

Geological Site Observation Database For Queensland (REGMAP)

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Introduction

The data contained on this DVD consists of geological site observation data (ca 183,000 sites) captured during geological mapping activities of the Geological Survey of Queensland, mostly since 1986. The data compiled includes rock types, rock characteristics (e.g. colour, grain size, texture etc), structural measurements and formation name. Some pre-1986 data has been entered retrospectively from notebooks, and many of these sites include only a free text summary and structural observations. In addition, some structural measurements have been digitised from 1:100 000 and 1:250 000K geological maps published pre-1986. The isotopic dates (SHRIMP U-Pb, K-Ar etc) included on this CD are all the age determinations obtained by the GSQ and some of those available in the public domain (>2700 dates). The whole rock geochemistry is a compilation of all the analyses (12666) completed by the GSQ during its regional map activities and those collected in joint projects between GSQ and Geoscience Australia. These analyses have been used to classify rock types and improve the understanding of Queensland's geology. The data set has been extracted from the department's corporate relational database and decoded and concatenated where possible for ease of use.

Most tables have been populated with latitude, longitude, AMG zone and co-ordinates for ease of display in GIS (Geographic Information System) software. The data is provided relative to the GDA94 datum, but a table containing coordinates in both AGD66 and GDA94 systems has been provided to allow conversion if required. In addition many tables have been populated with corresponding Rock Units and Structural Units. Although this introduces some redundancy, it reduces the amount of linking required when the data are used in the GIS software.

Software

The database has been compiled into Microsoft Access from the original Oracle database.

See table structure for table name details and content.

History of REGMAP data compilation in Queensland

The need for a computerised field data system

Reconnaissance mapping of the Queensland at 1:250 000 was completed in the early 1970s with the support of the Bureau of Mineral Resources. In 1984 the GSQ took over the responsibility of revising this geological mapping database. It was apparent that the field notes made during the first pass mapping could be useful when revising the maps. If the notes were sufficiently detailed, it might not be necessary to revisit many areas, and field work could thus be better directed. However, it was found that these notes, if preserved and available, required considerable work to retrieve selected and meaningful data and this often precluded their use. It was a lot easier to start more or less from scratch, using only the published maps and synthesis reports as a basis. Another problem was how to take advantage of modern

technology to rapidly retrieve, manipulate, and analyse the large amount of data collected as part of the more detailed second generation mapping, not only by individual geologists working on their own data, but groups of geologists being able to pool data. Another requirement was to make the field data compatible with geographic information systems (GIS) which were just starting to be developed.

The birth of REGMAP¹

After some experimentation and examining of systems used by other organisations, REGMAP was successfully trialled in 1986 and thereafter adopted for use by all geological mapping teams. REGMAP used standardised field notebooks. Data collected at each outcrop visited was divided into three basic types of information – site, structure, and lithology (Lang & others, 1990; Withnall & others, 1992). The site information recorded where the outcrop occurs spatially (map sheet, descriptive location, AMG coordinates etc.) and geologically (stratigraphic units, tectonic unit, and age). The orientations of various structural fabrics and palaeocurrents are recorded under the structural data. The major part of the database was the description of the rocks themselves, the lithological data. This data was the most difficult to adapt to a computerised system, because it is largely descriptive. For the system to overcome user resistance, it could not depend on too many codes, and had to be flexible enough to cope with the complete range of geological situations.

The concept behind the system adopted was that the description of each rock type at a field station or site can be broken down under a number of observation types or data types. The data type field was the key to the flexibility of the system, avoiding the restrictions imposed by fixed fields or 'tick-the-box' forms. The geologist decided what types of information need to be recorded, aided by a prompt list of common 'data types' and their four-letter codes. New types could be added to the system at any time to meet specialised needs. The description field for each 'data type' could contain as many lines as required and was essentially free text. Originally, Foxbase was used as the database management system and a range of programs to produce various kinds of selective retrieval and output were developed.

From 1986, data from all GSQ field programs were recorded using REGMAP and by the end of 1994, the database contained data from almost 45 000 field stations from about forty 1:100 000 map sheet areas. The system was quickly accepted by all geologists as a field recording system, and resulted in major changes to work practises in the office. The system proved its worth as many of the projects reached the final write-up stage. Data describing attributes of particular rocks or units could be selectively retrieved and output as lists and

¹ LANG, S.C, WITHNALL, I.W., & GRIMES, K.G., 1990: Regional Mapping Field Data Management System (REGMAP) - guide to data collection and entry. *Geological Mapping Manual 1*

WITHNALL, I.W., GRIMES, K.G., LANG, S.C. & THORNTON, M.P., 1992: Computerised geological field data management in Queensland - the REGMAP system; in *Geographic Information Systems, Cartographic and Geoscience Data Standards*, Bureau of Mineral Resources, Geology and Geophysics, 18-20 March 1992, Workshop Proceedings. *Bureau of Mineral Resources, Australia, Record 1992/27*.

in tabulated form without tedious manual searching of notebooks. The system was particularly useful for searching the data of staff who resigned before writing up their work. Output in graphical format was also aided by output of ASCII files in a variety of formats and read into in-house or proprietary software to produce plots of palaeocurrent or structural data etc. In addition to its use by GSQ field parties, the joint BMR-GSQ party in Cape York trialed the system and based its own field data management system OZROCKS on the concepts used by REGMAP.

However, by the mid-1990s, as REGMAP grew, file management, validation and security became major issues, and the need to migrate the data to a fully relational corporate database management system was recognised. The data tended to be stored as individual datasets by each geologist for ease and speed of manipulation by the then-available PC-based software and hardware. Also, the limitations of Foxbase prevented the development of validation on entry, and considerable effort was needed to validate codes. Because of the existence of multiple copies, it was difficult to determine which was the most up-to-date and whether it contained all the updates. Other datasets such as geochemical analyses were stored in separate databases, and could not be linked. The necessary locational data for these data had to be entered separately resulting in considerable redundancy.

Migration to Oracle

To address these deficiencies, a relational database structure, using Oracle software, was devised in 1993-94. This was finally put into production in early 1996 after existing data sets were migrated. The database is now referred to as the 'Surface Geology Database'. The data is broken up into Site information, Locations, Stratigraphic Intervals, Lithology (or Rocks), Observations, Interpretations, Samples and Analyses. Numerical measurements made on rocks such as Structures and Geophysical Measurements are linked to the text-based Observations. The basic REGMAP structure for the lithological observations was retained, but additional fields were added and wherever possible populated by codes selected from lookup tables. These are used to enable structured, shorthand recording of information and minimise both data storage requirements and the need for free text fields (although these are still available). Samples and analyses are all linked to the rocks that they apply to. The structured nature of the database enables accurate data searching processes to distil relevant information and assist, in targeting mineral exploration.

At present GSQ geologists have a choice to collect field data on hand-written proformas with data entry being done at head office or using a data-entry interface using Microsoft Access, which mirrors the Oracle data structure. This interface, which was developed around 2004, has a validation process to automate the clean-up of data errors, before this data is up-loaded in bulk to the Oracle 'Surface Geology Database' in the office. Tablet PCs with a Windows operating system, running the data-entry interface, combined with ArcMap environments, are now in common use in GSQ field mapping.

Attempts have also been made, particularly in south-east and central Queensland to enter data retrospectively from pre-REGMAP notebooks. These data are of mixed quality and completeness, many being limited to textual summaries and the structural measurements. Structural measurements on published hard copy maps have also been captured,

notably in the Mount Isa area, but also in the Drummond Basin and Yarrol Province.

The Surface Geology data are displayed through a structured graphical interface within the Department's Mineral and Energy Resources Location Information Network (MERLIN) and are also available to GIS software, other database software and report writer software via ODBC connection protocols. Internet delivery of this data via a GIS interface will be developed.

Geological Site Observation data, Isotopic Dates and Whole Rock Analyses (REGMAP database)

The site observation data on this DVD includes rock types, rock characteristics (e.g. colour, grain size, texture etc), structural measurements and formation name. These data have been decoded and in some cases concatenated into a simple relational database structure within Microsoft Access. The full unconcatenated database was considered too complex and unworkable (in excess of 60 separate linked tables) as a distribution format but is available as customised data extracts to clients who find the information in the simplified version unsuitable for their data analysis. The map below shows data coverage. The concatenated database is regenerated annually to capture any new or corrected/updated information.

Distribution of Site Data

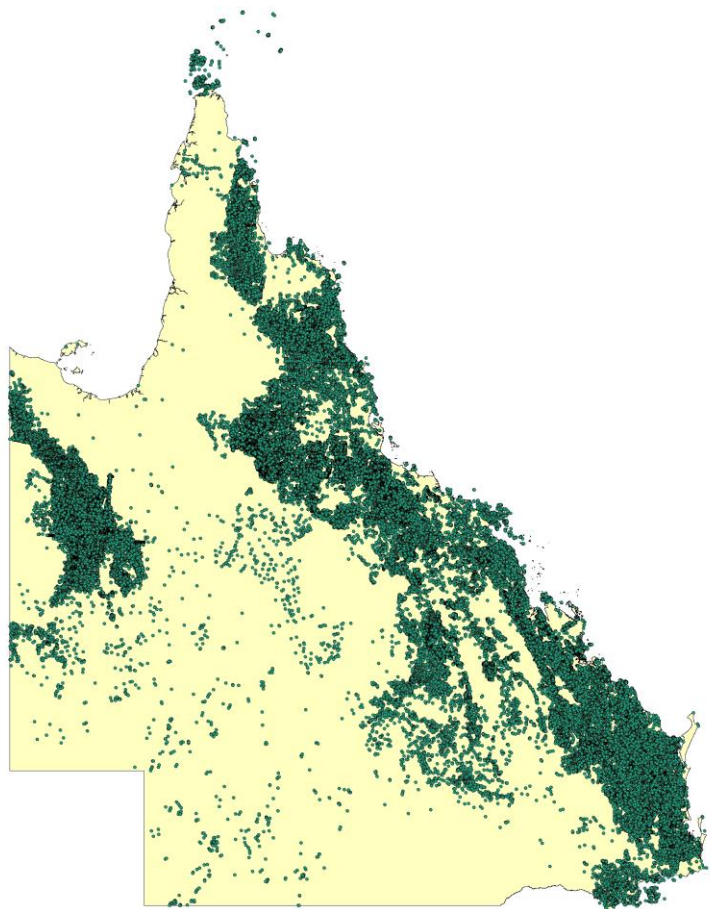


Table Structure

Data Table Names

[Agedets](#)
[Biblio](#)
[Comprep](#)
[Coord_conversion](#)
[Interval](#)
[Interval_Obs](#)
[Interval_Structure](#)
[Location](#)
[Mag_Sus](#)
[Petrography](#)
[Rock](#)
[Rock_Obs](#)
[Rock_Structure](#)
[Samples](#)
[Text](#)
[Whole Rock Geochem](#)

Tables of Frequency Listings

[100K Maps Used](#)
[Rock units used and parents](#)
[Structural units used and parents](#)

Agedets

This table contains the isotopic dates (SHRIMP U-Pb, K-Ar etc) obtained by the Geological Survey for regional mapping purposes as well as relevant dates in the public domain (>2700 dates). This table consists of 24 fields.

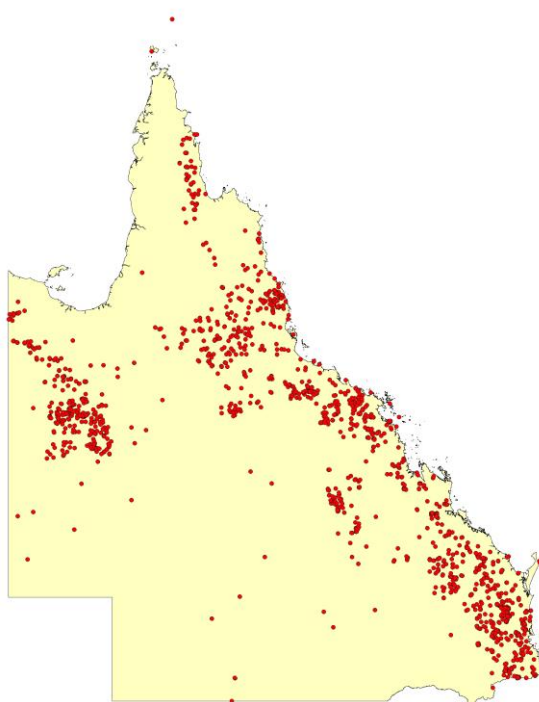
- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Intvl_Seq_No - The number identifying which interval (package of rocks) the rocks belong to. Several distinct intervals or packages belonging to separate rock units or ages may have been identified at a site.
- Intvl_Lith_Seq_No - The number identifying the rock for a particular interval at this site.
- Sample_seq_no - The number identifying the sample for a particular rock for a particular interval at this site.

Note: a combination of the Site_no, Intvl_Seq_No, Intvl_Lith_Seq_No and Sample_seq_no uniquely identifies a sample in MERLIN

- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project. Some earlier sites may use other systems (such as references to air photos).
- Struct_unit - The name of the Structural Unit containing the rocks being dated
- Rock_Unit - The name of the rock unit (e.g. formation or member) containing the rocks being dated.
- Rock_Name - Name of the rock type being dated (e.g. granite, basalt etc)

- Sample_id - A identifier given to the sample by the geologist. Commonly based on the Field_id of the site, with an appropriate suffix. However some Sample_ids are catalogue numbers given to samples in curated collections.
- Laboratory - The name of the laboratory where the analysis was performed.
- Lab_no.-An identifier for the analysis assigned by the laboratory.
- Method - The age determination method used.
- Mineral - The mineral (including whole-rock) on which the age determination was performed.
- Result Type - The type of result obtained from the age determination method. (May be an Age, an element or oxide or a ratio etc)
- Result_value - The actual numeric value obtained for the result type. (i.e. is Result type is age then the value will be the age.)
- Result_precision - Precision quoted by the laboratory, usually for the age.
- Units - The units applicable for the value (e.g. Million years ago, %, parts per million)
- Comments - Text describing the Result value and any relevant information.
- Reference - The published source of the information listed as a code e.g. BR 1342. This code links the Biblio table and is unique for each reference.
- Lat – Latitude in decimal degrees
- Long – Longitude in decimal degrees
- AMG_Zone - Australian Map Grid Zone
- Easting – in metres easting
- Northing - in metres northing
- Datum – Datum system for co-ordinates – Geodetic datum of Australia 1994 (GDA94 or Australian Map Grid 1966 (AGD66)

Distribution of Dating Sites



Biblio

This table contains the published information (if any) used to compile the data within the database. This table consists of 6 fields.

- Site_No - the unique number for each site used to link the separate data tables
- Reference - Reference number used to link specific data within the table to a discrete bibliographic reference
- Author - Author of the Reference
- Year - Year published
- Title - Title of paper or publication
- Source - Details about the report series, journal series or publisher, and page numbers (if applicable).

Company Reports

This table lists the company reports used to compile the data within the database. The Department of Employment, Economic Development and Innovation QDEX system holds scanned copies or submitted digital copies of company reports. For more information about the company report system and accessing this information go to [Department of Employment, Economic Development and Innovation - Home](#).

- Site_No - the unique number for each site used to link the separate data tables
- Reference - unique number used to refer to the company report. This number equates to the Company Report Number (CR) used by the NR&M for all company reports held by the Mines area.
- Author - Company Report Author
- Year - Year the Company Report was produced
- Title - Title of the Company Report

Coordinate conversion

This table contains coordinates (Latitude, longitude, easting, northing and zone) for both the AGD66 and GDA94 datums. Queries and buttons on the Main Menu are provided to update the coordinates in the LOCATION table.

- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project. Some earlier sites may use other systems (such as references to air photos).
- AMG_Zone - Australian Map Grid Zone (AGD 66)
- AMG_Easting - Australian Map Grid easting (AMG 66)
- AMG_Northing - Australian Map Grid northing (AMG 66)
- Lat_AGD66 - Latitude (Australian Geodetic Datum 1966)

- Long_AGD66 – Longitude (Australian Geodetic Datum 1966)
- MGA_Zone - Australian Map Grid of Australia Zone (GDA 94)
- MGA_Easting - Map Grid of Australia easting (GDA 94)
- MGA_Northing - Map Grid of Australia northing (GDA 94)
- Lat_GDA94 - Latitude (Geodetic Datum of Australia 1994)
- Long_GDA94 – Longitude (Geodetic Datum of Australia 1994)

Interval

This table contains details about the regional setting of the rock being described. This table consists of 12 fields.

- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Intvl_Seq_No - The number identifying which interval (package of rocks) the rocks at a site belong to. Several distinct intervals or packages belonging to separate rock units or ages may have been identified at a site.

Note: a combination of the Site_no, and Intvl_Seq_No uniquely identifies an interval in MERLIN

- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project. Some earlier sites may use other systems (such as references to air photos).
- Struct_unit - The name of the Structural Unit containing the rocks for the particular interval at the site
- Rock_Unit - The name of the rock unit (e.g. formation or member) for the particular interval at the site
- Informal - Informal details about a rock unit. This could include a provisional name or subdivision that the geologist may have applied to the interval (generally in the field). Note that in some cases this information may be outdated or obsolete, where updates have been made to the Rock Unit in the office, without deleting or modifying the informal information.
- Age - The age or age range of the Rock Unit
- Lat – Latitude in decimal degrees
- Long – Longitude in decimal degrees
- AMG_Zone - Australian Map Grid Zone
- Easting – in metres easting
- Northing - in metres northing
- Datum – Datum system for co-ordinates – Geodetic datum of Australia 1994 (GDA94 or Australian Map Grid 1966 (AGD66))

Interval_Obs

This table contains the observations made about the rock interval as a whole. This table consists of 14 fields.

- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Intvl_Seq_No - The number identifying which interval (package of rocks) the rocks belong to. Several distinct intervals or packages belonging to separate rock units or ages may have been identified at a site.
- Intvl_Obs_Seq_No - The number identifying the rock for a particular interval at this site.

Note: a combination of the Site_no, Intvl_Seq_No, and Intvl_Obs_Seq_No uniquely identifies an observation in MERLIN

- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project. Some earlier sites may use other systems (such as references to air photos).
- Rock_Unit - The name of the rock unit (e.g. formation or member) containing the rocks being dated.
- Type - Observation type being made e.g. alteration
- Value - The Value or subtype of the Observation being made e.g. epidotitic
- Qualifier - A qualifier to the observation value e.g. moderately

Note: stringing these three fields together creates the full observation description e.g. moderate epidotitic alteration.

- Comments - Any relevant textual information about the specific observation being made. In MERLIN, this is a free text field and not validated on data entry, and unless subsequently edited by the geologist, may contain typographic errors. Also the geologists commonly use shorthand abbreviations and these are not decoded. While some may be somewhat cryptic, most experienced geologists should be able to translate them from their context.
- Lat – Latitude in decimal degrees
- Long – Longitude in decimal degrees
- AMG_Zone - Australian Map Grid Zone
- Easting – in metres easting
- Northing - in metres northing
- Datum – Datum system for co-ordinates – Geodetic datum of Australia 1994 (GDA94 or Australian Map Grid 1966 (AGD66)

Interval_Structure

This table contains the structural observations made for the whole interval or rock package. This is mostly data collected in the pre-Oracle stage of REGMAP (most geologists now link their structural data to Rock Observations and it appears in the Rock_structure table). The Interval_structure table contains 22 fields.

- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Intvl_Seq_No - The number identifying which interval (package of rocks) the rocks belong to. Several distinct intervals or packages belonging to separate rock units or ages may have been identified at a site.
- Intvl_Obs_Seq_No - The number identifying the rock for a particular interval at this site.

Note: a combination of the Site_no, Intvl_Seq_No, and Intvl_Obs_Seq_No uniquely identifies an observation in MERLIN

- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project. Some earlier sites may use other systems (such as references to air photos).
- Rock_Unit - The name of the rock unit (e.g. formation or member) containing the rocks being dated.
- Structural Type - Observation type being made e.g. tectonic structure
- Structural Subtype- The subtype of the Observation being made e.g. foliation
- Qualifier - A qualifier to the observation value e.g. moderately

Note: stringing these three fields together creates the full observation description e.g. moderate tectonic foliation.

- Comments - Any relevant textual information about the specific observation being made. In MERLIN, this is a free text field and not validated on data entry, and unless subsequently edited by the geologist, may contain typographic errors. Also the geologists commonly use shorthand abbreviations and these are not decoded. While some may be somewhat cryptic, most experienced geologists should be able to translate them from their context.
- Structural Notation - The structural notation for the structural type being measured e.g. S2
- Structural Type - A decode of the structural notation e.g. 2nd generation foliation/cleavage
- Dip - The vertical angle from the horizontal plane of the surface or lineation.
- Younging - The direction of younging for bedding, expressed as UP (upright) or DOWN (overturned) or unspecified (null)
- Azimuth - The compass direction of the dip/plunge.
- Strike - The compass direction of the structure in the horizontal plane.

Note: the dip azimuth, and strike should be considered as corrected for magnetic declination.

- Hade_vector - An alternative method (to dip and azimuth) of expressing the direction of a linear feature on a plane. It is particularly used for palaeocurrent data that have a one-way directional component. It is expressed as the angle measured on the stratigraphic top of the bedding plane in a clockwise direction from the down-dip direction to the direction of the palaeocurrent. It ranges from 0(to 360(. The method uniquely records a directional line on a given plane which has been defined in the dip and azimuth fields of the same record.
- Confidence_Flag - A value of 'N' is used where the identification of the structural feature is uncertain. A null or 'Y' value indicates confidence.
- Lat – Latitude in decimal degrees

- Long – Longitude in decimal degrees
- AMG_Zone - Australian Map Grid Zone
- Easting – in metres easting
- Northing - in metres northing
- Datum – Datum system for co-ordinates – Geodetic datum of Australia 1994 (GDA94 or Australian Map Grid 1966 (AGD66)

Location

This table contains the general location information for a site. The table contains 19 fields.

- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project. Some earlier sites may use other systems (such as references to air photos).
- Data Date - Date data was collected in the field
- Site_Locality - Textural description of where the geological observation was made.
- Map Name (100,000) – A concatenation of the 100 000 map sheet number and name which covers the location
- Map_250_code - The code for the relevant 1:250 000 sheet
- Lat – Latitude in decimal degrees
- Long – Longitude in decimal degrees
- AMG_Zone - Australian Map Grid Zone
- Easting – in metres easting
- Northing - in metres northing
- Datum – Datum system for co-ordinates – Geodetic datum of Australia 1994 (GDA94 or Australian Map Grid 1966 (AGD66)
- Loc_method - The method used to determine the location (e.g GPS or 1:100 000 Topographic map)
- Location Accuracy - The accuracy with which the mine has been located
- Exposure type - The type of exposure at the site from which the observations were made (e.g. road cutting, outcrop, float)
- Air_Photo_Set_Name - Name of the aerial photography set used during geological mapping
- Air_Photo_Scale - Scale of the aerial photography used.
- Air_Photo_Year - Year the aerial photography was completed
- Air_Photo_Run_No - The run number of the aerial photography
- Air_Photo_No - The photo number of the specific photo used in the run.

Mag_Sus

This table contains a listing of the magnetic susceptibility readings taken at sites. The table consists of 13 fields. At this stage, the magnetic susceptibility readings have not been incorporated into the Forms that come with this package, but the sequence numbers have been included to allow users to link the data if they so desire.

- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Intvl_Seq_No - The number identifying which interval (package of rocks) the rocks belong to. Several distinct intervals or packages belonging to separate rock units or ages may have been identified at a site.
- Intvl_Lith_Seq_No - The number identifying the rock for a particular interval at this site.
- Lith_Obs_Seq_No - The number identifying the individual observations for each rock.

Note: using the Site_No, Intvl_Seq_No, Intvl_Lith_Seq_No, and Lith_Obs_Seq_No together will give a unique identifier for each observation.

- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project.
- Rock_Unit - The name of the rock unit (e.g. formation or member) containing the rocks being measured.
- Rock_Name - Name of the rock type for which the measurement was taken (e.g. granite, basalt etc)
- Instrument - The type of instrument used to take the reading
- Reading - The numeric value of the magnetic susceptibility
- Unit_Measure_Code - The units for the reading
- Reading Qualifier - A further description of the reading value (e.g. average reading)
- Lat – Latitude in decimal degrees
- Long – Longitude in decimal degrees
- AMG_Zone - Australian Map Grid Zone
- Easting – in metres easting
- Northing - in metres northing
- Datum – Datum system for co-ordinates – Geodetic datum of Australia 1994 (GDA94 or Australian Map Grid 1966 (AGD66)

Petrography

This table contains petrographic descriptions for samples collected during geological mapping. It is far from complete with data available for samples from only about 3300 sites. The table contains xx fields.

- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Intvl_Seq_No - The number identifying which interval (package of rocks) the rocks belong to. Several distinct intervals or packages belonging to separate rock units or ages may have been identified at a site.
- Intvl_Lith_Seq_No - The number identifying the rock for a particular interval at this site.
- Sample_seq_no - The number identifying the sample for a particular rock for a particular interval at this site.

Note: a combination of the Site_no, Intvl_Seq_No, Intvl_Lith_Seq_No and Sample_seq_no uniquely identifies a sample in MERLIN

- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project. Some earlier sites may use other systems (such as references to air photos).
- Struct_unit - The name of the Structural Unit containing the rocks being dated
- Rock_Unit - The name of the rock unit (e.g. formation or member) containing the rocks being dated.
- Rock_Name - Name of the rock type being dated (e.g. granite, basalt etc)
- Sample_id - A identifier given to the sample by the geologist. Commonly based on the Field_id of the site, with an appropriate suffix. However some Sample_ids are catalogue numbers given to samples in curated collections.
- Analysis_Method - The age determination method used.
- Result Type - The type of result obtained from the age determination method. (May be an Age, an element or oxide or a ratio etc)
- Result_Qualifier - A qualifier for the result value (e.g. ca., <, > etc)
- Result_value - The actual numeric value obtained for the result type. (i.e. is Result type is age then the value will be the age.)
- Units - The units applicable for the value (usually %)
- Comments - Text describing the Result value and any relevant information.
- Reference - The published source of the information listed as a code e.g. BR 1342. This code links the Biblio table and is unique for each reference.
- Lat – Latitude in decimal degrees
- Long – Longitude in decimal degrees
- AMG_Zone - Australian Map Grid Zone
- Easting – in metres easting
- Northing - in metres northing
- Datum – Datum system for co-ordinates – Geodetic datum of Australia 1994 (GDA94 or Australian Map Grid 1966 (AGD66)

Rock

This table contains a listing of the rock types identified at the site. This table contains 12 fields.

- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Intvl_Seq_No - The number identifying which interval (package of rocks) the rocks belong to. Several distinct intervals or packages belonging to separate rock units or ages may have been identified at a site.
- Intvl_Lith_Seq_No - The number identifying the rock for a particular interval at this site.

Note: a combination of the Site_no, Intvl_Seq_No, and Intvl_Lith_Seq_No uniquely identifies a rock in MERLIN

- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project. Some earlier sites may use other systems (such as references to air photos).
- Rock Type - The name of the rocks identified at the site. In this table it is generated by concatenating several fields from the parent table in MERLIN, namely ROCK_NAME, ROCK_QUALIFIER and LITH_COMMENTS. The last is a free text field and commonly contains abbreviated shorthand comments and is not decoded (e.g. BASALT META EPID-FILLED AMYGS means a metabasalt with epidote-filled amygdales or TONALITE -> GRDI, BI-HB means a biotite-hornblende tonalite or granodiorite).
- From age - This is the age of the rock unit in which the rock occurs, or its older limit if there is a range.
- To age - This is the younger age limit of the rock unit in which the rock occurs if there is a range.
- Lat – Latitude in decimal degrees
- Long – Longitude in decimal degrees
- AMG_Zone - Australian Map Grid Zone
- Easting – in metres easting
- Northing - in metres northing
- Datum – Datum system for co-ordinates – Geodetic datum of Australia 1994 (GDA94 or Australian Map Grid 1966 (AGD66)

Rock_Obs

This table contains the descriptions made about each rock recognised at the site (e.g. colour, grainsize, textures etc). This table consists of 15 fields.

- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Intvl_Seq_No - The number identifying which interval (package of rocks) the rocks belong to. Several distinct intervals or packages belonging to separate rock units or ages may have been identified at a site.

- Intvl_Lith_Seq_No - The number identifying the rock for a particular interval at this site.
- Lith_Obs_Seq_No - The number identifying the individual observations for each rock. Note: using the Site_No, Intvl_Seq_No, Intvl_Lith_Seq_No, and Lith_Obs_Seq_No together will give a unique identifier for each observation.
- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project. Some earlier sites may use other systems (such as references to air photos).
- Rock_Name - Name of the rock type being observed (e.g. GRANITE, BASALT etc)
- Observation Type - The type of observation being made (e.g. colour)
- Value - The value or subtype of the observation e.g. brown
- Qualifier - An additional descriptor for the value e.g. dark

Note: stringing these three fields together creates the full observation description e.g. colour is dark brown.

- Comments - Any relevant textual information about the specific observation being made. In MERLIN, this is a free text field and not validated on data entry, and unless subsequently edited by the geologist, may contain typographic errors. Also the geologists commonly use shorthand abbreviations and these are not decoded. While some may be somewhat cryptic, most experienced geologists should be able to translate them from their context.
- Lat – Latitude in decimal degrees
- Long – Longitude in decimal degrees
- AMG_Zone - Australian Map Grid Zone
- Easting – in metres easting
- Northing - in metres northing
- Datum – Datum system for co-ordinates – Geodetic datum of Australia 1994 (GDA94 or Australian Map Grid 1966 (AGD66))

Rock_Structure

This table contains the structural measurements made for the specific rock recognised at the site. This table consists of 24 fields.

- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Intvl_Seq_No - The number identifying which interval (package of rocks) the rocks belong to. Several distinct intervals or packages belonging to separate rock units or ages may have been identified at a site.
- Intvl_Lith_Seq_No - The number identifying the rock for a particular interval at this site.
- Lith_Obs_Seq_No - The number identifying the individual observations for each rock.

Note: using the Site_No, Intvl_Seq_No, Intvl_Lith_Seq_No, and Lith_Obs_Seq_No together will give a unique identifier for each observation.

- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project. Some earlier sites may use other systems (such as references to air photos).
- Rock_Unit - The name of the rock unit (e.g. formation or member) containing the rocks being dated.
- Rock_Name - Name of the rock type being observed (e.g. GRANITE, BASALT etc)
- Structural Type - Observation type being made e.g. tectonic structure
- Structural Subtype- The subtype of the Observation being made e.g. foliation
- Qualifier - A qualifier to the observation value e.g. moderately

Note: stringing these three fields together creates the full observation description e.g. moderate tectonic foliation.

- Comments - Any relevant textual information about the specific observation being made. In MERLIN, this is a free text field and not validated on data entry, and unless subsequently edited by the geologist, may contain typographic errors. Also the geologists commonly use shorthand abbreviations and these are not decoded. While some may be somewhat cryptic, most experienced geologists should be able to translate them from their context.
- Structural Notation - The notation for the structural type being measured e.g. S2
- Structural Type - A decode of the structural notation e.g. 2nd generation foliation/cleavage
- Dip - The vertical angle from the horizontal plane of the surface or lineation.
- Younging - The direction of younging for bedding, expressed as UP (upright) or DOWN (overturned) or unspecified (null)
- Azimuth - The compass direction of the dip/plunge.
- Strike - The compass direction of the structure in the horizontal plane.

Note the dip azimuth, and strike should be considered as corrected for magnetic declination.

- Hade_vector - An alternative method (to dip and azimuth) of expressing the direction of a linear feature on a plane. It is particularly used for palaeocurrent data that have a one-way directional component. It is expressed as the angle measured on the stratigraphic top of the bedding plane in a clockwise direction from the down-dip direction to the direction of the palaeocurrent. It ranges from 0 to 360. The method uniquely records a directional line on a given plane which has been defined in the dip and azimuth fields of the same record.
- Confidence_Flag - A value of 'N' is used where the identification of the structural feature is uncertain. A null or 'Y' value indicates confidence.
- Lat – Latitude in decimal degrees
- Long – Longitude in decimal degrees
- AMG_Zone - Australian Map Grid Zone
- Easting – in metres easting
- Northing - in metres northing
- Datum – Datum system for co-ordinates – Geodetic datum of Australia 1994 (GDA94 or Australian Map Grid 1966 (AGD66)

Samples

This table contains the descriptions made about each rock recognised at the site (e.g. colour, grainsize, textures etc). This table consists of 15 fields.

- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Intvl_Seq_No - The number identifying which interval (package of rocks) the rocks belong to. Several distinct intervals or packages belonging to separate rock units or ages may have been identified at a site.
- Intvl_Lith_Seq_No - The number identifying the rock for a particular interval at this site.
- Lith_Obs_Seq_No - The number identifying the individual observations for each rock. Note: using the Site_No, Intvl_Seq_No, Intvl_Lith_Seq_No, and Lith_Obs_Seq_No together will give a unique identifier for each observation.
- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project. Some earlier sites may use other systems (such as references to air photos).
- Rock_Name - Name of the rock type being observed (e.g. GRANITE, BASALT etc)
- Sample_ID – An identifier assigned to the sample, generally by the geologist in the field. Usually, but not always based on the Field_ID, with the addition of suffixes, A, B, C etc.
- Sample_type_code – A code for the type of sample. (common types are HSAMP hand sample, BLSAMP blasted sample, SHSAMP sledge hammered sample)
- Sample_comments – additional comments about the sample characteristics, reason for collection etc.
- Lat – Latitude in decimal degrees
- Long – Longitude in decimal degrees
- AMG_Zone - Australian Map Grid Zone
- Easting – in metres easting
- Northing - in metres northing
- Datum – Datum system for co-ordinates – Geodetic datum of Australia 1994 (GDA94 or Australian Map Grid 1966 (AGD66)

Text

This table provides textual information of the features present at the site. In most cases it is a shorthand summary of the geology at the site. The table contains 12 fields.

- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Text_Seq_No - The number identifying the sequence order of the text.

Note: using the Site_No and, Text_Seq_No together will give a unique identifier for each record of textual information.

- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project. Some earlier sites may use other systems (such as references to air photos).
- Map Name (100,000) - The 100 000 map sheet number and name which covers the location
- Map_250_code - The code for the relevant 1:250 000 sheet
- Lat – Latitude in decimal degrees
- Long – Longitude in decimal degrees
- AMG_Zone - Australian Map Grid Zone
- Easting – in metres easting
- Northing - in metres northing
- Datum – Datum system for co-ordinates – Geodetic datum of Australia 1994 (GDA94 or Australian Map Grid 1966 (AGD66))
- Type of Text - Classification used to describe the type of comments recorded. The most common type in this dataset will be "Abstract/Summary of Site"
- Text - Textual comments relating to the site. In MERLIN, this is a free text field and not validated on data entry, and unless subsequently edited by the geologist, may contain typographic errors. Also the geologists commonly use shorthand abbreviations and these are not decoded. While some may be somewhat cryptic, most experienced geologists should be able to translate them from their context.

Whole Rock Geochem

This table contains the "whole rock" geochemical analyses obtained for selected rocks recognised at the site. The table contains 62 columns.

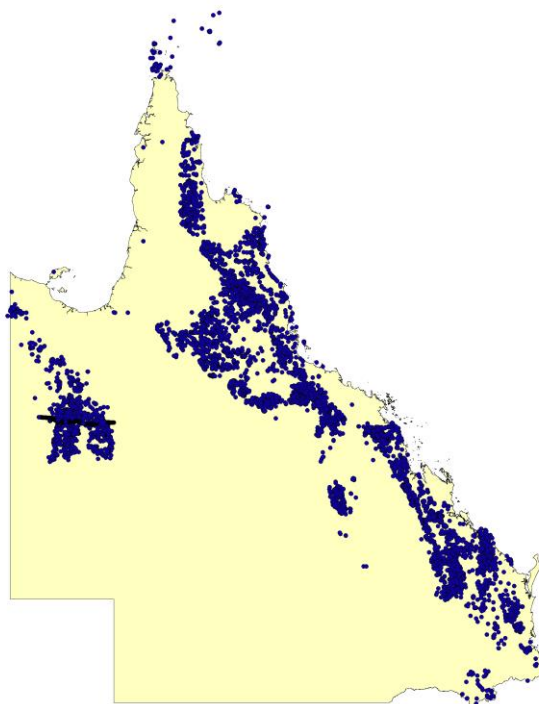
- Site_No - the unique computer generated number in MERLIN for each site used to link the separate data tables
- Intvl_Seq_No - The number identifying which interval (package of rocks) the rocks belong to. Several distinct intervals or packages belonging to separate rock units or ages may have been identified at a site.
- Intvl_Lith_Seq_No - The number identifying the rock for a particular interval at this site.
- Sample_seq_no - The number identifying the sample for a particular rock for a particular interval at this site.

Note: a combination of the Site_no, Intvl_Seq_No, Intvl_Lith_Seq_No and Sample_seq_no uniquely identifies a sample in MERLIN

- Field_ID - the identifier for a site assigned by the geologist during regional mapping. The Field_ID is generally constructed from the geologist's initials, map-sheet name or project, and a sequential number for that sheet or project. Some earlier sites may use other systems (such as references to air photos).
- Lat – Latitude in decimal degrees

- Long – Longitude in decimal degrees
- AMG_Zone - Australian Map Grid Zone
- Easting – in metres easting
- Northing - in metres northing
- Datum – Datum system for co-ordinates – Geodetic datum of Australia 1994 (GDA94 or Australian Map Grid 1966 (AGD66)
- Struct_unit - The name of the Structural Unit containing the rocks being analysed
- Rock_Unit - The name of the rock unit (e.g. formation or member) containing the rocks being analysed.
- Rock Type - The name of the rocks being analysed. In this table it is generated by concatenating two fields from the parent table in MERLIN, namely ROCK_NAME and ROCK_QUALIFIER.
- Lith_Comments. This is a free text field and commonly contains abbreviated shorthand comments and is not decoded. Most experienced geologists should be able to translate them from their context.
- Sample_id - An identifier given to the sample by the geologist. Commonly based on the Field_id of the site, with an appropriate suffix. However some Sample_ids are catalogue numbers given to samples in curated collections.
- Analysis Type - The type of analysis being performed. Will always be Whole Rock.
- Lab_code - A mnemonic abbreviation for the laboratory. These have not been decoded for brevity, but should all be easily recognisable.
- Lab_no.-.An identifier for the analysis assigned by the laboratory.
- The remaining 62 columns names which identify the element/oxide analysed for with the analysis result in the column. Note all oxide values are percentages all element analyses (except organic carbon) are ppm e.g. SiO₂ is percent Cr is as ppm, Values below the detection limit have been given as the detection limit expressed as a negative integer.

Distribution of Whole Rock Geochemistry Sites



100K Maps used

This table contains a list of 1:100 000 map sheets for which data is available in REGMAP. The user can sort the file in the datasheet view by either Map No or 100K Sheet name.

- Map No
- 100K Sheet name
- No of sites

Rock units used and parents

This table contains a list of all of the Rock Units for which data are available in REGMAP. The parent of a unit is also given where applicable. This is needed, because the Rock Unit given in the data is the lowest unit in a hierarchy. Therefore a query on Camboon Volcanics will not retrieve any data for sites in named members within that unit. The data pertaining to these will have to be queried separately. The user can sort the file in the datasheet view by Parent to obtain a list of 'daughter' units for a given parent.

- Rock Unit
- Parent
- Number

Structural units used and parents

This table contains a list of all of the Structural Units for which data are available in REGMAP. The parent of a unit is also given where applicable. This is needed, because the Structural Unit given in the data is the lowest unit in a hierarchy. Therefore a query on Yarrol Province will not retrieve any data for sites in 'daughter' structural units such as Rockhampton Subprovince. The data pertaining to these will have to be queried separately. The user can sort the file in the datasheet view by Parent to obtain a list of 'daughter' units for a given parent.

- Rock Unit
- Parent
- Number