

Guideline 7 - Reporting on Mineral Titles

Guidelines for submission of exploration and resource reports under the *Mineral Titles Act 2010* and Regulations

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1.0 SOURCE REFERENCES AND AMENDMENTS

1.1 Source References

Throughout this document there are references to the *Mineral Titles Act* and the *Mineral Titles Regulations*. References to the Act are shown as “section X(y) of the Act” eg “section 17(3)(b) of the Act”, and references to the Regulations are shown as Regulation Z(y) eg Regulation 127(1). Cross references to other sections within Guideline 7 are shown in italics eg *Section 3.2*.

Copies of these and other guidelines, and approved forms under the Mineral Titles Act are published on the nt.gov.au/industry/mining-and-petroleum website.

1.2 Recent amendments

These reporting guidelines are complementary and subordinate to the *Mineral Titles Act 2010* and its Regulations. The Guidelines will be updated from time to time. It is the responsibility of the titleholder to ensure that the latest version of the Guidelines is used when preparing a report or submitting expenditure or data.

28/11/2011, Version 1 release for the commencement of the *Mineral Titles Act 2010* and superseding all previous versions of reporting guidelines relating to the *Mining Act*.

13/06/2018, Version 2 update to *Section 3.5*, production reporting; *Section 3.6*, reserve reporting, and *Section 12.4.10*, resources and reserves estimation/modelling in annual and final technical reports. Addition of appendix 3: example of resource estimation summary report.

2.0 INTRODUCTION

The mineral exploration industry in Australia generates a vast amount of geoscientific and resource information each year. This large investment in basic data gathering should be available for future explorers so that similar effort is not duplicated and new exploration models can be developed on the basis of earlier data. State/Territory agencies play a critical role in promoting effective and efficient mineral exploration in Australia by archiving statutory mineral exploration information and then releasing it back into the public domain for the use of future explorers.

These Guidelines have been produced to assist mineral title holders in the Northern Territory (NT) with the preparation and submission of statutory reports to the Department of Primary Industry and Resources (the “Department”) under the *Mineral Titles Act 2010*. All reports must cover the exploration, mining and other technical work undertaken on the title. Annual and final reports must be of sufficient standard and detail to substantiate the expenditures claimed, and the activities undertaken. Data must be presented in standard formats and be capable of reprocessing and/or reinterpretation by others in the future.

Under the *Mineral Titles Act 2010*, it is the responsibility of the titleholder to comply with statutory reporting requirements, even if the title is being operated or managed by another party. Reports on separate activities (eg ore reserve statements, feasibility studies) prepared by consultants or bodies other than the title holder, must be submitted as appendices to the annual report. Reports must be in the English language.

Digital reporting is mandatory. The required digital formats follow nationally endorsed guidelines developed and maintained by the Government Geoscience Information Committee with representatives from all jurisdictions. These national guidelines standardise file types and content to enable consistent and complete reporting of activities by explorers that operate in Australian jurisdictions. Adherence to these standards will ensure that high quality reports, data and metadata will remain assessable to the mineral exploration industry and will provide a lasting information resource for future exploration. Hardcopy reports will only be accepted under exceptional circumstances and with prior permission.

Title holders need to be aware of the datum their data are in and explicitly state this information when supplying spatial data including maps. All spatial data is to be submitted and reported in the Geocentric Datum of Australia 94 (GDA94).

Reports that do not comply with the standards discussed in these Guidelines will be rejected which may result in late lodgment and thus incur late lodgment fees.

3.0 REPORTING TYPE AND FREQUENCY

3.1 Preliminary exploration

3.1.1 Airborne geoscientific surveys

Any explorer intending to undertake preliminary exploration by conducting an airborne survey over land for which they are not the title holder, or over land that has neither a granted mineral title or an application for a mineral title, or over land for which they are not the applicant for the mineral title, must first gain approval by submitting a request to the Minister no later than 30 days prior to any work being undertaken (section 17(3)(b) of the Act).

A report for the airborne survey, and all airborne data acquired as preliminary exploration must be supplied to the Department within 12 months of the approval date (Regulation 9). The report must contain:

- the specifications of the approved airborne survey and of the equipment used for conducting the survey;
- the data collected, including navigation data and details of all data processing;
- any interpretations or conclusions made about the land surveyed; and
- details of the expenditure for conducting the survey.

The report must meet the content requirements for an annual report with regard to the title page, abstract, location, geological setting, exploration rationale and details of the geophysical activities. The report must also meet the copyright requirements as outlined for annual and final reports in Section 12.3.

Preliminary exploration airborne survey data will be held confidential for 5 years where the explorer holds a granted title or has a current title application (Regulation 10(3)). If there are no titles or title applications by the explorer in an area covered by the survey the report may be released 6 months after the reporting date (Regulation 10(2)). When all or part of the title ceases to be in force, for whatever reason, the airborne survey data for the area no longer under title may be released (Regulation 10(4)).

3.1.2 Ground based activities

Under Part 2 of the Act an explorer can also undertake preliminary exploration on land that is either vacant, over which the explorer has a title application, or which is under application or held by other parties. Section 17(3) of the Act specifies preliminary exploration activities may include:

- Examination of geological characteristics
- Removal of small samples of minerals or extractive minerals for analysis

Although there is no mandatory reporting requirement for preliminary exploration work, it is possible to claim expenses in the first year of title provided the work is documented in the first annual report.

3.2 Annual reports

Annual technical reports detailing all exploration and geoscientific activities on each EL, ELR or ML are to be submitted to the Department. Annual reports are due 60 days from the anniversary of the date of grant of the title (Regulation 78(1)).

Where an application for amalgamated or group reporting has been made and subsequently approved by the Department, the group annual report is due on the nominated reporting date (Regulation 87). It is expected that an application for amalgamated annual reporting be accompanied by an application for amalgamated expenditure reporting with a common nominated reporting date. See Guideline 2 “*Amalgamated Reporting*” for information required when applying for approval of amalgamated reports.

If expenditure has been claimed for an activity then the activity must be reported and the data submitted in the annual report (Regulation 78(3)). Data need only be submitted once, so if data from the title(s) being reported has already been submitted to the Department this information needs to be explicitly stated in the report (for example, a geophysical survey that also covers an adjoining title and was previously reported upon).

3.2.1 Reports of Nil Activity

An annual report is still required where there has been no activity and must follow the format described in Section 12 of these Guidelines. The report must state the purpose for which the title is held, provide a location map, title history, target commodity, the reason why there was no activity, when activity will be resumed and what the nature of the activity will be (Regulation 78(4)).

3.3 Final reports

3.3.1 Partial relinquishment reports

Partial relinquishment reports are those final technical reports required when only part of an EL or ELR is surrendered and no longer in force. Partial relinquishments may be mandatory, voluntary or as a result of replacement of a title in part by another title. Final reports are required to be submitted within 60 days after the date of surrender or relinquishment (Regulation 86(1)).

Partial relinquishment reports are immediately available for release and therefore should deal ONLY with work conducted on the area relinquished. The report will be released regardless of the fact it may contain work in retained areas. There are provisions to obviate the need to “cookie-cut” remote-sensed or geophysical data if the data subset is not meaningful or useful.

All analytical and geophysical data pertinent to the relinquished area must be included, even if it has been previously submitted in annual reports, unless the title holder consents to all annual reports containing relevant information on the relinquished area to be released. In this case the partial relinquishment report must contain information and data for that part of the final reporting year not previously reported, a summary of all exploration activities for the life of the title area and the reason why the area was relinquished.

A report in the prescribed format is still required even if there was no work in the relinquished area. The report must provide a location map, title history and state the target commodity, exploration rationale, and an explanation as to why the area was relinquished (Regulation 86(5)).

3.3.2 Final surrender reports

Final surrender reports are those final technical reports required when an EL, ELR or ML is surrendered, expires or is cancelled in its entirety (Regulation 86). The report must include a summary of all the exploration activity over the life of the mineral title. A complete title history must be included as well as the rationale for dropping the ground.

For convenience it is usual to combine the last annual report with the final report and therefore information and data for that part of the final year of tenure that has not been previously reported in an annual report should be included in the final report. This should be stated on the title page, for example, *Fourth Annual and Final Report for EL 11111*.

A final report for each EL may or may not be required if two or more ELs are amalgamated in their entirety. The requirement for a report is dependent on the reporting period and the work undertaken in the operational year prior to the original titles ceasing to be in force. However, if part of the area is surrendered at the time of amalgamation, a final report **must** be provided for the surrendered area of each EL involved.

If an EL or ELR is replaced by an ELR or ML such that they only partially overlap the original title, two final reports are required. One relates to work in the area not included in the new title, which becomes open file as usual for partial relinquishment final reports. The second final report is required for those areas of the original title that are included in the new title. This report will be kept confidential for five years.

If two or more EL or ELR titles are replaced in their entirety by an ELR or ML, a final surrender report will be required and may be kept confidential for five years.

A report in the prescribed format is still required even if there was no work on the surrendered title. The report must provide a location map, a title history, a list of targeted commodities, the exploration rationale, and an explanation of why the title was surrendered.

3.4 Expenditure report

The title holder must submit an expenditure report on the approved form for each operational year of a mineral title within 30 days of the anniversary of the grant date for an EL or ELR, and 60 days for an ML (Regulation 81(1)). The operational year will cover the same period as the annual report for the title.

Where an application for amalgamated expenditure reporting has been made and subsequently approved by the Department, the amalgamated expenditure report is due on the nominated reporting date (Regulation 87) It is expected that an application for amalgamated annual reporting be accompanied by an application for amalgamated expenditure reporting with a common nominated reporting date. See Guideline 6 "*Amalgamated Reporting*" for information required when applying for amalgamated reporting.

An expenditure report in the approved form is also required to cover part or all of a year not already reported when titles are surrendered. This report must accompany the final report.

Expenditure reports for MLs with approval for annual reporting concurrently with reports required under the *Mining Management Act* are due on the nominated reporting date.

Expenditure is reported in Australian dollars against admissible expenditure categories and includes details of exploration activities. Proposed expenditure and work program are also required for the coming operational year.. The annual (or final) technical report must substantiate the expenditure claimed. Information on admissible expenditure can be found in Guideline 6 "*Benchmark minimum and admissible expenditure*"

The expenditure form must be submitted in a digital format with appropriate settings (see *Section 13.2*). Hardcopy forms are not acceptable. Forms are to be completed using a word processor (in

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which case the signature can be typed) and converted to Portable Document Format (PDF) unless prior permission has been given to provide a PDF file based on a scanned copy. Contact details (email, a phone number, or both) must be provided in case more information is required. A backup contact can also be nominated; neither has to be the same person who signs the form.

The form is to be named according to the file naming convention detailed in Section 7.1. Use of this form and the naming convention is mandatory and failure to submit a correctly completed expenditure form on time will result in late lodgement fees being charged.

If a section of expenditure is not relevant to your operations, insert "not applicable" at the appropriate section.

3.5 Production report

An annual production report is required for each ML (Regulation 84) , EML or EMP (Regulation 85) within 14 days after the end of the financial year. If an ML, EML or EMP has been transferred during the reporting year, then both the previous and current holder should submit a report.

MLs granted for purposes ancillary to mining are not required to lodge a production report. MLs and EMLs or EMPs that do not have an operational or extractive authorization under the *Mining Management Act* (MMA) are not required to lodge a production report.

Submit production returns using the approved form (AF22) for mineral production (MLs) or the approved form (AF23) for extractive production (EMLs, EMPs). Use one form per authorized project (MMA Authorisation number). If a project includes more than one ML/EML, then each title should be reported on a separate line, including titles with nil production or sales.

The required units of measure are specified on the approved form but in general all production figures and grades must be reported in SI units unless otherwise indicated eg carats for diamonds.

Reports will not be accepted unless correctly formatted and on the approved form.

3.6 Reserves report

An annual mineral resources and ore reserves return is required for each ML (Regulation 84) and ELR (Regulation 83) or within 14 days after the end of the financial year. MLs granted for purposes ancillary to mining are not required to lodge a reserves report.

The report must include all mineral resources and ore reserves as defined in *The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves* ('the JORC Code').

All reports must be submitted using the approved form (AF32). Submit one form for each deposit; List all titles that intersect the deposit. A title may be on more than one form if it intersects more than one deposit.

Resources and reserves should be substantiated therefore the report includes details of the author and organisation responsible and the date of the estimation. The preferred code for reporting is JORC 2012 but an equivalent international is acceptable. If the basis of the estimation is unknown then tick informal.

Nil returns are required for MLs and ELRs with no known resources. Submit a form with a list of relevant titles, the organization and contact details and tick the 'nil return' box.

Reports will not be accepted unless correctly formatted and on the approved form.

3.7 Core facility sampling report

Although not required under the *Mineral Titles Act* unless expenditure for the activity is claimed against a title, the Department requires reports describing any chemical, physical, geophysical, biostratigraphic or other studies done on material at, or removed from, its Core Facilities. The results of any non-destructive testing or assaying (eg handheld XRF, spot chemical tests) undertaken on the premises must also be reported.

The report must be a text PDF as described in *Section 13.2*.

The report must contain a title page with the following information:

- titleholder (where part of authorised activities on a mineral title)
- project operator (if different from above)
- report title including the report type ie core facility sampling report, and current titles if relevant
- date of sampling
- either a corporate, or personal author, or both,
- a date of compilation and/or submission
- the names of the standard NT 1:100 000- and 1:250 000-scale mapsheets to which the drill core relates

The report should clearly state the rationale behind the sampling and summarise the results and interpretations. Details of the sampling, processing and analytical methods should be included. Reports that merely present data will be rejected. Numerical tabular data (assays etc) must follow the same digital data formats described in *Section 14.0*. Please ensure that the results can be matched back to the sampled material using original hole identifications or numbers and depth intervals.

If a titleholder is sampling material and intends to claim expenditure against a granted title, this must be stated and the title number(s) given when requesting to sample the core. Otherwise, the report will be immediately available for public release unless otherwise negotiated with the Department. If the core sampling has been claimed as exploration expenditure the core sampling report should also be included as an appendix in the relevant annual report or reports and it will be subject to the same confidentiality conditions as the annual report.

3.7.1 Return of materials

All unused sample residues or off-cuts must be returned to the core facility from which they came within six months. All such material must be clearly labelled to match the material in the core facility. The only exceptions to the return of materials are if:

- the material removed from the core facility becomes part of a catalogued museum or university collection and the person responsible for the sampling can confirm this in writing with catalogue number(s) from that institution
- the residual material is of insufficient quantity (nominally less than 5 gm per sample) to warrant return; this requires written approval from the Department.

Failure to return materials may jeopardise further requests for sampling.

3.8 Notification of a significant discovery

On the discovery of a significant mineral occurrence a titleholder is required to notify the Department within 28 days (Section 32(2)(b) of the Act). The brief report is to include details of the type of occurrence or deposit, the location, including coordinates, a summary of the geological setting and current estimates of size and grade.

4.0 GEOLOGICAL SAMPLES (DRILL CORE AND CUTTINGS)

4.1 Notification of recovery

The Department must be notified of the recovery of drill core and cuttings on an EL, ELR or EMEL under section 93(1) of the Act. The Department accepts the notification as part of the annual report for ELs and ELRs. A separate notification is required for EMELs.

4.2 Submission and disposal

Drill core and cuttings from an EL, ELR or EMEL are to be offered to the Department when authorised activities cease or the title area under which drilling occurred is no longer in force (Section 93(3) of the Act). A form to assist in the offer of geological samples is available on the website. The samples are assessed for inclusion in the departmental collection and if selected, details of the samples are to be provided on the approved form, "Geological Sample Submission Form" and a submission date negotiated prior to delivery. Drill core and cuttings must be delivered to the Core Facility closest to the location of the mineral title on which the samples were collected. The drill core and cuttings are stored for public viewing and once released to open file, and if sufficient sample exists, are also available for further sampling and analysis. If the samples are not accepted for inclusion in the Core Facilities the titleholder is authorised to dispose of the samples.

The titleholder **must not dispose of any core** without the written permission of the Department (Section 93(4) of the Act). The current titleholder is also responsible for all core obtained from their title, regardless of it having been acquired by a previous holder of that title or by a joint venture partner or operator on the current title. The titleholder is also responsible for any actions by other parties that may jeopardise the integrity or availability of the core.

In addition to the requirements of Section 93 of the Act detailed above the Department may request geological samples at any time during the life of a mineral title, including a Mineral Lease (Regulation 127(1)).

4.3 Confidentiality

Geological samples submitted to the Department from a current EL or ELR are closed file for the same period as the annual report covering the reporting year in which they were required to be notified, that is, five years from the due date of the annual report (Regulation 128(3)). If a geological sample is submitted under Regulation 127(1) the sample is also closed file for a period of 5 years after the due date of the annual report in which it was notified.

Any geological sample from an EMEL given to the Department while the title over the land on which it was obtained is in force is closed file for five years after the date of the notification of recovery.

Geological samples submitted to the Department subject to the partial relinquishment or full surrender of a title are immediately available for public access.

4.4 Examination and sampling of submitted core and cuttings

Geological samples submitted to the department are available for examination, viewing and sampling once they become open file (Regulation 128). A person may apply to remove part of a submitted geological sample for analysis. The application must be made using the approved form, available from the website. See *Section 3.7 Core facility sampling report* for details of reporting requirements.

5.0 AMALGAMATED REPORTING

5.1 Group reporting

Titles may be amalgamated for annual and expenditure reporting purposes if they satisfy certain criteria (Regulation 87). This allows titleholders to report exploration activities on a project basis and facilitates reporting of regional geophysical or geochemical surveys across adjacent titles. This type of amalgamated reporting is referred to as group reporting.

Grouped annual reports must clearly distinguish work conducted on individual titles within the reporting group. Final surrender reports for complete cessation of a title included in a group reporting application will have to include all details of the work undertaken on the title since the date of grant, in the same manner as a partial relinquishment report. This is required because the annual reports for the preceding 5 years will ordinarily remain confidential due to the inclusion of information on work undertaken for other titles still in force within the reporting group.

A grouped expenditure report for the titles included in the group reporting application is to be submitted separately to the annual report but cover the same reporting period. Expenditure is to be identified against individual titles using the approved form for each. The grouped annual and expenditure reports are due on the approved group reporting date.

An application or an amendment for group reporting is to be made on the approved form "Amalgamated reporting – application and amendment". See Guideline 2 "*Amalgamated Reporting*" for information on the conditions under which an application for amalgamated reporting can be made. The reporting date for the group is nominated by the applicant as required by Regulation 87(4) and approved in consultation with the applicant. The first grouped report will cover varying periods for each individual title if they have been granted on different dates.

If a title is removed from a reporting group then the normal reporting conditions under Regulation 78 apply (see *Section 3.2*). A bridging annual report may be required depending upon the date of the last group report relative to the anniversary date of the title.

Group reporting may be revoked by the Department at anytime for any reason including non-compliance.

5.2 Reporting on MLs and under the *Mining Management Act*

An application may be made to submit annual and expenditure reports for MLs at the same time as reports due under the *Mining Management Act*. If approved, the reports remain separate but share the same reporting date and cover the same reporting period.

6.0 CONFIDENTIALITY

Annual and final reports submitted to the Department are kept confidential (closed file) until released to the public.

All annual reports may be released to open file five years after the date of lodgement. If the mineral title to which the annual report relates ceases to be in force the report may be released at any time after the cessation (Regulation 125(3)(a)).

A final report may be released to open file at any time after the report is lodged (Regulation 125(3)(a)), provided there is no replacement title. If the title is succeeded by a replacement title, the final report may be released five years after the date of lodgement. The annual reports for the original title will continue to be released five years after their individual dates of lodgement.

If part of a title ceases to be in force and is not succeeded by a replacement title, the final report, called a partial relinquishment report in these Guidelines, may be released at any time after relinquishment.

Expenditure reports remain confidential but non-identifying data may be used to produce statistics and summary reports which will be available to the public.

Production reports and reserve reports remain confidential but the data may be used to produce statistics and summary reports which will be available to the public, and to other government agencies.

7.0 REPORT FORMATS

7.1 File naming convention

File names should conform to the following file naming convention:

Title id_YYYY_[G|A|P|S|E]_##_ {data type}.eee

Where:

- **Title id** is an identifier for the title, or in the case of group reporting, the group reporting number is used; there is no space between the title type/prefix and the number ie EL12345 and a dash is used in the group reporting number between the number and the two digit year ie GR142-09.
- **YYYY** is a four-digit **report date representing year in which the report is due** (not the year of submission).
- **[G|A|P|S|E]** uses one or more of these letters where they denote respectively a **Group**, **Annual**, **Partial** relinquishment, **Surrender** or **Expenditure** form respectively, these letters can be used in combination in the order in which they are listed eg a combined annual and final surrender uses both A and S, a group annual is GA, and a group expenditure is GE
- **##** is a two digit sequential integer for each file submitted as part of the report.
- **{data type}** either denotes the data type contained in the file corresponding to one of the abbreviations in Table 7 or for documents appended to the report, the appendix number eg appendix4,
- **.eee** is the file suffix as shown in Table 5.

For example, the file EL22222_2010_04_drillcollars.txt would be the fourth file of the 2010 report for Exploration Licence 22222 and would contain tabular data in ASCII text format. A large document included in the report as an appendix and that has been split in two would be named EL22222_2010_03_appendix2.pdf and EL7766_200004_04_appendix2.pdf. Further examples are given in the table below:

Table 1. Examples of file names.

Type of File	Description of file	Name of title	File name
Report File	Expenditure form	ML 122	ML122_2010_E.pdf
	Annual report, body of text part one	ML 234	ML234_2010_A_01.pdf
	Annual report, body of text part two	ML 234	ML234_2010_A_02.pdf
	Annual report text with no data	EL 12345	EL12345_2010_A.pdf
	Partial relinquishment report text with no data	EL 12345	EL12345_2010_P.pdf
	Final report text with no data	EL 12345	EL12345_2010_S.pdf
	Group annual report text with no data	EL 1111, EL 1112	GR180-09_2010_GA.pdf
	Combined annual and final text with no data	EL 1111	EL1111_2010_AS.pdf
Tabular Data	Drilling location file in the annual report	EL 12345	EL12345_2010_A_02_DrillCollars.txt
	Geochemical analysis for drillhole samples in a final report	EL 12346	EL12346_2010_S_02_DownholeGeochem.txt
	Downhole geological data for the above;	EL 12346	EL12346_2010_S_03_DownhGeol.txt
	Appended text document of petrographic descriptions in a partial relinquishment report	EL 12345	EL12345_2010_P_03_Appendix1.pdf
	Compressed file containing Appendix of .jpg core photos for group annual report	EL 12301 EL 12302	GR123-10_2010_GA_04_Appendix2.zip
	Locations and assays of soil sampling for group annual report	EL 12301 EL 12302	GR123-10_2010_GA_05_SurfaceGeochem.txt
Example of a Complete Report – combined annual and surrender	Combined annual and final text	EL 33333	EL33333_2010_AS_01.pdf
	Appendix – consultant’s report recommending no further work		EL33333_2010_AS_02_Appendix1.pdf
	Assays of geochemical sampling with locations		EL33333_2010_AS_03_surfacegeochem.txt
	QA/QC data for assays of rockchip sampling		EL33333_2010_AS_04_QAQCGeochem.txt
	Drilling locations		EL33333_2010_AS_05_DrillCollars.txt
	Downhole survey data for the above drillholes		EL33333_2010_AS_06_DownholeSurveys.txt
	Geochemical analysis for drillhole samples		EL33333_2010_AS_07_DownholeGeochem.txt
	QA/QC data for assays of downhole geochemical samples		EL33333_2010_AS_08_QAQCGeochem.txt
	Downhole geological data/logs		EL33333_2010_AS_09_Lithologs.txt
	Lithological codes used by company for geological logs		EL33333_2010_AS_10_LithologyCodes.txt
	Summary of drilling on title		EL33333_2010_AS_11_DrillingSummary.txt
	Aeromagnetic data GDF format		EL33333_2010_AS_12_Aeromag.dat
	Aeromagnetic data GDF format		EL33333_2010_AS_13_Aeromag.dfn
	Aeromagnetic data GDF format		EL33333_2010_AS_14_Aeromag.des

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	File verification listing		EL33333_2010_AS_15_FileListing.txt
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8.0 ACCEPTABLE MEDIA AND LABELLING

The Department will accept the following media to deliver reports and data:

- Email, the total report and data not to exceed 10MB
- CD-ROM, no multisession, read only
- DVD-ROM, no multisession, read only
- Portable hard drive, non-returnable
- USB flash drives, non-returnable
- 3592 tape cartridges for large volume data sets, specifically seismic field data

Discs must be read-only full-sized disks, all media must be compatible with the Windows operating system, and must be supplied in a hard protective cover. Large volume datasets such as seismic or hyperspectral data must be provided on DVD or industry standard 3592 tape cartridges.

All digital media must be checked for viruses prior to submission. Any media that contains suspicious material will be rejected.

All media must be individually labelled with the company name, title number(s), report type and period, and numbered media, for example 1/5. A list of all files is to be included with the report (File verification listing in Table 1).

The titleholder or operator should keep a digital back-up copy of the report and data submitted to the Department for at least a year to cover the possibility of physical damage, data loss or corruption.

8.1 File compression

Files may be submitted in compressed form. The only acceptable formats are ZIP, RAR and ECW. Self-extracting executable files are not acceptable because of potential problems with virus detection software. File names specified within the report and templates must be the original (expanded) files. Compressed files must expand into a single directory with no subdirectories. Compressed files must not be compressed into another compressed file. Compressed files are not to be used for joining several PDF files in lieu of submitting them in separate components.

9.0 CONTACTS

General enquiries about report submission should be directed to:

Exploration Evaluation Geoscientist
Ph: +61 8 8999 7816
Email: geoscience.info@nt.gov.au

10.0 HOW AND WHERE TO LODGE REPORTS

All annual, expenditure, final, production and reserve reports must be lodged with:

Minerals and Energy InfoCentre
Northern Territory Geological Survey
Department of Primary Industry and Resources
GPO Box 4550
DARWIN NT 0801
or
3rd Floor Paspalis Centrepoint Building
48-50 Smith Street Mall DARWIN NT 0801

or emailed to geoscience.info@nt.gov.au.

If email is to be used, it must be a single email of the complete report and data and must not exceed 10 MB. Multiple emails to provide a single report and/or data are NOT acceptable. All material for large reports must be submitted on acceptable media and delivered to the address above rather than sent by email.

The Department will not accept the report until the total report is received and accepted as satisfactory in accordance with these Guidelines.

It is of no advantage and unnecessary to email the Department in advance to say that a report has been sent by surface delivery.

11.0 LATE OR NON-SUBMISSION OF REQUIRED REPORTS

If after the due date, the expenditure, annual or final report has not been received, or the content or format of these has been deemed to be incomplete or unacceptable, a warning will be issued to the titleholder to rectify the specific problem.

Late lodgment fees will be incurred if an acceptable report is not lodged with the Department by the due date. Fees commence the day after the due date and are charged for a maximum of 60 days. Following the 60 day period of late lodgment fees the Department can cancel all or part of a title. Late lodgment fees vary depending on the number of titles included in the report. Non-submission of a group report may result in the group reporting status being revoked. Non-submission of a report may jeopardise the standing of the title holder with respect to further title applications.

If a partial relinquishment report is not lodged with the Department by the end of the 60 day period in which late lodgment fees are incurred, all the relevant annual reports will be released to the public. This includes grouped annual reports regardless of whether any of the titles are still in force.

12.0 CONTENT FOR ANNUAL AND FINAL REPORTS

All reports must contain:

- a title page with mandatory content as listed in *Section 12.1*
- an abstract
- a body of text structured under meaningful headings
- a conclusion and recommendations for further work
- references and appendices as appropriate.
- Data sets structured and formatted as specified in *Section 13.0*

12.1 Title page

All reports must contain a title page which displays the following information:

- Name of titleholder,
- Name of project operator (if different from above), and may not be the same operator designated under the *Mining Management Act*)
- Report Title including:
 - titles involved or for amalgamated reports, the group reporting number,
 - the report type using the specific terms “annual”, “partial relinquishment”, “final surrender”, “annual and final”,
 - title and project names if applicable
- Reporting period as with a from and to date, or as the year ending on a specific date (avoid saying the “xth annual report” or “the report for 2010”),
- A corporate or personal author, or both,
- A date of compilation,
- Target commodity or commodities,
- The names of the standard NT 1:100 000 and 1:250 000 scale mapsheets relevant to the report.

Some examples follow:

EL 12345 “Red Spring” Partial relinquishment report, 30/6/2011
EL 12345 Annual report for the period 1/7/2010 to 30/6/2011
EL 12345 Bridging annual report for the period 1/2/2010 to 1/7/2010
EL 12345 Partial surrender report for the period 1/7/2010 to 30/6/2011
GR123/10 “Red Project” group annual report for the period 1/7/2010 to 30/6/2011
EL 12345 Combined annual and final report for the period 1/7/2010 to 30/6/2011

Contact details for the person(s) responsible for the technical content of the report must be supplied with each report. These will be the contacts used if the report is unsatisfactory. If such contact details are not initially supplied, the titleholder will be taken as the first point of contact.

12.2 Abstract

The report must contain a brief text-only abstract with no tables or figures. The summary must include discussion of the title history; refer to any relevant named prospects, commodity sought or mined, exploration rationale, geology, exploration activities during the reporting period and the main results and conclusions. A report on grouped titles should specify which titles were worked and which were not, with reasons.

To facilitate data entry into the Department’s report management system it is appreciated if the summary does not contain headings, references, paragraph breaks, hyperlinks, bullet points or other special characters such as @, ® or ±.

It should clearly quantify the work undertaken, eg the wording “RAB drilling was undertaken” should be “Drilling consisted of 25 RAB holes for 804 m and 1200 samples”. Aerial geophysical surveys must be described with the total line kilometres, line spacing and flying height specified. Where data relevant to the report has been submitted previously, for example airborne geophysical data, this must be explicitly stated in the abstract. The result of any resource and reserve estimation must be included in the abstract in plain English. Partial relinquishment and final reports must clearly state why the ground was dropped and detail any form of replacement tenure if applicable.

12.3 Copyright

All annual and final reports submitted under the *Mineral Titles Act 2010* must contain statements regarding copyright ownership (Regulation 126).

The person giving the annual or final report, the “relevant person”, must include a statement about that person’s ownership of copyright in part or all of the report, and if the statement relates to a specific part of the report, clearly identify the part. The relevant person must also authorise the Minister to publish information in which the copyright subsists where “publish” has the meaning under Regulation 10 or 125 of the *Copyright Act 1968* (Cth). This includes authorising the department to copy and distribute the report and associated data (Regulation 126(3)(a)).

If another person owns the copyright in part of the report, then the report must include a statement about the other person’s ownership of copyright and clearly identify the part of the report in which the copyright subsists. Furthermore the report must state whether or not the other person has authorised the publication of the information in that part, and if not, briefly describe the steps taken to obtain the authorisation (Regulation 126(3)(b)).

It is the responsibility of the relevant person to take all reasonable steps to obtain the other person’s written authority for the publication of the information contained in the report (Regulation 126(2)).

Reports must NOT include any material that is protected by copyright or prohibited from release by other laws (eg some aerial photos, some satellite imagery, data from technology embargoed by US International Traffic in Arms Regulations). Clients will be asked to resubmit reports that contain unacceptable material.

12.4 Body of text

The report must be as comprehensive as possible and must detail the work undertaken during the reporting period in sufficient detail to substantiate expenditure claims. Such work may include, but is not limited to, literature studies, remote sensing, geological mapping, petrological studies, isotopic studies, age dating, microprobe work, geophysical surveys, reprocessing of data, drilling, costeaning, surface geochemical surveys, underground investigations, and determining ore resources and reserves. Geotechnical work may include, but is not limited to, topographic surveys, rock quality designation, fracture density logging and other engineering studies, metallurgical testing, sterilisation drilling, drilling borefields, hydrogeological studies, metallurgical and mineral processing studies, mining feasibility, mine design studies, pilot plant testing and marketing studies etc.

Reports must NOT include any information, language, names or images that may be culturally sensitive, offensive or in confidence to Traditional Owners. For example no AAPA reports, locations or images of sacred sites, photos or names of persons recently deceased should be included. Clients will be asked to resubmit reports that contain unacceptable material. See also *Section 12.3*.

12.4.1 Location, title history, physiography and access

This section must include discussion of location of the title(s) or project area, general physiography and discussion of any logistical constraints. State the type of land involved (eg Freehold Land, Aboriginal Freehold Land, Native Title Affected Land or National Park), and if relevant discuss the steps taken and the progress in gaining access, for example obtaining AAPA clearances.

State the titles covered by the report, the area of the title(s), date of grant and, if relevant, the remaining period of tenure, and any corporate dealings eg transfers, JVs. If the title has resulted from amalgamation or has subsumed a former title(s) this needs to be stated. Any partial relinquishments must be mentioned. If the title is contiguous with other holdings by the same titleholder or is part of a project area as nominated by the titleholder, this must be stated.

All reports should include a scaled map detailing the title boundaries. The partial relinquishment report must contain a scaled block map which shows the blocks relinquished in relation to the area retained.

12.4.2 Geological setting, exploration/mining history and exploration rationale

The geological setting should be described in both regional and local context and named occurrences, prospects or mines are to be located on a map. Any relevant historical exploration and mining history should also be described.

For greenfields exploration, describe the empirical exploration philosophy, generic, genetic, conceptual or exploration models, targeting criteria (eg minimum target size and/or grade), the locations of known exploration targets, and exploration rationale. In the case of brownfields exploration, the philosophy behind the work (eg testing the lateral continuation of an ore body) must be stated.

12.4.3 Exploration index map

All reports must contain a scaled location map showing sample points and surveys in relation to boundaries of titles covered by the report.

12.4.4 Geological activities and office studies

Any literature searches must be demonstrated by the inclusion of a list of the references consulted. References to previous company reports should include Departmental CR numbers (see *Section 12.6*). Maps, GIS datasets, images or 3D models showing the results of all interpretations of existing data or reprocessed data (eg images of gravity worms generated and interpreted faults) must be provided.

Any area mapped geologically must be shown on a located, scaled map in relation to the title. The geological maps must be provided digitally at an appropriate scale, with a legend and accompanied by a discussion of the results. Geological maps must distinguish between geological 'fact' and interpretation by symbol or by separate maps. Other examples of geological work include structural studies, petrographic or petrological description.

If expenditure is claimed for the capture of legacy data or data reprocessing, that data must be supplied to the Department.

12.4.5 Remote sensing

Briefly describe the intention of the survey or the purchased dataset (eg LANDSAT, airborne multispectral surveys, or radar) and its specifications. Describe the results and interpretations. Images produced should be submitted as a georeferenced digital file (see *Section 13.0*). Where appropriate, the individual bands included in each image and their colour allocation should be identified. A brief description of the processes used to develop the image should also be provided.

If the data are protected by copyright or other laws that prevent inclusion of data, contour maps or images (see *Section 12.3*), this must be stated and a representative stitched image or scaled interpretative plan included in the body of the report in lieu of the prohibited content.

12.4.6 Geophysical activities

Quantify the geophysical exploration or interpretation undertaken. Include:

- a location plan which shows the boundaries of the data acquired in relation to the GDA94 datum and title boundaries. This can be a georeferenced image or a GIS data set (see *Section 13.4*)
- a quantitative description (eg line km flown, elevation and spacing) in each title or the percent of the survey in each title
- any data or observations on terrain conditions, nature of ground, quality of electrical contacts, extent of drifts and quality of data etc to enable another explorer to extend or reinterpret the survey
- discussion of what constitutes an anomaly; and how anomalies relate to geochemistry, geology and drilling results
- interpretations of results, including a selection of key profiles and plans.

Both processed and unprocessed data, all associated metadata and details of the programs, must be provided in digital form.

12.4.7 Surface geochemistry

Quantify the geochemical investigation program, its rationale, results and its relationship to other components of the exploration program. These must be described in sufficient detail and in a format to allow the results to be used by another party. Note that raw geochemical data, details of the surveys, standards and blanks must be submitted in the appropriate templates (see *Section 14.0*).

In the body of the text include:

- the types of surveys, eg rockchip, stream sediment sampling, vegetation sampling, water sampling, isotopic, age dating, microprobe, and these must be quantified for each title
- the program rationale and design parameters for eg general location, determining the number of samples, sample spacing or grid orientation
- a list or table of the elements, oxides, isotopes, etc analysed or other work undertaken
- details of quality control including the use of blanks and duplicates as appropriate
- advanced data processing and/or methods employed
- interpretations of the results and methods employed (statistical techniques used, parameters used to define threshold and/or background), highlighting and quantifying anomalous values, areas, etc
- processed data (eg gridded and contoured) and details of the processing techniques used is encouraged but optional
- the location and availability of samples at completion of the exploration program
- sample locations (with sample numbers) on plans shown in relation to relevant geological features
- a brief written statement of the sample preparation and analytical techniques, this is in addition to the proprietary codes from the laboratory included with the metadata given when submitting tabular data in accordance with the templates
- information on any renumbering of the samples or changes to recorded spatial locations since first reported

The general location of anomalies should be reported and the peak results of the target elements tabulated in the body of the report as per the following example:

Table 2. Surface geochemistry record example

Sample		Location			Survey Sample Statistics				
Sample Type	Sample Number	Zone	MGA East (m)	MGA North (m)	Peak Value Au (ppb)	No. of samples	Mean Au (ppb)	Median Au (ppb)	Standard Deviation Au (ppb)
Soil	AA5001	53	424930	7823969	1132	250	31	42	6

12.4.8 Drilling

All drilling must be quantified in the body of the report and this section of the report must also include a scaled map or plan showing drill collars in relation to the title boundary or another acceptable frame of reference. Greenfields, brownfields and grade control drilling, stratigraphic, water bore drilling, and geotechnical drilling etc must be discussed separately. The type of drilling (eg percussion /diamond coring), total depths and depth ranges must be specified. All digital data including hole locations, orientation, and assay results must be provided in the appropriate format using templates (see *Section 14.0*). Geological logging codes are to be provided even if they have been given in previous reports.

Information supplied in drill logs must include the following:

- drillhole number
- location coordinates
- azimuth, dip and length of each hole and method of downhole survey where applicable
- drilling method(s) (eg DDH, RC, AC, RAB) with intervals and drillrig type(s)
- date of hole completion
- geological log showing thickness and nature of each rock type penetrated. Where rock codes are used for the rock type, then the legend to the codes must be included
- drill sampling and sample splitting methods
- results of assays, analyses and tests made on drill samples
- results of geophysical and other downhole surveys
- drilling difficulties record: collar blowout, lost circulation, broken ground, major water inflow
- location (and ownership) of drillcore, following completion of the current drilling program.
- information on any renumbering or changes in depth intervals for the samples, or changes to recorded spatial locations of the drill hole since first reported

Include a summary table of all drilling during the reporting period, and significant intersections as per the following examples. Ensure that all hole numbers are shown on plans.

Table 3. Summary drilling table example

Hole Type	Hole Number Range	No of Holes	Total Metres
RAB	AARB 291-300	10	324
AC	AAAC 256-260	50	105
RC	AARC 1-2	2	122
Diamond	AADDH 1	1	200
Grand Total	-	63	751

Table 4. Significant intersections summary table example

Sample			Location			Drilling Sample Statistics (True Thickness)				
Hole No	Hole Dip	Hole Azimuth	Zone	MGA East (m)	MGA North (m)	Sample Interval (m)	Significant intersections		Total depths (m)	Comments
							From (m)	Cut-offs: 0.5 g/t Au, 5 g/t Ag		
AARC1	60	180	53	424930	7823969	0.5	20	3m at 3.4 g/t Au	60	Ironstone from 18 m to 24 m
AARC2	55	200	53	424980	78234980	0.5	22	4m at 4.1 g/t Au	62	Ironstone from 18 m to 24 m

Note: In the event that it is impractical to list all significant intercepts then list the best intersections giving the selection criteria, such as >5m and >1 g/t Au.

Section 13.1 Tabular data deals with the submission of drilling and downhole analytical data.

12.4.9 Geotechnical studies

All geotechnical work must be quantified in the body of the report. The spatial distribution of such studies or samples must be shown on a map in relation to the title boundaries. Separate detailed studies should be appended and all data must be provided digitally in the appropriate format.

12.4.10 Resources and reserve estimation/modelling

Details of estimation and modelling of mineral resources or ore reserves should be reported when they are first calculated on any mineral title type. The report must include all mineral resources and ore reserves as defined in *The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves* ('the JORC Code').

The preferred code for reporting is JORC 2012 but an equivalent international or earlier JORC code is acceptable. Indicate the code used or state if pre- or non- JORC compliant. Reporting of coal reserves should follow the guidelines in AS2519–1986. It is essential to stipulate if resources are inclusive of reserves.

The report must include:

- the software used in resource/reserve calculation
- the consultants (if any) employed
- statistical techniques used
- physical (eg bulk density) or chemical (eg limestone purity) properties used and how they were derived
- details of, and quantification of, the types of drillhole intercepts, pits etc that were used in generating the resource or reserve
- other determining factors eg overburden thickness, cut-off grade or recovery factor
- estimates as tonnes and grades in SI units unless otherwise indicated e.g. carats for diamonds.
- plans and sections showing ore blocks and ore outlines
- estimate summary on the template in Appendix 3

Attach the report as a separate appendix or volume to the annual report. If the resource estimation was undertaken by another party, their full report must be attached.

Annual summary mineral resource and ore reserve reports are required for ELRs and MLs on Approved Form 32 at the end of each financial year (see *Section 3.6*). Summaries of mineral resource and ore reserve estimates on ELs should be appended to the Annual Technical Report using the MS Excel template on the department website. See *appendix 3* for an example resource and reserve summary report. Summary reports do not include details of the estimation and modeling. Major revisions of resource or reserve estimates should be reported in full.

12.5 Conclusion and recommendations

Summarise and discuss the significant findings and interpretation of results obtained. This should be done in the context of exploration rationale, mine planning or future mining as appropriate. If relevant, it should also justify any shortfall in expenditure. If a proposed work program for the next reporting period is relevant, this needs to be briefly described and recommendations for further work included. If no further work is planned, the reasons need to be stated. Any plans for partial or complete surrender or change of tenure should be described.

12.6 References

References should be cited. References to previous statutory reports should include the Company Report (CR) numbers assigned by the Department.

12.7 Photographs other than those in the body of the text

Submissions of outcrop, mine face and core photographs is encouraged. These must be high-quality colour photos and must be clearly labelled so as to be able to relocate the material photographed.

13.0 DATA FORMATS AND SPECIFICATIONS

This section specifies acceptable data formats for the different types of data. The table below provides a summary and further explanation is available under the appropriate headings following the table.

Table 5. Summary of data formats and specifications

Data Type	Description	Format	Parameter	Suffix
Tabular data*	Point locations, geochemistry, heavy mineral, diamond indicator and drilling data	Tab Delimited ASCII	Standard as described in <i>Sections 13.1 and 14.0</i>	.txt
Report text	Documents, figures etc. previously provided only in hardcopy	Adobe Acrobat PDF	See <i>Section 13.2</i>	.pdf
Maps, plans, figures and photographs not embodied in report text	Files of maps, plans, figures, core photographs, aerial photographs etc.	Adobe Acrobat PDF	See <i>Section 13.2</i>	.pdf
		GEOTIFF/TIFF (colour)	Reproducible at 300 dpi, 24 bit	.tif
		JPEG	Q>95, reproducible at 300 dpi	.jpg
		GIF	8 bit	.gif
		PNG		.png
GIS data	Data in GIS format	MapInfo Tab ESRI Shape		.tab .shp
Video clips	Fly-throughs etc	MPEG Avi		.mpg .avi
3D mine models and resource estimation	3D mine model data, resource/reserve models	See Table 6	See <i>Section 13.10</i>	
3D modelling	3D models	As appropriate to fulfil requirements in <i>Section 13.10</i> ASCII .dxf files	See <i>Section 13.10</i>	.dxf .txt
Geophysics (other than seismic)	Raw and processed located data and gridded data. For example magnetics, radiometrics, EM, DTM and gravity data	ASEG GDF2 ASEG GXF (grid exchange format) ER Mapper grid XML (including schema)		.dfn .dat .des .gxf .grd, .ers .xml, .xsd
Geophysical and other remotely sensed images	Images derived from geophysical / remote sensing surveys, e.g. TMI, Bouguer, radiometrics, Landsat 5 or 7	GEOTIFF/TIFF (colour)	Reproducible at 300 dpi, 24 bit	.tif
		TIFF (greyscale)	Reproducible at 300 dpi, 8 bit	.tif
		Compressed	Best quality (least loss)	.ecw

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Data Type	Description	Format	Parameter	Suffix
		ER Mapper JPEG GIF PDF PNG	Quality as above 8 bit See <i>Section 13.2</i>	.jpg .gif .pdf .png
Geophysical Inversion and Numerical Modelling	Models	Points (DXF or ASCII) Images Surfaces 3D grids (UBC Grid or GoCAD Voxet)	 See <i>Section 13.2</i> See <i>parameters above for Geophysical Images</i>	.dxf .txt .pdf .tif .jpg .gif .png .dxf See Table 6
Seismic data	Raw and processed data	SEG Y, preferably Rev. 1 SEG D		.sgy .sgd
	Navigation data	UKOOA P1/90		.uka
	Processed sections (refer to Petroleum data submission guidelines for further information, www.ga.gov.au)	CGM+ format with metadata (line number, shotpoint number, ...) Images	 See <i>parameters above for Geophysical Images</i>	.cgm .tif, .jpg, .gif, .pdf, .png
Petrophysical and geophysical log data	Raw and processed wireline and MWD data (refer to Petroleum data submission guidelines for further information, www.ga.gov.au)	DLIS and LIS LAS	As defined by latest Industry Standard	.lis .las
		Delimited ASCII (format must be explained)		.asc
		WELLOGML (POSC standard)	Include schema	.xml, .xsd
	Log plots	Adobe Acrobat PDF TIFF (colour) TIFF (greyscale) JPEG GIF PNG	See <i>Section 13.2</i> See <i>parameters above for Geophysical Images</i> 8 bit	.pdf .tif .tif .jpg .gif .png
	Processed down-hole velocity data	SEG Y, preferably Rev. 1		.sgy

* proprietary formats will be accepted until an open-source International Standard is developed

*.TSG or FOS files are only accepted if accompanied by an equivalent ASCII file

Table 6. Summary of 3D model data types

Data Type	Description	Format	Suffix
3D Model Objects	3D spatial datasets including pit and underground design, mine development, geology and resources plus metadata	Attributed dxf export files.	.dxf
		ASCII xyz export files	.txt
		<u>Native software formats:</u>	
		Datamine	.asc .dm .dmb .dm *tr.asc & *pt.asc *tr.dm & *pt.dm
		Earth Vision	.2grd
		GemCom	.dat .nvflt .3dr
		GoCAD Pointset	.tri or .bt2 .vs .pl .ts .vs .sg
		Leapfrog Attributed mesh	.msh
		Micromine	.dat, .sec, .stp, .str, .svy .dat .out geol.par .grd .tdb .dmp
		Surpac Block	.msr .mdl .str .dtm
Vulcan Block model	.inp .bdf & *.bmf_asc .svg_dgd1.dbl & .scd .00t .00t_asc		

13.1 Tabular data

These data include point locations, geochemistry, diamond indicator observations and drilling data. Data will be submitted as TAB delimited ASCII files with a suffix of .txt. File format details are provided in *Section 14.0 Data standard specification – tabular data, metadata and templates* and Appendix 1.

The required file format for tabular data is a "flat file" rather than a "relational" file system. This allows more flexibility in the format and also reduces the need for relational keys between files. However, some datasets, particularly drill logs incorporating lithological, geochemical, structural and other data, including authority / lookup tables, may have to be submitted as a series of "linked" flat files, appropriately documented.

The "MRT" software creates the metadata headers required for compliant tabular files. Compliant files of tabular data can be modified manually using any text editor.

13.2 Report text

The report text and associated tables, maps, plans and figures that are part of the main body of the report must be compiled in a single Portable Document Format (PDF) file, such that the file is less than 10 MB. The PDF security must be set to allow "copy and paste" and "print", but not to "edit" the document. **The file must be a text (not image) PDF.**

PDF files created by software other than Adobe Acrobat must be able to be read by Adobe products. Only provide PDF files that are legible including the use of common standard fonts and readable maps and images. Avoid use of non-standard fonts as viewers of the documents may not have all the required fonts; Arial and Times New Roman are the safest option. Some software will create a PDF which looks correct in Adobe Reader but the special fonts will turn to meaningless characters when the text is copied and pasted. For ease of reading the text should use a font no smaller than 10 pt Arial or 11 pt Times New Roman.

The text must be in a read from "top to bottom" form; that is, if some pages are in landscape then pages must be rotated. For larger reports, both thumbnails and bookmarks are appropriate. Do not embed any files as attachments within the text PDF. All associated files must be separate. Hyperlinks from PDF documents may not work when the report is lodged into the report lodgment system.

When compressing or re-sampling image files, ensure that the final images have the resolutions and clarity for readers. Image resolutions have to be at least 75 dpi and the recommended resolutions for down hole logs is 150 dpi, but ensure that the final document size does not exceed the 10 MB limit. Any particularly high-quality graphics or georeferenced maps included within the text must be submitted as individual stand-alone image files (see below) and a thumbnail included in the report text as a placeholder. Where the single report PDF is too large (over 10 MB), it must be split into smaller PDF files and named according to the file naming conventions (see *Section 7.1*).

13.3 Maps, plans, figures, images and photographs

Depending on the number involved and the file size, maps, plans, figures, photographs and other illustrations may be inserted into the appropriate places within the text document or may be grouped together in a separate section or appendix. Refer to Table 5 for formats and parameters.

All maps, plans, sections, figures, etc. must:

- have a metric scale bar
- have a coordinate grid clearly marked and a label within the bounds of the map or plan that includes the datum and where relevant, the zone (52 or 53)
- have a north point (grid, true and magnetic north) or orientation of sections
- have a clear and comprehensive legend. We recommend using symbols defined in *Symbols Used on Geological Maps*, (1989) by the Bureau of Mineral Resources, Geology and Geophysics
- distinguish between geological 'fact' and interpreted geology
- show the author, acknowledged sources and date of drafting.

TIFF (.tif) is recommended for black and white and JPEG (.jpg) for greyscale or colour including photographs, but not for images containing text or line work.

Imagery will be primarily derived from geophysical surveys. Other imagery includes satellite, multispectral scanner and orthoimagery. Sufficient information should be provided to allow spatial registration of images where appropriate.

13.4 GIS data

Currently, there is no international standard for data in GIS format but most common software is able to read the common proprietary formats. GIS data formats accepted are ESRI shape files (SHP) and MapInfo tab files (TAB).

Where practical the symbology of the GIS displayed data should be provided (e.g. an ESRI layer file (LYR) or legend file (AVI) or MapInfo workspace file (WOR).

13.5 Geophysical data other than seismic

These data include magnetic, gravity, radiometric and electromagnetic (including TEM, SIROTEM and airborne EM) surveys. For both raw and processed located data, the standard ASEG GDF2 format is required. All airborne geophysical contractors operating in Australia can supply located data in ASEG GDF2 format and gridded data in ER Mapper format.

Unless an exemption has been granted to not cookie-cut data (see *Section 3.3.1 Partial relinquishment reports*), the submission of images alone does not exempt companies from submission of the located geophysical data from which the images were derived.

In the case of airborne EM surveys, as much of the following located information as is pertinent to the type of survey conducted shall be supplied, in addition to the operational data (such as line number, sample position, terrain clearance etc) normally supplied for airborne surveys. Such additional data shall be sufficient to enable inversion of the data to the current extent implied by the type of survey conducted:

- Raw EM data for each recorded component, if supplied by the survey contractor
- Levelled, windowed and processed EM data for each recorded sample and component
- All channels of information computed from the processed EM data eg half-space apparent conductivities, layered earth apparent conductivities
- Ancillary data such as those recorded by 50Hz monitors and spherics monitors
- Tx-Rx vertical and horizontal separation tabulated with accompanying diagram, or Tx and Rx positions, for each sample if recorded dynamically
- All parameters relevant to Tx and Rx moment and all orientation data
- If a B-field sensor is used, all relevant sensitivity information
- Tx current details and, if available, for each sample recorded dynamically
- All reference or real-time waveforms recorded and suitable for calibration purposes
- All calibration data relevant to the flight lines supplied
- Full metadata including frequencies, waveform and duty cycle, window times, centres and widths, measurement units and details of any amplitude normalization
- Full metadata about the EM data processing including a list defining the processing sequence employed and a quantitative description of each processing stage in the sequence sufficient that its effect on the data may be determined for future reference. Such descriptions may include references to published papers explaining the algorithms used
- Any other recorded parameters relevant to the current processed or interpretive outputs or useful for the further processing or inversion of the data.

Much of the reference information required will be in the operations report which should be lodged with the data. It is required that gridded data be submitted in either ASEG GXF or ER Mapper gridded data format

The data format specifications maybe waived for ground geophysical surveys of less than 1000 data points and/or over an area of less one square kilometre. Permission must be granted in advance.

13.6 Seismic data

International standards exist for seismic data and compliance with the following formats is required:

Raw and processed data - SEG Y (preferably Rev. 1) or SEG D, with file names including the survey name and line number where appropriate.

Navigation data - as a complete UKOOA P1/90 file.

Processed sections - CGM+ files complete with metadata, with the line number included within the file name. Images of processed sections may use geophysical image formats specified in Table 5.

Refer to *Guidelines for reporting and submission of petroleum data* at www.ga.gov.au for further details.

13.7 Petrophysical and downhole geophysical data

Raw and processed wireline (eg gamma or resistivity logs) and MWD data must be provided as DLIS, LIS, LAS, delimited ASCII or WELLOGML(POSC standard) files.

Log plots are to be provided as either PDF, TIFF, JPEG, GIF or PNG files. Processed down hole velocity data should be provided in SEG Y (preferably Rev.1) format, with the well/hole name as part of the file name.

13.8 Spectral and alteration logs

Proprietary files generated by spectral and/or alteration logging hardware or by the display and interpretation software may be submitted in the native format but MUST be accompanied by a generic ASCII equivalent. For example, PIMA™ FOS files must be accompanied by one or more .txt and/or .emf files and, if necessary, .jpg files that contain the same data and are readable without using specialist software.

13.9 Aerial hyperspectral data

Hyperspectral data must be submitted as reflectance-level data with all associated geocorrection files. In this form, the data has the full 125/128 bands while using minimum disk space, and will allow reprocessing in the future. Reflectance data must be submitted as .bil files, with accompanying .hdr header files and corresponding geocorrection information in .img and .glt files. Data older than 2004 may lack the .glt files or be at radiance level rather than reflectance. Mineral maps must also to be presented. All images must be georeferenced.

13.10 Computer modelling

13.10.1 3D Model Objects

Sufficient data and associated files to regenerate the models must be submitted. Supply regional and mine scale 3D model objects including points, lines, surfaces and volumes. Refer to Table 6 for formats.

Provide:

- details of software and version used
- model extents in GDA94 (MGA or latitude/longitude)
- local grid transformation data if local grid is used
- model points, lines and surfaces as ASCII .dxf files (or as ASCII point sets or ASCII line strings for point and line objects)

13.10.2 Geophysical inversion

Supply inputs to and results from geophysical inversion modelling, a description of the modelling process and a description of the model scope and purpose. Refer to Tables 5 and 6 for formats and parameters.

Provide:

- a description of the aim and scope of the inversion project
- details of software and version used
- model extents in GDA94 (MGA or latitude/longitude)
- a description of the input datasets and constraints (eg using drill data)
- a description of the modelling parameters (eg susceptibility, density, dimensions of body) used (control file)

Model outputs either as:

- points (DXF or ASCII)
- images – calculated, observed, residual
- surfaces (DXF and/or file type described in *Section 13.10.1*)
- 3D grids (UBC Grid sus, bin and mesh files or GoCAD Voxet)

Include a brief description of model convergence and confidence level (Is the model a good fit for the data?).

13.10.3 Numerical simulation

Describe the model scope and purpose. Supply inputs, to and results from, numerical simulation modelling. Refer to Table 6 for formats.

Provide:

- a description of the aim and scope of the numerical simulation
- details of software and version used
- model extents in GDA94 (MGA or latitude/longitude)
- a description of the input datasets and constraints
- a description of the simulation parameters used (control file)
- Model outputs in DXF, VRML, VTK, GoCAD or other appropriate format from the list in *Section 13.10.1*.

13.10.4 Resource/reserve modelling and estimation

Provide the data used to produce the estimate including:

- details of software and version used
- rock density estimate or measurement data
- boreholes involved (collars, assays and down hole survey files)
- additional grade information (eg bulk sampling data)
- all relevant model points, lines and surfaces as ASCII .dxf files (or as ASCII pointsets or ASCII line strings for point and line objects)
- assumptions made (eg cut-off grade, overburden etc)

Refer to Table 6 for formats.

14.0 DATA STANDARD SPECIFICATION – TABULAR DATA, METADATA AND TEMPLATES

Digital data must be submitted in common formats that will ensure that the data can be transferred directly into the Department's database with minimal risk of transcription errors. Standardised templates have been developed as a basis for the national reporting guidelines produced by GGIC. These templates facilitate the submission of the most common types of digital data.

All such data must be accompanied by metadata or "data about the data". The standard recommended by ANZLIC for metadata should be used where appropriate. However, some data require more information for intelligent use, and some data require specific metadata covered under other international standards.

The metadata should provide sufficient information about the data for it to be used again. Metadata are to be presented in a file header at the top of the file of related tabular data (preferred), or as a separate file. The objective of including the metadata with the numerical data is to remove the need to search elsewhere to complete or comprehend a dataset. Details of the metadata file headers information required is in Tables 3 and 4 and the metadata headers ("templates") in Examples 1 to 8 are discussed in the following sections.

Metadata should include:

- location of the data (or a pointer to a file providing this information);
- date the data were produced
- date the data were altered
- parameters controlling the data acquisition
- parameters controlling the data's alteration
- name of the company for whom the data was produced, eg the title holder
- titles(s) under which the data was produced
- activity which produced the data, eg drilling
- name of the contractor producing the data
- any translation parameters required for conversion of the data (especially location data)
- equipment used to generate the data
- original format of the data
- definition of codes.

14.1 Template Software

The software *Mineral Reporting Template* or *MRT*, available for download from the department website, captures the metadata and combines it with the relevant exploration data file. It prompts the user to choose a template relevant to the particular type of exploration data being submitted in the report. *MRT* formats this metadata according to the relevant template and inserts it as a header to the corresponding exploration data file. *MRT* then exports it in a comma delimited ASCII format (such as the .txt extension viewable in software like *Excel*) as required by the reporting guidelines.

14.2 File header format

The metadata header is constructed in such a way as to present the information by category, and then by sub-category. The main rules with these file headers are:

1. The field number series and description fields are mandatory for data supplied and must be placed in the first and second positions respectively
2. Header data fields must be tab delimited and allow for several separate pieces of information for each header type
3. The national standard numbering system described below must be strictly adhered to (note that some numbers have been reserved by other jurisdictions or are no longer used)
4. Do not embed the delimiter in any of the fields
5. Where a header row is not relevant to that type of data in the file, it should be omitted (eg H0800 series (assay information) would be omitted from a collar file generated from the SL3 template)

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6. Where a piece of metadata is otherwise not relevant or unknown, state this rather than leave a blank field
7. Users may add additional specific data fields to the mandatory fields in the data section of any template file. This is accomplished by adding header fields to the H1000 series.

14.2.1 Metadata file header codes

The following table contains example codes and shows all available variants in use within the Australian jurisdictions. Some header codes have been reserved and/or used by earlier versions and are now not available for use.

Table 7. Version 4 metadata file header information

Fields in **bold** are mandatory, fields in *italics* are recommended, and fields in normal face are optional.

Field Title explanation in italics

Square brackets denote alternatives, e.g. [AAA|BBB] denotes one of AAA or BBB

Header Number	Header Field Title	Examples of Values
H0000	<i>Reserved – used by earlier versions</i>	
H0001	<i>Reserved – used by earlier versions</i>	
H0002	Version (<i>of digital reporting guidelines</i>)	4.0
H0003	Date_generated	15-Oct-2002
H0004	Reporting_period_end_date	30-Sep-2002
H0005	State	SA
H0100	[Tenement_no Combined_rept_no] (When Combined_rept_no is used, a listing of all tenements under the combined reporting no for that year must be included in the text of the report. In addition, individual tenement numbers should be included in the H1000 and D series, i.e. identifying each row of data as belonging to a particular tenement.)	[EL99999 C316_99]
H0101	Tenement_holder	Big Time Mining
H0102	Project_name	Kryptonite
H0103 to H0105	<i>Reserved – used by earlier versions</i>	
H0106	Tenement_operator	Small Time Mining
H0110	<i>Documents (Reserved by SA)</i>	<i>ENV09876</i>
H0113	<i>Reserved – used by earlier versions</i>	
H0123	<i>Reserved – used by earlier versions</i>	
H0150	250K_map_sheet_number (covered by data)	SH5311
H0151	100K_map_sheet_number (covered by data)	5936 5937 6037
H0152	<i>50K_map_sheet_number</i>	<i>59361 59373 60374</i>
H0153	<i>25K_map_sheet_number</i>	<i>59361N 59373S 60374N</i>
H0200	Start_date_of_data_acquisition	01-Oct-2001
H0201	End_date_of_data_acquisition	30-Sep-2002
H0202	Template_format	SL1
H0203	Number_of_data_records (in this file)	7
H0204	Date_of_metadata_update	15-Oct-2002
H0300 onwards	(Pointers to other files directly related to this file. H0300 and H0308 are always present. Other H03nn records which relate to this file must be present. H03nn records which are not relevant to this file should be omitted. H0318 onward are currently used for variant data files which do not match the main categories listed. Those numbers are subject to reservation for particular data types in future.)	
H0300	This_filetype	EL99999_2002_A_06_DrillCollars.txt

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Header Number	Header Field Title	Examples of Values
	(H0300 should always contain the name and type of the file in which it is contained as a check against inadvertent filename changes)	
H0301	Location_data_file	<i>EL99999_2002_A_06_DrillCollars.txt</i>
H0302	Downhole_lithology_data_file	<i>EL99999_2002_A_08_Lithologs.txt</i>
H0303	Downhole_geochem_data_file	<i>EL99999_2002_A_09_DownholeGeochem.txt</i>
H0304	Downhole_survey_data_file	<i>EL99999_2002_A_14_DownholeSurveys.txt</i>
H0305	Surface_geochem_comp_data_file	<i>EL99999_2002_A_10_SurfaceGeochem.txt</i>
H0306	Surface_geochem_abbr_data_file	<i>EL99999_2002_A_13_SurfaceGeochem.txt</i>
H0307	Lithology_code_file	<i>EL99999_2002_A_16_LithologyCodes.txt</i>
H0308	File_Verification_Listing	<i>EL99999_2002_A_18_FileListing.txt</i>
H0309	Drilling_summary_data_file	<i>EL99999_2002_A_17_DrillingSummary.txt</i>
H0310	Water_data_file	<i>EL99999_2002_A_19_WaterDataFile.txt</i>
H0311	Hydrodata_in_litholog_flag	[Yes No]
H0313	Alteration_data_file	<i>EL99999_2002_A_21_Alteration_data_file.txt</i>
H0314	Magsusc_data_file	<i>EL99999_2002_A_22_Magsusc_data_file.txt</i>
H0315	Vein_data_file	<i>EL99999_2002_A_23_Vein_data_file.txt</i>
H0316	Recovery_data_file	<i>EL99999_2002_A_23_Recovery_data_file.txt</i>
H0317	Weathering_data_file	<i>EL99999_2002_A_23_Weathering_data_file.txt</i>
H0318 onward	Other_data_file (name appropriate to content)	<i>EL99999_2002_A_nn_Variant_data_file.txt</i>
H0400	Drill_code (All drilling codes used should be stated here. Where more than one type of drilling is used, an additional column stating the drilling type must be included in the H1000 and D series, i.e. identifying each row of data as applying to a particular drilling type.)	<i>RAB ACR DIA</i>
H0401	Drill_contractor (Drilling contractor used. If more than one, they should also be included in the H1000 and D series, i.e. identifying each row of data as applying to a particular driller.)	<i>Drill Faster Pty Ltd Drill Well Pty Ltd</i>
H0402	Description (Describe the drilling codes in the order they are shown in the H0400 record, with code/description paired and items separated by the standard delimiter.)	<i>RAB Rotary air blast ACR Aircore DIA Diamond bit coring</i>
H0500	Feature_type	<i>Hole collar</i>
H0501	Geodetic_datum	<i>GDA94</i>
H0502	Vertical_datum (If an arbitrary vertical datum has been used then this must be stated.)	<i>AHD</i>
H0503	Projection (Detailed as at right for a projected coordinate system, "None" for a geographic coordinate system.)	<i>UNIVERSAL TRANSVERSE MERCATOR (UTM)</i>

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Header Number	Header Field Title	Examples of Values
H0504 to H0507	Reserved – used by earlier versions	
H0508	Local_grid_name (When local grid coordinates are provided the Geographic or Projected coordinates must also be included in the H1000 and D series.)	<i>Neutron grid</i>
H0510	Local_grid_information (State specific)	
H0511	Local_grid_information (State specific)	
H0522 to H0524	Reserved by NSW	
H0530	Coordinate_system [Geographic Projected]	Projected
H0531	Projection_zone (Null for geographic coordinate system, zone specified for UTM. If more than one UTM zone is specified and this template file contains coordinates, an additional column specifying UTM zone must be included in the H1000 and D series, i.e. identifying each row of data as belonging to a particular zone.)	53
H0532	Surveying_instrument (Where more than 1 instrument applicable to this particular template file is used, an additional column stating the instrument type must be included in the H1000 and D series, i.e. identifying each row of data as applying to a particular survey method.)	GPS Differential Generic GPS Survey Grade
H0533	Surveying_company	<i>Super Surveying Pty Ltd</i>
H0600	Sample_code	DC CT CS
H0601	Sample_type (Sample source type code/description pairs, in the order they are shown in the H0600 record.)	DC Drill core CT Drill cuttings CS Core sludge
H0602	Sample_description (Describe field and pre-lab dispatch sampling methods)	Quarter core Half splits of cuttings
H0700	Sample_preparation_code (Codes used for laboratory sample preparation for assaying.)	S031
H0701	Sample_preparation_details (Lab sample preparation code/description pairs. Where more than one laboratory is specified in H0801, list sample prep details in order of H0801 lab listing, assuming one sample prep. method per laboratory. If more than one sample preparation method per laboratory, results should be presented in separate files.)	S031 Fine pulverise to 75µm
H702	Job_no (Laboratory job number. Where more than one laboratory is used, show job numbers in the order corresponding to the laboratories in H0801.)	G37215 ADL20406
H0800	Assay_code (All laboratory assay codes used should be stated in the metadata. Where more than one type of assay is used the assay code must also be included in the H1002 row.)	FA50 IC587
H0801	(Assay_company) Lab code/name pairs, name including location. Where more than one laboratory is used, each laboratory name should be preceded by an abbreviation code which is then used in the H1007 record to identify assay_code against laboratory.)	PLP Phlogiston Laboratories, Perth AAL Aardvark Laboratories, Adelaide
H0802	Assay_description (Assay code/description pairs, in order of codes specified in H0800.)	FA50 Aqua regia digest, Fire assay determination IC587 HClO4 + HNO3 + HF digest, Inductively coupled plasma mass

Header Number	Header Field Title	Examples of Values
		<i>spectrometry determination</i>
H0900	Comments (Free text comments and remarks, enclosed in quotes.)	<i>“Various general comments, remarks, observations etc.”</i>
H1000 onward	Note that, in the H1000 series, the record name is not shown after the H1nnn designator. Each record passes directly into field names, units etc.	
H1000	(Data field names)	<i>Xcoordinate, Lab Job no., Au SiO2 Zn</i>
H1001	(Units of measure for each dimensioned field – ensure that a delimiter is present as a placeholder for fields where this is null.)	<i>metres ddd.dddddd ddmms.sss ppm %</i>
H1002	(Assay_code - specify for each analyte)	<i>FA50</i>
H1003	(Lower detection limit as units specified in H1001)	<i>0.01</i>
H1004	(Accuracy - specify for each dimensioned field using the units in H1001)	<i>0.01</i>
H1005	(Upper detection limit as units specified in H1001)	<i>1000</i>
H1006	(Preferred assay indicator (P) for preferred assay where several values are presented for a single sample, null for others. The “preferred assay” field should also be the first listed for that analyte.)	<i>P</i>
H1007	(Assay_company_ID: where more than one laboratory is used, a code specified in H0801 identifies assay_code against laboratory.)	<i>PLP</i>
D	(Data)	

14.2.2 Content of file templates for tabular data

All headers require the “Numerical Header”, eg “H0100”, to appear in the first field (column) of each header row to enable transcription software to upload the metadata correctly. The underlying data records require the character “D” in the first field to allow transcription software to distinguish the data itself from the metadata on upload. An end of file marker “EOF” must immediately follow the last data record as the final line of the file. It must be emphasised that the format is flexible enough to handle more data than is shown in the example below because the H1000 series headers allow for self-definition of the data.

14.2.3 Description of individual templates for data submission

The most common types of data must be supplied using templates:

Table 8. Templates for tabular data submission.

Explanation in italics

Template	Data Type	Mandatory dependant/related templates	Dependent/related templates	Appendix 1 Examples
SL1	Surface point locations, drill collars		DG1, DL1, DS1 <i>(when downhole data collected)</i>	Example 1
SG1	Surface geochemistry		Lithology_code_file <i>(when lithology is specified for each sample)</i> QG1	Example 2
DG1	Downhole geochemistry	SL1	Lithology_code_file <i>(when lithology is</i>	Example 3

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			<i>specified for each sample)</i> QG1	
QG1	QA/QC file for capturing laboratory/field duplicates, standards and blanks.	SG1 &/or DG1		Example 4
DS1	Downhole directional survey	SL1		Example 5
DL1	Downhole lithological logs	SL1 Lithology_code_file		Example 6
VL1	File verification listing			Example 7
DU1	Drilling Summary	SL1		Example 8

Note that SG1, SG2 and DG1 templates may also be used for submission of heavy mineral or diamond indicator sampling results.

SL1: Surface point locations, drill collars (Example 1)

Drillhole collar and sample point locations require the additional parameters of geodetic datum, coordinate system, projection and spatial accuracy to ensure completeness, usefulness and longevity of data. Detailed explanations of these concepts are available from a number of sources, and are outside the scope of this document.

H1001 should include the datum for the azimuth as a suffix to the units of measurement, i.e. _M (Magnetic) or _T (True).

SG1: Surface geochemistry (Example 2)

A complete file of surface geochemistry contains both location and assay data and will therefore require metadata on both the spatial and analytical components. Spatial metadata are treated as in the SL1 header template. The H0600, H0700 and H0800 series contain metadata related to sample collection, preparation and analysis respectively. H1002, H1003, H1005, H1006 and H1007 are brought into use for analytical metadata.

The H0800 record should contain the assay method code as specified by the laboratory, rather than that used by the client. Description of each analytical method in H0802 should specify sample digestion as well as final analytical determination method.

When an assay result for a particular analyte is below detection limit, it should be shown in the data record as not detected “nd”, or the negative of the detection limit e.g. “-10”.

When an analyte was not assayed for a particular sample, it should be shown in the data record as null or not assayed “na”.

Each file must be consistent in its usage of “below detection limit” and “not assayed”.

SG1 templates may also be used for submission of heavy mineral or diamond indicator sampling results.

QA/QC data (laboratory/field duplicates, standards, blanks) should be included in a separate QA/QC file. See QG1 below.

DG1: Downhole geochemistry (Example 3)

Downhole geochemical data files require sample location data and metadata to be provided in separate files, i.e. in the SL1 file. In the DG1 file, only the drillhole identifier, sample code, downhole interval and assay data are provided for each sample in the data records, with pointers to the relevant SL1 file.

If downhole lithological logs (DL1) are not presented, it is recommended that the lithology of each sample be specified as an extra data field in the DG1 file.

DG1 template may also be used for submission of heavy mineral or diamond indicator sampling results.

QA/QC data (laboratory/field duplicates, standards, blanks) should be included in separate QA/QC file. See QG1 below.

QG1: QA/QC file for capturing laboratory/field duplicates, standards and blanks (Example 4)

It is considered that in addition to the metadata covering analytical method, laboratory, sample preparation, units of measure, and upper and lower detection limits, all of which are required in the various geochemistry templates, inclusion of analytical results of named standards as well as results of analyses of duplicate samples and blanks will assist in evaluating the quality of the data

The QG1 Template has the same structure and metadata as the Geochemistry files (SG1 & DG1) but will include:

- Lab Job Number – as provided by analytical laboratory,
- QA/QC type:
 - FDup = field duplicate submitted to laboratory
 - LDup = duplicate generated and reported by laboratory,
 - Standard = General and certified standards, and
 - Blank = Laboratory blanks
- Standard ID – name of standard be it certified or a general standard, and
- Duplicated Sample Number (original sample number for field duplicate).

DS1: Downhole directional survey (Example 5)

H1001 should include the datum for the azimuth as a suffix to the units of measurement, i.e. _M (Magnetic) or _T (True).

DL1: Downhole lithological logs (Example 6)

Only the drillhole identifiers, depth intervals and lithological data are provided in this file, with pointers to the relevant SL1 file and lookup / authority / validation / namespace files. In most cases, lithologies are presented as abbreviation codes. A TAB delimited ASCII file showing abbreviation code against full lithology name must be provided if this is the case, Lithology_code_file.

VL1: File Verification Listing (Example 7)

A listing of all digital files submitted as part of the report, including the file type and format. Sufficient information on graphics files to ensure valid interpretations can be made.

APPENDIX 1: DATA FILE EXAMPLES

In Examples 1 to 8, fields in **bold** are mandatory, fields in *italics* are recommended, and fields in normal face are optional.

Example 1. SL1 Surface point locations, drill collars.

Filename EL99999_2002_A_05_DrillCollars.txt

H0002	Version	4.0				
H0003	Date_generated	15-Oct-2002				
H0004	Reporting_period_end_date	30-Sep_2002				
H0005	State	NT				
H0100	Tenement_no	EL99999				
H0101	Tenement_holder	Big Time Mining Ltd				
H0102	Project_name	Kryptonite				
H0106	Tenement_operator	Small Time Mining NL				
H0150	250K_map_sheet_number	SD53-10				
H0151	100K_map_sheet_number	5669	5670	5770		
H0152	50K_map_sheet_number	56691	56692	56703	57703	57704
H0153	25K_map_sheet_number	56691N	56692N	56692S	56703S	57703N 57704S
H0200	Start_date_of_data_acquisition	01-Oct-2001				
H0201	End_date_of_data_acquisition	30-Sep-2002				
H0202	Template_format	SL1				
H0203	Number_of_data_records	7				
H0204	Date_of_metadata_update	15-Oct-2002				
H0300	Location_data_file	EL99999_2002_A_05_DrillCollars.txt				
H0301	Location_data_file	EL99999_2002_A_05_DrillCollars.txt				
H0302	Downhole_lithology_data_file	EL99999_2002_A_06_LithoLogs.txt				
H0303	Downhole_geochem_data_file	EL99999_2002_A_07_DownholeGeochem.txt				
H0304	Downhole_survey_data_file	EL99999_2002_A_10_DownholeSurveys.txt				
H0400	Drill_code	RAB	DIA			
H0401	Drill_contractor	Drill Faster Pty Ltd	Drill Well Pty Ltd			
H0402	Description	RAB	Rotary Air Blast	DIA	Diamond Bit – Coring	
H0500	Feature_located	Hole_collar				
H0501	Geodetic_datum	GDA94				
H0502	Vertical_datum	AHD Arbitrary RL500 Nominal				
H0503	Projection	UTM				

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```

H0530 Coordinate_system      Projected
H0531 Projection_Zone        53
H0532 Surveying_instrument  GPS Multi Base Wide Area Differential
H0533 Surveying_company     Super Surveying Pty Ltd
H1000 Hole_ID               Xcoordinate      Ycoordinate      Zcoordinate      Maxdepth      Collar_azimuth  Collar_Inclination  Drill_code  Drill_Date  Projection_Zone
H1001      metres          metres          metres          metres          degrees_M      degrees
H1004      0.001            0.001            0.5              0.1              1              1
D      RD01          512920          6928100          243.5            88.6           0              -90          RAB      17/08/2002
D      RD/DD02       513000          6926320          230.0            120.4          275            -73          RAB,DIA  17/08/2002
D      RD03          514970          6925540          211.5            35.3           0              -90          RAB      18/08/2002
D      RD04          511110          6923680          181.5            225.0          0              -90          RAB      18/08/2002
D      RD/DD05       513160          6925880          279.0            186.6          36             -82          RAB,DIA  24/08/2002
D      DD06          513320          6924990          222.0            105.4          0              -90          DIA      25/08/2002
D      RD07          513280          6924250          211.5            12.5           0              -90          RAB      19/08/2002
EOF

```

Example 2. SG1 Surface geochemistry.

Filename EL99999_2002_A_08_SurfaceGeochem.txt

For demonstration purposes only, it includes all methods of specifying “below detection limit” or “not assayed”; files actually submitted must be consistent in usage of “below detection limit” or “not assayed” designators.

```

H0002 Version                4.0
H0003 Date_generated         15-Oct-2002
H0004 Reporting_period_end_date 30-Sep-2002
H0005 State                  NT
H0100 Tenement_no            EL99999
H0101 Tenement_holder        Big Time Mining Ltd
H0102 Project_name           Kryptonite
H0106 Tenement_operator       Small Time Mining NL
H0150 250K_map_sheet_number   SD53-10
H0151 100K_map_sheet_number   5669
H0152 50K_map_sheet_number    56691
H0153 25K_map_sheet_number    56691N 56691S 56694N
H0200 Start_date_of_data_acquisition 01-Oct-2001
H0201 End_date_of_data_acquisition 30-Sep-2002
H0202 Template_format         SG1

```


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D	A116	RO	LMST	513320	6924990	220				55	30	65
D	A117	RO	GBRO	513280	6924250	220	na	na	na	10	10	20
EOF												

Example 3. DG1 Downhole geochemistry.

Filename EL99999_2002_A_07_DownholeGeochem.txt

H0002	Version	4.0	
H0003	Date_generated	15-Oct-2002	
H0004	Reporting_period_end_date	30-Sep_2002	
H0005	State	NT	
H0100	Tenement_no	EL99999	
H0101	Tenement_holder	Big Time Mining Ltd	
H0102	Project_name	Kryptonite	
H0106	Tenement_operator	Small Time Mining NL	
H0200	Start_date_of_data_acquisition	01-Oct-2001	
H0201	End_date_of_data_acquisition	30-Sep-2002	
H0202	Template_format	DG1	
H0203	Number_of_data_records	7	
H0204	Date_of_metadata_update	15-Oct-2002	
H0300	Downhole_geochem_data_file	EL99999_2002_A_07_DownholeGeochem.txt	
H0301	Location_data_file	EL99999_2002_A_05_DrillCollars.txt	
H0303	Downhole_geochem_data_file	EL99999_2002_A_07_DownholeGeochem.txt	
H0600	Sample_code	DC	CT
H0601	Sample_type	DC	Drill core
H0602	Sample_description	Quarter core	Half splits of cuttings
H0700	Sample_preparation_code	S031	R040
H0701	Sample_preparation_details	S031	Pulverise to 50um
H0702	Job_no	ADL12345	02A1234
H0800	Assay_code	FA3	IC587
H0801	Assay_company	PLP	Phlogiston Lab, Perth
H0802	Assay_description	FA3	Aqua regia digest,fire assay/carbon rod determination; IC587 HClO4+HNO3+HF

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digest, inductively coupled plasma mass spectrometry determination; AAS1 HClO4+HNO3+HF digest atomic absorption spectrometry determination

H1000	Hole_ID	Depfrom	Depto	Sample_ID	Sample_code	Au	Au	Ca	Cu	Pb	Zn
H1001		metres	metres			ppb	ppb	ppm	ppm	ppm	ppm
H1002						FA3	AAS1	IC587	IC587	IC587	IC587
H1003						1	10	10	10	10	10
H1004		0.1	0.1			1	1	10	5	5	5
H1005						10000	500000	500000	200000	200000	200000
H1006						P					
H1007						PLP	AAL	PLP	PLP	PLP	PLP
D	RD111	12	14	A111	CT	12	15	125000	75	15	30
D	RD111	14	16	A112	CT	nd	nd	11420	10	nd	10
D	RD111	16	18	A113	CT	2	nd	1530	nd	nd	10
D	DD112	123.4	123.5	A114	DC	4	nd	3770	15	10	25
D	DD112	120.0	121.0	A115	CS	76	50	18460	30	85	160
D	DD112	273.0	273.7	A116	DC	na	na	na	55	30	65
D	DD112	354.6	355.1	A117	DC	na	na	na	10	10	20

EOF

Example 4. QG1 QA/QC file for geochemistry.

Filename EL99999_2004_A_14_QAQCGeochem.txt

H0002	Version	4.0
H0003	Date_generated	19-Jan-2005
H0004	Reporting_period_end_date	28-Feb-2004
H0005	State	NT
H0100	Tenement_no	EL99999
H0101	Tenement_holder	Big Time Mining Ltd
H0102	Project_name	Kryptonite
H0106	Tenement_operator	Small Time Mining NL
H0150	250K_map_sheet_number	SD53-10
H0151	100K_map_sheet_number	5669 5769
H0152	50K_map_sheet_number	
H0153	25K_map_sheet_number	56691N 56691S 56694N
H0200	Start_date_of_data_acquisition	01-Mar-2003
H0201	End_date_of_data_acquisition	28-Feb-2004
H0202	Template_format	QG1

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H0203 Number_of_data_records 10
H0204 Date_of_metadata_update 19-Jan-2005
H0300 QAQC_Geochem_data_file EL99999_2004_A_14_QAQC_Geochem.txt
H0301 Location_data_file EL99999_2004_A_05_DrillCollars.txt
H0303 Downhole_geochem_data_file EL99999_2004_A_07_DownholeGeochem.txt
H0600 Sample_code ACC
H0601 Sample_type AC Chips
H0602 Sample_description 1m Chip samples
H0700 Sample_preparation_code S031
H0701 Sample_preparation_details S031 Pulverise to 50um
H0702 Job_no S20058 S20059
H0800 Assay_code AR BLEG
H0801 Assay_company PH Phlogiston Lab, Perth BR Brimstone Lab, Brisbane
H0802 Assay_description AR Aqua regia atomic absorption BLEG Bulk cyanide leach extractable gold
H0900 Remarks na-sample not assayed, below level of detection indicated by a minus sign.

H1000	LAB job No	Sample_ID	QAQC_Type	Standard_ID	Original_Sample	Ag	As	Au	Au1	Au2	Zn
H1001						ppm	ppm	ppm	ppm	ppm	ppm
H1002						AR	AR	AR	AR	BLEG	AR
H1003						0.1	5	1	1	1	1
H1006						P	P	P	P	P	P
H1007						PH	PH	PH	PH	BR	PH
D	S20058	123456	Ldup		0.1	-5	1	15	na	25	
D	S20058	123467	Ldup			0.1	-5	4	10	na	20
D	S20058		ST	STDKG1		20	100	10	1530	12	500
D	S20059	127928	Fdup		127921	0.1	-5	2	15	na	200
D	S20059	127969	Fdup		127940	0.1	-5	1	30	na	25
D	S20059	128162	Fdup		128144	0.1	-5	1	55	na	25
D	S20059	127928	Ldup			0.2	-5	1	10	na	210
D	S20059	128162	Ldup			0.2	-5	2	10	na	180
D	S20059		BL			-0.1	-5	-1	10	-1	-1
D	S20059		ST	STDBB1		25	300	10	10	10	300

EOF

Example 5. DS1 Downhole directional survey.
Filename EL99999_2002_A_10_DownholeSurveys.txt

H0002 Version 4.0

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H0003	Date_generated	15-Oct-2002		
H0004	Reporting_period_end_date	30-Sep_2002		
H0005	State	NT		
H0100	Tenement_no	EL99999		
H0101	Tenement_holder	Big Time Mining Ltd		
H0102	Project_name	Kryptonite		
H0106	Tenement_operator	Small Time Mining NL		
H0200	Start_date_of_data_acquisition	01-Oct-2001		
H0201	End_date_of_data_acquisition	30-Sep-2002		
H0202	Template_format	DS1		
H0203	Number_of_data_records	4		
H0204	Date_of_metadata_update	15-Oct-2002		
H0300	Downhole_survey_data_file	EL99999_2002_A_10_DownholeSurveys.txt		
H0301	Location_data_file	EL99999_2002_A_05_DrillCollars.txt		
H0304	Downhole_survey_data_file	EL99999_2002_A_10_DownholeSurveys.txt		
H0532	Surveying_instrument	Eastman multishot camera		
H0533	Surveying_company	Drill Faster Pty Ltd		
H1000	Hole_ID	Depth	Inclination	Azimuth
H1001		metres	degrees	degrees_M
H1004		0.1	0.1	0.1
D	DD112	10.0	-89.9	285.2
D	DD112	120.0	-87.3	276.0
D	DD112	275.0	-82.1	273.4
D	DD112	445.3	-79.7	268.9
EOF				

Example 6. DL1 Downhole lithological logs.

Filename EL99999_2002_A_11_Lithologs.txt

H0002	Version		4.0				
H0003	Date_generated		15-Oct-2002				
H0004	Reporting_period_end_date		30-Sep-2002				
H0005	State		NT				
H0100	Tenement_no		EL99999				
H0101	Tenement_holder		Big Time Mining Ltd				
H0102	Project_name		Kryptonite				
H0106	Tenement_operator		Small Time Mining NL				
H0200	Start_date_of_data_acquisition		01-Oct-2001				
H0201	End_date_of_data_acquisition		30-Sep-2002				
H0202	Template_format		DL1				
H0203	Number_of_data_records		7				
H0204	Date_of_metadata_update		15-Oct-2002				
H0300	Downhole_lithology_data_file		EL99999_2002_A_06_Lithologs.txt				
H0301	Location_data_file		EL99999_2002_A_05_DrillCollars.txt				
H0302	Downhole_lithology_data_file		EL99999_2002_A_06_Lithologs.txt				
H0307	Lithology_code_file		EL99999_2002_A_11_LithologyCodes.txt				
H0400	Drill_code		RAB	DIA			
H0402	Description		RAB	Rotary Air Blast	DIA	Diamond Bit – Coring	
H1000	Hole_ID	Depfrom	Depto	Drill_code	Recovery	Lithology	Description
H1001		metres		metres	%		
H1004		0.1	0.1		5		
D	RD111	0	2	RAB	90	SAND	<i>Fine to medium grained sand, red-brown</i>
D	RD111	2	4	RAB	85	SAND	<i>Fine to medium grained sand 30%, red-brown, with calcrete</i>
D	RD111	4	6	RAB	80	GRNT	<i>Granite, weathered</i>
D	DD112	123.4	123.7	DIA	100	LMST	<i>Massive limestone with traces of pyrite and chalcopyrite</i>
D	DD112	123.7	136.2	DIA	90	GBRO	<i>Medium and coarse layered gabbro, layers 10 to 50 cm thick</i>
D	DD112	136.2	136.4	DIA	20	FBRC	<i>Clayey, highly weathered fault breccia</i>
D	DD112	136.4	137.7	DIA	100	KOMT	<i>Spinifex-textured komatiite with minor sulphides</i>
EOF							

Example 7. VL1 Sample Hardcopy File Verification Listing

Filename EL99999_2002_A_13_Filelisting.txt

<i>Exploration Work Type</i>	<i>Filename</i>	<i>Format</i>
Office Studies		
Literature search	EL99999_2002_A_01_ReportBody.pdf	pdf
Database compilation		
Computer modelling	EL99999_2002_A_01_ReportBody.pdf	pdf
Reprocessing of data		
General research	EL99999_2002_A_01_ReportBody.pdf	pdf
Report preparation	EL99999_2002_A_01_ReportBody.pdf	pdf
Other (specify)		
Airborne Exploration Surveys		
Aeromagnetics	EL99999_2002_A_03_Aeromag.gdf EL99999_2002_A_04_Aeromag.ecw	gdf, ecw
Radiometrics		
Electromagnetics		
Gravity		
Digital terrain modelling		
Other (specify)		
Remote Sensing		
Aerial photography		
LANDSAT		
SPOT		
MSS		
Radar		
Other (specify)		
Ground Exploration Surveys		
Geological Mapping		
Regional		
Reconnaissance		
Prospect	EL99999_2002_A_02_ProspectGeology.tif	tif
Underground		
Coastal		
Ground geophysics		
Radiometrics		
Magnetics		
Gravity		
Digital terrain modelling		
Electromagnetics		
SP/AP/EP		
IP		
AMT		
Resistivity		
Complex resistivity		
Seismic reflection		
Seismic refraction		
Well logging		
Geophysical interpretation		
Other (specify)		
Geochemical		
	Surveying	
Drill sampling	EL99999_2002_A_07_DownholeGeochem.txt	txt

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	EL99999_2002_A_05_DrillCollars.txt EL99999_2002_A_14_QAQCGeochem.txt	
Surface sampling	EL99999_2002_A_08_SurfaceGeochem.txt EL99999_2002_A_09_SurfaceLocations.txt EL99999_2002_A_14_QAQCGeochem.txt	txt
Other (specify)		txt
Drilling		
All drilling	EL99999_2002_A_05_DrillCollars.txt EL99999_2002_A_06_Lithologs.txt EL99999_2002_A_10_DownholeSurveys.txt EL99999_2002_A_11_LithologyCodes.txt EL99999_2002_A_12_DrillingSummary.txt	txt
File Verification Listing (<i>this file</i>)	EL99999_2002_A_13_FileListing.txt	txt

Example 8. DU1 Drilling Summary.

Filename EL99999_2002_A_12_DrillingSummary.txt

The drilling details shown here are illustrative only. In a real exploration report, they would correspond to the details in drilling-related SL1 files within the report.

```

H0002 Version                4.0
H0003 Date_generated        15-Oct-2002
H0004 Reporting_period_end_date 30-Sep-2002
H0005 State                 NT
H0100 Tenement_no          EL99999
H0101 Tenement_holder       Big Time Mining Ltd
H0102 Project_name         Kryptonite
H0106 Tenement_operator     Small Time Mining NL
H0200 Start_date_of_data_acquisition 01-Mar-2001
H0201 End_date_of_data_acquisition 30-Sep-2002
H0202 Template_format      DU1
H0203 Number_of_data_records 3
H0204 Date_of_metadata_update 15-Oct-2002
H0300 Drilling_summary_data_file EL99999_2002_A_12_DrillingSummary.txt
H0301 Location_data_file    EL99999_2002_A_05_DrillCollars.txt
H0309 Drilling_summary_data_file EL99999_2002_A_12_DrillingSummary.txt
H0400 Drill_code           RAB DIA
H0402 Description         RAB Rotary Air Blast      DIA   Diamond Bit - Coring
H1000 Drill_code          DrilledLength      Expenditure  FinancialYear  ExplorationType
H1001                    metres          AU$
H1004                    10              100
D   RAB                   4950            34400         2000-2001
D   RAB                   2210            16100         2001-2002
D   DIA                   2260            213600        2001-2002
EOF

```

APPENDIX 2: GLOSSARY OF ABBREVIATIONS AND TERMS

Abbreviation	Description	Used as
AHD	Australian Height Datum	Geodetic datum for altitude measurement in Australia
AMIRA	Australian Mineral Industry Research Association	Organisation
ANZLIC	Australia and New Zealand Land Information Council	National organisation
ASCII	American Standard Code for Information Interchange	International standard
ASEG	Australian Society of Exploration Geophysicists	Organisation
BIL	Band Interleaved by Line	File format
CD-ROM	Compact Disc, Read only-memory	Acceptable media for submitting digital data
CGGC	Chief Government Geologists' Committee	Organisation – Chief Geologists from Australian Commonwealth, State and Territory geoscience agencies, plus New Zealand and Papua New Guinea
CGM	Concatenated Graphics Metafile	File type
CSIRO	Commonwealth Scientific and Industrial Research Organisation	Organisation
DG1	Downhole Geochemistry1	Metadata header template for drill hole assay data
dpi	Dots per inch	Spatial printing or video dot density
DL1	Downhole Lithology1	Metadata header template for drill hole lithology, structural, alteration etc data
DLIS	Digital Logging International Standard	International industry standard
DS1	Downhole Survey 1	Metadata header template for drill hole survey data
DTM	Digital Terrain Model	Digital representation of surface topography
DU1	Drilling Undertaken 1	Summary of drilling
DVD-ROM	Digital Video Disc, Read only-memory	Acceptable format for submitting digital data
DXF	Data Exchange File	2D and 3D graphic file format
EL	Exploration Licence	Mineral title for non-extractive exploration
ELR	Exploration Licence in Retention	Mineral title for evaluation of mineral discovery
EM	Electromagnetic	Geophysical survey method
EMEL	Extractive Mineral Exploration Licence	Mineral title for extractives exploration
EML	Extractives Mineral Lease	Mineral title for extractives mining
FTD	File Transfer Protocol	Method of exchanging files between computers on the internet
GB	Gigabyte	109 bytes of computer memory
GDA94	Geocentric Datum of Australia 94	projected coordinate system for Australia
GDF2	General Data Format (Version 2)	National standard for geophysical data
GEOTIFF	Geo-referenced Tagged Image File Format	File type
GGIC	Government Geoscience Information Committee	Organisation – advisory subcommittee to CGGC

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GIF	Graphics Interchange Format	File type
GIS	Geographic Information System	Integrates, stores, edits, analyses, shares and displays geographic data
GML	Geography Markup Language	International standard
GoCAD Voxet	Geological Object Computer Aided Design Voxet	Three dimensional regular grid of a GoCAD surface model that exports as a Noddy geological block model
GPS	Global Positioning System	Allows reliable location information
GXF	Grid Exchange Format	International standard
JPG, JPEG	Joint Photographic Experts Group	File type
LAS	Log ASCII Standard	International industry standard
LIS	Logging International Standard (binary format)	International industry standard
MB	Megabyte	1 million (10 ⁶) bytes of computer memory
MGA	Map Grid of Australia	Coordinate system based on the UTM projection and GDA94
ML	Mineral Lease	Mineral title for non-extractive mining
MRT, MINEX	Mineral Reporting Template	Preferred software for producing compliant metadata headers for tabular data files
MWD	Measurement While Drilling	Logging technique
OGC	Open GIS Consortium	Organisation (see http://www.opengis.org)
P1/90	Navigation data standard format	International standard
PDF	Portable Document Format	File type
PNG	Portable Network Graphics	File type
POSC	Petrotechnical Open Software Consortium	Organisation (see http://www.posc.org)
PPDM	Public Petroleum Data Model	International standard database model
QA/QC	Quality Assurance / Quality Control	Identifying data/samples used to validate geochemistry results
QG1	Quality Geochemistry1	Metadata header template for QA/QC duplicates and blanks assay data
SD card	Secure Digital card	A flash memory card that provides storage for digital files
SDTS	Spatial Data Transfer System	International standard
SEG	Society of Exploration Geophysicists	Organisation
SG1	Surface Geochemistry	Metadata header template for surface sample assay data
SGML	Standard Generalized Markup Language	International standard
SIROTEM	CSIRO Transient ElectroMagnetics	Geophysical method developed by CSIRO
SI	International System of Units	International standard
SL1	Surface Location 1	Metadata header template for location data such as collars
SPS	Shell Processing System	International standard
TEM	Transient ElectroMagnetics	Geophysical technique
TIF, TIFF	Tagged Image File Format	File type
TMI	Total Magnetic Intensity	Geophysical measurement
UBC GIF	University of British Columbia Geophysical Inversion Facility	Enables 3D inversion of geophysical data
UKOOA	United Kingdom Offshore Operators Association	International organisation

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USB Flash Drive	Universal Serial Bus Flash Drive	flash memory data storage device integrated with a USB interface.
UTM	Universal Transverse Mercator	International spatial specification / map projection
VL1	Verification List1	List of all digital files submitted with an exploration report
VRML	Virtual Reality Modelling Language	3D graphics language used on the Web
VTK	Visualisation Tool Kit	File format used in geophysical modelling
WELLOGML	Well Log Markup language	Standard for web-based exchange of digital well log data
XML	Extensible Markup Language	International standard
XMML	Exploration and Mining Markup Language	Standard under development by CSIRO

APPENDIX 3: EXAMPLE OF MINERAL RESOURCES AND ORE RESERVES REPORT

Mineral Resources and Ore Reserves - Report year ending [INSERT date of annual technical report]					
Guideline 7. Reporting on Mineral Titles. Appendix 3					
Submit a separate form for each deposit of metallic and non-metallic commodities.					
Deposit name:	Gold-silver-copper-zinc deposit		Project name:	Au-Ag-Cu-Zn Project	
Operator (organisation):	Majority owner or manager		Contact name:	Person who completed this form	
Contact phone:			Contact email:		
Date of MR/OR estimation:	date that this resource or reserve was estimated		Estimation author and/or organisation:	Person or company responsible for the estimation. Either a suitably qualified employee or independent consultant	
Mineral Title/s:	ML1				
	ML2				
<i>List Mineral Titles that contain or intersect the deposit.</i>					
<i>Are these mineral resources and ore reserve figures available in public reports or websites?</i>					
Type of Return: mineral resources (MR) ore reserves (OR)	<input checked="" type="checkbox"/> MR defined <input type="checkbox"/> OR defined	Estimation method:	<input type="checkbox"/> polygonal <input type="checkbox"/> cross sectional <input type="checkbox"/> geostatistical <input type="checkbox"/> unknown	Reporting Code used for estimation:	<input checked="" type="checkbox"/> JORC 2012 <input type="checkbox"/> JORC (pre-2012) <input type="checkbox"/> CIM (NI43-101) <input type="checkbox"/> Historical <input type="checkbox"/> Informal
Major commodity:	Main economic commodity	Minor commodities:	By product or credit commodity		
Deposit type: (optional)	Examples are Vein, lode, pegmatite, SEDEX, VMS, IOCG, unconformity, carbonate-hosted, etc				

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EXAMPLE

Deposit name:	Gold-silver-copper-zinc deposit				Project name:	Au-Ag-Cu-Zn Project				Title Number(s):	ML1, ML2	
Mineral Resources												
	Grade				Tonnes		Metal content				Cut-off	
Commodity	Au	Ag	Cu	Zn			Au	Ag	Cu	Zn		Au
Units	g/t	g/t	%	%			oz	oz	t	t		g/t
Resource Category												
<i>Inferred</i>												
oxide	1.75	4.38	2.50	5.00		1,500,000	84,396	210,989	37,500	75,000		0.80
transitional	2.50	6.25	2.25	4.00		500,000	40,188	100,471	11,250	20,000		0.80
primary/sulfide	3.00	7.50	1.75	2.00		4,000,000	385,809	964,522	70,000	80,000		0.80
Total Inferred	2.65	6.61	1.98	2.92		6,000,000	510,393	1,275,982	118,750	175,000		8.00
<i>Indicated</i>												
oxide	2.00	5.00	2.40	4.75		1,000,000	64,301	160,754	24,000	47,500		0.80
transitional	2.50	6.25	2.00	4.00		500,000	40,188	100,471	10,000	20,000		0.80
primary/sulfide	3.00	7.50	1.75	2.00		3,000,000	289,357	723,391	52,500	60,000		0.80
Total Indicated	2.72	6.81	1.92	2.83		4,500,000	393,846	984,616	86,500	127,500		0.80
<i>Measured</i>												
oxide												
transitional												
primary/sulfide												
Total Measured												
TOTAL Mineral Resources	2.68	6.70	1.95	2.88		10,500,000	904,239	2,260,598	205,250	302,500		0.80

Are Ore Reserves included in Mineral Resources?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<i>Ore Reserves can be reported as additional to the Mineral Resources, or as a subset of Mineral Resources.</i>
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