

A Guide for Exploration, Retention and Mining Licence Holders for Reporting on Exploration Activities

For Exploration, Retention and Mining Licence holders when reporting on exploration activities Mineral Resources (Sustainable Development) Act 1990

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## SUMMARY OF REQUIREMENTS

### Technical Report of exploration activity - Annual & Final

1. The Technical Report presents the technical results and geological interpretation of exploration during the reporting period. The report should include data and any consultant or laboratory reports as appendices. Section 2 of the guidelines presents the requirements for the Technical Report.

2. A Technical Report is required for all exploration, retention licences and for mining licences of more than 5 hectares where exploration expenditure has been claimed (including Office Studies).

3. A Technical Report must be submitted within 28 days after the annual reporting date of the licence AND within 4 weeks after the licence has ceased to exist (expired, surrendered, cancelled or not renewed).

4. A Technical Report may cover more than one licence belonging to a licensee if together the licences make a discrete exploration project and boundaries are adjoining. (Updated Regulation 57(2)). The licences must also have the same reporting date.

5. Partial Relinquishment Reports are required as areas are relinquished. These reports will provide details of all the work conducted within the relinquished area, from the grant of the title to the time of relinquishment.

6. If the Technical Report is a final report, that is, prepared after the licence has ceased to exist, it should cover all the work done since the last report. If the licence has been joint reported the final report should be a summary of the all the work done over the life of the licence and include the reason the licence was allowed to expire or is being surrendered. It must include any previously unsubmitted data.

7.Submit your technical report via the Resource Rights Allocation Management electronic system (RRAM) as a digital pdf document with exploration data files zipped. The current MRT software, which can be downloaded from the department’s website, is to be used to generate drilling and surface geochemistry files in tab delimited ASCII format.

### Annual Return of Expenditure & Activities

8. The Annual Return of Expenditure & Activities (return) lists the expenditure for the reporting year against a summary of operations.

9. The report must be submitted within 28 days after the annual reporting date of the licence, that is, at the same time as the annual Technical Report.

10. One report per licence must be completed. Your report must be submitted via the Resource Rights Allocation Management electronic system (RRAM).

#### Reporting date

11. The reporting date for exploration licences and retention licences may be one of the following dates: 31 March, 30 June, 30 September, 31 December. The reporting date is specified after consultation with the licensee and is shown on the licence document.

The reporting date for mining licences is 30 June.

#### Electronic Text & Data Submission

12. Licence holders are requested to submit, via RRAM, a digital copy of the Technical Report in pdf format and any associated data in zip files. Please contact the tenement geologist email (gsv.mineraltenements@ecodev.vic.gov.au) for submission of any data that exceeds the RRAM upload capacity. All digital data will become available for future public release according to legislation.

Software can be downloaded from the Department’s website to aid in the preparation of digital data for submission. See Section 4.4.1.

## 1. Introduction

These Guidelines detail the requirements of the Technical Report and provide additional prescription for digital data above that detailed in the “Australian Requirements for the Submission of Digital Exploration Data (for example, with respect to combined reporting). The national standards are developed by the Government Geoscience Information Committee (GGIC) on instructions of the Geoscience Working Group, a subcommittee of the Council of Australian Governments Energy Council (COAG Energy Council).

### 1.1 Contacts

Exploration reports:

Tenement Geologist  
Geological Survey of Victoria  
Email: [GSV.MineralTenements@ecodev.vic.gov.au](mailto:GSV.MineralTenements@ecodev.vic.gov.au)

These guidelines are available on the Department’s website here: <https://earthresources.vic.gov.au/legislation-and-regulations/compliance-enforcement/reporting-expenditure/exploration-reporting-guidelines>

### 1.2 Location coordinates

Geocentric Datum of Australia (GDA94) is the geodetic datum to be used for reporting exploration in Victoria. Since 1 July 2005 it is mandatory to submit all maps and location data referenced to this datum and using the associated Map Grid of Australia (MGA) coordinates.

Wherever coordinates are used in the report or data (including consultant’s reports), the datum must be specified explicitly. This is important to ensure that data can be correctly located without confusion now and in the future. The wrong use of datum could result in displaced positions of about 200 m to the NE or SW.

Data or maps presented to the Department in any other datum or without the datum and projection information specified will not meet the reporting requirements and licensees will be requested to resubmit the data or maps in the GDA 94 datum and appropriately labelled.

It is the responsibility of the licence holder to ensure that consultant’s reports included as appendices also comply.

## 2. Technical Report

The Technical Report describes in detail the exploration work done during the reporting period. The report must:

* be in English
* be typed in a simple font of reasonable point size (e.g. Arial 10pt or similar) on A4 paper, and have adequate margins;
* be divided into more than one volume if very large; and,
* not include data that is in previous Technical Reports unless it is a final or partial surrender report.

The Technical Report consists of four sections:

1. Front matter: The title page, contents list, verification listing, tenement details, abstract and key words; and an index map to show the exploration areas within the licence boundaries.

2. Body: The description of the work undertaken in the reporting period by exploration topic then region, or by region then exploration topic. The exploration topic headings are described in this booklet.

3. Appendices, Attachments: Plans, cross sections, mapping and survey information, tabulated data, laboratory and consultants’ reports and metadata file headers of digital data.

4. Digital Data.

## 2.1 Front matter

### 2.1.1 Title page

Give a title to the annual report that includes the current licence numbers (in increasing numerical order), the project name (if applicable), the type of report and reporting period. Do not include earlier licence numbers such as amalgamated licences.

Example:

|  |
| --- |
| **ELs 7766 & 7777, SOUTH INGLEWOOD PROJECT VICTORIA ANNUAL TECHNICAL REPORT FOR THE PERIOD 1st July 2012 to 30 June 2013**  Author: J.W Smith Exploration Consultants Pty Ltd Report No. EC12/13 Report Date: 15/07/2013 Licensee: Platypus Resources NL ABN: 24 064 999 777 |

### 2.1.2 Licence details

Include:

* licence number(s);
* project name including name of combined reporting group if applicable;
* licensee name and ABN (Australian Business Number) where applicable; and
* licence details: date of grant, period of validity and other important dates, joint venture arrangements if any, title transfers, etc. You may include reference here to earlier licence numbers such as amalgamated or relinquished titles that covered the same area.

### 2.1.3 Table of contents

The table of contents lists:

* chapter headings (and volumes' contents for multi-volume reports);
* figures, tables, plates, loose plans, maps and their size and scales; and
* appendices.

### 2.1.4 Verification Listing

The verification listing is a record of all the digital datasets submitted with the report and can be generated using the current MRT software that can be downloaded from the Departmental website (See Section 4.4.1 for how to obtain the Software )

Digital data should be submitted as outlined in Section 4.

### 2.1.5 Tenement Location Plan/Exploration index map

The Tenement Location Plan and Exploration index map (can be the same map) should be at an appropriate scale (1:25 000, 1:50 000 or 1:100 000) showing:

* the Map Grid of Australia (MGA) Geodetic Datum of Australia 1994 (GDA94) standard map sheet reference and major topographic and geographic features;
* the boundaries of the licence(s) covered in the report;
* the boundaries of areas covered by survey grids;
* the areas surveyed in the exploration period (e.g. those areas covered by geological mapping; drilling, soil geochemical sampling, airborne magnetics, etc.);
* the position of identified mineral resources or pre-resource mineralisation; and
* the prospect names used in the report.

All maps should conform to the standards described in Maps, plans, etc. (Section 2.3.2). The map can be generated using the Departmental online geospatial software GeoVic. See Figure 1 for an example.

Exploration Index Map


Figure 1 Exploration Index Map Example

#### 2.1.6 Abstract and keywords

The Abstract summarises the metals, minerals and deposit types sought, the areas of interest and the main exploration methods used; and outlines the results obtained and conclusions reached.

***Keywords***

Provide a list of 10 to 20 Keywords to enable future computer-based searches of the Department’s exploration report information. Use the following categories (includes examples):

|  |  |
| --- | --- |
| Location name; | Inglewood, Kingower, Tarnagulla |
| Earth science and related terms;\* | fault breccia, shear zone |
| Environment of mineralisation; | quartz veining-stockwork, saddle reef |
| Commodities/minerals; | gold, silver (do not use Au and Ag) |
| Exploration methods; | stream sediment, soil and rock-chip geochemistry, RC drilling, diamond drilling, ground magnetics, geological mapping |
| Mine/prospect name\*\*; | Quartz Hill, Main Reef Extension, Evening Star Reef |
| Stratigraphic name\*\*; | Inglewood Granite, Castlemaine Group |
| Lithologic name\*\*; | sandstone, slate, conglomerate |
| Geological province name\*\*; | Bendigo Zone, Lachlan Fold Belt |
| Geological age\*\*; | Ordovician, Devonian |

## 2.2 Body of report

The body of the report may be in the form of either:

* a series of topic-related sections, each of which contains relevant information for all locations within the licence area, as set out in this booklet; or
* a series of regional studies or prospect appraisals in which all topics are covered for each region or prospect.

### 2.2.1 Introduction, history and exploration rationale

Include:

* the exploration targets, rationale and philosophy;
* the exploration history any historical mining information;
* the work program, as set out at the commencement of the reporting period;
* a summary table of the work completed during the reporting period, giving type of exploration activity; location or prospect name; number of samples, holes, metres drilled; licence (if a combined report) and totals. This table should correlate with the exploration index map;
* a summary of the survey methods, grids established, drilling, costeaning, underground investigations, ore resources and reserves, metallurgical and mineral processing studies, mining feasibility, mine design studies and hydro-geological studies, etc.;
* results of literature surveys; and
* an outline of the proposed future exploration program.

### 2.2.2 Geology

Describe the regional setting and acknowledge all sources of information. Geological maps should distinguish between geological 'fact' and interpretation by symbol or by separate maps. These maps must fulfil the criteria outlined in Maps, Plans, etc. (Section 2.3.2).

### 2.2.3 Office Studies

Literature searches should include a list of all references consulted. Details of data compiled into databases should be provided and scans of historical plans and copies of digital databases submitted with the report. Computer modelling should be described and digital 3D data provided according to the specifications in Section 4.6 and format as prescribed in Section 4.7. Images of reprocessed data should be provided. A discussion of the results of any interpretation and lineament analysis performed should be accompanied by a map.

### 2.2.4 Remote sensing

Describe results from remote sensing surveys such as LANDSAT, LiDAR, airborne multispectral scanner (GeoScan), and radar. Append survey specifications, etc. (Section 2.3.8).

If the data are protected by copyright laws that prevent inclusion of contour maps or image prints, then submit a detailed interpretative plan.

### 2.2.5 Geological mapping

The area mapped should be shown on the Exploration Index Plan. A discussion of the results accompanied by a map at an appropriate scale and with a legend should be provided.

### 2.2.6 Geophysics

Describe the geophysical exploration activities. Include:

* an A3 or A4 plan showing the survey locations (at standard 1:100 000 or 1:250 000 scale) with coordinates as per Section 1.2;
* interpretations of results, including a selection of key profiles and plans;
* discussion of what constitutes an anomaly; and how anomalies relate to geochemistry, geology and drilling results; and
* the name, date flown and date submitted to the Department should be supplied for airborne geophysics surveys.
* The above information may be included as an entire report in an appendix.
* Both processed and unprocessed data, with details of the programs, should be provided in digital form. Section 2.3.4 describes how to submit airborne geophysics data.

#### 2.2.7 Geochemistry

Describe the geochemical investigation program, its rationale, results and its relationship to other components of the exploration program.

Include:

* the types of surveys, (e.g. rock-chip, soil, stream sediment sampling, etc.);
* program rationale and design parameters for e.g., numbers of samples, general location, grid orientation, line and sample spacing;
* the elements, oxides, isotopes, etc., analysed;
* details of quality control including any trip, field or equipment blank; unidentified blind duplicate and any samples taken to determine background.
* processed data (e.g. contoured, etc.) and details of the processing techniques;
* advanced data processing and/or methods employed:
* interpretations of the results and methods employed (statistically enhanced, whether background, threshold, etc.), highlighting any anomalous values, areas, etc.;
* storage location of, and availability of access to, samples at completion of exploration program; and
* sample locations (with sample numbers) on plans showing relevant geographical and geological features

Present unprocessed geochemical data, details of the surveys and the analytical procedures in the appendices in digital form (Section 2.3.5 and Section 5). Describe the geochemical surveys in sufficient detail to allow them to be reproduced or re-interpreted. The general location of anomalies should be reported and the peak results of the target elements tabulated as per the following example:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Peak Sample** | | | | | **Survey Sample Statistics** | | | |
| **Sample Type** | **Sample Number** | **MGA East (m)** | **MGA North (m)** | **Peak**  **Au (ppb)** | **No. of samples** | **Mean**  **Au (ppb)** | **Median**  **Au (ppb)** | **Standard Deviation**  **Au (ppb)** |
| Soil | KS003 | 816130 | 5848360 | 1132 | 100 | 21 | 20 | 5 |

#### 2.2.8 Drilling

Summarise the drilling program to describe the targets, types of mineralisation, drilling methods, elements assayed for, etc. Include information on traverse and hole spacings where applicable. Provide details of quality control including any trip, field or equipment blank; unidentified blind duplicate and any samples taken to determine background

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tenement** | **Hole Type** | **Hole Number Range** | **No of Holes** | **Total Metres** |
| EL7766 | RAB | QHRB 289-300 | 12 | 652 |
| AC | QHRA 255-262 | 7 | 315 |
| EL7777 | RC | QHRC001-2 | 2 | 425 |
| Diamond | QHRD004 | 1 | 200 |
| **Grand Total** |  |  | 22 | 1592 |

Also include a table of significant intersections

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Hole No** | **Hole Dip** | **Hole Azimuth** | **MGA East (m)** | **MGA North (m)** | **From**  **(m)** | **Significant intersections**  **Cut-offs: 0.5 g/t Au, 5 g/t Ag, 0.1% Cu, 0.2% Pb, 0.2% Zn, 0.1% Sb, 0.4% Ni, Cr, V and 0.2 % W** | **Total depth (m)** | **Comments** |
| QHRC1 | -60 | 180 | 725000 | 5906000 | 138 | 3 m @ 2.4 g/t Au | 210 | Reef intersected 135-145 m |
| QHRC2 | -55 | 200 | 725050 | 5906000 | 121 | 4 m @ 1.1 g/t Au | 215 | Reef intersected 120-130 m |

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

Append maps, drill logs and surveys (Section 2.3.7) and supply the results in digital form (Section 4).

#### 2.2.9 Mineralogy or Petrology

Mineralogical and/or petrological studies should be discussed and detailed descriptions, with sample location coordinates (see Section 1.2), should be included as an appendix. Sample locations should be plotted on appropriate plans or listed in drilling logs.

#### 2.2.10 Environment

Provide information relevant to the effects of the exploration program on the environment and its rehabilitation. Include:

* details of all operations that disturb the surface, vegetation or waterways and affect the environment;
* measures taken to avoid damage and protect flora/fauna (e.g. new or upgraded tracks, drill-pad construction, etc.);
* details of the rehabilitation works undertaken;
* details of any proposed follow-up work, such as maintenance or monitoring of rehabilitation; and
* a topographic plan showing the location of surface disturbing operations.

#### 2.2.11 Ore reserves and resources information

If pre-resource mineralisation, identified mineral resources, or ore reserves were identified during the reporting period, then report full details of these as a separate appendix (Section 2.3.9.).

The reporting requirements for identified resources are as recommended in the Australasian Code for Reporting of Identified Mineral Resources and Ore Reserves, issued by the Joint Ore Reserves Committee (JORC) of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists, and the Mining Council of Australia (2012); or as these requirements may be revised from time to time. Reporting of pre-resource mineralisation or identified resources in the category of inferred mineral resources may be prepared by a qualified geoscientist who need not be a "competent person" as specified in the JORC reporting code.

#### 2.2.12 Mining Licence Exploration

The following information should be supplied:

* An annual summary of the geology of the mine area and descriptions of mineralisation and ore controls, together with appropriate maps and sections or 3D model digital data.
* An annual update of resource and reserve estimates in summary form based on JORC requirements.
* Complete details of any drill holes designed for resource/reserve definition but not drilling within blocks of proven ore for the purposes of mine planning.
* A full description of geological, geotechnical, metallurgical, geochemical and geophysical investigations undertaken with respect to mining exploration during the year.
* Mining plans and sections or 3D model digital data showing any development undertaken.

## 2.3 Appendices and Attachments

#### 2.3.1 Data location coordinates for local grids

If a local grid was used, the conversion algorithm used to convert these coordinates to MGA GDA94 coordinates must be provided. Both the local and MGA coordinates may be reported together but MGA coordinates are mandatory.

#### 2.3.2 Maps, plans, figures and illustrations

Digital maps should be submitted as outlined in Section 4.

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

* be suitable for black and white reproduction;
* be "A-series" sized
* be at a scale related to the standard metric map series (ie. 1:250 000, 1:100 000, 1:50 000, 1:25 000, 1:10 000, 1:5 000, 1:2 000, 1:1 000 or 1:500);
* use metric measurements throughout;
* have a metric bar scale;
* have an MGA grid with coordinates clearly labelled;
* state the projection and datum used
* have a north point (grid, true and magnetic north) or orientation of sections;
* have a clear and comprehensive legend using symbols as per the Bureau of Mineral Resources, Geology and Geophysics (1989) publication entitled Symbols Used on Geological Maps;
* distinguish between geological ‘fact’ and interpreted geology;
* be clearly annotated and labelled including licence number(s); and
* show the author, acknowledged sources and date of drafting.

#### 2.3.3 Geological data

* All geological maps must be line drawings with graphical and/or alphabetical symbols for rock units and show geographical features, coordinates as per Section 1.2.
* Where a complicated system of abbreviations is used, include an index in the report, but not necessarily listed on each map. All interpretive maps should have a legend.
* Geological information used on maps and in the text that is not the result of original work should be acknowledged.
* Petrological descriptions:
  + Sample locations in coordinates as per Section 1.2.
  + All sample locations shown on the appropriate plans or drilling logs.

#### 2.3.4 Geophysical data

##### General

Provide:

* specifications of surveys and instruments, together with order of accuracy and units of measurement so that another operator can extend or re-interpret the survey. Provide conversion factors for any units outside the SI system;
* survey specifications; survey type, date, contractor, parameters recorded and instruments used, and if applicable, altitude, line and tie spacing, line orientation, mean terrain clearance, aircraft type;
* any data recorded on terrain conditions, nature of ground, quality of electrical contacts and extent of drifts to enable another operator to extend or reinterpret the survey;
* logistics report detailing data acquisition and processing;
* the original basic data in tabulated or profile form;
* reprocessed data, including tapes (with format listings);
* data processing techniques;
* all drift/diurnal/tie corrections applied and calibration constants and null values defined;
* processed data (e.g. contoured interpretive maps) tied to the MGA grid and at the same scales as other presented maps to enable cross-referencing with other data (e.g. geological maps);
* all additional location/navigational data at the end of the project (in the Final Technical Report);
* interpretation reports and a selection of key processed images.

##### Gravity data

Provide:

* station number, coordinates as per Section 1.2, latitudes and longitudes, AHD elevation, observed gravity (specify datum) terrain correction if calculated;
* the methods and parameters used to calculate the Bouguer anomalies; and
* information about the isogal or permanent benchmark used to tie the survey to the State isogal network.

##### Airborne geophysical data

Provide:

* located data in MGA, GDA94 and/or latitude/longitude;
* gridded data;
* field data compacted onto an Exabyte tape or DVD;
* 256 channel radiometric data;
* calibration parameters, procedures and any quality control products;
* a logistics report of the survey fully describing the acquisition, and processing and parameters for the survey;
* flight path maps also showing geographic features and any significant cultural features that may affect results; and
* cross-referencing of flight, line, date, aircraft, field tapes and test data.

#### 2.3.5 Geochemical data

Supply geochemical data in text (tab delimited) format with metadata header and provide the original laboratory assay report in digital format.

Provide:

* description of survey and discussion of results, with sample locations labelled with the sample number shown on base maps with relevant geological and geographical features and coordinates as per Section 1.2; and
* metadata, sample numbers, coordinates in MGA as per Section 1.2 and assay results in digital format generated using current version 4 MRT software that can be downloaded from the Departmental website. In the case of costeans the location coordinates of the start point, with bearing/azimuth, declination (if on a slope, interval from and to and coordinates of end point data.
* Details of assay quality control; data pertaining to trip, field or equipment blanks; unidentified blind duplicate and any samples taken to determine background.

Metadata:

* The file header of the surface geochemistry table will require the following information:
* Sample types: eg. water, stream sediment (size fraction, BLEG, etc.), soil (horizon sampled), rock-chip, gossan or mineralisation, drill sample (core, chips, sludge), costean, bulk, air, vegetation, etc.
* Method of collection, sample depth, sample weight, etc.
* Sample processing such as sieving and fraction analysed, sample concentration (heavy mineral separation etc.), filtering and acidifying, etc.
* analytical procedures including: assay code used by analytical laboratory; assay description including extraction/digestion techniques and methods of analysis with detection limits and accuracy of the results; and laboratory name.
* the surveying instrument and company.

For examples of surface geochemistry data metadata see “The Australian Requirements for the Submission of Digital Exploration data” (see Section 4.4 for how to obtain this document ).

#### 2.3.6 Mineralogical Activities

The same information is needed for diamond, heavy mineral, etc exploration as that for geochemical activities as well as:

* Mineralogy;
* analysis of indicator minerals and/or other minerals;
* results of bulk sampling.

#### 2.3.7 Drilling data

Provide:

* drill hole locations and identification numbers on base maps with relevant geological and geographical features and coordinates as per Section 1.2.
* geological interpretations from close spaced drilling programs on cross-sections and longitudinal sections, with a geological legend, scale etc. Highlight significant drill results. The location of any sections should be marked on a coordinated-scaled map, as per Section 1.2.
* Digital copies of each down hole geophysical survey log with header information and progressive depths from collar marked.
* tabular data and metadata generated using the current version 4 MRT software available from the Department’s website. These should include:
  + Surface location data consisting of drill hole number; MGA coordinates as per Section 1.2; elevation (RL); total depth; dip; azimuth (magnetic); dates commenced and completed; and drill code.
  + Surface location metadata such as the drilling method and type of rig, name of the drilling company; and the surveying instrument and company.
  + Downhole geochemistry data consisting of drill hole number; sample number, depth from and to; elements assayed; sample code; drill code; assay code with detection limits and accuracy of the results.
  + Downhole geochemistry metadata consisting of drill hole code and description, sample code and description; assay code used by analytical laboratory, assay description including extraction/digestion techniques and methods of analysis; and assay laboratory.
  + Downhole lithological and regolith logging comprising: drill hole number; depth from and to; recovery; and drill code.
  + Downhole lithological metadata comprising: separate look-up files for the lithology code and regolith code. Location (access and ownership) of drill core, cuttings etc., following completion of the exploration program can be included under Remarks.
  + Additional data obtained from the testing of the samples (petrological, mineralogical, metallurgical etc.) and any other relevant drilling information such as recovery, structure, alteration or water table data presented in the downhole lithological table format.
  + Downhole survey data and down-hole geophysical logging data should include the name of the quantity measured with units and accuracy and the depth or interval.
  + Downhole survey metadata should include the name of the contractor and name and details of the instrument used and relevant data as per Section 2.3.4.
  + groundwater data, eg. depth to water table and aquifers, flow rate, water quality, etc. using the lithological tabular format.

#### 2.3.8 Remote sensing

Provide:

* a description of the type of scan;
* images georeferenced in coordinates as per Section 1.2;
* images as digital 35 mm slides or colour photos with appropriate labels or descriptions and, where practicable, as gridded data files as TIFF or JPEG files. State the processes used to develop the images;
* flight diagrams and specifications of air-photography (ie., scale, contractor, date flown, etc.), as well as the location and ownership of prints and negatives; and
* specifications of other remote sensing surveys, including ownership and storage location of any data on magnetic media.

#### 2.3.9 Ore reserves and resources calculations

Report full details of the pre-resource mineralisation, identified mineral resources, or ore reserves that have been established, together with accompanying plans and sections showing ore blocks and ore outlines. Include:

* Table of significant results;
* significant results on longitudinal and cross-sections; and
* description and illustration of the method and basis of ore reserve calculation.

#### 2.3.10 References

References should follow the format of these examples:

AUSTRALIAN MINERAL FOUNDATION, 1999. Australian geoscience, minerals and petroleum thesaurus (4th edition.). *Australian Mineral Foundation Inc. Adelaide, S.A.*

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS, 1989. Symbols used on geological maps. *Commonwealth of Australia.*

JOINT ORE RESERVES COMMITTEE (J.O.R.C.) OF THE AUSTRALASIAN INSTITUTE OF MINING & METALLURGY, AUSTRALIAN INSTITUTE OF GEOSCIENTISTS AND THE MINING COUNCIL OF AUSTRALIA, 1999. Australasian code for reporting of mineral resources and ore reserves (The JORC code). *Australasian Institute of Mining & Metallurgy, Australian Institute of Geoscientists and the Mining Council of Australia.*

## 3. Expenditure Report

The Expenditure Report should only include expenditure incurred on that licence. Do not distribute expenditure incurred on one licence in a project over all licences in the project. If expenditure in a project is incurred mainly on one licence the Minister may take it into consideration when evaluating whether other licences in the project have met their expenditure commitment (Section 35, MRSDA). For further information contact your Licensing Officer.

Only whole dollars should be reported.

## 4. The Digital Version of the Report

This section describes the requirements for submitting the digital version of the report as part of exploration, retention and mining licence reporting. The Department’s requirements are as follows:

* The report text (including table of contents, file verification listing, abstracts etc), associated tables, maps, plans and figures that are part of the main body of the report and small appendices should be compiled in a single Portable Document Format (PDF) file, size permitting (<20 Mb). PDF files are created using Adobe Acrobat Writer software, Version 4 or later. Large plans and maps (larger than A3), created in software such as ArcView, may be printed to Acrobat Distiller as PS files first, specifying the size and orientation and then converted to PDF. For images use TIFF (.tif) for black & white or JPEG (.jpg) for greyscale or colour. JPEG is also useful for photographs. Documents in appendices should be in PDF.
* Where the single report PDF is too large for upload to RRAM (over 20 Mb), data can be split into smaller PDF files as appendices and named according to the file naming conventions (Section 4.8). Alternatively, the tenement geologist can be emailed to arrange for the report to be digitally transferred the department.
* Tabulated data such as geochemical or drilling results in tab delimited ASCII format with a header containing essential metadata (generated using the current MRT software that can be downloaded from the Department’s website).

PDF format has been chosen because of its wide acceptance in industry as a standard format, the ease of creation from other formats, the availability of free software to read the files and its ability to be searched for words or phrases.

Only provide PDF files that are legible, including the use of common standard fonts and readable maps and images. When compressing or re-sampling image files, ensure that the final images have the resolutions and clarity for readers. Image resolutions should be at least 75 dpi and the recommended resolutions for downhole logs is 150 dpi. Avoid use of any non-standard fonts as viewers of the documents may not have all the required fonts; Arial and Times Roman are usually the safe options.

Do not embed other files within PDF documents. Hyperlinks from PDF documents may no longer work when the report is lodged into respective digital report-lodgement systems.

### 4.1 Report structure and sequence

When compiling digital reports please ensure that:

* the integrity of the original report and associated data is maintained;
* the ordering of report components is clear; and
* all data are included.

The reports should retain the well-established structure and sequence of a hardcopy (paper) report including title page, list of contents, main body of text, attachment (plans, figures etc) and appendices (additional reports, tabular data etc).

#### 4.1.1 File verification listing

All file names should be recorded in the File Verification Listing. This can be generated using the current MRT Software downloadable from the Department’s website.

### 4.2 Text

If the body of the report is set up in Word using ‘Styles’, using “File/Create Adobe pdf” will automatically generate a table of contents in Acrobat under ‘Bookmarks’ that is hot-linked to the text. A cover page, the verification listing page, diagrams and metadata header pages can all be added to this document. These can be hot-linked with the table of contents and with references in the text.

### 4.3 Plans, figures, plates, images etc

PDF can handle plans up to A0 in size (1143 mm x 1143 mm). Plans greater than A3 will need to be converted to .PS files first using Acrobat Distiller. Depending on the size of the original full scale plot, raster, vector and contour files should be submitted in either PDF, JPEG, GIF, GEOTIFF/TIFF or EPS formats. Scans of plans must be of sufficient resolution that the smallest text is readable.

### 4.4 Digital Exploration data

“The Australian Requirements for the Submission of Digital Exploration data” guidelines specify the standards for Australia and can be viewed on the Geoscience Portal website ([http://www.australiaminerals.gov.au/legislation-regulations-and-guidelines](http://www.australiaminerals.gov.au/__data/assets/pdf_file/0004/60772/National_Guidelines_Version_4.5_February_18.pdf)). A summary of the various data submission requirements is provided in the following sections. Unless otherwise specified in preceding/following sections the National requirements apply to Victoria.

Data should be submitted using RRAM or if files are too large to upload then the tenement geologist should be emailed to arrange digital transfer.

The submission of certain types of exploration data in a particular digital format is mandatory as it facilitates adding the data to Departmental systems.

To aid in the submission of digital data, Mineral Reporting Template (MRT) software is available to aid in the preparation of data files (Section 4.4.1 for more information on how to obtain the Software and Victorian specific help information).

When submitting data it is important to include a file with the translation of any code used to represent lithology or any other descriptive characteristics used in logging. For example

|  |  |
| --- | --- |
| **Code** | **Lithology** |
| sd | sand |
| st | silt |
| cy | clay |
| lat | laterite |
| sap | saprolite |
| pe | pelite |
| ls | limestone |
| ba | basalt |
| gr | granite |

#### 4.4.1 Location, Drilling, Geochemistry, Lithology Data and metadata and the MRT Software

All tabular data (excluding small tables in the body of the report text) must be submitted as tab delimited ASCII files with a suffix of .txt. Header information (metadata) must be included at the beginning of each file.

To create these data files you should download Minerals Reporting Template (MRT) Software (together with Victorian specific help information) from the Departmental website (go to <https://earthresources.vic.gov.au/legislation-and-regulations/compliance-enforcement/reporting-expenditure/exploration-reporting-guidelines> and scroll to bottom). The Software (which you run on your PC) adds the metadata or "data about data” in the required format to your raw data. You can see examples of data files containing metadata in the “The Australian Requirements for the Submission of Digital Exploration data” guidelines.

The MRT Software can be used to generate formatted files for the following types of data

|  |  |
| --- | --- |
| Data Type | Description |
| Drill hole locations | For either hole collar locations, costean start and end coordinates, bearing and dip, surface geochemistry, mapping data and any other surface location data |
| Downhole Analysis /Geochemistry | Downhole assays or surface geochemistry results where a variable elevation (z component) is included (eg. vertical channel sampling in a mine pit); or where costean sampling (from, to interval) has been carried out |
| Downhole survey | Downhole deviation survey data |
| Downhole Geological Events | Downhole lithology descriptions and any other downhole logged data. If a code is used this must be accompanied by a code translation file. |
| Surface Sampling/Analysis (including locations) | Includes geographical location information and the assay data |
| QA/QC Information | For geochemical analyses |
| Verification listing | A summary list of all digital files accompanying the submission for the licence |

|  |
| --- |
| **NOTE: Combined Reporting – Victorian Requirement**  As Victoria has no Combined Report Number data must either be reported separately for each licence or a licence number field will have to be added manually to the submitted data files so that the data associated with each licence can be identified. |

#### 4.4.2 Ground geophysics

For details see Sections 2.4.7.2 and 2.4.7.3 of the “The Australian Requirements for the Submission of Digital Exploration data” guidelines. For geophysical data including ground magnetic, gravity, radiometric, electromagnetic (including TEM, SIROTEM) and for both raw and processed located data, the preferred standard format is ASEG GDF2.

Seismic data should be submitted in accordance with Petroleum standards.

#### 4.4.3 Airborne geophysical data (magnetic, radiometric, electromagnetic, hyperspectral etc)

For details see Sections 2.4.7.1 of the “The Australian Requirements for the Submission of Digital Exploration data” guidelines. The digital data for both raw and processed located data are required in the standard ASEG GDF2 format. Gridded data are required in either ASEG GXF or ER Mapper gridded format.

#### 4.4.4 Airborne/satellite imaging, multispectral remote sensing, LIDAR and drill core imaging data

For details see Sections 2.4.7.8, 2.4.12 and 2.4.13 of the “The Australian Requirements for the Submission of Digital Exploration data” guidelines.

#### 4.5 Photographs (not forming part of text)

These include core photographs, environmental photographs etc. and are recommended to be submitted as either PNG or JPG files.

### 4.6 Computer Modelling

#### 4.6.1 3D Model Objects

The software used should be specified. Supply regional and mine scale 3D model objects including points, lines, surfaces and volumes.

Provide:

* Model extents in MGA, GDA94
* Local grid transformation data if local grid is used
* Model points, lines and surfaces as ASCII .dxf files (or as ASCII pointsets or ASCII line strings for point and line objects)
* A copy of the same model points, lines, surfaces and volumes in the native format of the model (whichever is listed in Section 4.7 – 3D model objects).

#### 4.6.2 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.

Provide:

* Description of the aim and scope of the inversion project
* Model extents in MGA, GDA94
* 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 4.7. – 3D model objects)
* 3D grids (UBC Grid sus, bin and mesh files or GoCAD Voxet)
* Brief description of model convergence and confidence level (Is the model a good fit for the data?)

#### 4.6.3 Numerical Simulation

Supply inputs to and results from numerical simulation modelling, a description of the modelling process and a description of the model scope and purpose.

Provide:

* Description of the aim and scope of the inversion project
* Model extents in MGA, GDA94
* 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 4.7 – 3D model objects)

#### 4.6.4 Resource/Reserve Estimation

The software used should be specified. Provide the data used to produce the estimate including:

* 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)
* A copy of the same model points, lines, surfaces and volumes in the native format of the model (whichever is listed in Section 4.7 – 3D model objects).

Assumptions made (eg cut-off grade, overburden etc)

### 4.7 Acceptable data formats

| **Data Type** | **Description** | **Format** | **Parameter** | **Suffix** |
| --- | --- | --- | --- | --- |
| **Text, maps, plans and figures (included in report pdf)** | Includes documents, figures, maps etc normally provided in hardcopy. A4, A3 at full scale  >A3 at full scale will need to be converted to .PS files first using Acrobat Distiller | PDF | Normal \*\* | .pdf |
| **Large image files (not included in report pdf)** | Core photographs, aerial photographs etc | GEOTIFF/TIFF (colour) | 300 dpi, 24 bit | .tif |
|  |  | JPEG | Q>95, 300 dpi, | .jpg |
|  |  | GIF | 8 bit | .gif |
|  |  | EPS |  | .eps |
|  |  | PDF |  | .pdf |
|  |  | PNG |  | png |
| **Tabular data\*** | Geochemistry, drill log data and surveying data | TAB Delimited ASCII |  | .txt |
| **Geophysics (other than seismic)** | Raw and processed located data, gridded data. | ASEG GDF2,  ASEG GXF,  ER Mapper grid |  | .gdf  .gxf  .ers |
| **Geophysical images** | Images derived from magnetics or gravity, eg. TMI, Bouguer | GEOTIFF/TIFF (colour), TIFF (Greyscale)  JPEG  GIF  PDF  EPS  PNG | Reproducible at 300 dpi,  24 bit 300 dpi,  8 bit 300 dpi, Q=95 8 bit Normal\*\* | .tif  .jpg .  gif .pdf .eps .png |
| **Hyperspectral logging** | Reflectance point data | FOS, ASD, SDF,SDS |  |  |
|  | Hychip | TSG |  | tsg |
| **Hyperspectral imagery** | Airborne/Satellite Imaging Reflectance | BSQ, BIL or BIP, ENVI or ERMapper header files |  |  |
| **Petrophysical and geophysical log data** | Raw and processed wireline and MWD data | DLIS LIS LAS ASCII | As defined by latest Industry Standard | .lis .lis .las .asc |
|  | Log plots | PDF GEOTIFF/TIFF (colour) TIFF (Greyscale) JPEG GIF EPS | Normal\*\*With scaling factor 300 dpi, 24 bit 300 dpi, 8 bit 300 dpi, Q=95 8 bit | .pdf .tif .tif .jpg .gif .eps |
| **Down-hole velocity data** | Processed down-hole velocity data | SEG Y files |  | .seg |
| **Geo-referenced polygons and lines (primary datasets)** | GIS datasets | PDF preferred |  |  |
| **Geo-referenced polygons and lines (derived datasets)** | GIS datasets | To be determined |  |  |
| **Seismic data** | Raw and processed data | SEG Y SEG D SEG B |  | .seg |
|  | Navigation data | UKOOA P1/90 SPS |  | .uka .sps |
|  | Processed sections | CGM+ format with line number |  | .cgm |
| **3D Model Objects** | 3D spatial datasets including mine development, geology and resources plus metadata | Attributed dxf export files.  ASCII xyz export files  Native software formats: Datamine String (ASCII) Datamine String Datamine Block Model (ASCII) Datamine Block Model Datamine Wireframe (ASCII) Datamine Wireframe Earth Vision Grid Earth Vision String Earth Vision Polygon GemCom String GemCom Wireframe GoCAD Pointset GoCAD Curve GoCAD Surface GoCAD Voxet GoCAD Stratigraphic Grid Leapfrog Attributed mesh Micromine String Micromine Block model Micromine Outlines Micromine Geology model Micromine Grid mesh Micromine Triangulation Minescape Grid Mesh Minesight Wireframe Surpac Block model Surpac String Surpac Wireframe Surpac Mesh Vulcan Block model Vulcan Grid Mesh Vulcan String (ASCII) Vulcan Wireframe Vulcan Wireframe (ASCII) |  | dxf .txt .asc .dm .dmb .dm \*tr.asc & \*pt.asc \*tr.dm & \*pt.dm .2grd .dat .nvflt .3dr .tri or .bt2 .vs .pl .ts .vs .sg .msh .dat, .sec, .stp, .str, .svy .dat .out geol?.par .grd .tdb .dmp .msr .mdl .str .dtm .inp .bdf & \*.bmf\_asc .svg \_dgd1.dbl & .scd .00t .00t\_asc |

\* Where several related files cover one theme (e.g. surveying data, drill logs, look-up tables etc.) tabular data should be submitted in a self extracting zip file containing all relevant files. See requirements for file compression, Section 4.9.

\*\* PDF files should be created from the original plot file where possible and a scaling factor included for plots greater than 1143 mm in length.

### 4.8 File Name Convention

File names should conform to the following file naming convention:  
**Tenement\_id\_YYYYMM\_##\_{data type}.eee**

Where:

**Tenement\_id** is an identifier for the tenement  
**YYYYMM** is a six-digit report date representing year and month  
## is a 2 digit sequential number for each file submitted  
**data type** is for the data type contained in the file (eg report, appendix, map, geochemistry)  
**.eee** is the files extension. For example .pdf, .txt, .jpg, .tif

For example the file EL7766\_200003\_04\_collar.txt would be the fourth file of the March 2000 report for Exploration Licence 7766 and would contain tabular data in ASCII text format.

An example of names of a large file split in two:  
EL7766\_200004\_03\_appendix2.pdf and EL7766\_200004\_04\_appendix2.pdf.

### 4.9 File compression

Files may be submitted in compressed form. However, they must be self-extracting or be able to be unzipped by Winzip (.zip). File names specified in the report’s List of Contents and file verification listing must be the original (decompressed) file names, not the compressed files names.

Compressed files must decompress into a single directory with NO subdirectories. Compressed files must not be recompressed into another compressed file.

### 4.10 Media format

Digital files should be uploaded to RRAM, or if they exceed upload capacity, the tenement geologist is to be emailed to arrange digital data delivery. It must be readable in a Microsoft Windows environment.

## 5. Guidelines to submission of core and cuttings samples to the GSV Drill Core Library

Government encourages industry, academia and other interested parties to donate core and cuttings samples from drilling programs to the GSV Drill Core Library.

Such material will be used to assist in future geological exploration and research activity.

Please contact [gsv.drillcorelibrary@ecodev.vic.gov.au](mailto:gsv.drillcorelibrary@ecodev.vic.gov.au) to discuss submission of samples.

In general, boreholesintersecting important geological structures, mineralised zones and significant intersections, as well as boreholes hosting significant/unusual structures and mineral assemblages are sought.

For individual exploration programs, information on the samples submitted must be provided to give future explorers sufficient information to place what may by then be old records into a useful field context. This information, in digital format (ASCII, tab-delimited), must include the following:

### 5.1 Core Metadata

These data will probably only need to be supplied once if it is the same for all core being supplied.

|  |  |  |
| --- | --- | --- |
| Exploration\_company | Compulsory | owner company name |
| Purpose | Compulsory | eg minerals, extractive, general geological |
| Tenement | Compulsory | will help determine when confidentiality ceases |
| Reports | Compulsory | Complete details of any reports it is published in\*. |
| location\_accuracy | Preferred | plus/minus meters accuracy for location |
| location\_method | Preferred | method of obtaining location eg GPS, topo map scale |
| Drilling\_contractor | Preferred | drilling company name |
| Method | Preferred | eg RAB, Air core, percussion etc |
| elevation\_accuracy | Optional | should be supplied if elevation supplied |
| elevation\_datum | Optional | should be supplied if elevation supplied |

The GSV Drill Core Library is located at 18 South Road, Werribee. Visit the Core Library page on the Earth Resources website for more details: <https://earthresources.vic.gov.au/geology-exploration/maps-reports-data/drill-core-library>

### 5.2 Bore - Basic data on a bore

Individual bores

|  |  |  |
| --- | --- | --- |
| co-ordinates-easting | Compulsory | Six figures |
| co-ordinates-northing | Compulsory | Seven figures |
| co-ordinates-zone | Compulsory | Either MGA54 or MGA55 |
| co-ordinates-datum | Compulsory | GDA94 |
| drilling\_completion\_date or  drilling\_start\_date | Compulsory | must have one date |
| bore\_depth | Compulsory | in metres |
| core\_confidential | Compulsory | "Y" if licence is current, if blank assume non confidential whether licence is current or not |
| bore\_confidential | Compulsory | "Y" if licence is current, if blank assume non confidential whether licence is current or not |
| Local\_name | Compulsory | free text name assigned by the company |
| mapname | Optional | not needed if co-ordinates supplied, but good for double check of data |
| elevation\_gl | Preferred | elevation at ground level |
| parish | Optional | good double check for location |
| Core type | Compulsory | eg side wall cutting, Diamond Drill core etc |
| Depth from | Compulsory | in metres |
| Depth to | Compulsory | in metres |
| Recovery % | Preferred |  |

All core/cuttings should be packaged in clearly labelled core trays, with clearly labelled core separators where appropriate. Core should also be clearly marked to show orientation.

Since the samples will generally represent only selected intervals/boreholes, a brief report on the significance of these samples should also be submitted. However, an annotated digital image of these selected sections as produced by the project geologist, would greatly enhance the value of the collection to future users.

NOTE: The MRT Software (see section 4.4) may be used to generate a data file ‘Drill Hole Locations’ including most of the required data, although the resultant file may need manual editing to include any extra information requested.

# Appendix 1: Glossary

|  |  |  |
| --- | --- | --- |
| **Abbreviation** | **Description** | **Used as** |
| ASCII | American Standard Code for Information Interchange | International standard |
| ASEG | Australian Society of Exploration Geophysicists | Organisation |
| CGM | Concatenated Graphics Metafile | File type |
| DLIS | Digital Logging International Standard | International standard |
| EPS | Enhanced Postscript | File type |
| GDF2 | General Data Format (Version 2) | National standard |
| GEOTIFF | Geo-referenced Tagged Image File | File type |
| GXF | Grid Exchange Format | International standard |
| JPG | JPEG File Interchange Format | File type |
| LAS | Log ASCII Standard | International standard |
| LIS | Logging International Standard | International standard |
| PDF | Portable Data File | File type |
| PNG | Portable Network Graphics (file) | File type |
| SEG | Society of Exploration Geophysicists | Organisation |
| TIF | Tagged Image File | File type |
| TMI | Total Magnetic Intensity | Image type |
| UKOOA | United Kingdom Offshore Operators Association | International organisation |