

ICS 73.020
CCS D 14

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**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

MT/T 1091-2008

**Standard for exploration and evaluation of hydrogeology,
engineering geology and environment geology in coal beds
(English Translation)**

Issued on: December 11, 2009

Implemented on: July 1, 2010

Issued by: State Administration of Work Safety

Table of Contents

Foreword...	4
1 Scope...	5
2 Normative references...	5
3 Terms and definitions...	6
4 General...	8
5 Hydrogeological exploration and evaluation...	9
5.1 Degree of work...	9
5.2 Classification of hydrogeological exploration types...	9
5.3 Problems to be identified for various types of filling deposits...	11
5.4 Principles and quantity of exploration project layout...	13
5.5 Hydrogeological survey and mapping...	15
5.6 Hydrogeological and geophysical prospecting...	20
5.7 Simple hydrological and geological observations of borehole...	23
5.8 Pumping test...	25
5.9 Dynamic observation and water sampling...	33
5.10 Estimate of mine yield water...	37
6 Engineering geological exploration and evaluation...	38
6.1 Exploration types...	38
6.2 Basic requirements...	39
6.3 Principles for project layout...	41
6.4 Technical requirements for exploration...	42
6.5 Engineering geological evaluation...	46
7 Environmental geological exploration and evaluation...	47
7.1 General requirements...	47
7.2 Environmental geological investigation...	48
7.3 Environmental geological assessment...	50
Appendix A (Normative) Grading of water-richness of aquifer...	53
Appendix B (Normative) Grading of structural planes...	54

1 Scope

This standard specifies the basic guidelines for hydrogeological, engineering, and environmental geological work in the geological exploration of coal resources; it focuses on the technical requirements and working methods of the exploration.

This standard is applicable to the design and preparation, exploration and construction, geological research, geological report preparation and review, resource / reserve evaluation, mining right assessment, feasibility study at each stage of geological exploration of coal resources.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard;

however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable.

For undated references, the latest edition of the referenced document applies.

GB 3838 Environmental quality standards for surface water

GB 12719 Exploration specification of hydrogeology and engineering geology in mining areas

GB/T 14158 Survey code for regional hydrogeology, engineering geology and environmental geology

GB/T 14848 Quality standard for ground water

GB 50027 Standard for hydrogeological investigation of water-supply

DZ/T 0080 Specifications for geophysical logging of coal

DZ/T 0215 Specifications for coal, peat exploration

5.1 Degree of work

Pre-exploration stage: Hydrogeological work is generally not carried out.

General exploration stage: Roughly understand the hydrogeological conditions of the exploration area. Evaluate the economic significance of coal resources and the possibility of development and construction.

Detailed investigation stage: Basically, identify the hydrogeological conditions of the exploration area, evaluate the hydrogeological conditions that may affect the development

and construction of the mining area, provide a basis for the overall development planning of the mining area.

Exploration stage: Detailed identification of the hydrological and geological conditions of the mine field, evaluation of the mine water-filling factors, budgeting of water yield at the pre-mined mining area, prediction of the possibility and location of water yield during the mining process, comment on possible changes in hydrogeological conditions after mining, evaluation of the utilization possibility and approach of mining water, provide geological data for the feasibility study and preliminary design of the mine construction.

5.2.1.1 According to the characteristics of the water-containing space of the

directly filling aquifer, the hydrogeological exploration of the coal bed is divided into three categories:

- a) The first category, ore deposits dominated by loose pore aquifers, which are called pore-filled ore deposits;
- b) The second category, ore deposits dominated by clastic rock aquifers, which are called fissure filling deposits;
- c) The third category, ore deposits dominated by carbonate karst aquifers, which are called karst filling deposits. It is further divided into two sub- types according to their filling methods:

- 1) The first sub-category, karst filling deposits dominated by water yield from roof;
- b) The unit water yield of directly filled aquifer is $q < 1.0 \text{ L} / (\text{s} \cdot \text{m})$, without strong water-rich rock formations that are difficult to drain.

5.2.2.2 Type II has medium hydrogeological conditions and easy to dry out:

- a) The unit water yield of directly filled aquifer is $1.0 \text{ g} / (\text{s} \cdot \text{m}) \leq q \leq 10 \text{ L} / (\text{s} \cdot \text{m})$, the aquifer is weak in water-richness;
- b) The unit water yield of directly filled aquifer is $10.0 \text{ L} / (\text{s} \cdot \text{m}) < q \leq 20.0 \text{ L} / (\text{s} \cdot \text{m})$, but the recharge source is lacking.

5.2.2.3 Type III deposits have complicated hydrogeological conditions and difficult to dry out:

- a) The unit water yield of directly filled aquifer is $q > 10.0 \text{ L} / (\text{s} \cdot \text{m})$, there is a large surface water body nearby and it is hydraulically connected to groundwater; or although the recharge conditions are not good, $q > 20.0 \text{ L} / (\text{s} \cdot \text{m})$;
- b) Open-air direct filling aquifers are thick, widely distributed, has strong water-richness,

which are prone to engineering geological problems such as quicksand and difficult to dry out.

5.3 Problems to be identified for various types of filling

deposits

5.3.1 Pore-filled ore deposits

It shall focus on identifying the types of aquifers, distribution, lithology, thickness, depth, structure, grain size, roundness, sortability, cementation degree, water- richness, permeability, changes; identify the spatial distribution of quicksand layers and characteristics, the combined relationship of aquifers (water barriers), the hydraulic connection between aquifers, aquifers and weakly permeable layers, and surface water; evaluate the dredging conditions of quicksand layers and the effects of precipitation and surface water on mining of deposit.

5.3.2 Fissure-filled deposits

It shall emphatically investigate the thickness, depth, fissure properties, scale, development degree, distribution rules, filling conditions and water-richness of fractured aquifers; depth and weathering degree of rock weathering zone; the nature, shape and scale of tectonic fracture zone and its hydraulic connection with aquifers and surface water; the combined characteristics and proportion of fractured aquifers and their relative aquifers.

damage of the fault structure on the integrity of floor; analyze and demonstrate the segment which may produce lots of heaving floor and water yield.

5.4.1 Layout principles of exploration project

5.4.1.1

Hydrogeological exploration in the exploration area (well) shall be carried out in combination with geological exploration. Hydrogeological exploration work shall, based on the study of geological and regional hydrogeological conditions, consider the thickness of aquifers, water-richness, water conductivity, recharge and drainage conditions, the way to fill the mine as a whole for investigation and research. For large water mining areas with complex hydrogeological conditions (well-fields that flood more than 100000 m³ every day and night), the scope of work should be expanded to a complete hydrological unit.

5.4.1.2

The hydrogeological exploration must be based on the type of coal mine hydrogeology and the specific conditions of the exploration area. It shall clarify the issues that shall be focused on in this work, comprehensively use various exploration techniques (including drilling simple hydrogeology-engineering geological observation, hydrogeological survey and