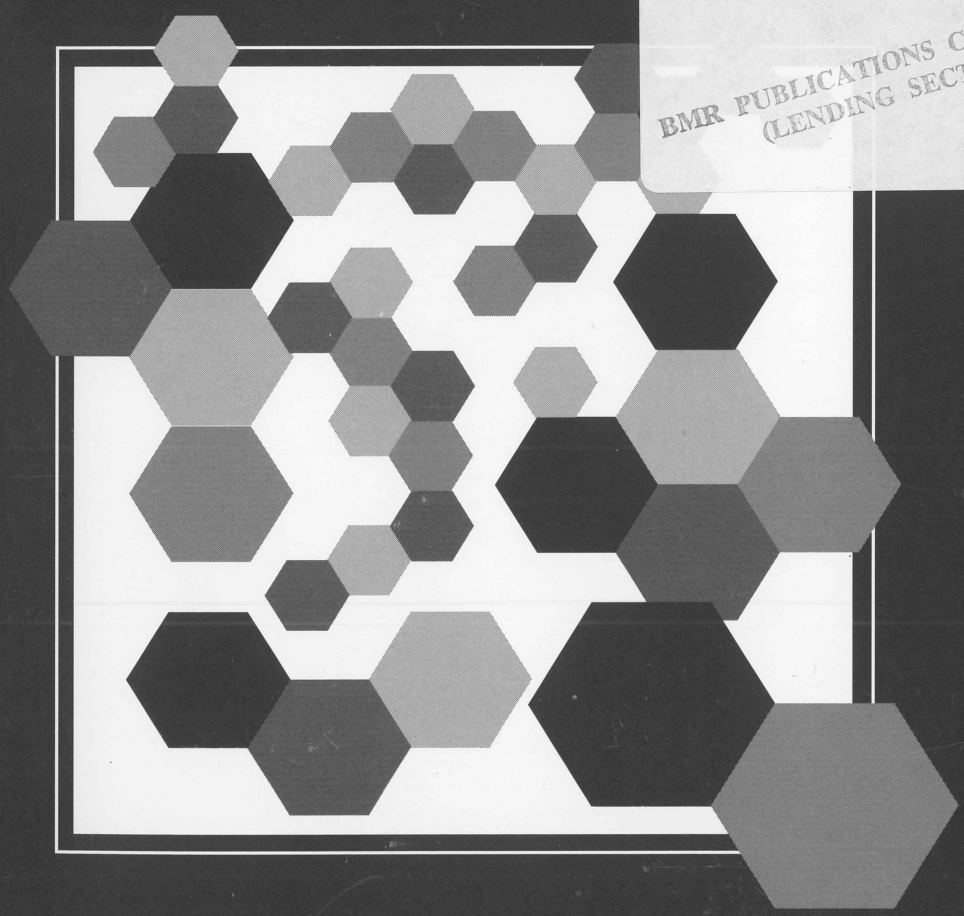
BMR
GEOLOGY AND
GEOPHYSICS
AUSTRALIA

1991/43
c.4

WEST AUSTRALIAN PROTEROZOIC ROCKCHEM DATA SET DOCUMENTATION

RECORD 1991/43

BMR PUBLICATIONS COMPACTUS
(LENDING SECTION)
BUREAU OF MINERAL RESOURCES
LIBRARY
17 SEP 1991
CANBERRA, A.C.T.



by L.A.I. Wyborn and R.J. Ryburn

1991/43
c.4

Bureau of Mineral Resources, Geology and Geophysics

BMR
GEOLOGY AND
GEOPHYSICS
AUSTRALIA

West Australian Proterozoic Rockchem Data Set Documentation

Record 1991/43

by

L.A.I. Wyborn, and R.J. Ryburn

R9104301

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

© Commonwealth of Australia, 1991.

ISSN 0811-062X

ISBN 0 642 16380 4

This work is copyright. Apart from any fair dealing for the purpose of study, research, critism, or review, as permitted under the Copyright Act, no part may be reproduced by any process without written permission. Copyright is the responsibility of the Director, Bureau of Mineral Resources. Inquiries should be directed to the Principal Information Officer, Bureau of Mineral Resources, GPO Box 378, Canberra City, ACT, 2601.

ABSTRACT

ROCKCHEM is the whole rock geochemical data storage system of the Minerals and Land Use Program of the BMR, Geology and Geophysics and utilises the relational database management system ORACLE. This data set contains 447 analyses (both major and trace elements) from the Capricorn Province, Granites Tanami Block, and Halls Creek Block. Most samples are located by AMG grid references and/or decimal latitude and longitude. This record describes tables used in ROCKCHEM and defines the fields used within these tables. A short description of the data contained is given and a bibliography of the main references that were generated from the data.

TABLE OF CONTENTS

Abstract iii

Table of Contents iv

1. Introduction 2

2. The West Australian Data Set 3

2a. The Capricorn Province Database 4

2b. The Granites Tanami Block Database 4

2c. The Halls Creek Block Database 5

3. Structure of the Rockchem Database 5

4. Description of the Main Tables in Rockchem 6

4.1 The Samples Table 6
4.2 The Sample Splits Table 9
4.3 The Majors Table 9
4.4 The Traces Table 10
4.5 The ppb Table 11
4.6 The References Table 12

5. Description of Authority Tables in Rockchem 12

5.1 The 1:100 000 Maps Form 12
5.2 Countries Table 13
5.3 States Table 13
5.4 Originator Table 14
5.5 Regions Table 16
5.6 Rock Types Table 18
5.7 Sample Types Table 18
5.8 Sources Table 19
5.9 Methods Table 19

Appendix 1a: Listings of the components of the Capricorn Data Set 21

A1a.1 Samples assigned to Stratigraphic Groups 21
A1a.2 Samples assigned to Subgroups 21
A1a.3 Samples assigned to Stratigraphic Units 21
A1a.4 Samples assigned to Stratigraphic Members 21
A1a.5 Samples assigned by Rocktype 21
A1a.6 Samples assigned by Chronological Age 21
A1a.7 Samples assigned by Geographic Area 22

A1a.8 Samples assigned to 1:100 000 Map Sheet Areas 22
A1a.9 Samples assigned to Drillholes 22
Appendix 1b: Listings of the components of the Granites-Tanami Block Data Set 23
A1b.1 Samples assigned to Stratigraphic Groups 23
A1b.2 Samples assigned to Subgroups 23
A1b.3 Samples assigned to Stratigraphic Units 23
A1b.4 Samples assigned to Stratigraphic Members 23
A1b.5 Samples assigned by Rocktype 23
A1b.6 Samples assigned by Chronological Age 24
A1b.7 Samples assigned by Geographic Area 24
A1b.8 Samples assigned to 1:100 000 Map Sheet Areas 24
A1b.9 Samples assigned to Drillholes 24
Appendix 1c: Listings of the components of the Halls Creek Block Data Set 25
A1c.1 Samples assigned to Stratigraphic Groups 25
A1c.2 Samples assigned to Subgroups 25
A1c.3 Samples assigned to Stratigraphic Units 25
A1c.4 Samples assigned to Stratigraphic Members 26
A1c.5 Samples assigned by Rocktype 26
A1c.6 Samples assigned by Chronological Age 26
A1c.7 Samples assigned by Geographic Area 26
A1c.8 Samples assigned to 1:100 000 Map Sheet Areas 26
A1c.9 Samples assigned to Drillholes 27
Appendix 2: Rockchem Database Definitions 28
A2.1 Samples Table Description 28
A2.2 Samplesplits Table Description 29
A2.3 Majors Table Description 29
A2.4 Traces Table Description 30
A2.5 ppb Table Description 32
A2.6 Rocktypes Table Description 32
A2.7 References Table Description 33
A2.8 Originators Table Description 33
A2.9 Regions Table Description 34
A2.10 Hmaps Table Description 34
A2.11 Sampletypes Table Description 34
A2.12 Sources Table Description 35
A2.13 Methods Table Description 35
A2.14 Storeboxes Table Description 35
A2.15 Maxnos Table Description 36

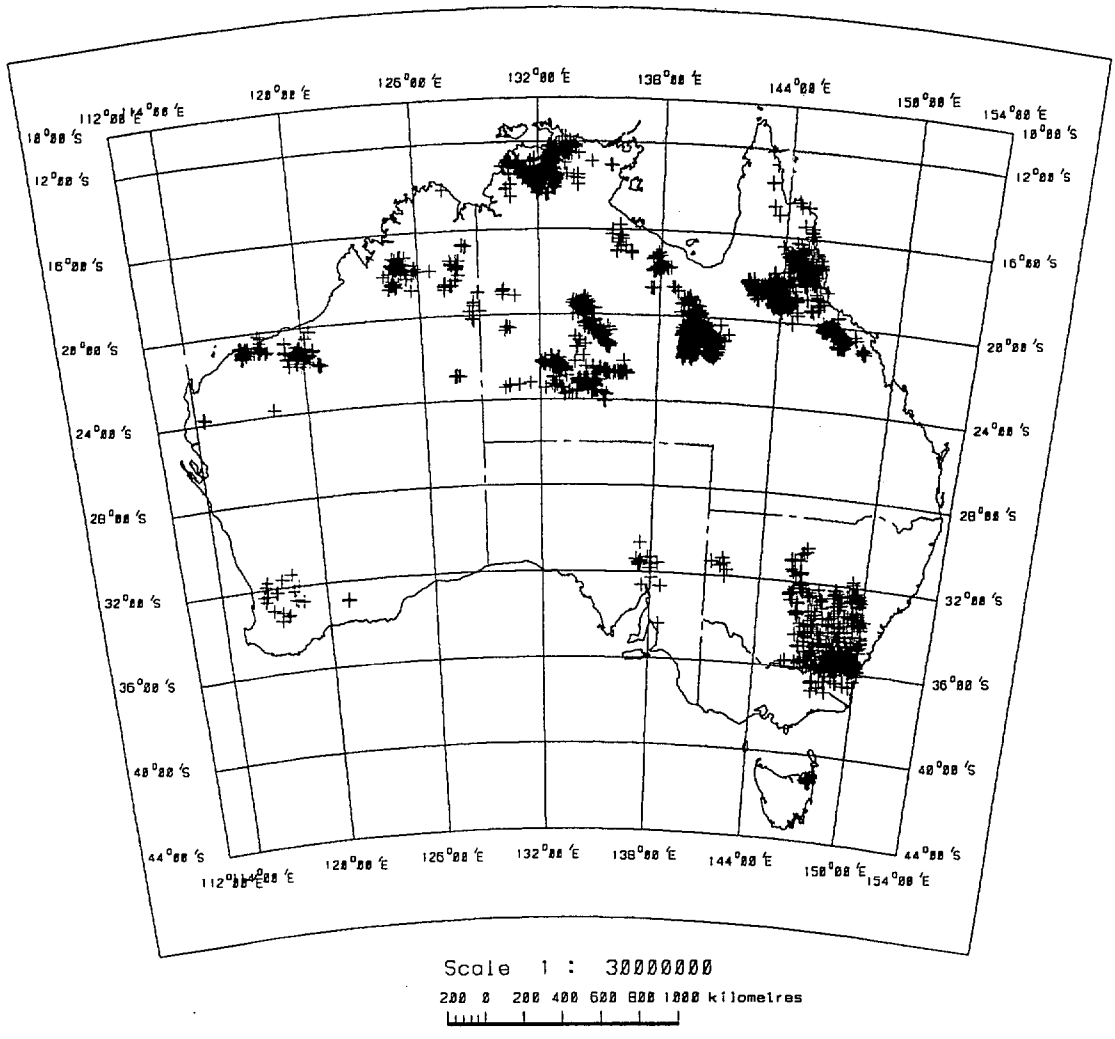


Figure 1. Distribution of Rockchem samples in Australia.

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 17445 analyses from Australia (see Figure 1) and Antarctica, and can be divided into either regional or thematic data sets. The data is currently subdivided into the data sets as listed in Table 1. Most of these data sets will be released by late 1991.

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 Tectonic Ridge	533 74	K. Plumb, L. Wyborn
Mount Isa	Mount Isa Inlier	2296	L. Wyborn
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, Adeliade 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	400	P.R. Williams
Thematic Databases			
Alkaline	Kimberlites Alkaline Rocks	880	A.L. Jaques
EAVS	East Australian Volcanics(Cainozoic)	2000	J. Knutson

Table 1. List of Data Sets in Rockchem.

2. THE WEST AUSTRALIAN DATA SET

This ROCKCHEM data set is a release of approximately 447 analyses from the Capricorn Province, Granites Tanami Block, and Halls Creek Block regions. Figure 2 shows the distribution of the analyses within the regions. Appendix 1 contains lisitngs of the individual components of the data set.

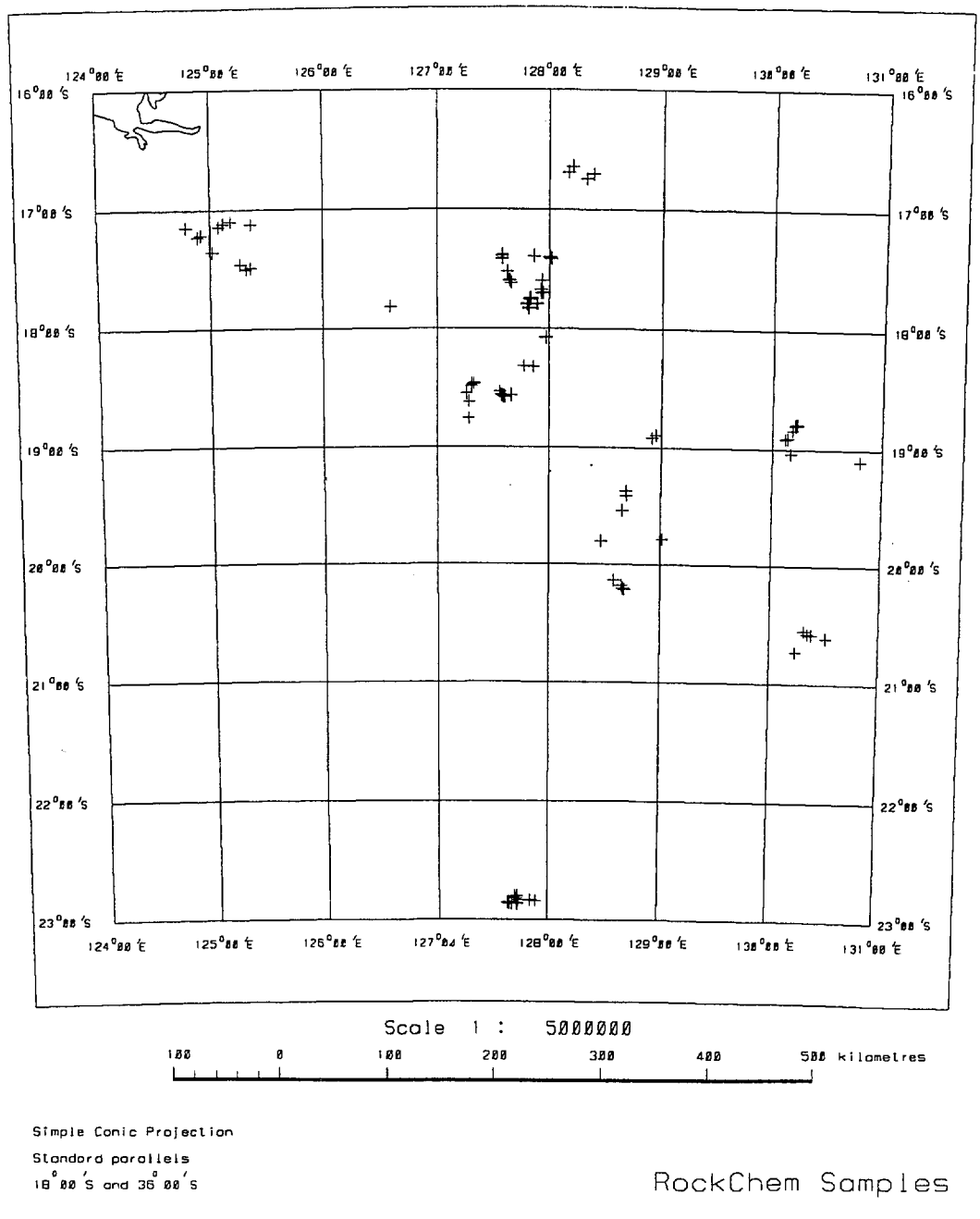


Figure 2. Rockchem samples in the Capricorn Province, Granites-Tanami Block and Halls Creek Block regions.

2a. Capricorn Province Database

Database type: regional

General Selection Criteria:

Field = regiono *Entry* = 53

Data description:

The Capricorn Province database contains 227 analyses of drill core samples from the Turee Creek uranium prospect. The data contain both mineralised and non-mineralised samples form the early Proterozoic Wyloo Group and the middle Proterozoic Bresnahan Group.

Future work:

No future work is planned in this area.

Bibliography:

Ewers, G.R., and Nakatsuka, N., 1986. Uranium mineralisation at Turee Creek, Western Australia - petrology, geochemistry and genesis. *Uranium*, 3, 27- 53.

2b. Granites-Tanami Block Database

Database type: regional

General Selection Criteria:

Field = regiono *Entry* = 36

Data description:

The Granites-Tanami database comprises 35 analyses of granites and felsic volcanics from throughout the region. The major element analyses were published by Blake & others (1979) and the trace element data were obtained in 1988.

Future work:

Granites and volcanics in the Granites-Tanami region will be sampled for chemical analysis during the 1990-1995 Kimberly-Arunta NGMA being carried out jointly by BMR, NT Geological Survey, and Geological Survey of WA.

Bibliography:

Blake, D.H., Hodgson, I.M., and Muhling, P.C., 1979. Geology of the Granites-Tanami Region Northern Territory and Western Australia. *Bureau of Mineral Resources, Geology and Geophysics, Australia, Bulletin,* 197.

2c. Halls Creek Block Database

Database type: regional

General Selection Criteria:

Field = regiono *Entry* = 17

Data description:

The Halls Creek Database consists of 62 analyses of mainly mafic igneous rocks obtained from (a) layered ultramafic-gabbroic intrusions, (b) tholeiitic dykes and (c) country rocks adjacent to the igneous bodies. The samples were collected in 1984 during a reconnaissance study to assess the platinum group element potential of this province.

Future work:

The BMR and the Geological Survey of WA are presently undertaking geochemical and geochronological work on granites and volcanics in this province as part of the 1990-1995 Kimberly-Arunta NGMA

Bibliography:

Wallace, D.A., Hoatson, D., and Sun, S-S. (in prep.). Whole rock geochemistry and petrography of selected mafic and ultramafic suites in the Pilbara Block and east Kimberley region, Western Australia. *Bureau of Mineral Resources, Geology and Geophysics, Australia, Record.*

Sun, S-S., Wallace, D.A., Hoatson, D.M., Glikson, A.Y., Keays, R.R., Hamlyn, P.R., and McCulloch, M.T., (in prep.). Geochemical characteristics of late Archaean to early Proterozoic mafic- ultramafic rocks from the west Pilbara Block and Halls Creek Mobile Zone, Western Australia, and their potential for platinum group element mineralisation. *Bureau of Mineral Resources, Geology and Geophysics, Australia, Report.*

3. STRUCTURE OF THE ROCKCHEM DATABASE

The Rockchem database contains seven main tables of data and eleven associated 'authority' tables. The names of the tables are as follows and full defintions 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 map 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.'.

*Fe_2O_3 - This field is reserved for total iron as Fe_2O_3. 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 Fe_2O_3 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 16 covering 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 southeast 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 ORIGINATOR 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 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.

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 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

5.6 ROCK TYPES TABLE

This table provides a coarse subdivision of samles based on broad rocktypes. It was initiated primarily for database management and block retrieval, and for future online extraction of data. For example, this table can be used 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
2	ANU
3	Adelaide University
4	AMDEL
5	BMR
6	BMR restricted
7	CSIRO/BMR
8	Macquarie University
9	Melbourne University
10	NTGS (AMDEL)
11	WA Govt. Chem. Lab.
12	WA/BMR Restricted
13	University of Queensland
14	James Cook University of North Queensland
15	Tasmanian Department of Mines
16	University of Tasmania
17	Queensland Department of Mines
18	BGR (Bundesanstalt fur Geowissenschaften und Rohstoffe)
19	Labtech Pty. Ltd., WAIT, WA Govt. Chem. Lab., Perth.
20	Institute for Petrology, Copenhagen University, Denmark
21	ANALABS
22	BMR/CRAE - T.Stachel

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.; H2O+, H2O-, & CO2 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, H2O(total), CO2 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 Cu Ni Pb Zn by emiss.
14	ICP,AES Inductively Coupled Plasma, Atomic Emission
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.

Appendix 1a - Listings of the components of the Capricorn Province Data Set.

A1a.1 Samples assigned to Stratigraphic Groups.

STRATGROUP	COUNT(*)
unassigned	2
Bresnahan Group	119
Wyloo Group	106

A1a.2 Samples assigned to Subgroups.

SUBGROUP	COUNT(*)
unassigned	227

A1a.3 Samples assigned to Stratigraphic Units.

STRATUNIT	COUNT(*)
unassigned	2
Ashburton Formation	11
Cherrybooka Conglomerate	7
Duck Creek Dolomite	18
Kunderong Sandstone	112
Mount McGrath Formation	77

A1a.4 Samples assigned to Stratigraphic Members.

STRATMEMBER	COUNT(*)
unassigned	227

A1a.5 Samples assigned by Rocktype.

ROCKNO	ROCKTYPE	COUNT(*)
10	clastic sediment	142
11	chemical sediment	7
15	metasomatite	78

A1a.6 Samples assigned by Chronological Age.

AGE	COUNT(*)
early Proterozoic	227

A1a.7 Samples assigned by Georgraphic Area.

GEOGAREA	COUNT(*)
unassigned	227

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

MAPNAME	MAPNO	COUNT(*)
KALLENIA	2550	227

A1a.9 Samples assigned to Drillholes.

DRILLHOLE	COUNT(*)
Pancontinental AR 1001	24
Pancontinental AR 1002	15
Pancontinental AR 1007	8
Pancontinental AR 1009	13
Pancontinental AR 1021	19
Pancontinental AR 1023	13
Pancontinental AR 1024	7
Pancontinental AR 1025	8
Pancontinental AR 1027	14
Pancontinental AR 1029	9
Pancontinental AR 1030	4
Pancontinental AR 1033	28
Pancontinental AR 1036	2
Pancontinental AR 1038	7
Pancontinental AR 1039	7
Pancontinental AR 1040	23
Pancontinental AR 1041	5
Pancontinental AR 1042	19
Pancontinental AR 2024	1
Pancontinental AR 2025	1

Appendix 1b - Listings of the components of the Granites-Tanami Block Data Set.

A1b.1 Samples assigned to Stratigraphic Groups.

STRATGROUP	COUNT(*)
unassigned	53

A1b.2 Samples assigned to Subgroups.

SUBGROUP	COUNT(*)
unassigned	53

A1b.3 Samples assigned to Stratigraphic Units.

STRATUNIT	COUNT(*)
unassigned	4
Killi Killi Beds	4
Lewis Granite	6
Mount Webb Granite	6
Mount Winnecke Formation	7
Nanny Goat Creek beds	1
Pollock Hills Formation	8
Slatey Creek Granite	4
The Granites Granite	5
Winnecke Granophyre	9
unnamed porphyry	1

A1b.4 Samples assigned to Stratigraphic Members.

STRATMEMBER	COUNT(*)
unassigned	53

A1b.5 Samples assigned by Rocktype.

ROCKNO	ROCKTYPE	COUNT(*)
2	felsic intrusive	28
5	felsic extrusive	18
6	intermediate extrusive	1
10	clastic sediment	1
14	metasediment	4

A1b.6 Samples assigned by Chronological Age.

AGE	COUNT(*)
unassigned	4
early Proterozoic	49

A1b.7 Samples assigned by Georgraphic Area.

GEOGAREA	COUNT(*)
unassigned	53

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

MAPNAME	MAPNO	COUNT(*)
BALWINA	4558	1
GIBBESMURRAY	5056	1
GORDON DOWNS	4669	3
GRANITES	4956	7
LEWIS	4657	6
MOUNT WINNECKE	4960	15
POLLOCK	4452	14
SLATEY CREEK	4659	3
WILSON CREEK	4959	1

A1b.9 Samples assigned to Drillholes.

DRILLHOLE	COUNT(*)
unassigned	53

Appendix 1c - Listings of the components of the Halls Creek Block Data Set.

A1c.1 Samples assigned to Stratigraphic Groups.

STRATGROUP	COUNT(*)
unassigned	24
ARGYLE LAMPROITES	17
Argyle Lamproite	30
Carr Boyd Group	4
Halls Creek Group	8
Kimberley Group	1
Lamboo Complex	78
Speewah Group	2

A1c.2 Samples assigned to Subgroups.

SUBGROUP	COUNT(*)
unassigned	164

A1c.3 Samples assigned to Stratigraphic Units.

STRATUNIT	COUNT(*)
unassigned	2
Alice Downs Ultrabasics	19
Argyle (AK1) Pipe	47
Biscay Formation	3
Bow Hill Dyke	5
Bow River Granite	2
Carson Volcanics	1
Ding Dong Downs Volcanics	1
Golden Gate Siltstone	1
Hart Dolerite	6
Hensman Sandstone	1
Kongorow Granite	1
Lennard River Granite	2
Lissadell Formation	2
Lissadell Road Dyke	2
McIntosh Gabbro	36
Mondama Granite	1
Olympio Formation	1
Revolver Creek Formation	3
Richenda Granodiorite	1
Saunders Creek Formation	1
Sophie Downs Granite	1
Tickalara Metamorphics	5
Valentine Siltstone	2
Whitewater Volcanics	1
Woodward Dolerite	17

A1c.4 Samples assigned to Stratigraphic Members.

STRATMEMBER	COUNT(*)
unassigned	144
Lamboo Sill	6
Panton Sill	13
ST. 'Sandy Tuff'	1

A1c.5 Samples assigned by Rocktype.

ROCKNO	ROCKTYPE	COUNT(*)
2	felsic intrusive	8
4	mafic intrusive	69
5	felsic extrusive	4
7	mafic extrusive	1
8	ultramafic	9
9	alkaline igneous	54
10	clastic sediment	12
12	metabasite	1
14	metasediment	6

A1c.6 Samples assigned by Chronological Age.

AGE	COUNT(*)
unnassigned	132
early Proterozoic	24
late Proterozoic	2
middle Proterozoic	6

A1c.7 Samples assigned by Geographic Area.

GEOGAREA	COUNT(*)
unassigned	54
Halls Creek Mobile Belt	88
Kimberley Basin	9
King Leopold Inlier	9
Victoria River Basin	4

A1c.8 Samples assigned to 1:100 000 Map Sheet Areas.

MAPNAME	MAPNO	COUNT(*)
ANGELO	4361	7
BOW	4564	61
DOCKRELL	4360	3
HALLS CREEK	4461	5
LAPTZ		2
LENNARD	3863	3
LEOPOLD DOWNS	3962	1
MCINTOSH	4462	48
MOUNT REMARKABLE	4463	5

RICHENDA	3963	7
RUBY PLAINS	4460	16
TURKEY CREEK	4563	6

A1c.9 Samples assigned to Drillholes.

DRILLHOLE	COUNT(*)
unassigned	109
AK1 Pipe	5
BHD3	3
DDH 106	3
DDH 108	4
DDH 110	2
DDH 113	1
DDH 123	1
DDH 130	1
DDH 153	3
DDH 160	2
DDH 17	9
DDH 22	3
DDH 31	5
DDH 56	2
DDH 59	2
DDH 82	2
DDH 87	1
DDH GT2	4
LDC	1
LRD2	1

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 Tables Description:

```
CREATE SPACE DEFINITION SPACE_GCTRACES
    DATAPAGES    ( INITIAL      1200,
                   INCREMENT    400,
                   MAXEXTENTS   9999,
                   PCTFREE      30     )
    INDEXPAGES   ( 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),
      TH                            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 ( ORIGNATOR );
```

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 DEFINTION 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 SOURCE ( 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 SOURCES (
    SOURCENO                NUMBER          (5,0)          NOT NULL,
    SOURCE                  CHAR            (64)           NOT NULL )
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    )
    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;
```