

Fundamental Rules
for

DOCUMENTATION OF FIELD GEOLOGICAL INVESTIGATIONS

*Prepared and translated
by*

DR. SÁNDOR VÉGH

*geologist, on behalf of the
HUNGARIAN GEOLOGICAL INSTITUTE
(Geological Survey of Hungary)*

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Criticism and suggestions made by

Dr. G. Hámor, and Dr. L. Szebényi,
Heads of Department

P. Gyarmati, Dr. Á. Jámor,
Dr. A. Rónai and Dr. F. Szentes
*Heads of Section
in the Hungarian Geological Institute*

Translation revised by

Dr. E. Dudich
*Head of Section for Documentation
in the Hungarian Geological Institute*

Technical Editor

D. Simonyi

Responsible Editor

Dr. J. Konda
*Director
of the Hungarian Geological Institute*

1. INTRODUCTION

1.1. VALUE OF THE GEOLOGICAL DOCUMENTATION

The documentation to rule of geological field surveying its modern data processing and retrieval for scientific and practical purposes is such a task that its improvement should not be delayed any longer.

No detailed explanation is required to make obvious that counter value from exploration investments will be expressed in form of results represented by documentations. Under ideal circumstances data can directly be utilized for practical aims but more often they will be used later or even cannot be applied with practical use at all. It is conceivable that some previously abandoned exploration area, because of new viewpoints, may come into focus again at a later date. In this case new plans are to be drawn up, all the previous data on the territory concerned /observations, maps, geological profiles, analyses, etc./ will be used in order to reduce the new exploration costs and they would mean some repay from earlier investments. The solution of many problems which may arise in all kinds of geological and mining research as well as in engineering-geological activity and industrial planning, will be facilitated in more economic way by means of using relevant informations and documents. Information stored in data banks and regarded as obsolete could start to earn dividends /financially and morally/ under the only condition of its being well-conserved and accessible.

After publishing exploration data their basic documentation will not become obsolete at all. Scientific and technical papers and even monographs are generally characterized by restricted possibilities with respect to complete data publication, laying more stress on interpretation. On the other hand, this interpretation of basic data can become obsolete with the time. Revision of basic data could be necessary with regard to the relation of facts and conclusions. Consequently, the original documents are to be conserved as eventual check-

up material for new evaluations and up-to-date syntheses, with the exception of such data that can be stored and easily retrieved by computer.

1.2. PURPOSE OF REGULATIONS

Storage, processing and selective dissemination of data is a task of data bank staffs. On the other hand, the objective sufficiently detailed and uniform documentation of geological observations constitutes a task for field geologists.

On the basis of world-wide experiences it is concluded that exaggeratedly desk-centric view cannot produce good-operating documentation rules. Accordingly, the rules presented here have been elaborated as a performable minimum of requirements. It is expected that filling these requirements will make data gathering and processing simpler and faster. The rules set in this brochure about field investigations represent the minimum necessity for the correct and complete documentation. Methodology of geological mapping e. g. is not covered here. Documentation of mining exploration works as well as reports on assessment of mineral raw materials had been previously regularized by the Hungarian State Committee for Mineral Resources. The present exploration state of Hungary requires to develop and improve special mapping methods to a greater extent. For the time being these methods are under continuous perfection.

It is appropriate to mention and acknowledge the very careful work carried out by all those who participated in the preparation of this prescription set. Suggested completions and modifications have been adopted in the final text.

2. FIELD DOCUMENTATION TO RULE

2.1. FIELD NOTEBOOK FOR GEOLOGICAL MAPPING

The field notebook of 12 by 20 cm size is a hard-bound one with red linen top cover that contains 120 sheets or 240

pages. Pages are ruled by printed horizontal and vertical lines, the columns being labelled for the data to be assembled. Inner parts of the hard top cover show a diagram and a nomogram respectively for commonly used mapping corrections.

2.2. INSTRUMENTAL DATA TO BE OBSERVED AND RECORDED

Continuous checking of all printed columns in the notebook is obligatory in case of detailed instrumental mapping only. The following data are to be recorded: station number, direction to the next station, slope or inclined distance to the next station, angle of slope, number and symbol of artificial topographical objects /in the same direction or in side compass traverses/, horizontal distance to the next station, altitude.

Destination of the labelled columns can be modified if it is needed by the selected and indicated mapping method /compass and clinometer method, hand level method, barometer method, plane table method, etc./.

2.3. NOTE-TAKING IN GENERAL

On the front page of the notebook the observer's personal references must be marked with block letters: full name, qualification, department and starting date of putting to use the notebook. Second and third pages will be left blank for future table of contents. It is also necessary to make legend on these pages for particular symbols or abbreviations used. All pages are numbered from one.

Geological notes in the field book should always be clear and accurate for any geologist who may subsequently read and continue them.

It is required to write with ballpoint pen. Shorthand is considered inadmissible here. Well understandable abridgements which should always be used uniformly, are not objectionable. Dips also are to be marked uniformly f.i.: $270/16^{\circ}$. Strike and inclination of faulting planes are marked as numer-

ator in a same form, and the size of dislocation will constitute the denominator.

Rock sampling or collecting of trimming and hand specimens has to be recorded using a special sampling block prepared for this purpose. Each blank of this consists of two parts: original and duplicate. The original one will be left in its place while the duplicate is to be taken from the block and wrapped up with the sample. Different samples from the same spot taken for different analyses, must be packed separately and provided with a common serial number which represents the exposure. These extra samples are marked with letters or other kind of register marks enclosed with the serial number. The serial number only may be recorded in the field book.

In case of recording descriptions and impressions to a greater extent it is admitted to write continuously but the column labelled for station number must be left blank.

The geological notebook itself also is used as a field log book. It is necessary to mark the date of all working days /day, month, year/ and the most significant events worth of being recorded /breaks in field work, new assignment, official visits, etc./.

2.4. REQUISITE DATA FOR A COMPLETED EXPOSURE DESCRIPTION

Description of the outcrops or geological exposures in general, as well as of trenches, stone pits, road cuttings etc. must be done systemitically and in detail. Sedimentary rocks and general field surveying were taken into consideration as scope of setting the concerned minimum requirements. Special data of igneous rocks /+/, of plain land surface sequences /++/ and some engineering-geological observations /+++/ are discriminated with cross marks in brackets.

It is evident that specialists will find more points of interest to be noted. Other times all points of the prescription should not be checked. Care should always be taken not to omit checking phenomena that can be observed. Examination in details is ruled as follows:

1. Serial number of the outcrop, its type, location, dimensions and height above the sea level
2. Name of rock /formation/, its stratigraphical correlation to a possible degree /age, formation unit or group, lithofacies/
 - /+/
Name, age, classification
 - /++/
Name, age, genetic type
3. Thickness of rock or full stratigraphical interval cropping out
4. Structural mode of outcropping, strike and dip
 - /+/
Phenomena of magmatectonics
5. Detailed outline of the rocks in chronological order
 - a/
Thickness
 - b/
Lithology determined by field methods /name of rock, colour, fresh or weathered, texture, visible mineral and rock constituents; grain size, sorting, cement, grade of consolidation
 - /+/
Rock constituents of surface gravel
 - /+++/
Assumed value of plasticity and hardness, breaking
 - c/
Relations to underlying and overlying rocks
 - /+/
Contact characteristics
 - d/
Infra-structure /interbeddings, intraformational fragments, lamination, cross-bedding, schistosity, foliation, etc./
 - /++/
Cryotectonics /ice-formed structure phenomena/, soil formation and erosion, accumulation of lime, ferrihydroxide and alkaline content
 - e/
Fossils, the position of fossils in a stratum
 - f/
Location and number of sample taking, used method for sampling
6. Location, classification and direction of joints
7. Location, classification, strike and dip, size of displacement of the faults
 - /+++/
Evidences of landfall and landslide

8. Fillings in the cracks /diaclasses, paraclases/
9. Orientation of the principal cutting plane to the dip of stratification
10. Other observations and measurements

Sketches should be made on interesting outcrops /with scale and orientation marked/. In many respects photographs are valuable means of geological illustration /taking photographs the field of the picture must have some kind of object for comparison, e.g. hammer, and the number of shot should be noted/. In larger stone pits if they are considered as basic outcrops, foot line and principal elevations should be traversed. All data must be carefully recorded.

2.5. REQUISITE DATA FOR THE RECORDING OF BOREHOLES

For the field examination and recording of the subsurface conditions in boreholes a special notebook of 12 by 20 cm size, had been introduced. It is a hard-bound one with blue linen top cover that contains 120 sheets or 240 pages. Pages are ruled by horizontal lines and vertical columns labelled for the following data: number of unit, depth interval, thickness of stratum /penetrated/, angle of dip, thickness of inclined stratum, rock hardness, recovery of core /metre, percentage/, number of sample, age of stratum, description of stratum, other recordings. It is demanded to write with ball-point pen. On the front page the observer's full name, qualification, department and the starting date of putting to use the notebook, must be marked with block letters. On the second and third page table of contents will be recorded. Destination of the labelled columns can be changed upon necessity.

Before the essential work the following information must be marked:

- a/ Number and destination of drilling
- b/ Location /final coördinates after checking/
- c/ Name and address of drilling company

- d/ Type and serial number of drill machine
- e/ Method of drilling, circulation system
- f/ First and last core diameter or casing diameter
- g/ Date of starting and completion of drilling
- h/ Total depth of the hole
- i/ Delivery of samples /where, when/

Data which cannot be determined previously, must have space to be filled after final checking.

If drilling takes place in the surveying area, then its location would be connected with the mapping traverse system. Drillings under the jurisdiction of the Hungarian Geological Institute must be previously numbered by its Documentation Department.

2.5.1. FIELD DESCRIPTION OF SAMPLES FROM BOREHOLES

As far as the detailing of penetrated formations is concerned, it depends by far on drilling method and surveying purposes. Formations may be recognized, distinguished and assembled according to previously established points of view but all discriminated rock types must be characteristic within the sequence. The term of "interbedding" would clearly be defined to use it appropriately, marking its depth interval accurately within the principal rock type if it has special importance. Mineral raw materials should be separated in every case.

At first the name of rock, its colour and other principal characteristics are to be recorded. Rock name will be underlined. Degree of accuracy in depth interval determination is as much as 0,1 metre.

Any change in drilling would be recorded: diameter of casing, change in drilling method or sampling /coring, alternated coring and reaming, rock fragments from drill stem, rock particles kept by the mud fluid, side-hole sampling, etc./. Grade of coring recovery would be determined at every interval of breaking down and making up the drill stem. In case of coring all the way down nearly from the surface recovery in metres is marked as cumulative /recovery of the entire length of

the core in the borehole is given in metres/. Do not omit to note carefully all kind of other observations /depth of ground water table, water temperature, etc./.

2.5.2. ORDER OF THE ADEQUATE DESCRIPTION OF SAMPLES FROM BOREHOLES

Description of formations must be done from the top downwards even if the examination of the samples from boreholes takes place at a later date. In no case will be permitted superficial description that can affect the reliability of expected surveying results.

3. PREPARATION OF GEOLOGICAL DOCUMENTATION

3.1. DOCUMENTATION STORED IN DATA BANK

The Section for Documentation in the Hungarian Geological Institute will stamp and number the official field notebooks which could be received upon the claim of section heads for any member of field groups against acknowledge receipt of them. The notebook is property of the State, it is only lent to professional geologists. Competent use and returning in time will be supervised by the section head. Preparation of geological reports as to their completion deadline is determined by the Head of the Institute. A finished geological report in typed form must be delivered up to the data bank in its original and duplicate. Documents to be turned to the data bank every year, are the followings:

- a/ Drilling informations of which report from other sources will not be delivered up;
- b/ Photographs taken in the field and worth of be stored in the data bank.

3.2. PREPARATION OF GEOLOGICAL REPORT

As for the paper, report must be typed using sheets about 21 by 30 cm. Write on paper of good quality, leave margin

and line gap according to the typing rules. *Title page* is made according to Enclosure No. 1. This is followed by the *Table of Contents*, then there is a *Summary* on the report. Titles must be numbered in decimal system. Among the text *illustrations* can be placed but they cannot exceed the prescribed sheet size. Full-page illustrations should be numbered as pages. All figures must have explanations. *Supplements* must be folded to prescribed sheet size if they exceed it, having title on the front part. Ozalid blue line machines limit any drawings put on transparent paper to 100 cm width. The report is placed in hard top plastic folder and, if it is necessary, supplements in a separate folder with title on it and with a list of drawings inside. The title on the folder includes the following informations:

- a/ Object of reporting
- b/ Name of the author
- c/ Place and date of report completion

Referring to Enclosure No. 1, required checking data should be interpreted as follows:

- a/ Number of volumes: number of volumes or folders of the report /text, supplements/
- b/ Number of text pages: total number of written pages and continuously numbered full-page illustration
- c/ Pages in full: number of written pages and extent of supplements computed in common sheet size /see 3.2/
- d/ Number of figures: total number of illustrations printed in the text, larger or smaller than a page
- e/ Number of supplements: total number of supplements

3.3. EXPLANATION AND COLOURING OF DRAWINGS

As it is adopted in the Institute, all black line works are to be done with India ink and each of them would have title and label put in the lower right hand corner. The following names /in block letters/ and signatures should be marked in the label: author, section head and draftsman. Transparent papers should not be coloured only the blue line

duplicates, for copying in original size neatly. Any essential changes or corrections made on duplicates should be put on the original, too. Geological sections, maps and map sketches must have a scale.

3.4. COMPLETION OF GEOLOGICAL SECTIONS

Requirements:

- a/ The title must indicate the source /if reproduced/ and method practiced to construct the profile geological section /upon data recorded in the field or data transferred from a map: measured or interpreted/
- b/ East directions are required to be at the right hand side /position of the section/
- c/ Direction of the section position is required in degrees. Block letters to indicate direction are to be put above the degrees on the drawing
- d/ Symbols for dips and faults are placed above the surface line of the section
- e/ The section is accompanied by vertical and horizontal scales
- f/ Vertical enlargement proportion must be marked /e.g. 1:2/
- g/ A completed geological section requires a legend
- h/ The author's signature proves that all required corrections were executed for the completed geological section

3.5. SKETCH OF OUTCROPS

It is desirable that for the completion of sketches made in the field on geological outcrops, all data of measurement and photographs should also be taken into account.

3.6. PHOTOGRAPHS

Cameras are excellent for recording all interesting features offered by geological exposures. Good quality photographs are needed to be stored in data bank. Their size must be at least 9 by 12 cm. Photographs will be mounted on plates of 21 by 30 cm size, with the following typed explanation to make them serviceable and comprehensible:

Region, map code, serial number of the outcrop, subject selected, symbols marked on the print, in brackets: name of photographer and date of taking.

Symbols can be marked on the print using black or white India ink but they should not cover any kind of important geological feature.

3.7. DOCUMENTATION OF WELL LOGGING

Complete documentation of well records /a more detailed well log showing any data discovered in the samples from boreholes and in the holes/ must be placed in the Data Bank of the Department for Geological Documentation. Documents as descriptions, lists, graphic log, plotted electrical log curves, drilling-rate charts, photos etc. should be assembled for each borehole separately.

4. DIRECTIONS FOR UNIFORM WRITINGS

Modern data processing requires more uniformity in writing and nomenclature.

In writing geological reports endeavour to use clear, idiomatic Hungarian and respect the rules of grammar set by the Hungarian Academy of Sciences. Technical terminology and units of measurement are to be used on the line of the Encyclopaedia of Natural Sciences /published by Akadémiai Kiadó, Budapest, in Hungarian/ but we should realize that uniformly writing requires a technical dictionary for this purpose.

Numbers are written according to international practice, grouped and separated in units of three. It means that triple groups are separated with a gap which corresponds to the space of one number figure:

10
100
1 000
1 000 000

Instead of decimal point decimal comma would be used. All data of measurement /measured or quoted from other works/ must be in CGS system /centimetre, gramme, second/.

Kiadja a Magyar Állami Földtani Intézet
Felelős kiadó: Dr. Konda József
Készült a Magyar Állami Földtani Intézet Házinyomdájában
Terjedelme: 1,4 A/5 iv - Példányszám: 250 - Engedélyszám: 21/972
Felelős vezető: Balogh Ernő