO          NUMBER          (5,0)           NOT NULL,
  SOURCENO        NUMBER          (5,0),
  METHODNO         NUMBER          (5,0),
  SIO2            NUMBER          (4,2),
  TIO2            NUMBER          (4,2),
  AL2O3           NUMBER          (4,2),
  FE2O3TOT        NUMBER          (4,2),
  FE2O3           NUMBER          (4,2),
  FEO             NUMBER          (4,2),
  MNO             NUMBER          (4,2),
  MGO             NUMBER          (4,2),
  CAO             NUMBER          (4,2),
  NA2O            NUMBER          (4,2),

```

```

K2O                NUMBER          (4,2),
P2O5               NUMBER          (4,2),
H2OPLUS            NUMBER          (4,2),
H2OMIN             NUMBER          (4,2),
CO2                NUMBER          (4,2),
LOI                NUMBER          (4,2),
REST               NUMBER          (4,2),
TOTAL              NUMBER          (5,2),
ENTRYDATE          DATE
SPACE SPACE_GCMAJORS;

```

```

CREATE UNIQUE INDEX MANALNO ON MAJORS ( ANALNO );
CREATE          INDEX MORIGSAMP ON MAJORS ( ORIGNO, SAMPNO );
CREATE          INDEX MSAMPLENO ON MAJORS ( SAMPNO );

```

A2.4 Traces Table Description:

```

CREATE SPACE DEFINITION SPACE_GCTRACES
  DATAPAGES    ( INITIAL      1200,
                 INCREMENT    400,
                 MAXEXTENTS   9999,
                 PCTFREE      30  )
  INEXPAGES    ( INITIAL      200,
                 INCREMENT    100,
                 MAXEXTENTS   9999  )

PARTITION C;

```

```

CREATE TABLE TRACES  (
  ORIGNO          NUMBER          (5,0)      NOT NULL,
  SAMPNO          CHAR            (16)        NOT NULL,
  ANALNO          NUMBER          (5,0)        NOT NULL,
  SOURCENO        NUMBER          (5,0),
  METHODNO        NUMBER          (5,0),
  AG              NUMBER          (8,2),
  AL              NUMBER          (8,2),
  ARS             NUMBER          (8,2),
  AU              NUMBER          (8,2),
  B               NUMBER          (8,2),
  BA              NUMBER          (8,2),
  BE              NUMBER          (8,2),
  BI              NUMBER          (8,2),
  BR              NUMBER          (8,2),
  C               NUMBER          (8,2),
  CA              NUMBER          (8,2),
  CD              NUMBER          (8,2),
  CE              NUMBER          (8,2),
  CL              NUMBER          (8,2),
  CO              NUMBER          (8,2),
  CR              NUMBER          (8,2),
  CS              NUMBER          (8,2),
  CU              NUMBER          (8,2),
  DY              NUMBER          (8,2),
  ER              NUMBER          (8,2),
  EU              NUMBER          (8,2),

```

F	NUMBER	(8,2),
FE	NUMBER	(8,2),
GA	NUMBER	(8,2),
GE	NUMBER	(8,2),
GD	NUMBER	(8,2),
HF	NUMBER	(8,2),
HG	NUMBER	(8,2),
HO	NUMBER	(8,2),
IR	NUMBER	(8,2),
K	NUMBER	(8,2),
LA	NUMBER	(8,2),
LI	NUMBER	(8,2),
LU	NUMBER	(8,2),
MG	NUMBER	(8,2),
MN	NUMBER	(8,2),
MO	NUMBER	(8,2),
NA	NUMBER	(8,2),
NB	NUMBER	(8,2),
ND	NUMBER	(8,2),
NI	NUMBER	(8,2),
OS	NUMBER	(8,2),
P	NUMBER	(8,2),
PB	NUMBER	(8,2),
PD	NUMBER	(8,2),
PR	NUMBER	(8,2),
PT	NUMBER	(8,2),
RB	NUMBER	(8,2),
S	NUMBER	(8,2),
SB	NUMBER	(8,2),
SE	NUMBER	(8,2),
SC	NUMBER	(8,2),
SI	NUMBER	(8,2),
SM	NUMBER	(8,2),
SN	NUMBER	(8,2),
SR	NUMBER	(8,2),
TA	NUMBER	(8,2),
TB	NUMBER	(8,2),
TE	NUMBER	(8,2),
TI	NUMBER	(8,2),
TH	NUMBER	(8,2),
TL	NUMBER	(8,2),
TM	NUMBER	(8,2),
U	NUMBER	(8,2),
V	NUMBER	(8,2),
W	NUMBER	(8,2),
Y	NUMBER	(8,2),
YB	NUMBER	(8,2),
ZN	NUMBER	(8,2),
ZR	NUMBER	(8,2),
ENTRYDATE	DATE)

SPACE SPACE_GCTRACES;

CREATE UNIQUE INDEX TANALNO ON TRACES (ANALNO);

CREATE INDEX TORIGSAMP ON TRACES (ORIGNO, SAMPNO);

CREATE INDEX TSAMPLENO ON TRACES (SAMPNO);

A2.5 ppb Table Description (elements in parts per billion):

CREATE SPACE DEFINITION SPACE_GSMALL

```

DATAPAGES  ( INITIAL      50,
              INCREMENT    50,
              MAXEXTENTS   9999,
              PCTFREE      25  )

INDEXPAGES  ( INITIAL      20,
              INCREMENT    12,
              MAXEXTENTS   9999  )

PARTITION C;
```

CREATE TABLE PPB (

ORIGNO	NUMBER	(5,0)	NOT NULL,
SAMPNO	CHAR	(16)	NOT NULL,
ANALNO	NUMBER	(5,0)	NOT NULL,
SOURCENO	NUMBER	(5,0),	
METHODNO	NUMBER	(5,0),	
SE	NUMBER	(8,3),	
RB	NUMBER	(8,3),	
RU	NUMBER	(8,3),	
RH	NUMBER	(8,3),	
PD	NUMBER	(8,3),	
AG	NUMBER	(8,3),	
CS	NUMBER	(8,3),	
LA	NUMBER	(8,3),	
CE	NUMBER	(8,3),	
PR	NUMBER	(8,3),	
ND	NUMBER	(8,3),	
PM	NUMBER	(8,3),	
SM	NUMBER	(8,3),	
EU	NUMBER	(8,3),	
GD	NUMBER	(8,3),	
TB	NUMBER	(8,3),	
DY	NUMBER	(8,3),	
HO	NUMBER	(8,3),	
ER	NUMBER	(8,3),	
TM	NUMBER	(8,3),	
YB	NUMBER	(8,3),	
LU	NUMBER	(8,3),	
RE	NUMBER	(8,3),	
OS	NUMBER	(8,3),	
IR	NUMBER	(8,3),	
PT	NUMBER	(8,3),	
AU	NUMBER	(8,3),	
ENTRYDATE	DATE)

CREATE UNIQUE INDEX PPBANALNO ON PPB (ANALNO);

CREATE INDEX PPBORIGSAMP ON PPB (ORIGNO, SAMPNO);

CREATE INDEX PPBSAMPLENO ON PPB (SAMPNO);

A2.6 Rocktypes Table Description:

CREATE SPACE DEFINITION SPACE_GSMALL

```

DATAPAGES  ( INITIAL      50,
              INCREMENT    50,
```

```

                                MAXEXTENTS 9999,
                                PCTFREE     25    )
INDEXPAGES  ( INITIAL         20,
              INCREMENT       12,
              MAXEXTENTS     9999 )

PARTITION C;

CREATE TABLE ROCKTYPES (
  ROCKNO          NUMBER          (5,0)      NOT NULL,
  ROCKTYPE        CHAR            (64)       NOT NULL
SPACE SPACE_GCSMALL

```

A2.7 References Table Description:

```

CREATE SPACE DEFINITION SPACE_GSMALL
  DATAPAGES  ( INITIAL         50,
              INCREMENT       50,
              MAXEXTENTS     9999,
              PCTFREE        25    )
  INDEXPAGES ( INITIAL         20,
              INCREMENT       12,
              MAXEXTENTS     9999 )

PARTITION C;

CREATE TABLE REFERENCES(
  REFNO          NUMBER          (5,0)      NOT NULL,
  OTHERID        CHAR            (16)
  USERNAME       CHAR            (16)
  AUTHORS        CHAR            (128)
  YEAR           CHAR            (16)
  TITLE          CHAR            (240)
  SOURCE         CHAR            (240)      )
SPACE SPACE_GCSMALL;

CREATE UNIQUE INDEX REFNUMBER ON REFERENCES ( REFNO );
CREATE UNIQUE INDEX REFUNIQUE ON REFERENCES ( AUTHORS, YEAR );

```

A2.8 Originators Table Description:

```

CREATE SPACE DEFINITION SPACE_GSMALL
  DATAPAGES  ( INITIAL         50,
              INCREMENT       50,
              MAXEXTENTS     9999,
              PCTFREE        25    )
  INDEXPAGES ( INITIAL         20,
              INCREMENT       12,
              MAXEXTENTS     9999 )

PARTITION C;

CREATE TABLE ORIGINATORS (
  ORIGNO          NUMBER          (5,0)      NOT NULL,
  ORIGINATOR      CHAR            (22)       NOT NULL )
SPACE SPACE_GCSMALL;

CREATE UNIQUE INDEX ORIGNOS ON ORIGINATORS ( ORIGNO );
CREATE UNIQUE INDEX ORIGINS ON ORIGINATORS ( ORIGINATOR );

```

A2.9 Regions Table Description:

CREATE SPACE DEFINITION SPACE_GSMALL

```

    DATAPAGES    (  INITIAL      50,
                   INCREMENT     50,
                   MAXEXTENTS    9999,
                   PCTFREE       25  )
    INDEXPAGES   (  INITIAL      20,
                   INCREMENT     12,
                   MAXEXTENTS    9999  )

    PARTITION C;
```

CREATE TABLE REGIONS (

```

    REGIONO      NUMBER      (5,0)      NOT NULL,
    REGION        CHAR        (64)       NOT NULL )
```

SPACE SPACE_GCSMALL;

CREATE UNIQUE INDEX REGIONO ON REGIONS (REGIONO);

CREATE UNIQUE INDEX REGIONAME ON REGIONS (REGION);

A2.10 HMAPS Table Description:

CREATE SPACE DEFINITION HMAPS

```

    DATAPAGES    (  INITIAL      50
                   INCREMENT     10
                   MAXEXTENTS    9999,
                   PCTFREE       10  )
    INDEXPAGES   (  INITIAL      20
                   INCREMENT     10
                   MAXEXTENTS    9999  )

    PARTITION C;
```

CREATE TABLE HMAPS (

```

    HMAPNO      NUMBER      (4,0)
    HMAPID      CHAR        (4)
    QMAPNO      NUMBER      (2,0)
    N_LAT       NUMBER      (3,1)
    W_LONG      NUMBER      (4,1)
    MEAST       NUMBER      (6)
    MNORTH      NUMBER      (7)
```

SPACE SP_LOCAL

CREATE UNIQUE INDEX HMAPNO ON HMAPS (HMAPNO);

CREATE INDEX HMAPNAME ON HMAPS (HMAPNAME);

CREATE INDEX NLAT ON HMAPS (N_LAT);

CREATE INDEX WLONG ON HMAPS (W_LONG);

A2.11 Sampletypes Table Description:

CREATE SPACE DEFINITION SPACE_GSMALL

```

    DATAPAGES    (  INITIAL      50,
                   INCREMENT     50,
                   MAXEXTENTS    9999,
                   PCTFREE       25  )
    INDEXPAGES   (  INITIAL      20,
                   INCREMENT     12,
                   MAXEXTENTS    9999  )
```

PARTITION C;

```
CREATE TABLE SAMPLETYPES (
  SAMPLETYPENO      NUMBER      (5,0)      NOT NULL,
  SAMPLETYPE        CHAR        (64)      NOT NULL )
SPACE SPACE_GCSMALL;
```

A2.12 Sources Table Description:

```
CREATE SPACE DEFINITION SPACE_GSMALL
  DATAPAGES    ( INITIAL      50,
                INCREMENT     50,
                MAXEXTENTS    9999,
                PCTFREE       25  )
  INDEXPAGES   ( INITIAL      20,
                INCREMENT     12,
                MAXEXTENTS    9999  )
  PARTITION C;
```

```
CREATE TABLE SOURCES (
  SOURCENO      NUMBER      (5,0)      NOT NULL,
  SOURCE        CHAR        (64)      NOT NULL )
SPACE SPACE_GCSMALL;
```

```
CREATE UNIQUE INDEX SOURCENOS ON SOURCES ( SOURCENO );
CREATE UNIQUE INDEX SOURCES ON SOURCES ( SOURCE );
```

A2.13 Methods Table Description:

```
CREATE SPACE DEFINITION SPACE_GSMALL
  DATAPAGES    ( INITIAL      50,
                INCREMENT     50,
                MAXEXTENTS    9999,
                PCTFREE       25  )
  INDEXPAGES   ( INITIAL      20,
                INCREMENT     12,
                MAXEXTENTS    9999  )
  PARTITION C;
```

```
CREATE TABLE SOURCES (
  SOURCENO      NUMBER      (5,0)      NOT NULL,
  SOURCE        CHAR        (64)      NOT NULL )
SPACE SPACE_GCSMALL;
```

```
CREATE UNIQUE INDEX METHODNO ON METHODS ( METHODNO );
CREATE UNIQUE INDEX METHOD ON METHODS ( METHOD );
```

A2.14 Storeboxes Table Description:

```
CREATE SPACE DEFINITION SPACE_GSMALL
  DATAPAGES    ( INITIAL      50,
                INCREMENT     50,
                MAXEXTENTS    9999,
                PCTREE        25  )
  INDEXPAGES   ( INITIAL      20,
                INCREMENT     12,
                MAXEXTENTS    9999  )
```


PARTITION C;

```
CREATE TABLE STOREBOXES (
  BOXNO          NUMBER      (5,0)      NOT NULL,
  ORIGNO         NUMBER      (5,0),
  FROMSAMPNO     CHAR        (16)
  TOSAMPNO       CHAR        (16)
  PROJECT        CHAR        (64)      )
SPACE SPACE_GCSMALL;
```

CREATE UNIQUE INDEX STOREBOXNOS ON STOREBOXES (BOXNO);

A2.15 Maxnos Table Description:

```
CREATE SPACE DEFINITION SPACE_GSMALL
  DATAPAGES    ( INITIAL      50,
                 INCREMENT    50,
                 MAXEXTENTS   9999,
                 PCTFREE      25  )
  INEXPAGES    ( INITIAL      20,
                 INCREMENT    12,
                 MAXEXTENTS   9999  )

PARTITION C;
```

```
CREATE TABLE MAXNOS (
  IDMAXNO       CHAR        (16)      NOT NULL,
  MAXNO         NUMBER      (6,0)     NOT NULL )
SPACE SPACE_GCSMALL;
```