ICS 75.020
CCS E 12

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 34163-2026

Replacing GB/T 34163-2017

Shale gas - Technical specification for the preparation of development plans

页岩气 开发方案编制技术规范

Issued on: May 25, 2026 **Implemented on: December 1, 2026**

Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC

Table of Contents

7 Working Mode

7.1 Timing of Compilation Development plans should be formulated when the geological and gas reservoir characteristics and development dynamics are clear, the main technological processes are well-defined, and the gas market is secured. plan.

7.2 Professional Task Breakdown According to geological and gas reservoir engineering, drilling engineering, well completion and reservoir stimulation engineering, gas production engineering, surface engineering, quality, health, safety, environmental protection and energy conservation. The investment estimation and economic evaluation specializations are divided, and special research and program development are carried out separately for each.

7.3 Technical Research Work Procedures Based on the interrelationships between research contents, and following an integrated approach, multi-disciplinary collaboration and overall optimization were employed to complete the gas reservoir geology and gas reservoir engineering plans. Case studies, drilling engineering plans, well completion and reservoir stimulation plans, gas production engineering plans, surface engineering plans, quality, health, safety, environmental protection and energy conservation assessments, and investment plans. Based on the research of asset estimation and economic evaluation, prepare a general report and sub-reports for the shale gas development plan. Each part should be submitted as a separate report. The document is a necessary component of the development plan. The stages of the technical research and the corresponding results are detailed in Appendix B.

7.4 Collaboration between Technology Research and Management Functional management departments and specialized teams clearly defined their responsibilities and collaborated to complete the development plan. The collaborative work process for shale gas development

plan preparation... See Appendix B for the preface.

8.1 Description of basic conditions of the work area

8.1.1 Overview of the Work Area The work area overview description includes, but is not limited to, the following.

---Geographical location;

---Mining rights information;

---Overview of natural and social conditions related to the development and construction of the work area, and regional geological conditions.

8.1.2 Exploration Evaluation and Preliminary Work The description of the exploration assessment and preliminary work includes, but is not limited to, the following.

---Exploration evaluation and preliminary work process;

---Plan test or trial production status;

---Reserve declaration status.

8.1.3 Work Area Data Work area data includes, but is not limited to. seismic data, drilling data, well logging data, well logging data, coring data, fluid sampling data, experimental analysis data, segmented production testing data, and production data. Including dynamic monitoring data, etc. Data acquisition shall be carried out in accordance with GB/T 41613.

8.2 Gas reservoir description and reserve evaluation

8.2.1 Key Points of Gas Reservoir Description Based on static and dynamic data obtained from exploration and evaluation, pilot tests, trial production, and production capacity construction, gas reservoir description is carried out. Key points of gas reservoir description are attached. Record C.

8.2.2 Structural Features Describe the distribution, type, morphology, and characteristic parameters of the geological structures; describe the nature, distribution, and attitude of the faults. Follow the specifications in GB/T 39541. The compiled maps include, but are not limited to, structural plan views, seismic profile views, and target layer depth plan views.

8.2.3 Stratigraphic Characteristics Describe the stratigraphic position, depth, lithology, paleontology, thickness, top-to-bottom contact relationship, and well logging electrical and seismic properties by group, section, subsection, and small layer unit. Based on response characteristics, compile a comprehensive stratigraphic column. Conduct stratigraphic correlation analysis, finely subdivide sublayers, and compile stratigraphic thickness maps and stratigraphic correlation diagrams. Figure. Comply with GB/T 39541.

8.2.4 Characteristics of sedimentary facies Based on lithofacies and logging facies, the

vertical and planar distribution characteristics of sedimentary facies, subfacies, and microfacies are described, and a comprehensive sedimentary facies column for a single well is compiled. Prepare a topographic map and a sedimentary facies plan to clearly identify areas with favorable sedimentary facies distribution. Follow the guidelines in GB/T 39541.

8.2.5 Reservoir Characteristics Describe the reservoir rock mineral characteristics, geochemical characteristics, pore structure characteristics, reservoir physical properties, gas content, and natural fracture development characteristics. Laminar characteristics, lateral reservoir distribution, and vertical interlayer stacking relationships. Comply with GB/T 39541.

8.2.6 Geomechanical characteristics Describe the characteristics of brittle minerals, rock mechanics, fracturability, geostress field characteristics, and geological body stability. According to GB/T 39541 The regulations shall be followed.

8.2.7 Gas reservoir types Describe formation temperature, formation temperature gradient, formation pressure, formation pressure coefficient, and fluid properties. The description method shall conform to GB/T 39541. Execution. Determine the gas reservoir type in accordance with NB/T 11335.

8.2.8 Geological Modeling Establish structural models, property models, geostress models, and natural fracture models in accordance with GB/T 39541 and NB/T 11043. The evaluation indicators for shale reservoir quality, drilling and completion performance, and reservoir stimulation adaptability are described in Appendix D. Models such as structural models, attribute models, geostress models, and natural fracture models are used for reserve calculation, reservoir stimulation simulation, gas reservoir numerical simulation, and production dynamic prediction. It provides support for the design of gas reservoir engineering schemes.

8.2.9 Production Dynamics Analyze the dynamic characteristics of gas well pressure, gas production, and fluid production, as well as formation flow characteristics; calculate the gas well pressure and gas production decline rate, and fracturing fluid return. Discharge rate and ultimate recoverable reserves (EUR) are used to evaluate the production capacity of gas wells. This should be carried out in accordance with NB/T 14015 and GB/T 41612.

8.2.10 Production Dynamics Forecasting It covers dynamic forecasting of pressure, production, and reserve utilization for individual wells, well groups, and development blocks, and establishes a system that includes analysis of production data. Statistical prediction models, dynamic prediction models based on well test analysis, and numerical simulation prediction models established based on geological modeling are used to predict biological phenomena. Production dynamics. The reliability of the model is verified using gas well production history, and model parameters are optimized and adjusted.

8.2.11 Gas Well Production Capacity Control Factors Analyze the impact of geological gas

reservoir characteristics, drilling technology and parameters, well completion and reservoir stimulation technology and parameters, and production system on gas well productivity. Identify the controlling factors that affect high gas well production.

8.2.12 High-yield well model Establish high-yield well models by optimizing geological parameters, engineering process parameters, and reasonable gas well production systems.

8.2.13 Establishment of Standard Wells Based on the high-yield well model, and taking into account geological characteristics, engineering technology level, process parameters, and production system, the horizontal section length of the standard well is determined. Degree, first year production and EUR.

8.2.14 Development Zone Designation The scope of the development zone is determined by comprehensively considering the underground and surface conditions within the mining rights area. The basic conditions and details for determining the development zone are provided in Appendix E.

8.3 Gas Reservoir Engineering Scheme

8.3.1 Scheme Design Principles The geological reserves are highly utilized, the development technology and policies are scientific, the engineering technology is mature and applicable, and the health, safety, environmental protection and energy-saving measures are feasible. The development scale is large. The model and implementation arrangements are reasonable, and the overall technical and economic indicators are relatively good.

8.3.2 Development Layer Division The development strata are divided by comprehensively considering the geological and engineering characteristics of the reservoir, its vertical distribution, and the scope of vertical reservoir stimulation.

8.3.3 Development Unit Division Development is divided based on a comprehensive consideration of factors such as stratigraphic sequence, burial depth, structural features, reservoir characteristics, gas reservoir characteristics, preservation conditions, and fluid properties. The development unit is defined, and development technology policies, engineering processes, and parameters are formulated based on the geological and engineering characteristics of the development unit.

8.3.4 Mining Methods The depletion extraction method is recommended, while gas injection extraction can be considered for shale condensate gas reservoirs.

8.3.5 Development Methodology Cluster well development should be adopted. Stable production can be achieved through well area replacement, platform well group replacement, or single-well replacement.

8.3.6 Development Well Design For single-layer development, based on the structural characteristics, reservoir characteristics, and stress field characteristics of the development