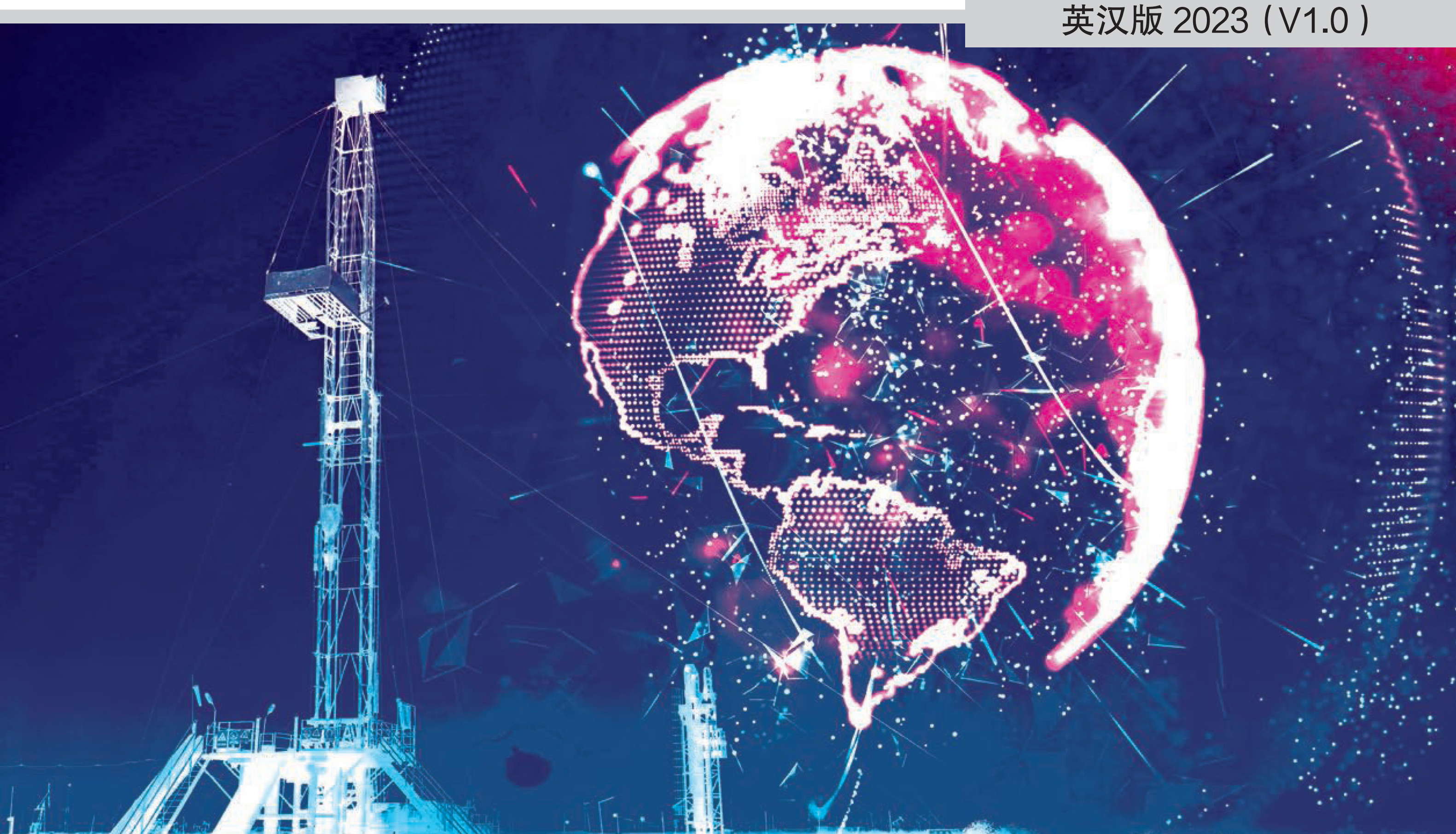
PRMS

Petroleum Resources Management System

石油资源管理系统

杨 桦 李其正 李二恒 等 编制

英汉版 2023（V1.0）



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English-Chinese Version 2023 (V1.0)

（Developed from PRMS 2018 V1.0）

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Preface 1

The Petroleum Resources Management System (hereinafter referred to as the “PRMS”), sponsored by the Society of Petroleum Engineers (SPE), American Association of Petroleum Geologists (AAPG), World Petroleum Council (WPC), Society of Petroleum Evaluation Engineers (SPEE), Society of Exploration Geophysicists (SEG), Society of Petrophysicists and Well Log Analysts (SPWLA) and European Association of Geoscientists and Engineers (EAGE), is an international standard generally abided by the global petroleum industry for resources management, evaluation and reporting. PRMS resources and reserves definitions, classification and categorization principles, evaluation methods and reporting rules have been widely adopted and applied in international cooperations, industry activities, entity business and capital markets. To better meet the needs of PRMS stakeholders around the world, the SPE Oil and Gas Reserves Committee (OGRC) granted authorization to the specific Taskforce to develop the PRMS in English-Chinese Version in January 2020, and has provided full supports and all way supervision. On May 5th 2023, the PRMS English-Chinese Version 2023 (V1.0) was approved in the OGRC meeting for publication.

The PRMS in English-Chinese, aiming to further improve the PRMS2018 in English and support the establishment of the Chinese terminology of PRMS concept system, is of significance to further improve PRMS’ ever-green development, promote its in-depth application over the world and serve as a bridge for global resources management systems. From the perspective of system engineering of whole life-cycle petroleum resources management, the PRMS in English-Chinese Version is a useful practical working manual for global petroleum industry and also a good reference textbook for young students and scholars in universities to learn knowledge on integrated resources management.

W.John LEE, Chairman

SPE Oil and Gas Reserves Committee

序 1

《石油资源管理系统》（以下简称“PRMS”），是石油工程师学会（SPE）、美国石油地质师协会（AAPG）、世界石油理事会（WPC）、石油评估工程师学会（SPEE）、勘探地球物理学家学会（SEG）、岩石物理学家和测井分析家学会（SPWLA）和欧洲地球科学家与工程师协会（EAGE）联合发布的国际标准。《PRMS》的资源储量定义、分类分级原则、评估技术方法与报告规则，已在全球石油行业广泛采纳，并在国际合作、行业活动、公司业务以及资本市场作为主流国际标准发挥着重要作用。为了更好满足全球《PRMS》用户需求，SPE 油气储量委员会（OGRC）于 2020 年 1 月授权专项研发工作组启动了《PRMS》英汉版的制修订工作，并给予了大力支持、全程监管和质量把控。2023 年 5 月 5 日，《PRMS》英汉版 2023（V1.0）在 OGRC 年度工作会议上通过全体委员审议，批准会后出版发布。

《PRMS》英汉版 2023，旨在进一步修订完善《PRMS》英文版 2018 基础上，创建《PRMS》的中文概念系统，这对 PRMS 的可持续发展、促进全球推广应用以及推动其与全球主流资源管理标准之间的互联互通具有重要意义。从全生命周期石油资源管理系统工程的角度，《PRMS》英汉版是一部对全球石油行业从业人员非常实用的工作手册，也是广大石油院校青年学生与学者学习和研究石油资源管理理念、技术和方法的理想教科书。

W. John LEE

石油工程师学会油气储量委员会主席

Preface 2

Standards, carry wisdom, serve as foundation and provide impetus for development. A standard on mineral resources and reserves management, is a complex and rigorous system, aiming to carry the concept of mineral resources management and guide the establishment of associated systematic theory, terminology, methodology and approaches supporting for the standardization of resources management, evaluation, reporting and decision-making processes throughout whole life cycle, and playing a leading role and practical significance in promoting the efficient resources utilization and high-quality business development.

The Petroleum Resources Management System (PRMS), sponsored by SPE, AAPG, WPC, SPEE, SEG, SPWLA and EAGE and serving as an international standard in global petroleum industry for resources management, evaluating and reporting, its resources and reserves definitions, classification and categorization principles, evaluation methods and reporting rules have been widely adopted in global international cooperations, industry activities, entity businesses and capital markets, playing an important role in leading and regulating international mining activities and cooperations. The publication of the PRMS English-Chinese Version 2023 will become a milestone in PRMS' ever-green development for further promoting the dissemination and application of PRMS in the practice, and serving as a bridge to interconnect global mineral resources management standards.

Petroleum is an essential energy supply for social and economic development, and its efficient utilization is of great significance to the sustainable development of human society. I initiate global experts to pay attention and engage in the development of mineral resources management standards, actively promote their mapping, and jointly cope with the challenges in green energy transition for contributing to the harmonious, win-win benefited and sustainable development of the global mining industry.

JU Jianhua

Vice President of the China Association of Mineral Resources Appraisers

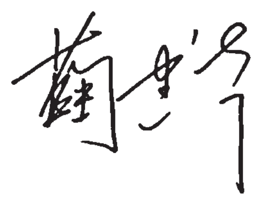
Former General Director of the Mineral Resources Protection and Supervision Department of the Ministry of Natural Resources of the People's Republic of China

序 2

标准，是智慧、基石和助力。矿产资源储量标准，作为一个复杂严谨的系统工程，旨在承载矿产资源管理理念，建立矿产资源储量管理的系统理论、术语体系、技术方法与流程，指引和规范油气矿产资源全生命周期管理、评估、报告和投资决策活动，对推动矿产资源高效利用以及企业实现高质量发展具有引领作用和现实意义。

在国际层面，石油工程师学会（SPE）、石油评估工程师学会（SPEE）、美国石油地质师协会（AAPG）、世界石油理事会（WPC）、勘探地球物理学家学会（SEG）、岩石物理学家和测井分析家学会（SPWLA）和欧洲地球科学家与工程师协会（EAGE）七家国际学术组织联合发布的《石油资源管理系统》（以下称“PRMS”），是全球石油行业开展油气资源管理、评估和报告（披露）等业务普遍遵循的国际标准，其资源储量定义、分类分级原则、评估技术方法与报告规则，已在国际合作、行业活动、公司业务以及资本市场等多领域广泛采纳和应用，对支撑和规范国际矿业活动与合作中具有重要作用。《PRMS》英汉版 2023 的出版发布，将成为《PRMS》发展的新里程碑，对进一步促进《PRMS》的知识传播与实践应用具有重要意义，并为全球矿产资源标准提供互联互通的桥梁。

石油是社会经济发展的重要能源基础，其高效、合理利用对人类社会的可持续发展具有重要意义。希望全球专家学者积极关注矿产资源标准的研究和编制工作，积极促进资源标准与管理机制的互联互通，共同应对绿色减排、能源转型和可持续发展新挑战，实现全球矿业和谐、共赢和可持续发展。



中国矿业权评估师协会副会长

中华人民共和国自然资源部矿产资源保护监督司原司长

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Preamble

Petroleum resources are the quantities of hydrocarbons naturally occurring on or within the Earth's crust. Resources assessments estimate quantities in known and yet-to-be-discovered accumulations. Resources evaluations are focused on those quantities that can potentially be recovered and marketed by commercial projects. A petroleum resources management system provides a consistent approach to estimating petroleum quantities, evaluating projects, and presenting results within a comprehensive classification framework.

International efforts to standardize the definitions of petroleum resources and how resources volumes are estimated began in the 1930s. Early guidance focused on Proved Reserves. Building on work initiated by the Society of Petroleum Evaluation Engineers (SPEE), the Society of Petroleum Engineers (SPE) published definitions for all reserves categories in 1987. In the same year, the World Petroleum Council (WPC), then known as the World Petroleum Congress, independently published reserves definitions that were strikingly similar. In 1997, the two organizations jointly released a single set of definitions for reserves that could be used worldwide. In 2000, the American Association of Petroleum Geologists (AAPG), SPE, and WPC jointly developed a classification system for all petroleum resources. This was followed by the Guidelines for the Evaluation of Reserves and Resources (2001), Estimating and Auditing Standards for Reserves (2001, latest revision June 2019), and a glossary of terms used in resources definitions (2005). In 2007, the SPE/WPC/AAPG/SPEE Petroleum Resources Management System (PRMS) was issued and subsequently supported by the Society of Exploration Geophysicists (SEG). The document is referred to by the abbreviated term SPE-PRMS or simply PRMS, with the caveat that the full title, including clear recognition of the co-sponsoring organizations, has been initially stated. In 2011, the SPE/WPC/AAPG/SPEE/SEG published Guidelines for the Application of the PRMS (referred to as Application Guidelines).

The PRMS definitions and the related classification system are now in common use internationally to support petroleum project and portfolio management requirements. PRMS is referenced for national reporting and regulatory

引　言

石油资源是指自然形成于地壳表面或内部的碳氢化合物的数量。资源评价则是估算已知和待发现油气聚集中的资源数量。资源评估是针对可由商业项目采出并销售的数量。石油资源管理系统，可在一个完整的分类框架下，为石油数量估算、项目评估及结果呈现提供一致的方法。

20 世纪 30 年代，国际社会开始推进石油资源定义和资源量估算的标准化。早期的指南主要针对证实储量。1987 年，在国际石油评估工程师学会（SPEE）开创工作基础上，国际石油工程师学会（SPE）发布了所有级别的储量定义。同年，世界石油理事会（WPC），即当时的“世界石油大会”，独自发布了非常相似的储量定义。1997 年，SPE 和 WPC 联合发布了全球通用储量定义。2000 年，美国石油地质师协会（AAPG）、SPE 和 WPC 联合编制适用于所有石油资源的分类系统。随后，又补充发布了《资源储量评估指南》（2001 年版)，《储量估算与审计标准》（2001 年版，最新修订于 2019 年 6 月）以及《资源定义术语表》（2005 年版）。2007 年，《 SPE/WPC/AAPG/SPEE 石油资源管理系统 (PRMS) 》发布，并随后得到地球物理学家学会（SEG）的认同。本标准名称的英文缩写为“SPE-PRMS”或简化为“PRMS”，但在开篇之处表述了完整名称以及合作机构。2011 年，SPE、WPC、AAPG、SPEE 和 SEG 发布了《石油资源管理系统应用指南》(简称《应用指南》)。

目前，PRMS 定义及其分类系统已在国际上普遍使用，以满足石油项目与投资组合的管理需求。许多国家将 PRMS 用于国家报告和监管披露，并为《联合国资源

disclosures in many jurisdictions and provides the commodity-specific specifications for petroleum under the United Nations Framework Classification for Resources (UNFC) to support petroleum project and portfolio management requirements. The definitions provide a measure of comparability, reduce the subjective nature of resources estimation, and are intended to improve clarity in global communications regarding petroleum resources.

Technologies employed in petroleum exploration, development, production, and processing continue to evolve and improve. The SPE Oil and Gas Reserves Committee works closely with related organizations to maintain the definitions and guidelines to keep current with evolving technology and industry requirements.

This document consolidates, builds on, and replaces prior guidance. Appendix A is a glossary of terms used in the PRMS and replaces those published in 2007. It is expected that this document will be supplemented with industry education programs, best practice reporting standards, future updates to the 2011 Application Guidelines and extension of PRMS principles to non-hydrocarbons.

This updated PRMS provides fundamental principles for the evaluation and classification of petroleum reserves and resources. If there is any conflict with prior SPE and PRMS guidance, approved training, or the Application Guidelines, the current PRMS shall prevail. It is understood that these definitions and guidelines allow flexibility for entities, governments, and regulatory agencies to tailor application for their particular needs; however, any modifications to the guidance contained herein must be clearly identified. The terms “shall” or “must” indicate that a provision herein is mandatory for PRMS compliance, while “should” indicates a recommended practice and “may” indicates that a course of action is permissible. The definitions and guidelines contained in this document must not be construed as modifying the interpretation or application of any existing regulatory reporting requirements.

分类框架》（UNFC）提供油气规范，以支持石油项目与投资组合的管理需求。这些定义为可比性提供了衡量标准，减少了资源估算主观性，并旨在全球范围提高对有关石油资源进行沟通交流时的清晰度。

石油勘探、开发、生产和加工技术在不断发展和改进。SPE 油气储量委员会在与相关组织密切合作，持续维护这些定义与指南，以跟上不断发展的技术与行业需求。

本标准整合、改进并替代了以前的指南。附录 A 是 PRMS 术语表，其替代了 2007 年版术语表。预期，本标准将进一步辅以《行业教育方案》《最佳实践报告标准》《应用指南》（2011 年版）的更新内容，以及 PRMS 原则在非烃资源中的拓展应用。

更新后的《石油资源管理系统》为石油资源储量评估和分类提供了基本原则。若与之前 SPE 和 PRMS 的指南、培训材料或应用指南有任何冲突，以本版 PRMS 为准。我们认为，这些定义和指南允许各企业实体、政府和监管机构根据自己的特定需求灵活应用；但是，对指南的任何改动须明确指出。术语“将（shall）”或“须（must）”，表示本条款在 PRMS 应用中须强制遵循，而“应（should）”表示推荐性实践做法，“可（may）”则表示允许采取的行动。本标准的定义和指南不得理解为是对任何现有监管报告要求的解释或应用的修改。

1.0 Basic Principles and Definitions

1.0.0.1 A classification system of petroleum resources is a fundamental element that provides a common language for communicating both the confidence of a project's resources maturation status and the range of potential outcomes to the various entities. The PRMS provides transparency by requiring the assessment of various criteria that allow for the classification and categorization of a project's resources. The evaluation elements consider the risk of geologic discovery and the technical uncertainties together with a determination of the chance of achieving the commercial maturation status of a petroleum project.

1.0.0.2 The technical estimation of petroleum resources quantities involves the assessment of quantities and values that have an inherent degree of uncertainty. Quantities of petroleum and associated products can be reported in terms of volumes (e.g., barrels or cubic meters), mass (e.g., metric tonnes) or energy (e.g., Btu or Joule). These quantities are associated with exploration, appraisal, and development projects at various stages of design and implementation. The commercial aspects considered will relate the project's maturity status (e.g., technical, economical, regulatory, and legal) to the chance of project implementation.

1.0.0.3 The use of a consistent classification system enhances comparisons between projects, groups of projects, and total company portfolios. The application of PRMS must consider both technical and commercial factors that impact the project's feasibility, its productive life, and its related cash flows.

1.1 Petroleum Resources Classification Framework

1.1.0.1 Petroleum is defined as a naturally occurring mixture consisting of hydrocarbons in the gaseous, liquid, or solid state. Petroleum may also contain non-hydrocarbons, common examples of which are carbon dioxide, nitrogen, hydrogen sulfide, and sulfur. In rare cases, non-hydrocarbon content can be greater than 50%.

1.1.0.2 The term resources as used herein is intended to encompass all quantities of petroleum naturally occurring within the Earth's crust, both discovered and undiscovered (whether recoverable or unrecoverable), plus those quantities already produced. Further, it includes all types of petroleum whether currently considered as conventional or unconventional resources.

1.0 基本原则与定义

1.0.0.1 石油资源分类系统是为实体之间交流项目资源成熟度和估值范围提供通用语言的基础要素。PRMS 为项目资源分类分级标准的评估提供了透明度。评价的要素考虑了地质发现风险与技术不确定性，以及石油项目达到商业成熟状态的几率。

1.0.0.2 石油资源数量的技术估算，包括对内蕴不确定性的数量与价值的评估。石油及相关产品数量可以按体积（例如，桶或立方米）、质量（例如，公吨）或能量（例如，英国热量单位或焦耳）进行报告。这些数量与不同设计和实施阶段的勘探、评价和开发项目有关。在商业性方面的考虑，将使项目的成熟度状况（例如，技术、经济、监管规定和法律）与项目执行的几率相关联。

1.0.0.3 使用统一的分类系统可加强项目、项目组和公司总投资组合方案之间的对比。PRMS 的应用必须考虑影响项目可行性、寿命期和相应现金流的技术与商业因素。

1.1 石油资源分类框架

1.1.0.1 石油，被定义为是一种自然形成的由气态、液态或固态碳氢化合物组成的混合物。石油也可能含有非烃组分，其中常见的如二氧化碳、氮、硫化氢和硫。在极少数情况下，非烃组分的含量可能大于 50%。

1.1.0.2 本标准所采用“资源”术语是指地壳中自然形成的所有石油数量，包括已发现和未发现的（无论可采与否），加上已产出的数量。此外，“资源”还涵盖石油的所有种类，无论当前被视作常规或非常规资源。

1.1.0.3 Figure 1.1 graphically represents the PRMS resources classification system. The system classifies resources into discovered and undiscovered and defines Production, the recoverable resources classes: Reserves, Contingent Resources, and Prospective Resources, as well as Unrecoverable Resources (or Unrecoverable).

1.1.0.3 图 1.1 展示了 PRMS 资源分类系统。该系统将资源划分为已发现和未发现两部分，并定义了产量，可采资源类别：储量、条件资源量、远景资源量，以及不可采资源量。

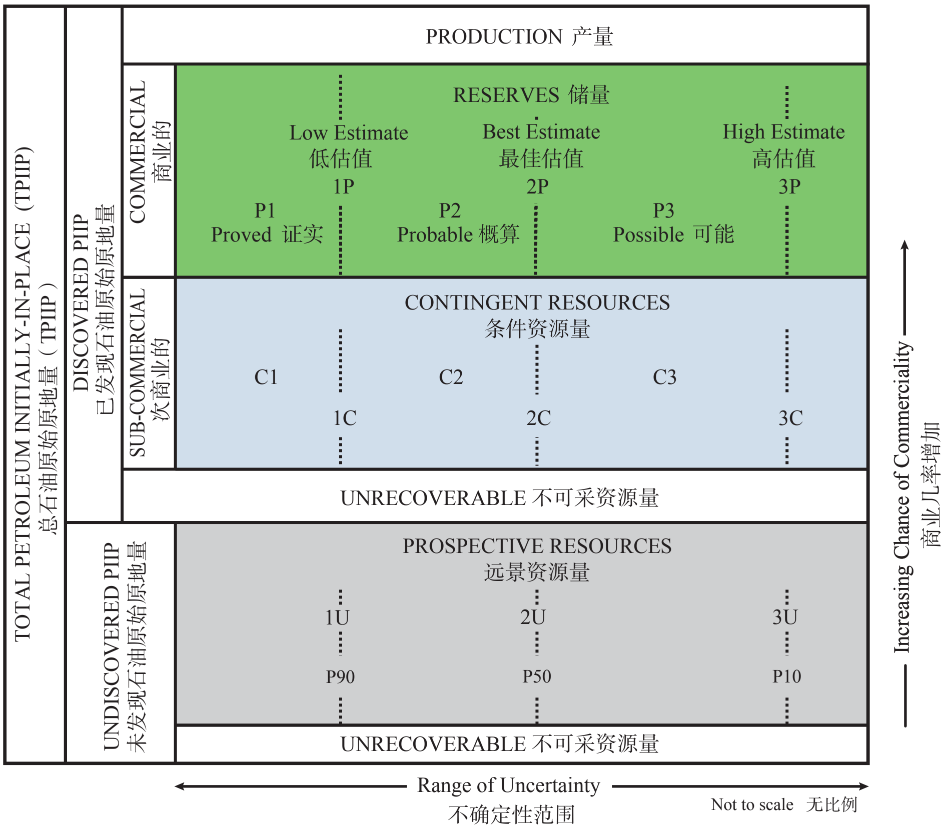

Figure 1.1 Resources classification framework
图 1.1 资源分类框架

1.1.0.4 The horizontal axis reflects the range of uncertainty of estimated quantities potentially recoverable from an accumulation by a project, while the vertical axis represents the chance of commerciality, P_c, which is the chance that a project will be committed for development and reach commercial producing status.

1.1.0.5 The following definitions apply to the major subdivisions within the resources classification:

(1) Total Petroleum Initially-In-Place (TPIIP) is all quantities of petroleum that are estimated to exist originally in naturally occurring accumulations, discovered and undiscovered, before production.

(2) Discovered PIIP is the quantity of petroleum that is estimated, as of a given date, to be contained in known accumulations before production.

1.1.0.4 横轴反映了一个项目可从一个油气聚集中采出数量估值的不确定性范围，而纵轴表示商业几率（P_c），即一个项目被批准开发并实现商业生产的几率。

1.1.0.5 以下定义适用于资源分类的主要次级划分：

（1）总石油原始原地量（TPIIP），是指天然油气聚集在投产之前所有原始（已发现和未发现的）石油蕴藏量估值。

（2）已发现石油原始原地量（Discovered PIIP），指给定日期估算的已知油气聚集在投产前的石油蕴藏量估值。

(3) Production is the cumulative quantities of petroleum that have been recovered at a given date. While all recoverable resources are estimated, and production is measured in terms of the sales product specifications, raw production (sales plus non-sales) quantities are also measured and required to support engineering analyses based on reservoir voidage (see Section 3.2, Production Measurement).

1.1.0.6 Multiple development projects may be applied to each known or unknown accumulation, and each project will be forecasted to recover an estimated portion of the initially-in-place quantities. The projects shall be divided into commercial, sub-commercial, and undiscovered, with the estimated recoverable quantities being classified as Reserves, Contingent Resources, or Prospective Resources respectively, as defined below.

(1) A. Reserves are those quantities of petroleum anticipated to be commercially recoverable by application of development projects to known accumulations from a given date forward under defined conditions. Reserves must satisfy four criteria: discovered, recoverable, commercial, and remaining (as of the evaluation's effective date) based on the development project (s) applied.

B. Reserves are recommended as sales quantities as metered at the reference point. Where the entity also recognizes quantities consumed in operations (CiO) (see Section 3.2.2, Consumed in Operations), as Reserves these quantities must be recorded separately. Non-hydrocarbon quantities are recognized as Reserves only when sold together with hydrocarbons or CiO associated with petroleum production. If the non-hydrocarbon is separated before sales, it is excluded from Reserves.

C. Reserves are further categorized in accordance with the range of uncertainty and should be sub-classified based on project maturity and/or characterized by development and production status.

(2) Contingent Resources are those quantities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations, by the application of development project (s) not currently considered to be commercial owing to one or more contingencies. Contingent Resources have an associated chance of development. Contingent Resources may include, for example, projects for which there are currently no viable markets, or where commercial recovery is dependent on technology under development, or where evaluation of the accumulation is insufficient to clearly assess commerciality. Contingent Resources are further categorized in accordance

（3）产量，指给定日期累计采出的石油数量。在估算所有可采资源数量的同时，产量是根据销售产品的规格进行计量，同时也计量井口产量（销售量加非销售量），以支持油气藏亏空分析（见第 3.2 节，产量计量）。

1.1.0.6 每个已知或未知油气聚集可以实施多个开发项目，每个项目则将预测可从原始原地量中采出的数量。这些项目可划分为商业、次商业和未发现的，其可采量估值则相应地划归为储量、条件资源量或远景资源量类别，定义如下。

（1）A. 储量，是指确定条件下，自给定日期起，预期可通过开发项目从已知油气聚集中商业开采的石油数量。基于已实施开发项目，储量须满足四个条件：已发现的、可采的、商业的和剩余的（即评估有效日剩余数量）。

B. 储量，建议为参照点计量的销售量。当实体将作业自用油气量（见第 3.2.2 节，作业自用油气）也认定为储量时，须单独记录。非烃组分，仅在与烃类同时销售或在石油生产相关作业中被自用消耗时，才确认为储量。如果非烃在销售前已分离，则不能计入储量。

C. 储量可根据不确定性范围进一步分级，并根据项目成熟度进行次级分类和 / 或采用开发与生产状态进行表征。

（2）条件资源量，指给定日期估算的，通过开发项目，有可能从已知油气聚集中开采的石油数量；但由于一项或多项或有因素，该开发项目目前尚无商业性。条件资源量具有相应的开发几率。划归条件资源量的情形可以包括：例如，目前没有市场的项目，或商业可采量依赖正开发技术，或对油气聚集的评估不足以确定商业性等。条件资源量可根据估值的不确定

with the range of uncertainty associated with the estimates and should be sub-classified based on project maturity and/or economic status.

(3) Undiscovered PIIP is that quantity of petroleum estimated, as of a given date, to be contained within accumulations yet to be discovered.

(4) Prospective Resources are those quantities of petroleum estimated, as of a given date, to be potentially recoverable from undiscovered accumulations by application of future development projects. Prospective Resources have both an associated chance of geologic discovery and a chance of development. Prospective Resources are further categorized in accordance with the range of uncertainty associated with recoverable estimates, assuming discovery and development, and may be sub-classified based on project maturity.

(5) Unrecoverable Resources are that portion of either discovered or undiscovered PIIP evaluated, as of a given date, to be unrecoverable by the currently defined project(s). A portion of these quantities may become recoverable in the future as commercial circumstances change, technology is developed, or additional data are acquired. The remaining portion may never be recovered because of physical/chemical constraints represented by subsurface interaction of fluids and reservoir rocks.

1.1.0.7 The sum of Reserves, Contingent Resources, and Prospective Resources may be referred to as "remaining recoverable resources." Importantly, these quantities should not be aggregated without due consideration of the technical and commercial risk involved with their classification. When such terms are used, each classification component of the summation must be provided.

1.1.0.8 Other terms used in resource assessments include the following:

(1) Estimated Ultimate Recovery (EUR) is not a resources category or class, but a term that can be applied to an accumulation or group of accumulations (discovered or undiscovered) to define those quantities of petroleum estimated, as of a given date, to be potentially recoverable plus those quantities already produced from the accumulation or group of accumulations. For clarity, EUR must reference the associated technical and commercial conditions for the resources; for example, proved EUR is Proved Reserves plus prior production.

性范围进一步分级，并根据项目成熟度和/或经济状态进行次级分类。

（3）未发现石油原始原地量，指给定日期估算的待发现油气聚集中蕴藏的石油数量。

（4）远景资源量，指给定日期估算的，有可能通过未来开发项目从未发现油气聚集中开采出的石油数量。远景资源量与一个地质发现几率和一个开发几率相关联。假定可发现和开发，远景资源量则可根据可采量估值的不确定性范围进一步分级，并根据项目成熟度进行次级分类。

（5）不可采资源量，指给定日期估算的，通过当前确定项目不能从已发现或未发现石油原始原地量中采出的部分。随着商业环境的变化、技术的发展，或更多数据的获取，这些数量的一部分有可能在未来转化为可采量。其余部分则可能由于地下流体和储集岩石相互作用的物理－化学约束而永远无法采出。

1.1.0.7 储量、条件资源量和远景资源量之和可以称为“剩余可采资源数量”。重要的是，在未适当考虑分类依据的技术与商业风险情形下，这些数量不应进行汇并。在使用此类集合术语时，须提供各类别的构成。

1.1.0.8 资源评估中采用的其他术语如下：

（1）最终可采量（EUR），不是一个资源量级别或类别，而是可用于一个或一组油气聚集（已发现或未发现）的术语，以定义给定日期所估算的，未来可从某个或某组油气聚集中采出的石油量加上累计产量。需澄清，EUR 必须参考技术和商业条件；例如，证实最终可采量为证实储量加上前期产量。

(2) Technically Recoverable Resources (TRR) are those quantities of petroleum producible using currently available technology and industry practices, regardless of commercial considerations. TRR may be used for specific Projects or for groups of Projects, or, can be an undifferentiated estimate within an area (often basin-wide) of recovery potential.

(3) Technically Ultimate Recovery (TUR) is not a resources category or class, but a term that can be applied to an accumulation or group of accumulations (discovered or undiscovered) to define the total quantities of petroleum producible using available technology and industry practices, regardless of commercial considerations. TUR, based on TRR plus prior production, is a term helpful for reservoir engineering analysis and the long-tern planning at company or national level.

1.1.0.9 Whenever these terms are used, the conditions associated with their usage must be clearly noted and documented.

1.2 Project-Based Resources Evaluations

1.2.0.1 The resources evaluation process consists of identifying a recovery project or projects associated with one or more petroleum accumulations, estimating the quantities of PIIP, estimating that portion of those in-place quantities that can be recovered by each project, and classifying the project(s) based on maturity status or chance of commerciality.

1.2.0.2 The concept of a project-based classification system is further clarified by examining the elements contributing to an evaluation of net recoverable resources (see Figure 1.2).

（2）技术可采资源量（TRR），指不考虑商业条件而采用现有技术与行业做法可采出的石油量。TRR 可用于一个特定项目或一组项目，或无差别地估算一个地区（通常为盆地范围）的开发潜力。

（3）最终技术可采量（TUR），不是资源级别或类别，而是一个可用于一个或一组油气聚集（已发现或未发现）的术语，以定义利用现有技术和工业实践（不考虑商业因素）可生产的石油总量。最终技术可采量（TUR），即技术可采资源量（TRR）加上前期产量，是一个有助于油藏工程分析以及企业或国家层面长期规划的术语。

1.1.0.9 无论何时使用这些术语，都必须清楚标注和记录使用时的条件。

1.2 基于项目的资源评估

1.2.0.1 资源评估过程包括：确定一个或多个油气聚集相关的一个或多个项目，估算石油原始原地量，估算原地量中可由各项目开采出的部分，并根据项目成熟度或商业几率进行分类。

1.2.0.2 通过净可采资源量的评估要素，可进一步清晰梳理基于项目的分类系统概念（图 1.2）。

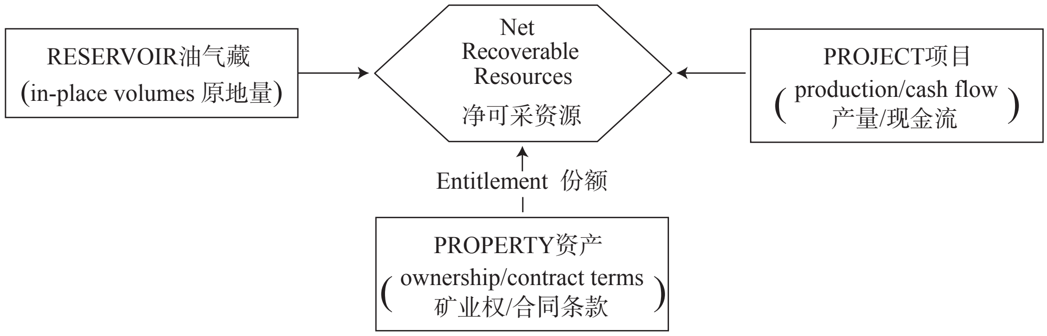

Figure 1.2 Resources evaluation elements
图 1.2 资源评估要素

1.2.0.3 The reservoir (contains the petroleum accumulation): Key attributes include the types and quantities of PIIP and the fluid and rock properties that affect petroleum recovery.

1.2.0.3 油气藏（含油气聚集体）：关键属性包括石油原始原地量的种类与数量，以及影响石油开采的流体与岩石性质。

1.2.0.4 The project: A project may constitute the development of a well, a single reservoir, or a small field; an incremental development in a producing field; or the integrated development of a field or several fields together with the associated processing facilities (e.g., compression). Within a project, a specific reservoir's development generates a unique production and cash-flow schedule at each level of certainty. The integration of these schedules taken to the project's earliest truncation caused by technical, economic, or the contractual limit defines the estimated recoverable resources and associated future net cash flow projections for each project. The ratio of EUR to total PIIP quantities defines the project's recovery efficiency. Each project should have an associated recoverable resources range (low, best, and high estimate).

1.2.0.4 项目：一个项目可以是由一口井、一个单一油气藏或一个小油气田的开发；或是一个正生产油气田的增量开采；或是一个或数个油气田与关联设施（如增压）的一体化开发。在一个项目中，一个具体油气藏的开发作业会在不同确定性级别形成唯一的产量与现金流剖面。根据技术、经济或合同期限而最早截断的剖面，即可确定每个项目的可采资源量估值及相应的未来净现金流剖面。最终可采量与总原始原地量的比率为项目采收率。每个项目的可采资源数量应为一个范围（低估值、最佳估值和高估值）。

1.2.0.5 The property (lease or license area): Each property may have unique associated contractual rights and obligations, including the fiscal terms. This information allows definition of each participating entity's share of produced quantities (entitlement) and share of investments, expenses, and revenues for each recovery project and the reservoir to which it is applied. One property may encompass many reservoirs, or one reservoir may span several different properties. A property may contain both discovered and undiscovered accumulations that may be spatially unrelated to a potential single field designation.

1.2.0.5 资产（租赁或许可区）：每个资产都可拥有独特的合同权益与义务，包括财税条款。基于这些信息，可确定每个参与实体在每个开采项目及相关油气藏产量的分成（份额）以及投资、成本和收益的分成。一个资产可以包括多个油气藏，或一个油气藏可以涵盖多个不同资产。一个资产可以包含与一个油气田在空间上没有关联的已发现和未发现油气聚集。

1.2.0.6 An entity's net recoverable resources are the entitlement share of future production legally accruing under the terms of the development and production contract or license.

1.2.0.6 一个实体拥有的净可采资源数量，是指其根据开发生产合同或许可证条款，可依法获得的未来产量的份额权益数量。

1.2.0.7 In the context of this relationship, the project is the primary element considered in the resources classification, and the net recoverable resources are the quantities derived from each project. A project represents a defined activity or set of activities to develop the petroleum accumulation(s) and the decisions taken to mature the resources to reserves. In general, it is recommended that an individual project has assigned to it a specific maturity level sub-class (See Section 2.1.3.5, Project Maturity Sub-Classes) at which a decision is made whether or not to proceed (i.e., spend more money) and there should be an associated range of estimated recoverable quantities for the project (See Section 2.2.1, Range of Uncertainty). For completeness, a developed field is also considered to be a project.

1.2.0.7 在此关系背景下，项目是资源分类需考虑的主要因素，而净可采资源数量是每个项目所获取的资源数量。一个项目代表了一个或一系列已确定的活动进行油气聚集的开采，以及将资源量升级为储量的决策。一般来说，建议一个单一项目分配一个特定的成熟度等级（见第 2.1.3.5 节，项目成熟度亚类），并据此决定是否继续实施项目（例如花费更多资金），且该项目应有一个可采量估值范围（见第 2.2.1 节，不确定性范围）。从完整性角度考虑，一个已开发油气田也可以视为是一个项目。

1.2.0.8 An accumulation or potential accumulation of petroleum is often subject to several separate and distinct projects that are at different stages of exploration or development. Thus, an accumulation may have recoverable quantities in several resources classes simultaneously. When multiple options for development exist early in project maturity, these options should be reflected as competing project alternatives to avoid double counting until decisions further refine the project scope and timing. Once the scope is described and the timing of decisions on future activities established, the decision steps will generally align with the project's classification. To assign recoverable resources of any class, a project's development plan, with detail that supports the resource commercial classification claimed, is needed.

1.2.0.9 The estimates of recoverable quantities must be stated in terms of the production derived from the potential development program even for Prospective Resources. Given the major uncertainties involved at this early stage, the development program will not be of the detail expected in later stages of maturity. In most cases, recovery efficiency may be based largely on analogous projects. In-place quantities for which a feasible project cannot be defined using current or reasonably forecast improvements in technology are classified as Unrecoverable.

1.2.0.10 Not all technically feasible development projects will be commercial. The commercial viability of a development project within a field's development plan is dependent on a forecast of the conditions that will exist during the time period encompassed by the project (see Section 3.1, Assessment of Commerciality). Conditions include technical, economic (e.g., hurdle rates, commodity prices), operating and capital costs, marketing, sales route(s), and legal, environmental, social, and governmental factors forecast to exist and impact the project during the time period being evaluated. While economic factors can be summarized as forecast costs and product prices, the underlying influences include, but are not limited to, market conditions (e.g., inflation, market factors, and contingencies), exchange rates, transportation and processing infrastructure, fiscal terms, and taxes.

1.2.0.11 The resources being estimated are those quantities producible from a project as measured according to delivery specifications at the point of sale or custody transfer (see Section 3.2.1, Reference Point) and may permit forecasts

1.2.0.8 一个石油聚集体（或潜在的石油聚集体）往往属于几个处于不同勘探或开发阶段的单独项目。因此，一个石油聚集体可能同时拥有多个资源类别的可采量。当项目成熟早期存在多个开发备选方案时，应反映为相互竞争的项目选项以避免重复计算，直至对项目工作范围与计划安排作出进一步决策。一旦明确项目工作范围并确定活动安排计划，决策的步骤通常与项目的类别划分保持一致。任何类别可采资源量的核定，需要有详细的项目开发方案（包含资源商业分类的所需信息）。

1.2.0.9 可采量的估算结果必须以潜在开发计划的产量来表示，即便是远景资源量也是如此。鉴于早期阶段所涉及的主要不确定性因素，开发计划可能相对简略，不及后续开发成熟阶段那样详细。大多数情况下，采收率主要通过类比项目获取。对于利用现有技术或合理预测未来技术进步情形下，不能确定可行项目的原地量，只能定义为不可采量。

1.2.0.10 并非所有技术可行的开发项目都具有商业价值。在一个油气田的开发方案中，一个开发项目的商业可行性取决于对项目运行期各种条件的预测（见第3.1 节，商业性评估）。这里的条件，包括预计在评估期存在并影响项目的技术、经济（例如最低基准收益率、商品价格）、作业与资本成本、市场营销、销售途径、法律、环境、社会和政府等因素。虽然经济因素可以概括为预测成本和产品价格，但潜在的影响包括但不限于市场条件（如通货膨胀、市场因素和意外事件）、汇率、运输和加工基础设施、财会条款和税负。

1.2.0.11 估算的资源数量，是指根据销售点或托管转运点（见第 3.2.1 节，参照点）的交付规格所计量的可通过项目生产

of CiO quantities (see Section 3.2.2., Consumed in Operations). The cumulative production forecast from the effective date forward to cessation of production is the remaining recoverable resources quantity (see Section 3.1.1, Net Cash-Flow Evaluation).

1.2.0.12 The supporting data, analytical processes, and assumptions describing the technical and commercial basis used in an evaluation must be documented in sufficient detail to allow, as needed, a qualified reserves evaluator or qualified reserves auditor to clearly understand each project's basis for the estimation, categorization, and classification of recoverable resources quantities and, if appropriate, associated commercial assessment.

的数量，并且允许预计作业自用量（见第3.2.2 节，作业自用油气）。自评估日至停产所估算的累计产量即为剩余可采资源数量（见第 3.1.1 节，净现金流评价）。

1.2.0.12 须详细记录支撑评估的技术与商业数据、分析过程与假设条件，并根据要求由合资格储量评估师或合资格审计师在需要时能够清楚了解每个项目可采资源量的估算、分级与分类依据，以及在适合的情况下了解商业评估过程。

2.0 Classification and Categorization Guidelines

2.0.0.1 To consistently characterize petroleum projects, evaluations of all resources should be conducted in the context of the full classification system shown in Figure 1.1. These guidelines reference this classification system and support an evaluation in which projects are "classified" based on their chance of commerciality, P_c (the vertical axis labeled Chance of Commerciality), and estimates of recoverable and marketable quantities associated with each project are "categorized" to reflect uncertainty (the horizontal axis). The actual workflow of classification versus categorization varies with individual projects and is often an iterative analysis leading to a final report. Report here refers to the presentation of evaluation results within the entity conducting the assessment and should not be construed as replacing requirements for public disclosures under guidelines established by regulatory and/or other government agencies.

2.1 Resources Classification

2.1.0.1 The PRMS classification establishes criteria for the classification of the total PIIP. A determination of a discovery differentiates between discovered and undiscovered PIIP. The application of a project further differentiates the recoverable from unrecoverable resources. The project is then evaluated to determine its maturity status to allow the classification distinction between commercial and sub-commercial projects. PRMS requires the project's recoverable resources quantities to be classified as either Reserves, Contingent Resources, or Prospective Resources.

2.1.1 Determination of Discovery Status

2.1.1.1 A discovered petroleum accumulation is determined to exist when one or more exploratory wells have established through testing, sampling, and/or logging the existence of a significant quantity of potentially recoverable hydrocarbons and thus have established a known accumulation. In the absence of a flow test or sampling, the discovery determination requires confidence in the presence of hydrocarbons and evidence of producibility, which may be supported by suitable producing analogs (see Section 4.1.1, Analogs). In this context, "significant" implies that there is evidence of a sufficient quantity of petroleum to justify estimating the in-place quantity demonstrated by the well(s) and for evaluating the potential for commercial recovery.

2.0 分类分级指南

2.0.0.1 为了一致地表征石油项目，所有资源的评估应遵循图 1.1 所示的完整分类系统。根据本分类系统的指南，按商业几率，P_c（纵轴为商业几率）对项目进行“分类”，并对每个项目可采的市场可销售量估值进行“分级”，以反映不确定性（横轴）。分类与分级的实际工作流程因项目而异，通常是需迭代分析才能得到一份最终报告。这里的报告，是指在企业实体内部评估的结果呈现，而不应解读为替代监管机构和 / 或其他政府部门所规定的公开披露要求。

2.1 资源分类

2.1.0.1 PRMS 分类为总石油原始原地量（TPIIP）的划分建立了标准。“一个发现”的确定，可区分已发现和未发现石油原始原地量；通过实施一个项目可进一步区分出可采资源和不可采资源。然后，对项目进行评估，确定其成熟度状态，从而可划分商业和次商业项目。PRMS 要求将项目的可采资源划分为储量、条件资源量或远景资源量中的一个类别。

2.1.1 发现状态的确定

2.1.1.1 当一口或多口探井中，通过测试、取样和 / 或测井记录确定了大量潜在可采碳氢化合物存在时，可判定一个已发现油气聚集的存在，并由此确定一个已知油气聚集。若未进行生产测试或取样的情况下，发现的判定需要对碳氢化合物的存在与可开采性提供足够依据，并可以通过适当的生产类比进行论证（见第 4.1.1 节，类比法）。在这种情况下，“大量”意味着有足够的石油数量来支持单个（或多个）油气井所证实的石油原地量并评估其商业开采的潜力。

2.1.1.2 Where a discovery has identified potentially recoverable hydrocarbons, but it is not considered viable to apply a project with established technology or with technology under development, such quantities may be classified as Discovered Unrecoverable with no Contingent Resources. In future evaluations, as appropriate for petroleum resources management purposes, a portion of these unrecoverable quantities may become recoverable resources as either commercial circumstances change or technological developments occur.

2.1.2 Determination of Commerciality

2.1.2.1 Discovered recoverable quantities (Contingent Resources) may be considered commercially mature, and thus attain Reserves classification, if the entity claiming commerciality has demonstrated a firm intention to proceed with development. This means the entity has satisfied the internal decision criteria (typically rate of return at or above the weighted average cost-of-capital or the hurdle rate). Commerciality is achieved with the entity's commitment to the project and all of the following criteria:

(1) Evidence of a technically mature, feasible development plan.

(2) Evidence of financial appropriations either being in place or having a high likelihood of being secured to implement the project.

(3) Evidence to support a reasonable time-frame for development.

(4) A reasonable assessment that the development projects will have positive economics and meet defined investment and operating criteria. This assessment is performed on the estimated entitlement forecast quantities and associated cash flow on which the investment decision is made (see Section 3.1.1, Net Cash-Flow Evaluation).

(5) A reasonable expectation that there will be a market for forecast sales quantities of the production required to justify development. There should also be similar confidence that all produced streams (e.g., oil, gas, water, CO_2) can be sold, stored, re-injected, or otherwise appropriately disposed.

(6) Evidence that the necessary production and transportation facilities are available or can be made available.

(7) Evidence that legal, contractual, environmental, regulatory, and government approvals are in place or will be forthcoming, together with resolving any social and economic concerns.

2.1.1.2 若发现潜在可开发的油气资源，但应用现有技术或正研发技术的项目尚不可行，那么这些油气数量可划归为已发现不可采量，而不是条件资源量。在未来评估中，若符合石油资源管理需求，一部分不可采量可能随商业环境的变化或技术的发展，转变为可采资源量。

2.1.2 商业性的确定

2.1.2.1 若实体公司宣称项目已证实具有商业性，并表明开发的坚定意愿，那么已发现可采量（条件资源量）可视为具有商业成熟度，继而可划归为储量。这意味着实体达到了内部决策所需条件（通常情况下，项目收益率达到或高于加权平均资本成本或最低基准收益率）。判定项目的商业性需要实体公司对项目的开发给予承诺，并满足以下所有条件：

（1）有依据表明，有一个技术成熟、可行的开发方案。

（2）有依据表明，项目实施的财政拨款已到位，或得到保障的可能性高。

（3）有依据表明，开发的时间计划表是合理可行的。

（4）合理评估表明，开发项目的经济效益可为正，并满足投资和运营标准。评估是基于投资决策估算的份额量及现金流（见第 3.1.1 节，净现金流评价）。

（5）对开发实施条件——产量中可销售数量的市场，存在合理预期。同样，所有生产流体（如原油、天然气、水、二氧化碳）可被出售、储存、回注或以其他恰当方式处置的置信度相似。

（6）有依据表明，具备或可获得必要生产与运输设施。

（7）有依据表明，法律、合同、环境、监管和政府批准已到位或即将到位，任何社会与经济关切都将解决。

2.1.2.2 The commerciality test for Reserves determination is applied to the best estimate (P50) forecast quantities, which upon qualifying all commercial and technical maturity criteria and constraints become the 2P Reserves. Stricter cases [e.g., low estimate (P90)] may be used for decision purposes or to investigate the range of commerciality (see Section 3.1.2, Economic Criteria). Typically, the low- and high-case project scenarios may be evaluated for sensitivities when considering project risk and upside opportunity.

2.1.2.3 To be included in the Reserves class, a project must be sufficiently defined to establish both its technical and commercial viability as noted in Section 2.1.2.1. There must be a reasonable expectation that all required internal and external approvals will be forthcoming and evidence of firm intention to proceed with development within a reasonable time-frame. A reasonable time-frame for the initiation of development depends on the specific circumstances and varies according to the scope of the project. While five years is recommended as a benchmark, a longer time-frame could be applied where justifiable; for example, development of economic projects that take longer than five years to be developed or are deferred to meet contractual or strategic objectives. In all cases, the justification for classification as Reserves should be clearly documented.

2.1.2.4 While PRMS guidelines require financial appropriations evidence, they do not require that project financing be confirmed before classifying projects as Reserves. However, this may be another external reporting requirement. In many cases, financing is conditional upon the same criteria as above. In general, if there is not a reasonable expectation that financing or other forms of commitment (e.g., farm-outs) can be arranged so that the development will be initiated within a reasonable time-frame, then the project should be classified as Contingent Resources. If financing is reasonably expected to be in place at the time of the final investment decision (FID), the project's resources may be classified as Reserves.

2.1.3 Project Status and Chance of Commerciality

2.1.3.1 Evaluators have the option to establish a more detailed resources classification reporting system that can also provide the basis for portfolio management by subdividing the chance of commerciality axis according to project maturity. Such sub-classes may be characterized qualitatively by the project maturity level descriptions and associated quantitative

2.1.2.2 判定“储量”类别的商业性测试应采用最佳估值（P50）的预测结果，在符合所有商业性和技术成熟度标准和约束条件后，即可得到2P储量。更保守的情形[例如，低估值（P90）]，可用于决策分析或调查商业化程度（参见第3.1.2节，经济指标）。通常，在考虑项目风险和乐观机会时，可评估低估值与高估值方案来进行敏感性分析。

2.1.2.3 如第2.1.2.1节所述，要把一个项目纳入“储量”类别，必须充分确定其技术和商业可行性。对于即将获得所有所需的内部和外部批准一定要有合理预期，且有证据表明将在合理时间表内进行开发的坚定意愿。开发启动的合理时间表应取决于具体情况，并根据项目工作范围的不同而变化。尽管推荐将五年作为基准，但在合理情形下可采用更长的时间框架；比如，有经济性的项目需要花五年以上的时间才能开发，或者为了达到合同规定要求或战略性目标而推迟的情形。在任何情况下，储量分类的理由都应清楚地记录在案。

2.1.2.4 虽然PRMS指南要求提供财政拨款证据，但并不要求项目在划归“储量”之前确认融资。然而，这可能会是其他外部对报告的要求。在许多情况下，融资条件与上述标准相同。一般而言，若对融资安排没有合理预期或其他形式承诺（例如资产出售），以支撑在合理时限内启动开发，则应将项目划归为“条件资源量”。在最终投资决策（FID）时，若预期所需融资可及时到位，那么项目的资源数量则可划归为“储量”。

2.1.3 项目状态与商业几率

2.1.3.1 评估师还可以通过项目成熟度细分商业几率轴，以建立更细化的资源

chance of reaching commercial status and being placed on production.

2.1.3.2 As a project moves to a higher level of commercial maturity in the classification (see Figure 1.1 vertical axis), there will be an increasing chance that the accumulation will be commercially developed and the project quantities move to Reserves. For Contingent and Prospective Resources, this is further expressed as a chance of commerciality, P_c, which incorporates the following underlying chance component(s):

(1) The chance that the potential accumulation will result in the discovery of a significant quantity of petroleum, which is called the "chance of geologic discovery," P_g.

(2) Once discovered, the chance that the known accumulation will be commercially developed is called the "chance of development," P_d.

2.1.3.3 There must be a high degree of certainty in the chance of commerciality, P_c, for Reserves to be assigned; for Contingent Resources, $P_c = P_d$; and for Prospective Resources, P_c is the product of P_g and P_d.

2.1.3.4 Contingent and Prospective Resources can have different project scopes (e.g., well count, development spacing, and facility size) as development uncertainties and project definition mature.

2.1.3.5 Project Maturity Sub-Classes

2.1.3.5.1 As Figure 2.1 illustrates, development projects and associated recoverable quantities may be sub-classified according to project maturity levels and the associated actions (i.e., business decisions) required to move a project toward commercial production.

2.1.3.5.2 Maturity terminology and definitions for each project maturity class and sub-class are provided in Table 1. This approach supports the management of portfolios of opportunities at various stages of exploration, appraisal, and development. Reserve sub-classes must achieve commerciality while Contingent and Prospective Resources sub-classes may be supplemented by associated quantitative estimates of chance of commerciality to mature.

2.1.3.5.3 Resources sub-class maturation is based on those actions that progress a project through final approvals to implementation and initiation of production and product sales. The boundaries between different levels of project maturity are frequently referred to as project "decision gates."

分类报告系统，为投资组合管理提供基础。细分的类别可根据项目成熟度的描述定性表征，并与定量商业化状态和投产几率相关联。

2.1.3.2 当一个项目在分类系统中进入更高商业成熟度水平（见图 1.1 纵轴），该油气聚集商业开发、项目资源数量划归为储量的几率增加。对于条件资源量和远景资源量，可进一步表述为商业几率 P_c，并由以下因素构成：

（1）潜在油气聚集有可能导致大量油气数量的发现，该可能性称为“地质发现几率（P_g）”。

（2）一旦油气发现，已知油气聚集被商业开发的可能性被称为“开发几率（P_d）”。

2.1.3.3 对于“储量”，必须具有确定度高的商业几率（P_c）; 对于“条件资源量”，$P_c=P_d$；对于“远景资源量”，P_c 为 P_g 与 P_d 的乘积。

2.1.3.4 由于开发不确定性与项目成熟度不同，条件资源量和远景资源量可以有不同的项目内容（例如不同的井数、开发井距以及设施规格等）。

2.1.3.5 项目成熟度亚类

2.1.3.5.1 如图 2.1 所示，开发项目及其可采量可根据项目成熟度和一个项目实现商业生产所需的行动（即商业决策）进行次级划分。

2.1.3.5.2 表 1 提供了项目成熟度类别和亚类的术语与定义，以对不同勘探、评价与开发阶段下投资组合进行管理。储量的亚类须达到商业化，而条件资源量和远景资源量的亚类可以进一步定量评估其商业几率。

2.1.3.5.3 资源亚类的成熟度，是基于项目从最终批准实施，到投产及产品销售过程所开展的活动。不同项目成熟度之间的边界，通常称为项目“决策关口”。

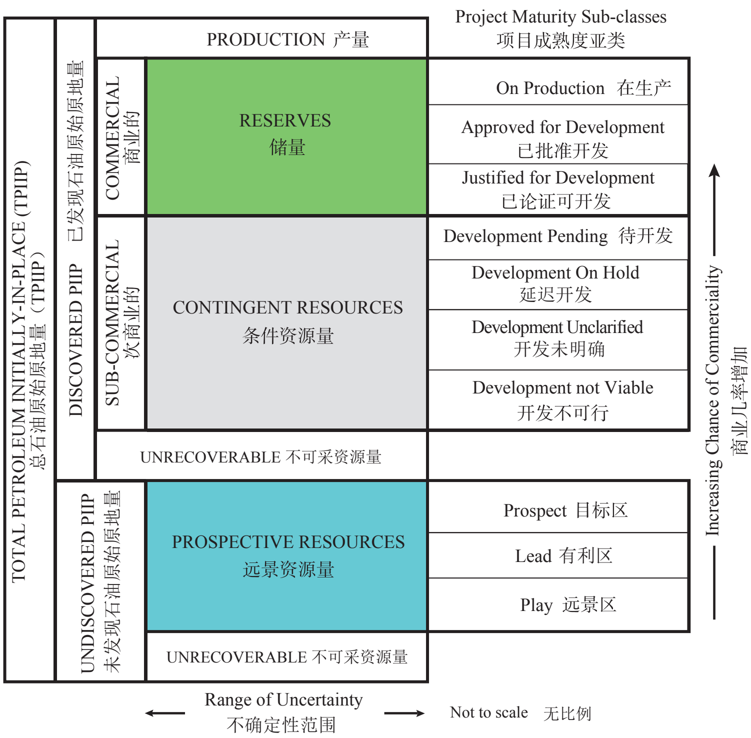

Figure 2.1 Sub-classes based on project maturity
图 2.1 项目成熟度亚类

2.1.3.5.4 Projects that are classified as Reserves must meet the criteria as listed in Section 2.1.2, Determination of Commerciality. Projects sub-classified as Justified for Development are agreed upon by the managing entity and partners as commercially viable and have support to advance the project, which includes a firm intent to proceed with development. All participating entities have agreed to the project and there are no known contingencies to the project from any official entity that will have to formally approve the project.

2.1.3.5.5 Justified for Development Reserves are reclassified to Approved for Development after the FID has been made. Projects should not remain in the Justified for Development sub-class for extended time periods without positive indications that all required approvals are expected to be obtained without undue delay. If there is no longer the reasonable expectation of project execution (i.e., historical track record of execution, project progress), the project shall be reclassified as Contingent Resources.

2.1.3.5.6 Projects classified as Contingent Resources have their sub-classes aligned with the entity's plan to manage its portfolio of projects. Thus, projects on known accumulations that are actively being studied, undergoing feasibility review,

2.1.3.5.4 划归“储量”的项目必须满足“第 2.1.2 节，商业性的确定”的规定标准。进一步划归为“已论证可开发”亚类的项目，是作业者及其合作方认为商业可行、具备进一步推进条件（包括有明确的开发意愿）的项目。所有的合作实体均同意该项目，且没有任何来自官方的已知风险。

2.1.3.5.5 在最终投资决策（FID）之后，“已论证可开发”储量重新划归为“已批准开发”亚类。若无积极迹象表明所需批准可顺利获得且不会过度延误，那么项目不应长时间保留在“已论证可开发”亚类。若对项目的执行不再有合理预期（实施的历史记录和项目的进展表明），项目将重新划归为“条件资源量”。

2.1.3.5.6 划分为“条件资源量”的项目，其亚类要与实体管理项目投资组合的计划一致。因此，正积极研究已知油气

and have planned near-term operations (e.g., drilling) are placed in Contingent Resources Development Pending, while those that do not meet this test are placed into either Contingent Resources Development On Hold, Development Unclarified, or Development Not Viable.

2.1.3.5.7 Where commercial factors change and there is a significant risk that a project with Reserves will no longer proceed, the project shall be reclassified as Contingent Resources.

2.1.3.5.8 For Contingent Resources, evaluators should focus on gathering data and performing analyses to clarify and then mitigate those key conditions or contingencies that prevent commercial development. Note that the Contingent Resources sub-classes described above and shown in Figure 2.1 are recommended; however, entities are at liberty to introduce additional sub-classes that align with project management goals.

2.1.3.5.9 For Prospective Resources, potential accumulations may mature from Play, to Lead and then to Prospect based on the ability to identify potentially commercially viable exploration projects. The Prospective Resources are evaluated according to chance of geologic discovery, P_g, and chance of development, P_d, which together determine the chance of commerciality, P_c. Commercially recoverable quantities under appropriate development projects are then estimated. The decision at each exploration phase is whether to undertake further data acquisition and/or studies designed to move the Play through to a drillable Prospect with a project description range commensurate with the Prospective Resources sub-class.

2.1.3.6 Reserves Status

2.1.3.6.1 Once projects satisfy commercial maturity (criteria given in Table 1), the associated quantities are classified as Reserves. These quantities may be allocated to the following subdivisions based on the funding and operational status of wells and associated facilities within the reservoir development plan (Table 2 provides detailed definitions and guidelines):

(1) Developed Reserves are quantities expected to be recovered from existing wells and facilities.

A. Developed Producing Reserves are expected to be recovered from completion intervals that are open and producing at the time of the estimate.

B. Developed Non-Producing Reserves include shut-in and

聚集、开展可行性论证以及计划近期作业（如钻井）的项目，划归为“条件资源量”的“待开发”亚类，而未满足这些要求的项目则划归为“条件资源量”的“延迟开发”“开发未明确”或“开发不可行”亚类。

2.1.3.5.7 当拥有“储量”的项目发生商业因素变化，出现不再继续执行的重大风险，那么该项目应重新划归为“条件资源量”。

2.1.3.5.8 对于“条件资源量”，评估师应注重数据采集与分析，厘清并消除影响商业开发的关键因素或风险事项。请留意，建议采用图 2.1 所示的条件资源量亚类；当然，实体也可自主引入其他与项目管理目标一致的亚类。

2.1.3.5.9 对于“远景资源量”，根据勘探项目的潜在商业可行性，其成熟度亚类可从“远景区”升级为“有利区”，再升级为“目标区”。远景资源量的评估，可通过地质发现几率（P_g）和开发几率（P_d）确定其商业几率（P_c），再估算适宜开发项目的商业可采量。每个勘探阶段的决策点为：是否进一步采集数据和 / 或进行研究，对应远景资源量亚类表述，将“远景区”升级到可钻探的“目标区”。

2.1.3.6 储量状态

2.1.3.6.1 一旦项目满足商业成熟度要求（见表 1 列出标准），其资源数量则划归为“储量”。根据油气藏开发方案中井和相关设施的资金与运行状况，还可进一步细分（见表 2 给出了详细定义与指南）：

（1）已开发储量，是指预期通过现有生产井和设施可开采出的数量。

A. 已开发正生产储量，是指从评估日开始预期可从已射孔正生产的完井层段中开采出的数量。

behind-pipe reserves with minor costs to access.

(2) Undeveloped Reserves are quantities expected to be recovered through future significant investments.

2.1.3.6.2 The distinction between the "minor costs to access" Developed Non-Producing Reserves and the "significant investment" needed to develop Undeveloped Reserves requires the judgment of the evaluator taking into account the cost environment. A significant investment would be a relatively large expenditure when compared to the cost of drilling and completing a new well. A minor cost would be a lower expenditure when compared to the cost of drilling and completing a new well.

2.1.3.6.3 Once a project passes the commercial assessment and achieves Reserves status, it is then included with all other Reserves projects of the same category in the same field for estimating combined future production and applying the economic limit test (see Section 3.1, Assessment of Commerciality).

2.1.3.6.4 Where Reserves remain Undeveloped beyond a reasonable time-frame or have remained Undeveloped owing to postponements, evaluations should be critically reviewed to document reasons for the delay in initiating development and to justify retaining these quantities within the Reserves class. While there are specific circumstances where a longer delay (see Section 2.1.2, Determination of Commerciality) is justified, a reasonable time-frame to commence the project is generally considered to be less than five years from the initial classification date.

2.1.3.6.5 Development and Production status are of significant importance for project portfolio management and financials. The Reserves status concept of Developed and Undeveloped status is based on the funding and operational status of wells and producing facilities within the development project. These status designations are applicable throughout the full range of Reserves uncertainty categories (1P, 2P, and 3P or Proved, Probable, and Possible). Even those projects that are Developed and On Production should have remaining uncertainty in recoverable quantities.

2.1.3.7 Economic Status

2.1.3.7.1 Projects may be further characterized by economic status. All projects classified as Reserves must be commercial under defined conditions (see Section 3.1, Assessment of Commerciality Assessment). Based on assumptions regarding

B. 已开发未生产储量，包括需少量成本的关井和管外储量。

（2）未开发储量，是指预期未来通过大额投资可开采出的数量。

2.1.3.6.2 "已开发未生产储量"所需"少量成本"与"未开发储量"所需"大额投资"之间的区别，需要评估师根据成本情况进行判断。相对而言，高于一口新井的钻完井费用，属于"大额投资"；低于一口新井的钻完井费用，可以视为"少量成本"。

2.1.3.6.3 当一个项目通过商业性评估，达到储量状态，那么该项目则可纳入同一油气田相同级别的其他储量项目，合并预测未来产量剖面并测试经济极限（见第 3.1 节，商业性评估）。

2.1.3.6.4 当储量处于"未开发"状态超出合理时限，或者因开发延期而停留在"未开发"状态，应严格审查其评估过程，记录开发延迟的原因，并证明维持"储量"类别的合理性。尽管延迟在某些特殊情况下是可接受的（见第 2.1.2 节，商业性的确定），但通常认为，从划归储量类别到项目实施的合理时限应少于五年。

2.1.3.6.5 开发与生产状态对项目投资组合的管理与财务核算十分重要。已开发和未开发的储量状态概念，是基于开发项目的井与生产设施的资金和运行状态。这些状态的标识，适用于所有储量的不确定性级别（1P、2P 和 3P，或证实、概算和可能储量）。甚至已开发和在生产项目的可采量也应具有不确定性。

2.1.3.7 经济状态

2.1.3.7.1 项目可进一步以经济状态进行表征。所有划归"储量"的项目必须在确定条件下具备商业性（见第 3.1 节，

future conditions and the impact on ultimate economic viability, projects currently classified as Contingent Resources may be broadly divided into two groups:

(1) Economically Viable Contingent Resources are those quantities associated with technically feasible projects where cash flows are positive under reasonably forecasted conditions but are not Reserves because it does not meet the commercial criteria defined in Section 2.1.2.

(2) Economically Not Viable Contingent Resources are those quantities for which development projects are not expected to yield positive cash flows under reasonable forecast conditions.

2.1.3.7.2 The best estimate (or P50) production forecast is typically used for the economic evaluation for the commercial assessment of the project. The low case, when used as the primary case for a project decision, may be used to determine project economics. The economic evaluation of the project high case alone is not permitted to be used in the determination of the project's commerciality.

2.1.3.7.3 For Reserves, the best estimate production forecast reflects a specific development scenario recovery process, a certain number and type of wells, facilities, and infrastructure.

2.1.3.7.4 The project's low-case scenario is tested to ensure it is economic, which is required for Proved Reserves to exist (see Section 2.2.2, Category Definitions and Guidelines). It is recommended to evaluate the low case and the high case (which will quantify the 3P Reserves) to convey the project downside risk and upside potential. The project development scenarios may vary in the number and type of wells, facilities, and infrastructure in Contingent Resources, but to recognize Reserves, there must exist the reasonable expectation to develop the project for the best estimate case.

2.1.3.7.5 The economic status may be identified independently of, or applied in combination with, project maturity sub-classification to more completely describe the project. Economic status is not the only qualifier that allows defining Contingent or Prospective Resources sub-classes. Within Contingent Resources, applying the project status to decision gates (and/or incorporating them in a plan to execute) more appropriately defines whether the project is placed into the sub-class of either Development Pending versus Development On Hold, Development Unclarified or Development Not Viable.

商业性评估）。基于对未来条件的假设以及对最终经济可行性的影响，目前划归为“条件资源量”的项目大体上可分为两组：

（1）经济可行条件资源量，指合理预测条件下现金流为正的技术可行项目的资源数量，但由于尚不符合第 2.1.2 节所规定的商业性条件，不能划归为储量。

（2）经济不可行条件资源量，指与在合理预测条件下开发项目无法获得正现金流的资源数量。

2.1.3.7.2 通常，是采用最佳估值（或 P50）产量预测剖面来进行项目商业评估的经济评价。当采用低估值方案为项目决策主要依据时，可用以确定项目经济指标。不允许单独采用项目高估值方案的经济评价来确定项目的商业性。

2.1.3.7.3 对于储量，最佳估值方案的产量预测剖面反映了特定开发情景的开采过程、井数与类型、生产设备与基础设施等。

2.1.3.7.4 测试项目的低估值方案的经济性，是拥有证实储量的条件（见第 2.2.2 节，级别的定义与指南）。建议评估项目的低估值与高估值方案（这将量化 3P 储量），以体现项目的下行风险和上行潜力。条件资源量的项目开发方案可能有不同的井、设备和基础设施数量与类型，但储量的认定，必须对开发项目的最佳估值方案有合理期望。

2.1.3.7.5 为了更全面地描述项目，项目的经济状态可独立于项目成熟度亚类的划分，也可以与之相结合。项目的经济状态并不是定义“条件资源量”或“远景资源量”亚类的唯一条件。在“条件资源量”中，将项目状态作为决策关口（和 / 或将其纳入一个实施计划），可更恰当地确定项目是划归为“待开发”亚类，还是“延迟开发”、“开发未明确”或“开发不可行”。

2.1.3.7.6 Where evaluations are incomplete and it is premature to clearly define the associated cash flows, it is acceptable to note that the project economic status is "undetermined."

2.2 Resources Categorization

2.2.0.1 The horizontal axis in the resources classification in Figure 1.1 defines the range of uncertainty in estimates of the quantities of recoverable, or potentially recoverable, petroleum associated with a project or group of projects. These estimates include the uncertainty components as follows:

(1) The total petroleum remaining within the accumulation (in-place resources).

(2) The technical uncertainty in the portion of the total petroleum that can be recovered by applying a defined development project or projects (i.e., the technology applied).

(3) Known variations in the commercial terms that may impact the quantities recovered and sold (e.g., market availability; contractual changes, such as production rate tiers or product quality specifications) are part of project's scope and are included in the horizontal axis, while the chance of satisfying the commercial terms is reflected in the classification (vertical axis).

2.2.0.2 The uncertainty in a project's recoverable quantities is reflected by the 1P, 2P, 3P, Proved (P1), Probable (P2), and Possible (P3) reserves; 1C, 2C, 3C, C1, C2, and C3 contingent resources; or 1U, 2U, and 3U prospective resources categories. The chance of commerciality is associated with resources classes or sub-classes and not with the resources categories reflecting the range of recoverable quantities.

2.2.0.3 There must be a single set of defined conditions applied for resource categorization. Use of different commercial assumptions for categorizing quantities is referred to as "split conditions" and are not allowed. Frequently, an entity will conduct project evaluation sensitivities to understand potential implications when making project selection decisions. Such sensitivities may be fully aligned to resource categories or may use single parameters, groups of parameters, or variances in the defined conditions.

2.2.0.4 Moreover, a single project is uniquely assigned to a sub-class along with its uncertainty range. For example, a project cannot have quantities classified in both Contingent Resources and Reserves, for instance as 1C, 2P, and 3P. This is referred to as "split classification".

2.1.3.7.6 当评估未完成，现金流的确定为时过早，则项目的经济状态可标记为“未确定”。

2.2 资源分级

2.2.0.1 图 1.1 资源分类框架图的横轴定义了一个或一组项目的石油可采量或潜在可采量估值的不确定性范围。这些估值含以下不确定性因素：

（1）油气聚集中剩余的油气总量（原地资源量）。

（2）通过实施一个或多个已确定开发项目（即对应其采用技术）可采出数量的技术不确定性。

（3）商业条件中可能影响采出量和销售量的已知变数——例如有无市场、合同变更（如产量台阶要求或产品质量规格），是属于项目范畴，包含在横轴中，而满足商业条件的几率则反映在体现分类的纵轴。

2.2.0.2 项目可采量的不确定性是通过资源级别：1P、2P、3P，证实（P1）、概算（P2）和可能（P3）储量；1C、2C、3C，C1、C2 和 C3 条件资源量；或 1U、2U、3U 远景资源量来反映。商业几率是与资源类别或亚类相关联，而不是与反映可采量范围的资源级别相关联。

2.2.0.3 资源分级必须依据一组单一的确定条件。采用不同商业条件的假设来进行分级则称为“条件劈分”，这是不允许的。通常，一个实体在项目决策时往往会进行项目敏感性分析，以了解潜在影响。那么，敏感性分析可对应资源级别，也可采用单个参数、参数组合或确定条件的变化。

2.2.0.4 此外，单个项目及其不确定性范围只能分配一个亚类。例如，一个项目不能同时拥有“条件资源量”和“储量”（如 1C、2P 和 3P）。这称为“类别劈分”。

2.2.1 Range of Uncertainty

2.2.1.1 Uncertainty is inherent in a project's resources estimation and is communicated in PRMS by reporting a range of category outcomes. The range of uncertainty of the recoverable and/or potentially recoverable quantities may be represented by either deterministic scenarios or by a probability distribution (see Section 4.2, Resources Assessment Methods).

2.2.1.2 When the range of uncertainty is represented by a probability distribution, a low, best, and high estimate shall be provided such that:

(1) There should be at least a 90% probability (P90) that the quantities to be actually recovered will equal or exceed the low estimate.

(2) There should be at least a 50% probability (P50) that the quantities to be actually recovered will equal or exceed the best estimate.

(3) There should be at least a 10% probability (P10) that the quantities to be actually recovered will equal or exceed the high estimate.

2.2.1.3 In some projects, the range of uncertainty may be limited, and the three scenarios may result in resources estimates that are not significantly different. In these situations, a single value estimate may be appropriate to describe the expected result.

2.2.1.4 When using the deterministic scenario method, typically there should also be low, best, and high estimates, where such estimates are based on qualitative assessments of relative uncertainty using consistent interpretation guidelines. Under the deterministic incremental method, quantities for each confidence segment are estimated discretely (see Section 2.2.2, Category Definitions and Guidelines).

2.2.1.5 Project resources are initially estimated using the above uncertainty range forecasts that incorporate the subsurface elements together with technical constraints related to wells and facilities. The technical forecasts then have additional commercial criteria applied (e.g., economics and license cutoffs are the most common) to estimate the entitlement quantities attributed and the resources classification status: Reserves, Contingent Resources, or Prospective Resources.

2.2.1.6 While there may be significant chance that sub-commercial and undiscovered accumulations will not achieve commercial production, it is useful to consider the range of potentially recoverable quantities independent of such likelihood when considering what resources class to assign the project quantities.

2.2.1 不确定性范围

2.2.1.1 不确定性是项目资源估算的内在因素，在 PRMS 中是通过分级结果的范围来体现。可采量和 / 或潜在可采量的不确定性范围可通过确定性情景或概率分布来表征（见第 4.2 节，资源评估方法）。

2.2.1.2 当采用概率分布表征不确定性范围时，所提供的低估值、最佳估值和高估值分别表征：

（1）未来实际采出量等于或大于低估值的概率应至少为 90%（P90）。

（2）未来实际采出量等于或大于最佳估值的概率应至少为 50%（P50）。

（3）未来实际采出量等于或大于高估值的概率应至少为 10%（P10）。

2.2.1.3 在一些项目中，可能不确定性范围分布有限，且三种情景方案的资源量估值没有明显差异。在这些情况下，单一估算值可能更适合预期结果的描述。

2.2.1.4 当采用确定性情景法时，通常应根据统一指南对相对不确定性进行定性评估，得到低估值、最佳估值和高估值。若采用确定性增量法，每个置信度区间的数量是进行离散估算（见第 2.2.2 节，级别的定义与指南）。

2.2.1.5 首先，采用上述不确定性范围的预测值（含储层要素及井与设施相关技术约束条件）评估项目资源数量。然后，在技术估值基础上进行商业性条件（如最常见的经济极限与许可证期限）评估，以确定应得的份额数量以及资源的类别：储量、条件资源量或远景资源量。

2.2.1.6 尽管次商业和未发现油气聚集很可能无法实现商业生产，但分别考虑潜在可采量的范围与项目资源的类别划分，是有用的。

2.2.2 Category Definitions and Guidelines

2.2.2.1 Evaluators may assess recoverable quantities and categorize results by uncertainty using the deterministic incremental method, the deterministic scenario (cumulative) method, geostatistical methods, or probabilistic methods (see Section 4.2, Resources Assessment Methods). Also, combinations of these methods may be used.

2.2.2.2 Use of consistent terminology (Figures 1.1 and 2.1) promotes clarity in communication of evaluation results. For Reserves, the general cumulative terms low/best/high forecasts are used to estimate the resulting 1P/2P/3P quantities, respectively. The associated incremental quantities are termed Proved (P1), Probable (P2) and Possible (P3). Reserves are a subset of, and must be viewed within the context of, the complete resources classification system. While the categorization criteria are proposed specifically for Reserves, in most cases, the criteria can be equally applied to Contingent and Prospective Resources. Upon satisfying the commercial maturity criteria for discovery and/or development, the project quantities will then move to the appropriate resources sub-class. Table 3 provides criteria for the Reserves categories determination.

2.2.2.3 For Contingent Resources, the general cumulative terms low/best/high estimates are used to estimate the resulting 1C/2C/3C quantities, respectively. The terms C1, C2, and C3 are defined for incremental quantities of Contingent Resources.

2.2.2.4 For Prospective Resources, the general cumulative terms low/best/high estimates also apply and are used to estimate the resulting 1U/2U/3U quantities. No specific terms are defined for incremental quantities within Prospective Resources.

2.2.2.5 Quantities in different classes and sub-classes cannot be aggregated without considering the varying degrees of technical uncertainty and commercial likelihood involved with the classification(s) and without considering the degree of dependency between them (see Section 4.2.6, Aggregating Resources Classes).

2.2.2.6 Without new technical information, there should be no change in the distribution of technically recoverable resources and the categorization boundaries when conditions are satisfied to reclassify a project from Contingent Resources to Reserves.

2.2.2 级别的定义与指南

2.2.2.1 评估师可采用确定性增量法、确定性情景（累计）法、地质统计法或概率法进行可采量评估和不确定性分级（见第 4.2 节，资源评估方法）。此外，还可以综合应用这些方法。

2.2.2.2 采用统一术语（见图 1.1 和图 2.1），有助于清晰地交流评估结果。对于储量，通用累计量术语“低估值 / 最佳估值 / 高估值”分别用于“1P/2P/3P”评估结果，而相应的增量，用证实（P1）、概算（P2）和可能（P3）来表述。储量，是完整资源分类系统的一个子集，必须在完整分类框架下来考虑。虽然针对储量提出了特定的分级标准，但大多数情况下，这些标准条件也同样适用于条件资源量和远景资源量。在满足发现和 / 或开发的商业成熟条件后，项目的资源数量将升级至适合的资源亚类。表 3 提供了储量级别判定的标准条件。

2.2.2.3 对于条件资源量，通用累计量术语“低估值 / 最佳估值 / 高估值”分别用于“1C/2C/3C”评估结果。条件资源量的增量术语则定义为 C1、C2 和 C3。

2.2.2.4 对于远景资源量，通用累计量术语“低估值 / 最佳估值 / 高估值”分别用于“1U/2U/3U”评估结果。远景资源量没有特定的增量术语定义。

2.2.2.5 若不考虑分类过程中涉及的不同技术不确定性和商业可能性，以及它们之间的关联程度，不同类别与亚类的资源数量就无法进行汇并（见第 4.2.6 节，资源类别的汇并）。

2.2.2.6 在没有获得新的技术信息情况下，当一个项目满足从“条件资源量”重新划归为“储量”的条件时，其技术可采资源量分布范围和分级界限不应发生变化。

2.2.2.7 All evaluations require application of a consistent set of forecast conditions, including assumed future costs and prices, for both classification of projects and categorization of estimated quantities recovered by each project (see Section 3.1, Assessment of Commerciality).

2.2.2.8 Tables 1, 2, and 3 present category definitions and provide guidelines designed to promote consistency in resources assessments. The following summarize the definitions for each Reserves category in terms of both the deterministic incremental method and the deterministic scenario method, and also provides the criteria if probabilistic methods are applied. For all methods (incremental, scenario, or probabilistic), low, best and high estimate technical forecasts are prepared at an effective date (unless justified otherwise), then tested to validate the commercial criteria, and truncated as applicable for determination of Reserves quantities.

(1) Proved Reserves are those quantities of Petroleum that, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be commercially recoverable from known reservoirs and under defined technical and commercial conditions. If deterministic methods are used, the term "reasonable certainty" is intended to express a high degree of confidence that the quantities will be recovered. If probabilistic methods are used, there should be at least a 90% probability that the quantities actually recovered will equal or exceed the 1P estimate.

(2) Probable Reserves are those additional Reserves which analysis of geoscience and engineering data indicate are less likely to be recovered than Proved Reserves but more certain to be recovered than Possible Reserves. It is equally likely that actual remaining quantities recovered will be greater than or less than the sum of the estimated Proved plus Probable Reserves (2P). In this context, when probabilistic methods are used, there should be at least a 50% probability that the actual quantities recovered will equal or exceed the 2P estimate.

(3) Possible Reserves are those additional Reserves that analysis of geoscience and engineering data suggest are less likely to be recoverable than Probable Reserves. The total quantities ultimately recovered from the project have a low probability to exceed the sum of Proved plus Probable plus Possible (3P) Reserves, which is equivalent to the high-estimate scenario. When probabilistic methods are used, there should be at least a 10% probability that the actual quantities recovered will equal or exceed the 3P estimate. Possible Reserves that are

2.2.2.7 所有的评估要求采用一套一致的预测条件，包括为项目分类和每个项目可采量分级所假定的未来成本与价格（见第 3.1 节，商业性评估）。

2.2.2.8 表 1、表 2 和表 3 列出了级别的定义，并提供了统一的资源评估指南。下文总结确定性增量法和确定性情景法对每个储量级别的定义，并为概率法的应用提供了条件要求。所有方法（增量法、情景法或概率法），均采用有效评估日（除非另有指定）的低估值、最佳估值和高估值方案的技术预测结果，然后进行商业可行性条件测试，并截断处理得到储量数量。

（1）证实储量，指通过地球科学和工程数据分析，在确定的技术与商业条件下，能合理确定地从已知油气藏中商业开采的石油数量。如果采用确定法，其“合理确定性”旨在表示可采数量的置信度高。若采用概率法，则实际采出量将等于或大于 1P 估值的概率至少为 90%。

（2）概算储量，指通过地球科学和工程数据分析表明，其采出可能性低于证实储量，但确定程度高于可能储量的储量增量。实际剩余可采量大于或小于证实储量加概算储量之和（2P）的概率相等。在这种情形下，当采用概率法，实际采出量将等于或大于 2P 估值的概率至少为 50%。

（3）可能储量，指通过地球科学和工程数据分析，采出可能性小于概算储量的储量增量。项目最终采出量大于证实储量、概算储量和可能储量总和（3P，相当于高估值情景）的概率低。当采用概率法时，实际采出量等于或大于 3P 估值的概率至少为 10%。分布在 2P 区域外的可能

located outside of the 2P area (not upside quantities to the 2P scenario) may exist only when the commercial and technical maturity criteria have been met (that incorporate the Possible development scope). Stand-alone Possible Reserves must reference a commercial 2P project (e.g., a lease adjacent to the commercial project that may be owned by a separate entity), otherwise stand-alone Possible is not permitted.

2.2.2.9 One, but not the sole, criterion for qualifying discovered resources and to categorize the project's range of its low/best/high or P90/P50/P10 estimates to either 1C/2C/3C or 1P/2P/3P is the distance away from known productive area(s) defined by the geoscience confidence in the subsurface.

2.2.2.10 A conservative (low-case) estimate may be required to support financing. However, for project justification, it is generally the best-estimate Reserves or Resources quantity that passes qualification because it is considered the most realistic assessment of a project's recoverable quantities. The best estimate is generally considered to represent the sum of Proved and Probable estimates (2P) for Reserves, or 2C when Contingent Resources are cited, when aggregating a field, multiple fields, or an entity's resources.

2.2.2.11 It should be noted that under the deterministic incremental method, discrete estimates are made for each category and should not be aggregated without due consideration of associated confidence. Results from the deterministic scenario, deterministic incremental, geostatistical and probabilistic methods applied to the same project should give comparable results (see Section 4.2, Resources Assessment Methods). If material differences exist between the results of different methods, the evaluator should be prepared to explain these differences.

2.3 Incremental Projects

2.3.0.1 The initial resources assessment is based on application of a defined initial development project, even extending into Prospective Resources. Incremental projects are designed to either increase recovery efficiency, reduce costs, or accelerate production through either maintenance of or changes to wells, completions, facilities, through infill drilling or by means of improved recovery. Such projects are classified according to the resources classification framework (Figure 1.1), with preference for applying project maturity sub-classes (Figure 2.1). Related incremental quantities are similarly categorized on the range of uncertainty of recovery. The projected

储量（非 2P 情景方案上方的数量），仅在满足技术和商业成熟度条件（含可能储量开发工作量）时才可能存在。单独出现的可能储量，必须依托一个 2P 商业项目（例如，其他实体商业项目的相邻合同区）；否则不允许单独出现的可能储量。

2.2.2.9 界定已发现资源以及将项目低估值 / 最佳估值 / 高估值（或 P90/P50/P10）分级为 1C/2C/3C 或 1P/2P/3P 的一个（但非唯一）条件，是根据地质置信度确定与已知生产区的距离。

2.2.2.10 融资，可能要求提供一个保守（低）估值。然而，对于项目论证，通常符合质量要求的是最佳估值的储量或资源量，因为最佳估值被认为是项目可采量最现实的评估结果。当汇并一个（多个）油气田或一个实体的资源数量时，通常采用最佳估值代表 2P 储量或 2C 条件资源量。

2.2.2.11 应当指出，确定性增量法获得的是每个级别的离散估值，若未适当考虑其置信度水平，不应进行汇并。同一项目的确定性情景法、确定性增量法、地质统计法和概率法估值结果，应进行对比（见第 4.2 节，资源评估方法）。若不同方法的结果存在实质性差异，评估师应能解释这些差异。

2.3 增量项目

2.3.0.1 初始资源评估是基于一个确定的初始开发项目（即便是远景资源量）。增量项目用于提高采收率，降低成本，或者通过维护或更换井 / 完井层段 / 设备设施、钻加密井或提高产量来加速生产。这些项目按照资源分类框架（见图 1.1）进行分类，并特别适用项目的成熟度亚类（见图 2.1）。相应的增量按可采量的不确定性进行类似的分级。如果项目实施程度达到

recovery change can be included in Reserves if the degree of commitment is such that the project has achieved commercial maturity (See Section 2.1.2, Determination of Commerciality). The quantity of such incremental recovery must be supported by technical evidence to justify the relative confidence in the resources category assigned.

2.3.0.2 An incremental project must have a defined development plan. A development plan may include projects targeting the entire field (or even multiple, linked fields), reservoirs, or single wells. Each incremental project will have its own planned timing for execution and resource quantities attributed to the project. Development plans may also include appraisal projects that will lead to subsequent project decisions based on appraisal outcomes.

2.3.0.3 Circumstances when development will be significantly delayed and where it is considered that Reserves are still justified should be clearly documented. If there is no longer the reasonable expectation of project execution (i.e., historical track record of execution, project progress), forecasted project incremental recoveries are to be reclassified as Contingent Resources (see Section 2.1.2, Determination of Commerciality).

2.3.1 Workovers, Treatments, and Changes of Equipment

2.3.1.1 Incremental recovery associated with a future workover, treatment (including hydraulic fracturing stimulation), re-treatment, changes to existing equipment, or other mechanical procedures where such projects have routinely been successful in analogous reservoirs may be classified as Developed Reserves, Undeveloped Reserves, or Contingent Resources, depending on the associated costs required (see Section 2.1.3.6, Reserves Status) and the status of the project's commercial maturity elements.

2.3.1.2 Facilities that are either beyond their operational life, placed out of service, or removed from service cannot be associated with Reserves recognition. When required facilities become unavailable or out of service for longer than a year, it may be necessary to reclassify the Developed Reserves to either Undeveloped Reserves or Contingent Resources. A project that includes facility replacement or restoration of operational usefulness must be identified, commensurate with the resources classification.

2.3.2 Compression

2.3.2.1 Reduction in the backpressure through compression can increase the portion of in-place gas that can be commercially

商业成熟度要求（见第 2.1.2 节，商业性的确定），其预计的可采量变化可以纳入储量。该可采量增量必须有技术证据支持，以证实其资源级别认定的置信度。

2.3.0.2 增量项目必须有一个确定的开发方案。一个开发方案可以是涉及整个油气田（或者，甚至多个相连油气田）、油气藏或单井的项目。每个增量项目都有自己的计划实施时间表和项目资源数量。开发方案还可以包括勘探评价项目，基于评价结果指引后续的项目决策。

2.3.0.3 在开发将明显推迟的情形下，若“储量”仍被认为具有合理确定性，应清晰记录。若对项目的执行不再有合理预期（即，有执行和项目进展历史记录），预测的项目可采量增量则要重划归为条件资源量（见第 2.1.2 节，商业性的确定）。

2.3.1 修井、措施与设备更换

2.3.1.1 未来修井、措施（包括水力压裂增产措施）、重复措施、现有设备更换或其他机械作业（通常这些项目已在类比油气藏取得成功）的采出量增量，可依据所需成本（参见第 2.1.3.6 节，储量状态）和项目商业成熟度的要素状态划分为已开发储量、未开发储量或条件资源量。

2.3.1.2 对于使用寿命过期、停用或退出使用的设施不能参与储量认定。当所需设施无法使用或停用超过一年，可能有必要将已开发储量重新划分为未开发储量或条件资源量。必须对一个需更换设施和恢复作业的项目进行识别，以匹配资源分类的要求。

2.3.2 增压作业

2.3.2.1 通过增压设施降低回压，可提高天然气原地量的商业开采量，因而纳

produced and thus included in resources estimates. If the eventual installation of compression meets commercial maturity requirements, the incremental recovery is included in either Undeveloped Reserves or Developed Reserves, depending on the investment on meeting the Developed or Undeveloped classification criteria. However, if the cost to implement compression is not significant, relative to the cost of one new well in the field, or there is reasonable expectation that compression will be implemented by a third party in a common sales line beyond the reference point, the incremental quantities may be classified as Developed Reserves. If compression facilities were not part of the original approved development plan and such costs are significant, it should be treated as a separate project subject to normal project maturity criteria.

入资源估值。如果最终增压设施满足商业成熟度要求，增加的可采量则纳入未开发储量或已开发储量中，这取决于投资是否满足已开发或未开发的分类条件。但是，如果启用增压设施的成本不高（相对于该油气田一口新井成本而言，或者可合理预期由第三方在参照点外部的共用销售线上安装），则增量可划分为已开发储量。如果压缩设施不属于已批准原始开发方案的内容，且成本较高，则应视为一个单独的项目，按正常的项目成熟度标准划分。

2.3.3 Infill Drilling

2.3.3.1 Technical and commercial analyses may support drilling additional producing wells to reduce the well spacing of the initial development plan, subject to government regulations. Infill drilling may have the combined effect of increasing recovery and accelerating production. Only the incremental recovery (i.e. recovery from infill wells less the recovery difference in earlier wells) can be considered as additional Reserves for the project; this incremental recovery may need to be reallocated.

2.3.3 加密钻井

2.3.3.1 按照政府相关规定，技术与商业分析结果可能支持钻更多生产井，以降低初始开发方案的井网井距。加密钻井可获得提高产量和加速生产的综合效应。只有采出量增量（即加密钻井方案可采量与之前生产井方案可采量的差异）可认定为项目的储量增量，该增量可能需要重新回配。

2.3.4 Improved Recovery

2.3.4.1 Improved recovery is the additional petroleum obtained, beyond primary recovery, from naturally occurring reservoirs by supplementing the natural reservoir energy. It includes secondary recovery (e.g., waterflooding and pressure maintenance), tertiary recovery processes (thermal, miscible gas, chemical injection, and other types), and any other means of supplementing natural reservoir recovery processes.

2.3.4.2 Improved recovery projects must meet the same Reserves technical and commercial maturity criteria as primary recovery projects.

2.3.4.3 The judgment on commerciality is based on pilot project results within the subject reservoir or by comparison to a reservoir with analogous rock and fluid properties and where a similar established improved recovery project has been successfully applied.

2.3.4.4 Incremental recoveries through improved recovery methods that have yet to be established through routine, commercially successful applications are included as

2.3.4 提高采收率

2.3.4.1 提高采收率是在一次开采的基础上，通过油气藏能量补充，可从天然储层中额外获取的石油数量。提高采收率包括二次开采（例如，注水保压）、三次开采（热采、混相驱驱、化学驱等注入项目），以及其他辅助天然油气藏开采的过程。

2.3.4.2 与一次开采项目相同，提高采收率项目必须满足储量的技术与商业成熟度条件。

2.3.4.3 提高采收率项目的商业性判断是基于油气藏的先导试验项目结果，或者在类比油气藏（具有可类比的岩石与流体性质）已成功实施类似的提高采收率项目。

2.3.4.4 若提高采收率项目所采用的提高采收率方法尚须在日常生产中成功商业应用，其采出量增量要划入储量，须获

Reserves only after a favorable production response from the subject reservoir from either (a) a representative pilot or (b) an installed portion of the project, where the response provides support for the analysis on which the project is based. The improved recovery project's resources will remain classified as Contingent Resources Development Pending until the pilot has demonstrated both technical and commercial feasibility and the full project passes the Justified for Development "decision gate."

得以下有利生产响应：（a）具有代表性的先导试验项目；（b）项目已部分实施，并获得了支持分析的生产响应。提高采收率项目的资源数量将保留为"条件资源量"的"待开发"亚类，直至其先导试验证实了技术与商业可行性，且整个项目通过了"已论证可开发"决策关口。

2.4 Unconventional Resources

2.4.0.1 The types of in-place petroleum resources defined as conventional and unconventional may require different evaluation approaches and/or extraction methods. However, the PRMS resources definitions, together with the classification system, apply to all types of petroleum accumulations regardless of the in-place characteristics, extraction method applied, or degree of processing required.

(1) Conventional resources exist in porous and permeable rock with pressure equilibrium. The PIIP is trapped in discrete accumulations related to a local geological structure feature and/or stratigraphic condition. Each conventional accumulation is typically bounded by a down dip contact with an aquifer, as its position is controlled by hydrodynamic interactions between buoyancy of petroleum in water versus capillary force. The petroleum is recovered through wellbores and typically requires minimal processing before sale.

(2) Unconventional resources exist in petroleum accumulations that are pervasive throughout a large area and are not significantly affected by hydrodynamic influences (also called "continuous-type deposit"). Usually there is not an obvious structural or stratigraphic trap. Examples include coalbed methane (CBM), basin-centered gas (low permeability), tight gas and tight oil (low permeability), gas hydrates, natural bitumen (very high viscosity oil), and oil shale (kerogen) deposits. Note that shale gas and shale oil are sub-types of tight gas and tight oil where the lithologies are predominantly shales or siltstones. These accumulations lack the porosity and permeability of conventional reservoirs required to flow without stimulation at economic rates. Typically, such accumulations require specialized extraction technology (e.g., dewatering of CBM, hydraulic fracturing stimulation for tight gas and tight oil, steam and/or solvents to mobilize natural bitumen for in-situ recovery, and in some cases, surface mining of oil sands). Moreover, the extracted petroleum may require significant processing before sale (e.g., bitumen upgraders).

2.4 非常规资源

2.4.0.1 不同类型常规与非常规油气资源原地量可能要求不同评估方法和/或开采方式。但是，PRMS 的资源定义及其分类系统，适用于所有类型的油气聚集，而不受原地量特征、开采方法或所需加工程度的影响。

（1）常规资源赋存于压力平衡的多孔渗透性岩石。石油原始原地量（PIIP）被就地圈闭在由地质构造和/或地层岩性条件控制的离散油气聚集体中。每个常规油气聚集通常与下倾水层的接触面为边界，而含水层位置是由石油在水中的浮力与毛细管力之间的水动力作用所控制的。通过井开采的石油，通常在销售前只需少量加工处理。

（2）非常规资源赋存于大面积连续分布的油气聚集，没有明显的水动力影响（也称为"连续型沉积"）。通常，不存在明显的构造或地层圈闭。非常规资源，包括煤层气（CBM）、盆地中心气（低渗透率）、致密气和致密油（低渗透率）、天然气水合物、天然沥青（超黏油）和油页岩（干酪根）等。需注意，页岩气和页岩油是致密气和致密油的次级分类，岩性以页岩或粉砂岩为主。这些油气聚集缺乏常规油气藏的孔隙度与渗透率，不能在没有改造措施情况下获得经济油气流。通常，此类油气聚集需要特定的开采技术（例如，煤层气排水采气、致密油气水力压裂增产措施、天然沥青注蒸汽和/或溶剂原位开采，以及在某些情况下采用的油砂露天采矿等）。此外，采出的石油在销售之前可能需要大量加工（例如，沥青改质）。

2.4.0.2 For unconventional petroleum accumulations, reliance on continuous water contacts and pressure gradient analysis to interpret the extent of recoverable petroleum is not possible. Thus, there is typically a need for increased spatial sampling density to define uncertainty of in-place quantities, variations in reservoir and hydrocarbon quality, and to support design of specialized mining or in-situ extraction programs. In addition, unconventional resources typically require different evaluation techniques than conventional resources.

2.4.0.3 Extrapolation of reservoir presence or productivity beyond a control point within a resources accumulation must not be assumed unless there is technical evidence to support it. Therefore, extrapolation beyond the immediate vicinity of a control point should be limited unless there is clear engineering and/or geoscience evidence to show otherwise.

2.4.0.4 The extent of the discovery within a pervasive accumulation is based on the evaluator's reasonable confidence based on distances from existing experience, otherwise quantities remain as undiscovered. Where log and core data and nearby producing analogs provide evidence of potential economic viability, a successful well test may not be required to assign Contingent Resources. Pilot projects may be needed to define Reserves, which requires further evaluation of technical and commercial viability.

2.4.0.5 A fundamental characteristic of engagement in a repetitive task is that it may improve performance over time. Attempts to quantify this improvement gave rise to the concept of the manufacturing progress function commonly called the "learning curve." The learning curve is characterized by a decrease in time and/or costs, usually in the early stages of a project when processes are being optimized. At that time, each new improvement may be significant. As the project matures, further improvements in time or cost savings are typically less substantial. In oil and gas developments with high well counts and a continuous program of activity (multi-year), the use of a learning curve within a resources evaluation may be justified to predict improvements in either the time taken to carry out the activity, the cost to do so, or both. While each development project is unique, review of analogs can provide guidance on such predictions and the range of associated uncertainty in the resulting recoverable resources estimates (see also Section 3.1.2 Economic Criteria).

2.4.0.2 对于非常规油气聚集，不可能依靠连续的油气水界面和压力梯度来解析石油可采数量。因此，一般需要增加空间上的采样密度，以确定原地量的不确定性、油气藏与油气性质的变化，并支持具体采矿或原位开采方案的设计。此外，非常规资源通常需要与常规资源不同的评估技术。

2.4.0.3 除非有技术支撑依据，否则不能根据假定将油气聚集的存在与产能外推到控制点之外。因此，应限制控制点附近的外推，除非有明确的工程和 / 或地球科学证据。

2.4.0.4 一个大面积分布油气聚集的发现范围，是基于评估师对其与已有发现的距离的合理置信度，否则这些资源数量仍保留为“未发现”。若测井、岩芯数据以及邻近在产的类比油气藏可提供潜在经济可行性的证据，那么条件资源量的认定不需要成功的试井结果。储量的认定则可能需要先导试验项目进一步评估技术与商业可行性。

2.4.0.5 重复性工作的一个基本特征是，随着时间推移，效果会不断改善。尝试量化这种改进，则形成了生产进度函数的概念，一般称为“学习曲线”。通常在项目早期阶段的流程优化后，学习曲线呈现用时缩短和 / 或成本降低的特征。在该阶段，每项新改进都可能很重要。随着项目逐步成熟，时间或成本的进一步改善通常不再明显。在井数多和持续作业（多年）的油气开发中，可在资源评估中使用学习曲线，以预测作业时间及成本改善情况。虽然每个开发项目都是独特的，但通过类比项目的检验，可为这种预测以及由此得到的开采资源量估值的不确定性范围提供指引（见第 3.1.2 节，经济指标）。

3.0 Evaluation and Reporting Guidelines

3.0.0.1 The following guidelines are provided to promote consistency in project evaluations and reporting. “Reporting” in this document refers to the presentation of evaluation results within the entity conducting the evaluation and should not be construed as replacing requirements for public disclosures established by regulatory and/or other government agencies or any current or future associated accounting standards.

3.0.0.2 Reserves and resources evaluations are based on a set of defined conditions that are used to classify and categorize a project’s expected recoverable quantities. The defined conditions include the factors that impact commerciality, such as decision hurdle rates; commodity prices; operating and capital costs; technical subsurface parameters; marketing, sales route(s); environmental, governmental, legal, and social factors; and timing issues. These factors are forecast for the project over time, and evaluators must clearly identify and document the assumptions used in the evaluation because these assumptions can directly impact the project quantities eligible for classification as Reserves or Resources. A project with Contingent Resources may not yet have all defined conditions addressed, and reasonable assumptions should be made and documented.

3.0.0.3 Hydrocarbon evaluations recognize production and transportation practices that involve methods of extraction other than through the flow of fluids from wells to surface facilities, such as surface mining of bitumen or in-situ conversion processes.

3.1 Assessment of Commerciality

3.1.0.1 Commercial assessments are conducted on a project basis and are based on the entity’s view of future conditions. The forecast commercial conditions, technical feasibility, and the entity’s decision to commit to the project are several of the key elements that underpin the project’s resources classification. Commercial conditions include, but are not limited to, assumptions of an entity’s investment hurdle criteria; financial conditions (e.g., costs, prices, fiscal terms, taxes); partners’ investment decision(s); organization capabilities; and marketing, legal, environmental, social, and governmental factors. Project value may be assessed in several ways (e.g., cash flow analysis, historical costs, comparative market values, key economic parameters) (see Section 2.1.2, Determination

3.0 评估与报告指南

3.0.0.1 下列指南用以促进项目评估和报告的一致性。“报告”是指评估实体内部对评估结果的呈现，不能取代监管部门和/或其他政府机构、或任何当前或未来会计准则的公开披露要求。

3.0.0.2 储量与资源量的评估是基于项目可采量估值分类分级的一组确定条件。这些条件包括商业性的影响因素，例如决策所需的最小基准收益率、商品价格、作业与资本成本、储层技术参数、市场条件、营销途径、环境、政府、法律和社会因素以及时间计划等。这些项目的影响因素随时间而变化，评估师必须清楚地识别并记录评估所采用的假设条件，因为这些假设条件可能会直接影响项目认定为储量或资源量的数量。条件资源量项目可能尚不满足所有规定条件，应合理假设并记录在案。

3.0.0.3 石油评估确认了生产与运输涉及的提取方法，而非流体从井筒流至地面设施的过程（例如天然沥青露天开采或原位改质）。

3.1 商业性评估

3.1.0.1 商业性评估以项目为基础，并基于实体对未来条件的预测。这些预测的商业条件、技术可行性以及实体对项目的承诺是支撑项目资源分类的关键要素。商业条件包括但不限于以下假设：实体的投资回报标准、财税条件（例如成本、价格、财会条款、税负）、合作伙伴的投资决策、组织能力、市场条件、法律、环境、社会以及政府因素。项目的价值可通过几种方式进行评估（例如现金流分析、历史

of Commerciality). The guidelines herein apply only to assessments based on cash-flow analysis. Moreover, modifying factors that may additionally influence investment decisions, such as contractual or political risks, should be recognized so the entity may address these factors if they are not included in the project analysis.

成本法、市场价值对比法、关键经济参数）（见第 2.1.2 节，商业性的确定）。本标准仅适用于基于现金流分析的评估。此外，还应认识到其他可能影响投资决定的修正因素（例如合同或政治风险），以便在项目分析中未包含这些因素时，实体可以处理这些问题。

3.1.1 Net Cash-Flow Evaluation

3.1.1.1 Project-based resource economic evaluations are based on estimates of future production and the associated net cash-flow schedules for each project as of an effective date. These net cash flows should be discounted using a defined discount rate, and the sum of the future discounted cash flows is termed the net present value (NPV) of the project. The calculation shall be based upon an appropriately defined reference point (see Section 3.2.1, Reference Point) and should reflect the following:

(1) The forecasted production quantities over identified time periods.

(2) The estimated costs and schedule associated with the project to develop, recover, and produce the quantities to the reference point, including abandonment, decommissioning, and restoration (ADR) costs, based on the entity's view of the expected future costs.

(3) The estimated revenues from the quantities of production based on the evaluator's view of the prices expected to apply to the respective commodities in future periods, taking into account any sales contracts or price hedges specific to a property, including that portion of the costs and revenues accruing to the entity.

(4) Future projected production- and revenue-related taxes and royalties expected to be paid by the entity.

(5) A project life that is limited to the period of economic interest or a reasonably certain estimate of the life expectancy of the project, which is typically truncated by the earliest occurrence of either technical, license, or economic limit.

(6) An appropriate discount rate applicable to the entity at the time of the evaluation.

3.1.1 净现金流评价

3.1.1.1 基于项目的资源经济评价，以每个项目的未来产量及相应评估日的净现金流计划为基础。该净现金流应采用规定折现率进行折现，得到的未来折现现金流的总和称为项目的净现值（NPV）。相关计算要基于适当参照点（见第 3.2.1 节，参照点），并应考虑以下因素：

（1）指定时间段的预测产量。

（2）预计成本和计划：基于实体对未来成本的预期，所估算的项目开发、开采和生产（至参照点）成本及计划，包括弃置费（ADR，即废弃、停运和复原成本）。

（3）预计产量收入：根据评估师对未来商品价格的预期，结合产品销售合同或对资产价格的对冲（含实体历史成本与收入），预测产量的收入。

（4）根据计划的产量与收入，实体预期将支付的税负和矿费。

（5）项目经济寿命：受项目经济权益周期或对项目寿命的合理预期限制，通常是根据最早出现的技术可采年限、合同截止期或经济极限进行截断。

（6）适用于实体的评估日折现率。

3.1.2 Economic Criteria

3.1.2.1 Economic determination of a project is tested assuming a zero percent discount rate (i.e., undiscounted). A project with a positive undiscounted cumulative net cash flow is considered economic. Production from the project is

3.1.2 经济指标

3.1.2.1 一个项目的经济可采性判定，是基于项目折现率为零（即未折现）的假定条件。未折现累计净现金流为正

economic when the revenue attributable to the entity interest from production exceeds the cost of operation. A project's production is economically producible when the net revenue from an ongoing producing project exceeds the net expenses attributable to a certain entity's interest. The ADR costs are excluded from the economic producibility determination. A project is commercial when it is economic and it meets the criteria discussed in Section 2.1.2.

3.1.2.2 Economic viability is tested by applying a forecast case that evaluates cash-flow estimates based on an entity's forecasted economic scenario conditions (including costs and product price schedules, inflation indexes, and market factors). The forecast made by the evaluator should reflect and document assumptions the entity assesses as reasonable to exist throughout the life of the project. Inflation, deflation, or market adjustments may be made to forecast costs and revenues.

3.1.2.3 Forecasts based solely on current economic conditions are estimated using an average of those conditions (including historical prices and costs) during a specified period. The default period for averaging prices and costs is one year. However, if a step change has occurred within the previous 12-month period, the use of a shorter period reflecting the step change must be justified. In developments with high well counts and a continuous program of activity, the use of a learning curve within a resources evaluation may be justified to predict improvements in either time taken to carry out the activity, the cost to do so, or both, if confirmed by operational evidence and documented by the evaluator. The confidence in the ability to deliver such savings must be considered in developing the range of uncertainty in production and NPV estimates.

3.1.2.4 All costs, including future ADR liabilities, are included in the project economic analysis unless specifically excluded by contractual terms. ADR is not included in determining the economic producibility or for determining the point the project reaches the economic limit (see Section 3.1.3, Economic Limit). ADR costs may also be reported for other purposes, such as for a property sale/acquisition evaluation, future field planning, accounting report of future obligations, or as appropriate to the circumstances for which the resource evaluation is conducted. The entity is responsible for providing the evaluator with documentation to ensure that funds are available to cover forecast costs and ADR liabilities in line with the contractual obligations.

的项目则视为是经济的。当实体的权益所属收入超过作业成本时，项目产量为经济的。经济产能的判定不考虑弃置费（ADR）。当一个项目具有经济性并满足第 2.1.2 节讨论的条件，则项目具有商业性。

3.1.2.2 经济可行性是通过一个预测方案来进行测试，即基于实体预计的经济条件（包括成本和产品价格计划、通货膨胀指数和市场因素）来估算现金流。评估师的测算应反映和记录实体认为项目寿命期内合理存在的假设。预测成本和收入时，可考虑通货膨胀、通货紧缩或市场条件的调整。

3.1.2.3 仅基于当前经济条件，采用特定阶段的均值（包括历史价格和成本）进行测算。价格和成本的均值默认期为一年。但是，若前 12 个月出现阶跃变化，则须采用更短时间段的数据来反映这种变化。在井数众多和持续作业（多年）的油气开发中，若有确认的评估师作业信息记录，则可在资源评估中采用学习曲线预测作业时间与成本的改善情况。在评估产量和净现值（NPV）的不确定性范围时，须考虑这种改进能力的置信度。

3.1.2.4 所有成本费用（包括未来的弃置费义务）都要纳入项目经济分析，除非有明确的合同条款除外。在判定项目经济产能或经济极限点时，不考虑弃置费（见第 3.1.3 节，经济极限）。弃置费也可用于其他目的，如资产的出售或收购评估、油气田规划、债务会计报告或适用资源评估的其他情形。负责向评估师提供文件资料，以确保资金能够按照合同义务支付预测成本和弃置费。

3.1.2.5 Figure 3.1 illustrates a net cash-flow profile for a simple project. The project's cumulative net cash flow exceeds the ADR liability, thereby satisfying the economic viability required to consider a project's quantities as Reserves. The project's economic production (i.e., economic producibility) is truncated at the economic limit when the maximum cumulative net cash flow is achieved, before consideration of ADR.

3.1.2.5 图 3.1 展示了一个简单项目的净现金流剖面。项目的累计净现金流大于弃置费义务，因而满足将项目资源数量划分为储量的经济性要求。在考虑弃置费之前，项目经济产量（即经济产能）在最大累计净现金流所对应的经济极限处进行截断。

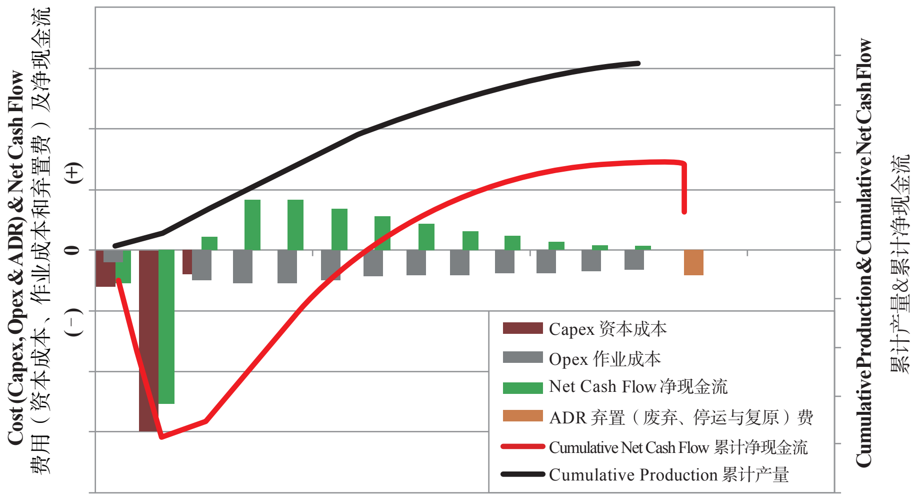

Figure 3.1 Undeveloped project economic forecast
图 3.1 未开发项目经济指标预测

3.1.2.6 Alternative economic scenarios may also be considered in the decision process and, in some cases, may supplement reporting requirements. Evaluators may examine a constant case in which current economic conditions are held constant without inflation or deflation throughout the project life.

3.1.2.6 决策过程中也可能会考虑其他经济情景方案，在某些情况下，还可以补充报告要求。评估师可通过恒定方案（即保持当前经济条件在整个生命期不变，不存在通货膨胀或通货紧缩）来进行测试。

3.1.2.7 Evaluations may also be modified to accommodate criteria regarding external disclosures imposed by regulatory agencies. For example, these criteria may include a specific requirement that, if the recovery were confined to the Proved Reserves estimate, the constant case should still generate a positive cash flow. External reporting requirements may also specify alternative guidance on the definition of current conditions or defined criteria with which to evaluate Reserves.

3.1.2.7 评估也可以根据监管机构规定的对外披露标准进行调整。例如，这些标准可能包含一项具体要求：如果采出量只限于证实储量的估算，则其恒定方案应该仍有正现金流。对外披露要求也可能规定当前条件定义或储量评估标准的替代指南。

3.1.2.8 There may be circumstances in which the project meets criteria to be classified as Reserves using the best estimate (2P) forecast but the low case is not economic and fails to qualify for Proved Reserves. In this circumstance, the entity may record 2P and 3P estimates and no Proved Reserves. As costs are incurred in future years (i.e. become sunk costs) and development proceeds, the low estimate may eventually become

3.1.2.8 在某些情况下，项目的最佳估值（2P）满足划分为储量的标准要求，但其低估值方案不经济。不能划归为证实储量。在这种情况下，实体可以登记 2P 和 3P 估值，但没有证实储量。随着成本的逐年发生（即成为沉没成本）和开发的实施，低估值方案可能最终成为经济的，

economic and be reported as Proved Reserves. Some entities, according to internal policy or to satisfy regulatory reporting requirements, will defer reclassifying projects from Contingent Resources to Reserves until the low estimate case is economic.

3.1.3 Economic Limit

3.1.3.1 The economic limit is defined as the production rate at the time when the maximum cumulative net cash flow occurs for a project. The entity's entitlement production share, and thus net entitlement resources, includes those to be produced quantities up to the earliest truncation occurrence of either technical, license, or economic limit.

3.1.3.2 In this evaluation, operating costs should include only those costs that are incremental to the project for which the economic limit is being calculated (i.e., only those cash costs that will actually be eliminated if project production ceases). Operating costs should include fixed property-specific overhead charges if these are actual incremental costs attributable to the project and any production and property taxes, but for purposes of calculating the economic limit, should exclude depreciation, ADR costs, and income tax as well as any overhead that is not required to operate the subject property. Operating costs may be reduced, and thus project life extended, by various cost-reduction and revenue-enhancement approaches, such as sharing of production facilities, pooling maintenance contracts, or marketing of associated non- hydrocarbons (see Section 3.2.4, Associated Non-Hydrocarbon Components).

3.1.3.3 For a given project, no future development costs can exist beyond the economic limit date. ADR costs are not included in the economic limit calculations, even though they may be reported for other purposes.

3.1.3.4 Interim negative project net cash flows may be accommodated in periods of development capital spending, low product prices, or major operational problems provided that the longer-term cumulative net- cash-flow forecast determined from the effective date becomes positive. These periods of negative cash flow will qualify as Reserves if the following positive periods more than offset the negative.

3.1.3.5 In some situations, entities may choose to initiate production below or continue production past the economic limit. Production must be economic to be considered as Reserves, and the intent to or act of producing sub-economic resources does not confer Reserves status to those quantities. In these instances, the production represents a movement from

并报告为证实储量。根据内部政策或监管报告要求，一些实体会延迟将项目从条件资源量重新划归为储量，直至其低估值方案具有经济性。

3.1.3 经济极限

3.1.3.1 经济极限，指项目达到最大累计净现金流时的产量。实体的份额产量分成（即净份额资源数量），包括了在技术、许可或经济极限截断前所采出的数量。

3.1.3.2 在评估中，操作成本应只包含用以计算项目经济极限的成本（即仅指项目停止生产就会消失的现金成本）。操作成本应包括固定资产管理费（如果确实是项目的成本增量）以及所有与生产与资产有关的税负；但经济极限的计算，应不包括折旧、ADR 费、所得税以及资产运营不必要的管理费。通过各种降低成本和增加收益的方式，如共享生产设施、分摊维修合同或销售伴生的非烃产品（见第 3.2.4 节，非烃伴生组分）可以降低操作成本，并延长项目寿命。

3.1.3.3 对于一个给定项目，其生产达到经济极限之后不再有开发费用。经济极限的计算不考虑 ADR 费，但其可用于其他报告目的。

3.1.3.4 在项目自评估日测算的长期累计净现金流为正的前提下，项目可能在有开发资本支出、产品价格低，或者存在重大运营问题的时期出现净现金流间歇为负的情形。如果后期的正现金流可以补偿负现金流，那么负现金流阶段的采出量也可认定为储量。

3.1.3.5 在某些情况下，实体可能选择低于经济极限的情况下投产或达到经济极限后仍继续生产。产量必须是经济的，才能视为储量，生产次经济资源量的意图

Contingent Resources to Production. However, once produced such quantities can be shown in the reconciliation process for production and revenue accounting as a positive technical revision to Reserves. No future sub-economic production can be Reserves.

3.2 Production Measurement

3.2.0.1 In general, all petroleum production from the well or mine is measured to allow for the evaluation of the extracted quantities' recovery efficiency in relation to the PIIP. The marketable product, as measured according to delivery specifications at a defined reference point, provides the basis for sales production quantities. Other quantities that are not sales may not be as rigorously measured at the reference point(s) but are as important to take into account.

3.2.0.2 The operational issues in this section should be considered in defining and measuring production. While referenced specifically to Reserves, the same logic would be applied to projects forecast to develop Contingent and Prospective Resources conditional on discovery and development.

3.2.1 Reference Point

3.2.1.1 Reference point is a defined location within a petroleum extraction and processing operation where the produced quantities are measured or assessed. A reference point is typically the point of sale to third parties or where custody is transferred to the entity's midstream or downstream operations. Sales production and estimated Reserves are normally measured and reported in terms of quantities crossing this point over the period of interest.

3.2.1.2 The reference point may be defined by relevant accounting regulations to ensure that the reference point is the same for both the measurement of reported sales quantities and for the accounting treatment of sales revenues. This ensures that sales quantities are stated according to the delivery specifications at a defined price. In integrated projects, the appropriate price at the reference point may need to be determined using a netback calculation.

3.2.1.3 Sales quantities are equal to raw production less non-sales quantities (those quantities produced at the wellhead but not available for sales at the reference point). Non-sales quantities include petroleum consumed as lease fuel, flared, or lost in processing, plus non-hydrocarbons that must be removed before sale (including water). Each of these may be allocated

或行为并不能为其赋予“储量”状态。在这些情况下，“生产过程”体现了“条件资源量”到“产量”的转变。然而，这些数量一旦采出，则在呈现在产量与收入的核算校验过程中，提示对“储量”作正向技术修订。未来次经济产量不能作为储量。

3.2 产量计量

3.2.0.1 一般来说，井或矿场的所有石油产量都需进行计量，以评估采出量与石油原始原地量（PIIP）相关联的采收率。根据参照点交付规格计量的可销售产品是销售量核定的基础。其他非销售数量可能不在参照点严格计量，但同样重要，需考虑在内。

3.2.0.2 在定义和计量产量时，应考虑本节所述的操作问题。在具体提及储量时，相同的逻辑也适用于根据发现与开发状态进行项目预测的条件资源量和远景资源量。

3.2.1 参照点

3.2.1.1 参照点，是石油开采和加工作业过程中计量或评估产量的确定位置。通常，参照点是提供给第三方的销售点或向实体中游或下游业务转运的托付点。销售产量和估算的储量通常以权益期内通过该参照点的数量为依据进行计量和报告。

3.2.1.2 参照点可以根据有关财会规则来确定，以确保所报告销售量的计量与销售收入会计核算所采用的参照点相同。这样可确保销售量符合规定价格的交付规格。在一体化项目中，参照点的合理价格可能需要采用净回价计算。

3.2.1.3 销售量等于井口产量减去非销售量（指井口产出但未在参照点销售的数量）。非销售量包括矿区燃料消耗、火炬燃放或加工损耗的石油数量，以及销售前须除去的非烃（包括水）。其中每一种非销售量都可以使用单独的参照点进行分

using separate reference points but, when combined with sales, should sum to raw production. Sales quantities may need to be adjusted to exclude components added in processing but not derived from raw production. Raw production measurements are necessary and form the basis of many engineering calculations (e.g., material balance and production performance analysis) based on total reservoir voidage. Substances added to the production stream for various reasons, such as diluents added to enhance flow properties, are not to be counted as Production, sales quantities, Reserves, or Resources.

3.2.2 Consumed in Operations (CiO)

3.2.2.1 CiO (also termed lease fuel) is that portion of produced petroleum consumed as fuel in production or plant operations before the reference point.

3.2.2.2 Although Reserves are recommended to be sales quantities (see Section 1.1 Petroleum Resources Classification Framework), the CiO quantities may be included as Reserves or Resources; when included these quantities must be stated and recorded separately from the sales portion. Entitlement rights for the fuel usage must be in place to recognize CiO as Reserves. Flared gas and oil and other petroleum losses must not be included in either product sales or Reserves but once produced are included in produced quantities to account for total reservoir voidage.

3.2.2.3 The CiO quantities must not be included in the project economics because there is neither a cost incurred for purchase nor a revenue stream to recognize a sales quantity. The CiO fuel replaces the requirement to purchase fuel from external parties and results in lower operating costs. All actual costs for facilities-related equipment, the costs of the operations, and any purchased fuel must be included as an operating expense in the project economics.

3.2.3 Wet or Dry Natural Gas

3.2.3.1 The Reserves for wet or dry natural gas should be considered in the context of the specifications of the gas at the agreed reference point. Thus, for gas that is sold as wet gas, the quantity of the wet gas would be reported, and there would be no reporting of any associated hydrocarbon liquids extracted downstream of the reference point. It would be expected that the corresponding enhanced value of the wet gas would be reflected in the sales price achieved for such gas.

3.2.3.2 When liquids are extracted from the gas before

配，但当与销售量汇总时，总量应等于井口产量。销售量可能需要扣减加工过程添加的非原始产出组分。井口产量的计量是必要的，也是许多基于油气藏亏空的油气藏工程计算（例如物质平衡和生产动态分析）的基础。由于各种原因添加到流体中的物质（例如增强流动性的稀释剂），不计入产量、销售量、储量或资源量。

3.2.2 作业自用油气

3.2.2.1 作业自用油气量（CiO）（也称“矿区燃料”），指产出石油中，作为燃料在生产或加工过程（参照点之前）被消耗的部分。

3.2.2.2 尽管建议“储量”应考虑为可销售的数量（见第 1.1 节，石油资源分类框架），但作业自用油气（CiO）可以计入储量或资源量。当计入这部分数量时，须与销售量分开说明并记录。将作业自用油气认定为储量的前提是必须拥有作业燃料使用的份额权益。火炬燃放以及其他类型石油损失量不能计入产品销售量或储量；但一旦产出，应计入产出量以计算油气藏总亏空体积。

3.2.2.3 作业自用油气数量不能纳入项目经济评价，因为既没有采购成本，也没有销售收入。作业自用油气替代了需从外部购买的燃料，从而降低了操作成本。设施相关设备的所有实际成本、操作成本以及任何购买的燃料都必须在项目经济评价中计入作业支出费用。

3.2.3 湿气或干气

3.2.3.1 湿气或干气的储量应在商定的参照点根据天然气的规格要求加以考虑。因此，对于以湿气形式出售的天然气，报告湿气数量，而不是报告在参照点下游所提取的任何伴生液烃。可以预期，湿气相应的价值增长可反映在其销售价值里。

sale and the gas is sold in dry condition, then the dry gas quantity and the extracted liquid quantities, whether condensate and/or natural gas liquids (NGLs), must be accounted for separately in resources assessments at the agreed reference point(s).

3.2.4 Associated Non-Hydrocarbon Components

3.2.4.1 In the event that non-hydrocarbon components are associated with production, the reported quantities should reflect the agreed specifications of the petroleum product at the reference point. Correspondingly, the accounts will reflect the value of the petroleum product at the reference point. If it is required to remove all or a portion of non-hydrocarbons before delivery, the Reserves and Production should reflect only the marketable product recognized at the reference point.

3.2.4.2 Even if an associated non-hydrocarbon component, such as helium or sulfur, removed before the reference point is subsequently separately marketed, these quantities are included in the voidage extraction quantities (e.g., raw production) from the reservoir but are not included in Reserves. The revenue generated by the sale of non-hydrocarbon products may be included in the project's economic evaluation.

3.2.5 Natural Gas Re-Injection

3.2.5.1 Natural gas production can be re-injected into a reservoir for a number of reasons and under a variety of conditions. Gas can be re-injected into the same reservoir or into other reservoirs located on the same property for recycling, pressure maintenance, miscible gas injection, or other enhanced oil recovery processes. In cases where the gas has no transfer of ownership and with a development plan that is technically and commercially mature, the gas quantity estimated to be eventually recoverable can be included as Reserves.

3.2.5.2 If injected gas quantities are included as Reserves, these quantities must meet the criteria in the definitions, including the existence of a viable development, transportation, and sales marketing plan. Gas quantities should be reduced for losses associated with the re-injection and subsequent recovery process. Gas quantities injected into a reservoir for gas disposal with no committed plan for recovery are not classified as Reserves. Gas quantities purchased for injection and later recovered are not classified as Reserves.

3.2.3.2 如果天然气在销售前提取出液烃，且天然气以干气形式销售，那么干气数量和所提取液烃数量（无论是凝析油和 / 或天然气液），必须在商定参照点单独进行资源评估核算。

3.2.4 非烃伴生组分

3.2.4.1 在产量中含有伴生的非烃组分时，所报告的数量应反映在参照点议定的石油产品规格。相应地，财务帐目也应反映石油产品在参照点的价值。如果在交付之前要求分离全部或部分非烃组分，那么储量和产量应只反映在参照点认定的可销售产品。

3.2.4.2 即便非烃组分（例如氦气或硫磺）在参照点之前进行了分离，并随后单独销售，这些数量可计入油气藏物质亏空采掘量（即井口产量），也不计入储量。非烃产品的销售收入可以纳入项目经济评价。

3.2.5 天然气回注

3.2.5.1 根据多种原因和各种条件，天然气可以回注油气藏。天然气可回注到同一储层或同一资产的其他储层，以开展循环注气、维持压力、混相气体注入或其他提高采收率作业。如果，天然气的所有权没有转让，开发方案的技术商业条件成熟，那么预计最终可采出的天然气数量可计入储量。

3.2.5.2 若注入气计入储量，须满足储量定义的标准，包括具备可行的开发、集输和市场销售方案。天然气的数量应在回注和随后的开采过程中有所耗减。对于在一个油气藏注气的目的是进行废气处理的情形，在没有确定开发方案情况下，不计入储量。采购的注入天然气量且随后采出，也不计入储量。

3.2.6 Underground Natural Gas Storage

3.2.6.1 Natural gas injected into a gas storage reservoir, which will be recovered later (e.g., to meet peak market demand periods) should not be included as Reserves.

3.2.6.2 The gas placed in the storage reservoir may be purchased or may originate from prior native production. It is important to distinguish injected gas from any remaining native recoverable quantities in the reservoir. On commencing gas production, allocation between native gas and injected gas may be subject to local regulatory and accounting rulings. Native gas production would be drawn against the original field Reserves. The uncertainty with respect to original field quantities remains with the native reservoir gas and not the injected gas.

3.2.6.3 There may be occasions in which gas is transferred from one lease or field to another without a sale or custody transfer occurring. In such cases, the re-injected gas could be included with the native reservoir gas as Reserves.

3.2.6.4 The same principles regarding separation of native resources from injected quantities would apply to underground liquid storage.

3.2.7 Mineable Oil Sand

3.2.7.1 Mineable oil sands that meet the criteria listed in Section 2.1.2 can be considered as a potentially economic material and therefore Reserves. Mining operations may result in mined materials being stockpiled rather than processed. Stockpiled mined oil sands should be included in Reserves only when the project to recover and blend the stockpile has achieved technical and commercial maturity. The project's quantities are not included in Production until measured at the reference point.

3.2.8 Production Balancing

3.2.8.1 Reserves estimates must be adjusted for production withdrawals. This may be a complex accounting process when the allocation of Production among project participants is not aligned with their entitlement to Reserves. Production overlift or underlift can occur in oil production records because participants may need to lift their production in parcel sizes or cargo quantities to suit available shipping schedules agreed upon by the parties. Similarly, an imbalance in gas deliveries can result from the participants having different operating or marketing arrangements that prevent gas quantities sold from being equal to the entitlement share within a given time period.

3.2.6 天然气地下储集

3.2.6.1 注入储气库并后期开采（如满足市场高峰值需求）的天然气量，不应计入储量。

3.2.6.2 储气库贮存的天然气可能是采购的，也可能来源于前期生产的原生天然气。重要的是将注入气与该储层剩余的原生可采量区分开。在天然气投产时，原生天然气和注入气的劈分可参照当地监管规定与会计规则。原生天然气产量应从气田的原始储量中采出。气田原始油气数量的不确定性保持与原生天然气关联，而与注入气无关。

3.2.6.3 某些情况下，天然气从一个矿区或气田转运到另一个矿区或气田，期间不发生出售或委托交付。在这些情况下，回注天然气可以与原生天然气一起计入储量。

3.2.6.4 原生资源数量与注入气的区分原则，同样适用于地下储油库。

3.2.7 油砂矿

3.2.7.1 符合 2.1.2 节标准的可采油砂矿，可视为潜在经济原料，因此可纳入储量。采矿作业可能使得开采的原料被贮存而不是加工。只有当开采与掺混贮存原料的项目达到技术商业成熟度条件，贮存的油砂才能纳入储量。在参照点计量之前，不计入产量。

3.2.8 产量平衡

3.2.8.1 储量估值必须根据采出量的提取情况进行调节。当项目合作伙伴之间的产量分配与他们拥有的储量权益不一致时，这可能是一个复杂的会计核算过程。在原油产量提取记录中可能出现超提或欠提的情形，因为合作伙伴可能需按包装大小或货船数量来提取产量，以满足各方议定的船运计划。同样，天然气交付中不平衡可能是由于合作伙伴的生产作业或市场营销安排有所不同，导致在某一时间段内，天然气的销售量与分成权益不一致。

3.2.8.2 Based on production matching the internal accounts, annual production should generally be equal to the liftings actually made by the entity and not on the production entitlement for the year. However, actual production and entitlements must be reconciled in Reserves assessments. Resulting imbalances must be monitored over time and eventually resolved before project abandonment.

3.2.9 Equivalent Hydrocarbon Conversion

3.2.9.1 The industry sometimes simplifies communication of Reserves, Resources, and Production quantities with the term "barrel of oil equivalent" (BOE). The term allows for consolidation of multiple product types into a single equivalent product. In instances where natural gas is the predominate product, liquids may be converted to gas equivalence (i.e. one thousand cubic feet (MCF) volume = 1 McfGE (MCF gas equivalent)).

3.2.9.2 Oil, condensate, bitumen and synthetic crude oil can be summed together without conversion (i.e., 1 bbl volume = 1 BOE). NGLs may need to be converted, depending on the actual composition. Natural gas and Synthetic Gas must be converted to report on a BOE basis.

3.2.9.3 The presentation of Reserve or Resources quantities should be made in the appropriate units for each individual product type reported (e.g. barrels, cubic meters, metric tonnes, joules, etc.). If BOE's or McfGE's are presented, they must be provided as supplementary information to the actual liquid or gas quantities with the conversion factor(s) clearly stated.

3.3 Resources Entitlement and Recognition

3.3.0.1 While assessments are conducted to establish estimates of the total PIIP and that portion recovered by defined projects, the allocation of sales quantities, costs, and revenues impacts the project economics and commerciality. This allocation is governed by the applicable contracts between the mineral lease owners (lessors) and contractors (lessees) and is generally referred to as entitlement.

3.3.0.2 Evaluators must ensure that, to their knowledge, the recoverable resource entitlements from all participating entities sum to the total recoverable resources.

3.2.8.2 根据产量与内部帐目趋同原则，实体公司的年产量通常应等于其实际提取量，而不是当年的份额产量。然而，在储量评估中，实际产量与份额产量须进行对账核验。须全程监管出现的不平衡情况，并在项目废弃前彻底解决。

3.2.9 烃当量转换

3.2.9.1 在石油行业，有时会采用术语"桶油当量（BOE)"来简化对"储量、资源量和产量"的数量的表述。该术语允许将多个类型的产品整合为一个等价产品。在天然气为主导产品的情形下，液烃也可转化为天然气当量：即，1 千立方英尺液烃（MCF）= 1 千立方英尺天然气当量（McfGE）。

3.2.9.2 原油、凝析油、沥青和合成油可以不经转换进行加合（即，1 桶体积 =1BOE）。天然气液（NGL）可能需要根据实际的组分构成进行转换。天然气和合成气须转换为桶油当量（BOE）进行报告。

3.2.9.3 储量或资源量应以适当的单位（例如，桶、立方米、公吨、焦耳等）呈现所报告的每种产品。如果单位为桶油当量（BOE）或千立方英尺天然气当量（McfGE)，则必须将其作为实际液烃或天然气数量的补充信息予以提供，并明确说明转换系数。

3.3 资源份额与认定

3.3.0.1 在评估总石油原始原地量（total PIIP）和既定项目的可采量时，销售量、成本和收入的配置会影响项目的经济性和商业性。配置方案是由矿区业主（租赁方）和合同者（承租方）签订的适用合同规定，通常称为"份额权益"。

3.3.0.2 评估师必须据所知确保所有合同者的份额可采资源数量之和等于总可采资源数量。

3.3.0.3 The ability for an entity to recognize Reserves and Resources is subject to satisfying certain key elements. These include (a) having an economic interest through the mineral lease or concession agreement (i.e., right to proceeds from sales); (b) exposure to market and technical risk; and (c) the opportunity for reward through participation in exploration, appraisal, and development activities. Given the complexities of some agreements, there may be additional elements that must be considered in determining entitlement and the recognition of Reserves and Resources.

3.3.0.4 For publicly traded companies, securities regulators may set criteria regarding the classes and categories that can be "recognized" in external disclosures. For national interests, the reporting of 100% quantities without concession agreement constraints is typically specified.

3.3.1 Royalty

3.3.1.1 Royalty refers to a type of entitlement interest in a resources project that is free and clear of the costs and expenses of development and production to the royalty interest owner as opposed to a working interest where an entity has cost exposure. A royalty is commonly retained by a resources owner (lessor/ host) when granting rights to a producer (lessee/ contractor) to develop and produce the resources. Depending on the specific terms defining the royalty, the payment obligation may be expressed in monetary terms as a portion of the proceeds of production in-cash or as a right to take a portion of production in-kind. The royalty terms may also provide the option to switch between forms of payment at the discretion of the royalty owner. In either case, royalty quantities must be deducted from the lessee's entitlement to resources so that only net revenue interest quantities are recognized.

3.3.1.2 In some agreements, production taxes imposed by the host government may be referred to as royalties. These payment obligations are expressed in monetary terms and are typically linked to production rates, quantities produced, cost recovery, the value of production (price sensitive), or the profits derived from it. These payments are not associated with an interest retained by the lessor/host. Thus, such payment obligations are effectively a production tax instead of a royalty. In such cases, the production and underlying resources are controlled by the lessee/contractor who may (subject to contractual terms and/or regulatory guidance) elect to report these obligations as a tax without a corresponding reduction in lessor/ contractor's entitlement.

3.3.0.3 实体能否核定储量和资源量，取决于是否满足以下关键要素：（a）通过矿区或合同区租赁许可或合同协议获得经济权益（即销售收益的权利）；（b）承担市场和技术风险；（c）通过参与勘探、评价和开采活动获得回报机会。鉴于一些协定的复杂性，在确定权益和认定储量与资源量时可能还必须考虑其他因素。

3.3.0.4 对于公开交易的上市公司来说，证券监管机构可能会就对外披露中可“认定”的类别和级别设定标准。对于国家层面，若没有合同协议限制，通常规定报告 100% 的数量。

3.3.1 矿费

3.3.1.1 矿费，是指资源项目的一种份额权益；与企业实体的工作权益的成本风险不同，矿业主收取的矿费是免费的，与任何开发生产的成本与费用无关。当矿业主授权生产商（承租方 / 合同者）开发生产资源时，通常会保留矿费。根据矿费规定的具体条款，支付义务可作为产量现金收益的一部分以货币形式表示，也可以是获得部分实物产量的权利。矿业主还可以通过矿费条款的规定自由选择支付方式。无论哪种情况，矿费必须从承租方获得的资源份额中扣除，以便只确认其净收益数量。

3.3.1.2 在某些协议中，资源国征收的生产税可能也被称为“矿费”。这些支付义务以用货币形式表示，并且通常与生产速度、采出量、成本回收、产量价值（对价格敏感）或从中获得的利润相关，与租赁方 / 业主保留的权益无关。因此，这些支付义务实际上是一种生产税，而不是矿费。在这种情况下，控制产量及相关资源的承租方 / 合同者可以根据合同条款和 / 或监管规则选择将这些支付义务作为一项税负进行报告，而不扣减承租方 / 合同者的份额数量。

3.3.1.3 Conversely, if an entity owns a royalty or equivalent interest of any type in a project, the related quantities can be included in resources entitlements and should not be included in entitlements of the others.

3.3.1.3 相反，如果一个实体在一个项目中拥有矿费（或任何类型等同权益），相关数量可计入其资源份额权益，而不能计入其他方的资源份额。

3.3.2 Production-Sharing Contract Reserves

3.3.2 产品分成合同下储量认定

3.3.2.1 Production-sharing contracts (PSCs) of various types are used in many countries instead of conventional tax-royalty systems. Under the PSC terms, producers have an entitlement to a portion of the production. This net entitlement, often referred to as entitlement, occurs when a net economic interest is held by an entity and is estimated using a formula based on the contract terms incorporating costs and profits. The terms of the PSC provide the remuneration to the host government/lessor that would be accomplished by the royalty in other agreements.

3.3.2.2 Ownership of the production is retained by the host government; however, the contractor may receive title to the prescribed share of the quantities when produced or at point of sale and may claim that share as their Reserves.

3.3.2.3 Risk service contracts (RSCs) are similar to PSCs, but the producers may be paid in cash rather than in production. As with PSCs, the Reserves claimed are based on the entity's economic interest as risk is borne by the contractor. Care needs to be taken to distinguish between an RSC and a pure service contract. Reserves can be claimed in an RSC, whereas no Reserves can be claimed for pure service contracts because there is insufficient exposure to petroleum exploration, development, and market risks and the producers act as contractors.

3.3.2.4 Unlike conventional tax-royalty agreements, the cost recovery system in production-sharing, risk- service, and other related contracts typically reduce the production share and hence Reserves entitlement to a contractor in periods of high price and increase quantities in periods of low price. While this ensures cost recovery, it also introduces significant price-related volatility in annual Reserves estimates under cases using a constant case. The terms governing cost recovery in a particular PSC may require special treatment of items such as taxes, overhead, and ADR to determine entitlement.

3.3.2.1 许多国家采用不同类型的产品分成合同（PSC），而不是传统的税负－矿费制。根据产品分成合同的条款，生产商拥有部分产量的权益。该净份额权益，通常称为“份额”，在实体持有净经济权益时生产，并根据合同条款编制的公式结合成本与收益进行估算。产品分成合同为资源国政府 / 租赁方提供的报酬，将由其他协议中的矿费来实现。

3.3.2.2 资源国政府保留产量的所有权；但合同者可以在生产或销售时获得规定的份额数量，并将该分成申报为储量。

3.3.2.3 风险服务合同（RSC）与产品分成合同类似，但生产商可获取现金，而不是产量。与产品分成合同一样，由于风险是由合同者承担，因而实体申报的储量是基于其经济权益。需要注意区分风险服务合同与纯服务合同。风险服务合同可以申报储量，而纯服务合同不能申报储量，因为作为合同者的生产商，不承担足够的石油勘探、开发与市场风险。

3.3.2.4 与传统税负－矿费协议不同，在产品分成合同、风险服务合同和其他相关合同的成本回收机制作用下，高油气价格时期，合同者的产量分成通常会降低，从而导致份额储量也减少；而低油气价格时期，合作者的产量和份额储量的数量则增加。虽然确保了成本回收，但通过恒定方案测试可知，这会在年度储量评估中产生与价格相关的明显波动。在特定产品分成合同中，有关成本回收的条款可能要求对税负、管理费和弃置费进行特定处理，以确定份额权益。

3.3.2.5 The treatment of taxes and the accounting procedures used can also have a significant impact on the Reserves recognized and production reported from these contracts.

3.3.3 Contract Extensions or Renewals

3.3.3.1 As production-sharing or other types of agreements approach the specified end date, extensions may be obtained through contract negotiation, by the exercise of options to extend, or by other means.

3.3.3.2 Reserves cannot be claimed for those quantities that will be produced beyond the expiration date of the current agreement unless there is reasonable expectation that an extension, a renewal, or a new contract will be granted. Such reasonable expectation may be based on the status of renewal negotiations and historical treatment of similar agreements by the license-issuing jurisdiction. Otherwise, forecast production beyond the contract term must be classified as Contingent Resources with an associated reduced chance of commercialization. Moreover, it may not be reasonable to assume that the fiscal terms in a negotiated extension will be similar to existing terms.

3.3.3.3 Similar logic should be applied where gas sales agreements are required to ensure adequate markets. Reserves should not be claimed for quantities that will be produced beyond those specified in the current agreement or that do not have a reasonable expectation to be included in either contract renewals or future agreements.

3.3.2.5 税负的处理和使用的会计程序，也会对这些合同的储量认定和产量产生重大影响。

3.3.3 合同延期或续约

3.3.3.1 当产品分成合同或其他类型协议接近规定的终止日期，可以通过合同谈判、行使延期选择权或其他方式来获得延期。

3.3.3.2 除非对合同延期、续签或新签合同的批准有合理预期，超出现有协议有效期的采出量不能申报储量。这种合理预期可以基于续签合同的谈判进展以及许可证签发机构处理类似合同的历史情况。否则，合同期外的预测产量必须划归为商业几率减小的条件资源量。此外，假设谈判后的延期合同财税条款与现有条款相似，可能是不合理的。

3.3.3.3 同样，需有天然气销售协议，以确保足够的市场需求。对于超出现有协议规定或尚无合理预期的续签或未来协议的采出量，不应申报储量。

4.0 Estimating Recoverable Quantities

4.0.0.1 Assuming that projects have been classified according to project maturity, estimation of associated recoverable quantities under a defined project and assignment to uncertainty categories may be based on one or a combination of analytical procedures. Such procedures may be applied using an incremental and/or scenario approach; moreover, the method of assessing relative uncertainty in these estimates of recoverable quantities may employ both deterministic and probabilistic methods.

4.1 Analytical Procedures

4.1.0.1 The analytical procedures for estimating recoverable quantities fall into three broad categories: (a) analogy, (b) volumetric estimates, and (c) performance-based estimates (e.g., material balance, history- matched simulation, decline-curve analysis, and rate-transient analysis). Reservoir simulation may be used in either volumetric or performance-based analyses. Pre- and early post-discovery assessments typically are made with analog field/project data and volumetric estimation. After production commences and production rates and pressure information become available, performance-based methods can be applied. Generally, the range of EUR estimates is expected to decrease as more information (pressure, performance, and PIIP) becomes available, but this is not always the case.

4.1.0.2 In each procedure evaluated under either the deterministic scenario, deterministic incremental, geostatistical, or probabilistic methods, the results are not a single quantity of remaining recoverable petroleum, but rather a range that reflects the underlying uncertainties in both the in-place quantities and the recovery efficiency of the applied development project. By applying consistent guidelines (see Section 2.2, Resources Categorization), evaluators can define remaining recoverable quantities using the approaches listed above. The confidence in assessment results generally increases when the estimates are supported by more than one analytical procedure.

4.1.1 Analogs

4.1.1.1 Analogs are widely used in resources estimation, particularly in the exploration and early development stages when direct measurement information is limited. The methodology is based on the assumption that the analogous

4.0 可采量估算

4.0.0.1 假定项目已根据成熟度进行了分类，那么可根据一个或多个分析方法来确定一个既定项目的可采量估值及其不确定性分级。这些方法包括增量法和 / 或情景法；此外，可采量估值的不确定性评估可使用确定法和概率法。

4.1 分析方法

4.1.0.1 可采量估算的分析方法可分为三大类：（a）类比法，（b）容积法，（c）动态法（例如，物质平衡法、历史拟合模拟法、产量递减曲线分析以及产量不稳定分析）。可通过容积法或动态法分析来进行油气藏模拟。发现前和发现后早期的评估，通常采用类比油气田 / 项目的数据和容积法评估结果。项目投产后，有了产量和压力数据，则可采用动态法进行评估。通常情况下，随着数据信息（压力、生产动态数据和石油原始原地量等）增多，最终可采量（EUR）估值的分布范围减小，但情况也并非总是如此。

4.1.0.2 无论是采用确定性情景法、确定性增量法、地质统计法或概率法，石油剩余可采量估算结果都不是一个单一的数量，而是反映已实施开发项目原地量与采收率固有的不确定性分布范围。评估师可以根据一致的指导原则（见第 2.2 节，资源分级），应用上述方法确定剩余可采量。当评估结果得到一种以上分析方法支持时，其置信度通常会增加。

4.1.1 类比法

4.1.1.1 类比法广泛应用于资源估算，尤其是直接测量数据信息有限的勘探和早期开发阶段。该方法所依据的假设是：类比油气藏与目标油（气）藏在储层描述、

reservoir is comparable to the subject reservoir in regard to reservoir description, fluid properties, and most likely recovery mechanism(s) applied to the project that control the ultimate recovery of petroleum. By selecting appropriate analogs, where performance data of comparable development plans are available, a similar production profile may be forecast. Analogs are frequently applied for aiding in the assessment of economic producibility, production decline characteristics, drainage area, and recovery factor (for primary, secondary, and tertiary methods).

4.1.1.2 Analogous reservoirs, as used in resources assessments, are defined by similarities of features and characteristics that include but are not limited to the following:

(1) Reservoir deposition and structure (e.g., lithology, depositional environment, diagenetic history, natural fractures, chemical/mineral composition, geometry, mechanical history, and structural deformation).

(2) Petrophysical properties (e.g., net pay and gross thickness, porosity, saturation, permeability, heterogeneity, and net-to-gross ratio).

(3) Reservoir conditions (e.g., depth, temperature and pressure, and size of the petroleum accumulation and aquifer).

(4) Fluid properties (e.g., original fluid type, composition, density, and viscosity).

(5) Drive mechanisms.

(6) Development plan (e.g., well spacing, well type and number, completion methods, artificial lift, development and operating costs, facility type and constraints, and processing).

4.1.1.3 The above list is not exhaustive and the comparative analog characteristics must be relevant to the key characteristics of the project.

4.1.1.4 It is not necessary for all parameters to match to consider a reservoir as an analog. The evaluator should consider the specifics of each application and its suitability in providing insight to assist in the estimation of recoverable resources.

4.1.1.5 Comparison to several analogs, rather than a single analog, often improves the understanding of the range of uncertainty in the estimated recoverable quantities from the subject reservoir. While reservoirs in the same geographic area and of the same geological age typically provide better analogs, such proximity alone may not be the primary consideration. In all cases, evaluators should document the similarities and differences between the analog and the subject reservoir/project. Review of analog reservoir performance is useful in quality assurance of resources assessments at all stages of development.

流体性质以及项目用以控制最终石油可采量的最可能开采机理等方面具有可比性。通过选择恰当的类比油气藏，获得类比开发方案的生产动态数据，就可以预测相似的产量剖面。类比法经常用于辅助经济产能、产量递减特征、泄油面积和采收率（对应一次、二次和三次开采方式）的评估。

4.1.1.2 资源评估采用的类比油气藏，是根据特点与特征的相似性进行定义，包括（但不限于）：

（1）储层的沉积与构造（例如，岩性、沉积环境、成岩历史、天然裂缝、化学/矿物组分、几何形状、力学史和构造变形）。

（2）岩石物性（例如，有效厚度和总厚度、孔隙度、饱和度、渗透率、非均质性和净毛比）。

（3）油气藏条件（例如，深度、温度与压力、石油聚集体与地下水体的大小）。

（4）流体特性（例如，原始流体类型、组分、密度和黏度）。

（5）驱替机理。

（6）开发方案（例如，井距、井型与井数、完井方式、人工举升、开发与作业成本、设施类型与限制以及加工处理）。

4.1.1.3 以上清单并非详尽无遗，可对比的类比特征必须是项目的关键特征。

4.1.1.4 考虑类比油气藏，不需要所有参数都匹配。评估师应考虑具体应用的情况及适用性，以提供有助于可采资源评估的见解。

4.1.1.5 选用多个（而不是一个）类比油气藏，往往可以提升对目标油气藏可采量不确定性范围的理解。虽然同一地理区域和相同地质时代的储层通常可以提供更好的类比油气藏，但单独考虑这种邻近性可能不是首要的。无论什么情况下，评估师应记录类比油气藏/项目与目标油气藏/项目之间的相似和不同之处。在开发的各个阶段对类比油气藏的生产动态进行审查，有利于资源评估的质量保障。

4.1.2 Volumetric Analysis

4.1.2.1 This procedure uses reservoir rock and fluid properties to calculate PIIP and then estimate that portion that will be recovered by a specific development project. The volumetric estimate may be based on either probabilistic or deterministic approaches. A probabilistic approach is typically applied in the early development stages when data are most limited. As the project matures through development, the evaluation methodology often shifts towards deterministic estimates.

4.1.2.2 The key uncertainties affecting in-place quantities include but are not limited to the following:

(1) Reservoir geometry, heterogeneity, compartmentalization, and trap limits that impact gross rock volume.

(3) Geological characteristics that define pore volume and petroleum saturation distribution.

(4) Position and nature of contacts or limits [e.g., lowest known hydrocarbons (LKH), oil/water contact, gas/water contact (GWC), gas/oil contact, and tilted contact gradient].

(5) Combinations of reservoir quality, fluid types, and contacts that control saturation distributions (vertically and horizontally).

4.1.2.3 The gross rock volume of interest is that for the total reservoir. While spatial distribution and reservoir quality impact recovery efficiency, the calculation of in-place petroleum often uses average net- to-gross ratio, porosity, and fluid saturations. In more complex reservoirs, increased well density may be required to confidently evaluate, assess, and categorize resources.

4.1.2.4 Given estimates of the in-place petroleum, the portion that can be recovered by a defined set of wells and operating conditions must then be estimated based on analog field performance and/or modeling/ simulation studies using available reservoir information. Key assumptions must be made regarding reservoir drive mechanisms.

4.1.2.5 The estimates of recoverable quantities must reflect the combined uncertainties in the petroleum in- place and the recovery efficiency of the development project(s) applied to the reservoir.

4.1.2 容积法

4.1.2.1 该方法是采用油气藏的岩石和流体性质来计算石油原始原地量（PIIP），然后估算通过一个特定开发项目可采出的部分。容积法估算可基于概率法或确定法。概率法通常用于数据有限的早期开发阶段。随着开发过程中项目成熟度的增加，评估方法往往转为确定法。

4.1.2.2 影响原地量的主要不确定性因素，包括（但不限于）以下方面：

（1）油气藏几何形状、非均质性、区块封隔，以及影响岩石总体积的圈闭界限。

（2）确定孔隙体积和油气饱和度分布的地质特征。

（3）流体界面或界限的位置与性质[例如，已知烃底（LKH）、油/水界面、气/水界面、气/油界面，以及倾斜界面的梯度]。

（4）储层质量、流体类型以及控制饱和度分布（垂向和水平）的流体界面的组合。

4.1.2.3 关注的岩石总体积是整个油气藏的体积。虽然其空间分布和油气藏的质量会影响采收率，但石油原地量的计算往往是采用净毛比、孔隙度和流体饱和度的均值。在比较复杂的油气藏中，可能要求增加井的密度，以提高评价、评估和分级的置信程度。

4.1.2.4 若给定石油原地量估值，那么基于类比油气田的生产动态和/或利用可获得的信息开展建模/数模研究，一定可以估算出一套确定井网和开采条件下的可采量。这里，必须对油气藏的驱替机理做出关键性假设。

4.1.2.5 可采量的估算必须反映石油原地量和开发项目采收率的综合不确定性。

4.1.3 Material Balance Analysis

4.1.3.1 Material balance methods used to estimate recoverable quantities involve the analysis of pressure behavior as reservoir fluids are withdrawn. In ideal situations, such as depletion-drive gas reservoirs in homogeneous, high-permeability reservoir rocks and where sufficient and high-quality pressure data are available, estimation based on material balance may provide very reliable estimates of ultimate recovery at various abandonment pressures. In complex situations, such as those involving water influx, compartmentalization, multiphase behavior, and multilayered or low-permeability reservoirs, shales or CBM, material balance estimates alone may provide erroneous results. Evaluators should take care to accommodate the complexity of the reservoir and its pressure response to depletion in developing uncertainty profiles for the applied recovery project.

4.1.3.2 Reservoir modeling or reservoir simulation can be considered a more rigorous form of material balance analysis. While such modeling can be a reliable predictor of reservoir behavior under a defined development program, the reliability of input rock properties, reservoir geometry, relative permeability functions, fluid properties, and constraints (e.g., wells, facilities, and export) are critical. Predictive models are most reliable in estimating recoverable quantities when there is sufficient production history to validate the model through history matching.

4.1.4 Production Performance Analysis

4.1.4.1 Analysis of the change in production rate and production fluid ratios versus time and versus cumulative production as reservoir fluids are withdrawn provides useful information to predict ultimate recoverable quantities. In some cases, before production decline rates become apparent, trends in performance indicators such as gas/oil ratio, water/oil ratio, condensate/gas ratio, and bottomhole or flowing pressures can be extrapolated to economic limit conditions to estimate Reserves.

4.1.4.2 Reliable results require a sufficient period of stable operating conditions after wells in a reservoir have established drainage areas. In estimating recoverable quantities, evaluators must consider additional factors affecting production performance behavior, such as variable reservoir and fluid properties, transient versus stabilized

4.1.3 物质平衡分析

4.1.3.1 物质平衡法估算可采量，需要分析油气藏流体在采出过程中的压力变化。在理想情况下，例如在均质、高渗的天然气藏进行衰竭式开采，若有足够和高质量的压力数据，那么通过物质平衡法评估，可以非常可靠地获得不同废弃压力下的最终可采量。在复杂的情况下，如水侵、区块封隔、多相流、层状或低渗透储层、页岩油气或煤层气（CBM），单一使用物质平衡法可能会导致错误结果。评估师在落实已执行开发项目的不确定性剖面时，应仔细考虑油气藏的复杂性以及开采过程中的压力响应。

4.1.3.2 油气藏建模或油气藏数值模拟可视为一种更为严谨的物质平衡分析方式。虽然这种模型可以在确定的开发计划下可靠预测油气藏的动态，但所输入的岩石性质、油气藏形态、相渗函数、流体性质以及约束条件（如井、设施和外输）的可靠性都是至关重要的。当有足够的生产历史采用历史拟合方法来校验模型时，预测模型对可采量的估算是最可靠的。

4.1.4 生产动态分析

4.1.4.1 随着油气藏流体的开采，对产量变化以及产液比率随时间和累计产量的变化关系进行分析，可为最终可采量的预测提供有用信息。某些情况下，在生产速率明显衰减之前，可通过外推气 / 油比（GOR）、水 / 油比（WOR）、凝析油 / 气比（CGR）以及井底压力或流动压力等动态指标的趋势至经济极限，来估算储量。

4.1.4.2 要得到可靠的分析结果，需要油气藏的井网在控制泄油面积之后，有足够长的稳采期。评估可采量时，评估师还必须考虑影响生产动态特征的其他因

flow, changes in operating conditions, interference effects, and depletion mechanisms. In early stages of depletion, there may be significant uncertainty in both the ultimate performance profile and the other factors (e.g., operational, regulatory, contractual) factors that impact abandonment rate. Such uncertainties should be reflected in the reserves categorization.

4.1.4.3 For mature reservoirs, the future production forecast may be sufficiently well defined that the remaining uncertainty in the technical profile is not significant; in such cases, the best estimate 2P scenario may be justifiable to also use for the 1P and 3P production forecasts. Other uncertainties (e.g., operational, regulatory, contractual) that will impact the abandonment rate may still exist, however, and these should be accommodated in the reserves categorization uncertainty range.

4.1.4.4 In very low-permeability reservoirs (e.g., unconventional reservoirs), care should be taken in the production performance analyses because the lengthy period of transient flow and complex production physics can make analyses very difficult.

素，如变化的油藏与流体性质，不稳定流与稳态流、作业条件变化、井间干扰、衰竭机理等。在衰竭开采的早期阶段，影响废弃产量的最终动态剖面和其他因素（例如，作业、监管、合同）都可能存在很大不确定性，这些不确定性应反映在储量的分级中。

4.1.1.3 对于成熟油气藏，其未来产量预测可能已足够确定，那么技术剖面中剩余的不确定性并不显著；在这种情况下，最佳估值（2P）情景方案也可以用于 1P 和 3P 方案的产量预测。但是，影响废弃产量的其他不确定性（例如，作业、监管、合同）因素可能仍然存在，这些因素应考虑在储量分级的不确定性范围之中。

4.1.4.4 对于渗透率很低的油气藏（例如非常规油气藏），在进行生产动态分析时要格外小心，因为不稳定流周期长且生产特征复杂，分析难度大。

4.2 Resources Assessment Methods

4.2.0.1 Regardless of the analytical procedures used, the goal is to communicate the range of uncertainty in the recoverable resources. An underlying principle is that the reliability of the estimates depends on the quantity and quality of the source data.

4.2.0.2 In all methods, as confidence away from a known productive area decreases, the uncertainty in the ability to estimate recoverable quantities increases. In assessing the range of uncertainty in recovery from a project, the evaluator should consider the uncertainty in all components of a project, including that forecast from existing and future wells. Additionally, an increasing diversity in data sources, such as well logs, cores, seismic, or production history, will provide an increased confidence in the resources estimates.

4.2.0.3 Assessment methods may be broadly characterized as deterministic, geostatistical, and probabilistic and may be applied in combination for integrated uncertainty analysis.

4.2 资源评估方法

4.2.0.1 无论采用何种分析方法，目的都是表述可采资源数量的不确定性范围。一个基本原则是，评估的可靠性取决于数据源的数量与质量。

4.2.0.2 在所有方法中，远离已知生产区会导致置信度降低，可采量估算的不确定性增大。评估师在评估一个项目的可采量不确定性范围时，应考虑项目所有因素的不确定性，包括对老井和未来新井的预测。另外，数据来源的多样性增加，如测井、岩芯、地震或生产历史等，将提高资源评估的置信度。

4.2.0.3 评估方法可概括为确定法、地质统计法和概率法，并可在不确定性综合分析中合并应用。

4.2.1 Deterministic Method

4.2.1.1 In the deterministic method, quantities are

4.2.1 确定法

4.2.1.1 在确定法中，其估算结果是

estimated by taking a discrete value or array of values for each input parameter to produce a discrete result. For the low-, best- and high-case estimates, the internally consistent deterministic inputs are selected to reflect the resultant confidence of the project scenario and the constraints applied for the resources category and resources class. A single outcome of recoverable quantities is derived for each deterministic increment or scenario. Two approaches are included in the deterministic method—the scenario (or cumulative) method and the incremental method—and should yield similar results.

4.2.1.2 In the deterministic scenario method, the evaluator provides three estimates of the quantities to be recovered from the project being applied to the accumulation. Estimates consider the full range of values for each input parameter based on available engineering and geoscience data, but one set is selected that is most appropriate for the corresponding resources confidence category. A single outcome of recoverable quantities is derived for each category. Thus, low, best and high estimates for the total project reflect uncertainty and consider confidence constraints of the categories. The low case should take into account specific choices for some variables (e.g., contact assumptions).

4.2.1.3 The deterministic incremental method is based on defining discrete parts or segments of the accumulation that reflect high, best, and low confidence regarding the estimates of recoverable quantities under the defined development plan. Typically, this approach is applied to different segments of the accumulation based on considerations of well spacing and/or geological knowledge (i.e., the different degrees of confidence are governed by distance from known data). The individual segment estimates reflect realistic combinations of parameters, and care is required to ensure that a reasonable range is used for the uncertainty in reservoir property averages (e.g., average porosity) and that interdependencies are accounted for (e.g., a high gross rock volume estimate may have a low average porosity).

4.2.1.4 While deterministic estimates may have broadly inferred confidence levels, these estimates do not have associated quantitatively defined probabilities. Nevertheless, the ranges of the probability guidelines established for the probabilistic method (see Section 2.2.1, Range of Uncertainty) influence the amount of uncertainty generally inferred in the estimate derived from the deterministic method.

通过为每个输入参数选取一个离散数值或一组数值来产生的一个离散结果。在对低估值、最佳估值和高估值情景方案进行预测时，选择协调一致的确定性输入参数以反映相应项目情景的置信度以及资源分类分级的约束条件。每种确定性增量法或情景法都可以得到一个单一可采量结果。确定法包含的两种方法——情景法（或累积量）和增量法，应得到相似结果。

4.2.1.2 在确定性情景法中，评估师将为油气聚集所采用的项目提供三个可采量估值。估算是在工程与地球科学数据基础上，考虑每个输入参数的全部数值范围，但选择最适合相应资源置信度级别的一组数值。每个资源级别可获得一个单一的可采量估值。因此，整个项目的低估值、最佳估值和高估值反映了不确定性，并考虑各级别的置信度约束条件。项目的低估值应考虑一些变量（如假设的流体界面）的特定选择。

4.2.1.3 确定性增量法，是基于对油气聚集进行离散的区域划分或层段划分，以分别反映既定开发方案可采量估值的高、最佳和低置信度。通常，该方法可根据井距和/或地质知识（不同的置信度受控于与已知数据的距离），应用于油气聚集的不同层段。单个层段的评估要反映参数的现实组合，需要注意确保油气藏物性的均值（例如，平均孔隙度）的不确定性合理范围，并考虑参数之间的关联性（例如，岩石总体积高估值有可能关联低的平均孔隙度）。

4.2.1.4 虽然确定性估值可能有宽泛的推断置信度，但并没有相应定量化的概率定义。然而，概率法关于概率分布范围的指南（见第 2.2.1 节，不确定性范围）可以对确定法估值的不确定性产生影响。

4.2.2 Geostatistical Method

4.2.2.1 Geostatistical methods are a variety of mathematical techniques and processes dealing with the collection, methods, analysis, interpretation, and presentation of large quantities of geoscience and engineering data to (mathematically) describe the variability and uncertainties within any reservoir unit or pool. Geostatistical methods can be used to preserve spatial distribution information in the static reservoir model and to incorporate it in subsequent reservoir simulation applications. Such processes may yield improved estimates of the range of recoverable quantities. For example, incorporating seismic analyses typically improves the understanding of reservoir models and can contribute to more reliable resources estimates.

4.2.2.2 Where large amounts of well production data and associated EUR estimates are available, statistical methods can be applied to yield distributions that underpin Reserves categorization. When this is done, the comparability of the wells and reservoirs in the historically developed area with the target area should be considered before accepting such data as appropriate.

4.2.3 Probabilistic Method

4.2.3.1 In the probabilistic method, the evaluator defines a distribution representing the full range of possible values for each input parameter. This includes dependencies between parameters that must also be defined and applied. These distributions are randomly sampled (e.g., using stochastic geological modelling or Monte Carlo simulation) to compute a full distribution of potential in-place or recoverable quantities. Because the outcome of the resources estimates is directly linked to the input parameter distributions (both type of distribution and range), it is critically important that the evidence for each of the input distributions is properly justified and fully documented.

4.2.3.2 This approach is most often applied to volumetric resources calculations in the early phases of exploration, appraisal and development projects. The resources categorization includes confidence criteria that provide limits to parameters associated with each category. Moreover, the resources analysis must consider commercial uncertainties. Accordingly, when probabilistic methods are used, constraints on parameters may be required to ensure that results are not outside the range imposed by the deterministic guidelines and commercial uncertainties. Likewise, tests on alternative parameter distributions should be performed to fully consider the uncertainties.

4.2.2 地质统计法

4.2.2.1 地质统计法，是指大量地球科学与工程数据的采集、处理、分析、解释和展现的多种数学技术和过程，以（在数学上）描述任何储层单元或单层的可变性与不确定性。地质统计法可用于保存静态储层模型的空间分布信息，并将其纳入后续的油气藏模拟应用中。该方法可以改善可采量的估值范围。例如，结合地震分析通常可以提高对储层模型的理解，有助于更可靠的资源评估。

4.2.2.2 在有大量生产数据及相应最终可采量（EUR）估值的情况下，地质统计法可用于分析支撑储量分级的产量分布。这样做时，在接受这些数据之前，应考虑历史已开发区与目标区的井与油气藏的可比性。

4.2.3 概率法

4.2.3.1 在应用概率法时，评估师为每个输入参数定义一个分布来表示其可能数值的全部范围。这包括必须加以定义和应用的参数之间的相关性。这些分布是通过随机抽样获得（例如，采用随机地质建模或蒙特卡罗模拟法），用以计算潜在原地量或可采量的完整分布。由于资源数量的估算结果与输入参数的分布（包括分布类型与范围）直接关联，因此每个输入分布的依据都有适当理由并完整记录，是至关重要的。

4.2.3.2 该方法最常用于勘探、评价和开发项目早期阶段的容积法资源计算。资源分级（包括其置信度标准）为各级别的关联参数提供限制条件。此外，资源分析必须考虑商业不确定性。相应地，使用概率法时，可能需对参数进行约束，以确保结果不超出确定性指导原则与商业不确定性允许的范围。同样，应对其他备选参数分布进行测试，以充分考虑不确定性。

4.2.3.3 When using the probabilistic approach, the resultant P90, P50, and P10 scenarios should reconcile with the deterministically derived quantities for the low-, best-, and high-estimate cases, respectively. Among the key comparative inputs to the probabilistic results are the contacts, specifically for the LKH, and the areal extent.

4.2.4 Integrated Methods

4.2.4.1 Resources assessments typically employ different methods as appropriate at each stage of exploration, appraisal, and development and often integrate several methods to better define the uncertainty.

4.2.4.2 An example of integration is the multi-scenario method, which is an extension of the deterministic scenario method. In this case, a significant number of discrete deterministic scenarios of the defined project (in the Reserves class) are developed by the user, with each scenario leading to a single deterministic outcome. Probabilities may be assigned to each discrete input assumption from which the probability of the scenario can be obtained; alternatively, each outcome may be assumed to be equally likely. Given sufficient scenarios (which may be supported through the use of experimental design techniques), it is possible to develop a full pseudo-probability distribution from which the three specific deterministic scenarios that lie close to P90, P50, and P10 probability levels may be selected for evaluation to confirm confidence levels of each of the categories. The low case must take into account specific choices for some variables (e.g., fluid contact assumptions). When the multi-scenario method is used in Contingent Resources, it allows for alternative scope of the project (e.g., range of well counts, development schemes).

4.2.4.3 Deterministic, geostatistical, and probabilistic methods may be used in combination to ensure that results of the methods are reasonable.

4.2.5 Aggregation Methods

4.2.5.1 Oil and gas quantities are generally estimated and categorized according to certainty of recovery within individual reservoirs or portions of reservoirs; this is referred to as a “reservoir level” assessment. These estimates are summed to

4.2.3.3 使用概率法时，得到的 P90、P50 和 P10 情景方案结果应分别与确定法的低估值、最佳估值和高估值一致。影响概率法估算结果的关键输入参数是流体界面（特别是已知烃底）和面积。

4.2.4 综合法

4.2.4.1 在勘探、评价和开发各个阶段，通常采用不同的适用方法进行资源评估，并时常结合多种方法进行一体化综合应用，以便更好地定义不确定性。

4.2.4.2 综合法的一个应用案例是多情景法，它是确定性情景法的扩展。在多情景法中，用户为既定项目（处于储量类别）编制大量离散的确定性情景方案（每个情景方案有一个单一确定性结果）。可为每个离散的输入参数（假定）配置概率分布，以获取情景方案估值的概率分布；或者，假设每个结果都有相同的可能性。如果情景方案足够多（可通过实验设计技术支持），就有可能获得一个完整的可以计算出完整的“拟概率分布曲线”，选择三个邻近 P90、P50 和 P10 的确定性情景方案进行评价，并确保每个储量级别的置信度水平。低估值方案必须考虑一些变量（如假设的流体界面）的特定选择。当多情景法用于条件资源量估算时，项目的工作内容（如井数、开发计划等）可以存在选择范围。

4.2.4.3 可采用确定法、地质统计法和概率法相结合的方法，以确保这些方法的估算结果合理可靠。

4.2.5 汇并方法

4.2.5.1 石油天然气的数量，通常是基于单个油气藏或部分油气藏采出量的确定性进行评估与分级，这称为“油气藏层级”的评估。将这些评估结果进行汇总，

arrive at estimates for fields, properties, and projects. Further summation is applied to yield totals for geographic areas, countries, and companies; these are generally referred to as "resources reporting levels." The uncertainty distribution of the individual estimates at each of these levels may differ widely, depending on the geological settings and the maturity of the resources. This cumulative summation process is generally referred to as aggregation.

4.2.5.2 Two general methods of aggregation may be applied: arithmetic summation of estimates by category and statistical aggregation of probability distributions. There are typically significant differences in results from these alternative methods. In statistical aggregation, except in the rare situation when all the reservoirs being aggregated are totally dependent, the P90 (high degree of certainty) quantities from the aggregate are always greater than the arithmetic sum of the reservoir level P90 quantities, and the P10 (low degree of certainty) of the aggregate is always less than the arithmetic sum of P10 quantities assessed at the reservoir level. This "portfolio effect" is the result of the central limit theorem in statistical analysis. Note that the mean (arithmetic average) of the sums is equal to the sum of the means; that is, there is no portfolio effect in aggregating mean values.

4.2.5.3 In practice, there may be a large degree of dependence between reservoirs in the same field, and such dependencies must be incorporated in the probabilistic calculation. When dependency is present and not accounted for, aggregation will overestimate the low estimate and underestimate the high estimate.

4.2.5.4 The aggregation method used depends on the purpose. It is recommended that for reporting purposes, assessment results should not incorporate statistical aggregation beyond the field, property, or project level. Results reported beyond this level should use arithmetic summation by category but should caution that the aggregate Proved may be a very conservative estimate and aggregate 3P may be very optimistic, depending on the number of items in the aggregate. Aggregates of 2P results typically have less portfolio effect, which may not be significant in mature properties where the median approaches the mean of the resulting distribution.

就可以得到油气田、资产组或项目层级的结果。再进一步汇总，可得到各地理区域、国家和公司的总量；通常称之为“资源报告层级”。每个层级单项估值的不确定性分布范围可能差异很大，这取决于地质条件和资源的成熟度。通常，这种累积加合的过程称为“汇并”。

4.2.5.2 可采用两种常用汇并方法：按级别进行算术求和，以及按概率分布进行统计汇并。这两种替代方法的结果通常存在显著差异。采用统计汇并时，除了所有储层完全相关的罕见情况外，汇并曲线 P90 值（高确定度）总是大于油气藏层级 P90 估值的算术求和；而其 P10 值（低确定度）总是小于油气藏层级 P10 估值的算术求和。这种“组合效应”是统计分析中的中心极限定理的结果。需注意的是，总和（即统计汇并结果）的均值（算术平均值）等于均值（即油气藏层级估值均值）的总和，也就是说，均值的汇并不存在“组合效应”。

4.2.5.3 实际应用中，同一油气田储层之间可能存在很大相关性，在概率法计算中必须考虑这种相关性。当相关性存在，却未能考虑时，汇并结果将是：低估值高评，高估值低评。

4.2.5.4 汇并方法的应用取决于其目的。对于报告（披露）数据，建议评估结果不应包括超出油气田、资产或项目层级的统计汇并数据。超出这些层级的报告（披露）数据应按级别算术求和，但应注意，这样得到的 P1（证实）储量会非常保守，而 3P 储量可能非常乐观，这取决于汇并的估值数量。2P 结果的汇并，通常组合效应比较小；成熟资产的组合效应可能也不明显，因为其估值的均值接近于结果分布的中值。

4.2.5.5 Various techniques are available to aggregate deterministic and/or probabilistic field, property, or project assessment results for the purposes of detailed business unit or corporate portfolio analyses where the results incorporate the benefits of portfolio size and diversification. Again, aggregation should incorporate the degree of dependency. Where the underlying analyses are available, comparison of arithmetic and statistical aggregation results may be valuable in assessing the impact of the portfolio effect. Whether deterministic, geostatistical, or probabilistic methods are used, care should be taken to avoid systematic bias in the estimation process.

4.2.5.6 It is recognized that the monetary value associated with petroleum recovery is dependent on the production and cash flow schedules for each Project; thus, aggregate distributions of recoverable quantities may not be a direct indication of corresponding uncertainty distributions of aggregate value.

4.2.6 Aggregating Resources Classes

4.2.6.1 Petroleum quantities classified as Reserves, Contingent Resources, or Prospective Resources should not be aggregated with each other without a clear understanding and explanation of the technical and commercial risk involved with their classification. In particular, there may be a chance that accumulations containing Contingent Resources and/or Prospective Resources will not achieve commercial maturity.

4.2.6.2 Where the associated discovery and commerciality chances have been quantitatively defined, statistical techniques may be applied to incorporate individual project estimates in portfolio analysis of quantity and value.

4.2.5.5 可采用各种技术，对油气田、资产或项目的确定法和 / 或概率法评估结果进行汇并，以支持公司具体业务或投资组合分析（包括投资组合规模和多样性的优化）。再次重申，汇并应考虑相关性。在有基础分析的情况下，将算术求和与统计汇并的结果进行对比，可能有助于评估组合效应的影响。无论是采用确定法、地质统计法还是概率法，都应注意避免评估过程中的系统偏差。

4.2.5.6 人们认识到，石油开采量的货币价值取决于每个项目的产量与现金流计划剖面。因此，可采量的汇并分布，可能并不直接表示汇并价值的不确定性分布。

4.2.6 资源类别的汇并

4.2.6.1 若未明确理解和说明资源分类的技术与商业风险，储量、条件资源量或远景资源量的石油数量不应相互汇并。尤其是，拥有条件资源量和 / 或远景资源量的油气聚集可能存在无法达到商业性成熟度的几率。

4.2.6.2 如果已定量确定发现几率和商业几率，则可应用统计技术，将项目的单一估值纳入资源数量与价值的组合分析。

Table 1　Recoverable Resources Classes and Sub-Classes
表 1　可采资源的类别和亚类

Class/Sub-Class 类别 / 亚类	Definition 定义	Guidelines 指南
Reserves 储量	Reserves are those quantities of petroleum anticipated to be commercially recoverable by application of development projects to known accumulations from a given date forward under defined conditions. 储量，是指确定条件下，自给定日期起，预期可通过开发项目从已知油气聚集中商业开采的石油数量。	Reserves must satisfy four criteria: discovered, recoverable, commercial, and remaining based on the development project(s) applied. Reserves are further categorized in accordance with the level of certainty associated with the estimates and may be sub-classified based on project maturity and/or characterized by the development and production status. 储量必须满足四个条件（基于已实施开发项目）：已发现的、可采的、商业的和剩余的。储量可根据估值的不确定性范围进一步分级，并基于项目的成熟度进行次级分类和 / 或采用开发和生产状态进行表征。 To be included in the Reserves class, a project must be sufficiently defined to establish its commercial viability (see Section 2.1.2, Determination of Commerciality). This includes the requirement that there is evidence of firm intention to proceed with development within a reasonable time-frame. 要纳入储量类别 , 一个项目必须充分定义，以确定其商业可行性（见第 2.1.2 节，商业性的确定），包括要求存在证据表明合理时间表内将进行开发的坚定意愿。 A reasonable time-frame for the initiation of development depends on the specific circumstances and varies according to the scope of the project. While five years is recommended as a benchmark, a longer time-frame could be applied where, for example, development of an economic project is deferred at the option of the producer for, among other things, market-related reasons or to meet contractual or strategic objectives. In all cases, the justification for classification as Reserves should be clearly documented. 启动开发的合理时间表取决于具体情况，并根据项目的内容范围而有所不同。虽然推荐以五年作为合理时间表的基准，但如果一个经济项目的开发因市场因素或者为了达到合同或战略目标而由生产商推迟开发，可采用更长时间表。任何情况下，储量划分的依据都应清晰记录在案。 To be included in the Reserves class, there must be a high confidence in the commercial maturity and economic producibility of the reservoir as supported by actual production or formation tests. In certain cases, Reserves may be assigned on the basis of well logs and/or core analysis that indicate that the subject reservoir is hydrocarbon-bearing and is analogous to reservoirs in the same area that are producing or have demonstrated the ability to produce on formation tests. 要纳入储量类别，油气藏的商业成熟度和经济产能必须具有高置信度，并得到实际生产或地层测试结果的支持。在某些情况下，当测井和 / 或岩芯分析表明，目标油气藏含有油气，并且可与同一地区正生产油气藏类比或经地层测试证实产能的，可核定储量。
On Production 在生产	The development project is currently producing or capable of producing and selling petroleum to market. 开发项目当前正在生产或能够生产，并正向市场出售石油。	The key criterion is that the project is receiving income from sales, rather than that the approved development project is necessarily complete. Includes Developed Producing Reserves. 关键判据是项目是否有销售收入，而不是已批准开发项目是否一定完成。此亚类包括“已开发正生产储量”。 The project decision gate is the decision to initiate or continue economic production from the project. 项目决策关口：项目启动或继续经济生产的决策。

Continued
续表

Class/Sub-Class 类别 / 亚类	Definition 定义	Guidelines 指南
Approved for Development 已批准开发	All necessary approvals have been obtained, capital funds have been committed, and implementation of the development project is ready to begin or is under way. 已获得所有必要批准，资本资金已承诺，开发项目的实施已准备就绪或正在实施。	At this point, it must be certain that the development project is going ahead. The project must not be subject to any contingencies, such as outstanding regulatory approvals or sales contracts. Forecast capital expenditures should be included in the reporting entity's current or following year's approved budget. 在这点上，必须确信开发项目正在推进中。项目不受任何或有因素（如未获监管批准或无销售合同）影响。预测资本支出应已列入报告实体本年度或下年度的已批准预算。 The project decision gate is the decision to start investing capital in the construction of production facilities and/or drilling development wells. 项目决策关口：在生产设施建设中启动资本投资和 / 或钻开发井的决策。
Justified for Development 已论证可开发	Implementation of the development project is justified on the basis of reasonable forecast commercial conditions at the time of reporting, and there are reasonable expectations that all necessary approvals/contracts will be obtained. 基于报告时对商业条件的合理预测，开发项目的实施是合理可行的，并对获取所有必要批准 / 合同有合理预期。	To move to this level of project maturity, and hence have Reserves associated with it, the development project must be commercially viable at the time of reporting (see Section 2.1.2, Determination of Commerciality) and the specific circumstances of the project. All participating entities have agreed and there is evidence of a committed project (firm intention to proceed with development within a reasonable time-frame). There must be no known contingencies that could preclude the development from proceeding (see Reserves class). 要达到这一项目成熟度水平，并因此获得相应的储量，开发项目在报告时的具体状态必须具有商业可行性（见第 2.1.2 节，商业性的确定）。所有参与合作的实体均已同意，且有证据表明项目已承诺（有坚定意愿在合理时间框架内进行开发）。不得有任何可能阻止开发实施的已知或有因素（见“储量”类别）。 The project decision gate is the decision by the reporting entity and its partners, if any, that the project has reached a level of technical and commercial maturity sufficient to justify proceeding with development at that point in time. 项目决策关口：项目的技术和商业性成熟度水平足以证明开发作业的合理性，需实体及其合作伙伴（如果有的话）做出决策。
Contingent Resources 条件资源量	Those quantities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations by application of development projects, but which are not currently considered to be commercially recoverable owing to one or more contingencies. 指在给定日期估算的，通过开发项目，可从已知油气聚集中潜在开采的石油数量；但由于一项或多项或有因素，该开发项目目前尚无商业可采性。	Contingent Resources may include, for example, projects for which there are currently no viable markets, where commercial recovery is dependent on technology under development, where evaluation of the accumulation is insufficient to clearly assess commerciality, where the development plan is not yet approved, or where regulatory or social acceptance issues may exist. 条件资源量可以包括以下项目，例如，目前没有可行市场、商业可采量依赖正开发技术、对油气聚集体的评估不足以确定商业性、开发方案尚未批准、或可能存在监管或社会认可问题的项目。 Contingent Resources are further categorized in accordance with the level of certainty associated with the estimates and may be sub-classified based on project maturity and/or economic status. 条件资源量可进一步根据估值的确定程度分级，并应根据项目成熟度和 / 或经济状况进行次级分类。

Continued
续表

Class/Sub-Class 类别 / 亚类	Definition 定义	Guidelines 指南
Development Pending 待开发	A discovered accumulation where project activities are ongoing to justify commercial development in the foreseeable future. 项目正在已发现油气聚集开展作业活动，以证明在可预见未来实现商业开发的合理性。	The project is seen to have reasonable potential for eventual commercial development, to the extent that further data acquisition (e.g., drilling, seismic data) and/or evaluations are currently ongoing with a view to confirming that the project is commercially viable and providing the basis for selection of an appropriate development plan. The critical contingencies have been identified and are reasonably expected to be resolved within a reasonable time-frame. Note that disappointing appraisal/evaluation results could lead to a reclassification of the project to Development On Hold or Development Not Viable status. 该项目被认为具有合理的商业开发潜力，目前正进一步采集数据（例如，钻井、地震数据）和 / 或开展评估，以确认该项目是商业可行的，并为适当开发方案的选择提供基础。已查明关键或有因素，并合理预期可在合理时期内加以解决。需注意，令人失望的评价 / 评估结果，可能导致将项目重新划分为“延迟开发”或“开发不可行”亚类状态。 The project decision gate is the decision to undertake further data acquisition and/or studies designed to move the project to a level of technical and commercial maturity at which a decision can be made to proceed with development and production. 项目决策关口：关于进一步采集数据和 / 或开展研究的决策，旨在将提升项目的技术和商业成熟度，以便决策继续开发和生产。
Development on Hold 延迟开发	A discovered accumulation where project activities are on hold and/or where justification as a commercial development may be subject to significant delay. 项目在已发现油气聚集的作业活动已暂停，且 / 或商业开发的合理依据可能会严重延误。	The project is seen to have potential for commercial development. Development may be subject to a significant time delay. Note that a change in circumstances, such that there is no longer a probable chance that a critical contingency can be removed in the foreseeable future, could lead to a reclassification of the project to Development Not Viable status. 该项目被认为具有商业开发潜力。开发可能严重延误。需注意情况的变化，如在可预见的未来不再存在消除关键或有因素的可能，则可能导致将项目重新划分为“开发不可行”亚类状态。 The project decision gate is the decision to either proceed with additional evaluation designed to clarify the potential for eventual commercial development or to temporarily suspend or delay further activities pending resolution of external contingencies. 项目决策关口：决策是否继续进行更多的评价，以便澄清最终商业开发的潜力；或者在外部或有因素解决之前，暂时中止或推迟进一步的作业活动。
Development Unclarified 开发未明确	A discovered accumulation where project activities are under evaluation and where justification as a commercial development is unknown based on available information. 项目在已发现油气聚集的作业活动正在评估中，基于现有信息，其商业开发的合理性尚无法确定。	The project is seen to have potential for eventual commercial development, but further appraisal/evaluation activities are ongoing to clarify the potential for eventual commercial development. 项目被视为具有最终商业开发的潜力，但进一步的评价 / 评估活动正在进行，以澄清其最终商业开发的潜力。 This sub-class requires active appraisal or evaluation and should not be maintained without a plan for future evaluation. The sub-class should reflect the actions required to move a project toward commercial maturity and economic production. 该亚类要求积极开展评价或评估活动，没有评估计划，不应该保留。该亚类应该反映将项目向商业成熟和经济生产推进所需要的行动。

Continued
续表

Class/Sub-Class 类别 / 亚类	Definition 定义	Guidelines 指南
Development Not Viable 开发不可行	A discovered accumulation for which there are no current plans to develop or to acquire additional data at the time because of limited commercial potential. 商业潜力有限，且当前没有开发计划或新增数据采集计划的已发现油气聚集。	The project is not seen to have potential for eventual commercial development at the time of reporting, but the theoretically recoverable quantities are recorded so that the potential opportunity will be recognized in the event of a major change in technology or commercial conditions. 项目在报告时被认为没有最终商业开发的潜力，但记录理论可采数量，以便技术或商业条件发生重大变化时可确认潜在的开发机会。 The project decision gate is the decision not to undertake further data acquisition or studies on the project for the foreseeable future. 项目决策关口：对项目在可预见的未来不再进行数据采集或研究做出决策。
Prospective Resources 远景资源量	Those quantities of petroleum that are estimated, as of a given date, to be potentially recoverable from undiscovered accumulations. 指给定日期估算的，有可能从未发现油气聚集中采出的石油数量。	Potential accumulations are evaluated according to the chance of geologic discovery and, assuming a discovery, the estimated quantities that would be recoverable under defined development projects. It is recognized that the development programs will be of significantly less detail and depend more heavily on analog developments in the earlier phases of exploration. 根据地质发现几率以及假定发现情形下既定开发项目的开采量估值，来评估潜在的油气聚集。人们认识到，在勘探的早期阶段，开发方案的细节很少，很大程度上依赖于类比。
Prospect 目标区	A project associated with a potential accumulation that is sufficiently well defined to represent a viable drilling target. 一个与潜在油气聚集体关联的项目；已开展了详实的勘查评价，是一个可行的钻探目标。	Project activities are focused on assessing the chance of geologic discovery and, assuming discovery, the range of potential recoverable quantities under a commercial development program. 项目活动的重点是评估地质发现几率，以及在假设发现情形下，商业开发计划的潜在可采量范围。
Lead 有利区	A project associated with a potential accumulation that is currently poorly defined and requires more data acquisition and/or evaluation to be classified as a Prospect. 一个与潜在油气聚集体关联的项目；目前尚未查明，需要更多数据采集和 / 或评估活动，才能划分为“目标区”。	Project activities are focused on acquiring additional data and/or undertaking further evaluation designed to confirm whether or not the Lead can be matured into a Prospect. Such evaluation includes the assessment of the chance of geologic discovery and, assuming discovery, the range of potential recovery under feasible development scenarios. 项目活动的重点是获得更多数据和 / 或开展进一步评价，以确认“有利区”是否可成熟为“目标区”。这种评价包括对地质发现几率的评估，以及在假设发现情形下，可行开发情景方案的潜在可采量范围。
Play 远景区	A project associated with a prospective trend of potential prospects, but that requires more data acquisition and/or evaluation to define specific Leads or Prospects. 一个与潜在目标区有利区带关联的项目；但需要更多的数据采集和 / 或评估才能确定为具体的“有利区”或“目标区”。	Project activities are focused on acquiring additional data and/or undertaking further evaluation designed to define specific Leads or Prospects for more detailed analysis of their chance of geologic discovery and, assuming discovery, the range of potential recovery under hypothetical development scenarios. 项目活动的重点是获得更多的数据和 / 或开展进一步评价，以确定具体的“有利区”或“目标区”，并更详实地分析其地质发现几率，以及在假设发现情形下，假定开发情景方案的潜在可采量范围。

Table 2 Reserves Status Definitions and Guidelines
表 2 储量状态的定义与指南

Status 状态	Definition 定义	Guidelines 指南
Developed Reserves 已开发储量	Expected quantities to be recovered from existing wells and facilities. 预计可通过现有生产井和设施采出的数量。	Reserves are considered developed only after the necessary equipment has been installed, or when the costs to do so are relatively minor compared to the cost of a well. Where required facilities become unavailable, it may be necessary to reclassify Developed Reserves as Undeveloped. Developed Reserves may be further sub-classified as Producing or Non-producing. 已开发储量，须已具备必要设备，或所需费用相对较少（相比于一口新井费用）。如果无法获得所需设施， 可能有必要将已开发储量重新划归为未开发储量。已开发储量可进一步细分为正生产或未生产。
Developed Producing Reserves 已开发正生产储量	Expected quantities to be recovered from completion intervals that are open and producing at the effective date of the estimate. 在评估有效日预计可从已射孔正生产的完井层段中采出的数量。	Improved recovery Reserves are considered producing only after the improved recovery project is in operation. 提高采收率储量只有在提高采收率项目正式实施之后才能视为正生产。
Developed Non-Producing Reserves 已开发未生产储量	Shut-in and behind-pipe Reserves. 关井和管外储量	Shut-in Reserves are expected to be recovered from (1) completion intervals that are open at the time of the estimate but which have not yet started producing, (2) wells which were shut-in for market conditions or pipeline connections, or (3) wells not capable of production for mechanical reasons. Behind-pipe Reserves are expected to be recovered from zones in existing wells that will require additional completion work or future re-completion before start of production with minor cost to access these reserves. 关井储量，预期可从以下情景开采：（1）评估时已打开，但尚未投产的完井层段；（2）由于市场条件或管线连接原因而关停的井；（3）因机械原因不能生产的井。管外储量，指在现有老井储层中，预计可通过额外的完井作业或未来的重新完井开采出的数量，这些储量的开采所需费用较小。 In all cases, production can be initiated or restored with relatively low expenditure compared to the cost of drilling a new well. 在所有情况下，与钻一口新井的成本相比，投产或恢复生产的费用相对较低。
Undeveloped Reserves 未开发储量	Quantities expected to be recovered through future significant investments. 预计未来通过大额投资可采出的数量。	Undeveloped Reserves are to be produced (1) from new wells to be drilled on undrilled acreage in known accumulations, (2) from deepening existing wells to a different (but known) reservoir, (3) from infill wells that will increase recovery, or (4) where a relatively large expenditure (e.g., when compared to the cost of drilling a new well) is required to (a) recomplete an existing well or (b) install production or transportation facilities for primary or improved recovery projects. 未开发储量可能存在于以下情景：（1）已知油气聚集未钻井区域的待钻新井；（2）老井加深至一个不同油气藏（但已知）；（3）可增加采出量的加密井；（4）需要相对较高费用（例如与钻一口新井费用相比）的情形（a）老井重新完井，（b）一次开采或提高采收率项目安装生产或运输设施。

Table 3 Reserves Category Definitions and Guidelines
表 3 储量级别的定义与指南

Category 级别	Definition 定义	Guidelines 指南
Proved Reserves 证实储量	Those quantities of petroleum that, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be commercially recoverable from a given date forward from known reservoirs and under defined economic conditions, operating methods, and government regulations. 证实储量是通过地球科学和工程数据分析，自给定日期起，在确定的经济条件、作业方式及政府规定下，可合理确定地从已知油气藏中商业开采的石油数量。	If deterministic methods are used, the term "reasonable certainty" is intended to express a high degree of confidence that the quantities will be recovered. If probabilistic methods are used, there should be at least a 90% probability (P90) that the actual quantities to be recovered will equal or exceed the low estimate. 如果采用确定法，则 "合理确定性" 术语表示这些可采数量的置信度高。如果采用概率法 , 则未来实际采出量等于或大于低估值的概率至少为 90%。 The area of the reservoir considered as Proved includes (1) the area delineated by drilling and defined by fluid contacts, if any, and (2) adjacent undrilled portions of the reservoir that can reasonably be judged as continuous with it and commercially productive on the basis of available geoscience and engineering data. 证实油气藏面积包括：（1）经钻井评价并由流体界面确定 (如果有的话) 的区域；（2）油气藏邻近的未钻井部位，可合理判断其连续性，且在现有地球科学和工程数据基础上可实现商业生产。 In the absence of data on fluid contacts, Proved quantities in a reservoir are limited by the LKH as seen in a well penetration unless otherwise indicated by definitive geoscience, engineering, or performance data. Such definitive information may include pressure gradient analysis and seismic indicators. Seismic data alone may not be sufficient to define fluid contacts for Proved reserves. 缺少流体界面数据情形下，油气藏证实储量的底限为井钻遇的已知烃底（LKH），除非有可靠地球科学、工程或生产动态数据支持，包括压力梯度分析和地震信息识别指标。只有地震数据时，可能不足以界定证实储量的流体界面。 Reserves in undeveloped locations may be classified as Proved provided that: A. The locations are in undrilled areas of the reservoir that can be judged with reasonable certainty to be commercially mature and economically productive. B. Interpretations of available geoscience and engineering data indicate with reasonable certainty that the objective formation is laterally continuous with drilled Proved locations. 若满足以下条件，未开发井位可划为证实级别： A. 位于油气藏的未钻井区域 , 可合理确定这些地区具有商业成熟度，且经济可采。 B. 现有地球科学和工程数据解释显示，目标储层与已钻证实井位存在合理确定的横向连通性。 For Proved Reserves, the recovery efficiency applied to these reservoirs should be defined based on a range of possibilities supported by analogs and sound engineering judgment considering the characteristics of the Proved area and the applied development program. 对于证实储量，在证实区域储层特征和开发方案基础上，根据类比和可靠工程判定的可能性范围来确定油气藏的采收率。

Continued
续表

Category 级别	Definition 定义	Guidelines 指南
Probable Reserves 概算储量	Those additional Reserves that analysis of geoscience and engineering data indicates are less likely to be recovered than Proved Reserves but more certain to be recovered than Possible Reserves. 通过地球科学和工程数据分析表明，其采出可能性低于证实储量，但确定程度高于可能储量的储量增量。	It is equally likely that actual remaining quantities to be recovered will be greater than or less than the sum of the estimated Proved plus Probable Reserves (2P). In this context, when probabilistic methods are used, there should be at least a 50% probability that the actual quantities to be recovered will equal or exceed the 2P estimate. 实际剩余可采量大于或小于证实储量与概算储量之和（2P）的概率相等。在这种情形下，当采用概率法时，未来实际采出量等于或大于 2P 估值的概率应至少为 50%。 Probable Reserves may be assigned to areas of a reservoir adjacent to Proved where data control or interpretations of available data are less certain. The interpreted reservoir continuity may not meet the reasonable certainty criteria. 概算储量可配置给油气藏中与证实储量紧邻的区域，这些地区现有数据的控制程度或解释（认识）还不太确定。解释的储层连续性可能不满足合理确定性标准。 Probable estimates also include incremental recoveries associated with project recovery efficiencies beyond that assumed for Proved. 概算储量估值还包括与项目采收率相关、超出证实储量范畴的可采量增量。
Possible Reserves 可能储量	Those additional reserves that analysis of geoscience and engineering data indicates are less likely to be recoverable than Probable Reserves. 通过地球科学和工程数据分析表明，其采出可能性小于概算储量的储量增量。	The total quantities actually to be recovered from the project have a low probability to exceed the sum of Proved plus Probable plus Possible (3P), which is equivalent to the high-estimate scenario. When probabilistic methods are used, there should be at least a 10% probability (P10) that the actual quantities to be recovered will equal or exceed the 3P estimate. 项目未来实际可采总量大于证实加概算加可能储量之和 (3P，当于高估值情景）的概率低。当采用概率法时，未来实际采出量将等于或大于 3P 估值的概率至少为 10% (P10)。 Possible Reserves may be assigned to areas of a reservoir adjacent to Probable where data control and interpretations of available data are progressively less certain. Frequently, this may be in areas where geoscience and engineering data are unable to clearly define the area and vertical reservoir limits of economic production from the reservoir by a defined, commercially mature project. 可能储量可分配到与概算油气藏相邻的区域，在这些地区，数据控制和对现有数据的解释逐渐不那么确定。这种情况往往发生在地球科学和工程数据无法通过一个明确的商业成熟项目明确界定油气藏经济生产的区域和纵向储集层界限的地区。 Possible estimates also include incremental recoveries associated with project recovery efficiencies beyond that assumed for Probable. 可能储量的估值还包括与项目采收率有关、超出概算储量范畴的可采量增量。

Continued
续表

Category 级别	Definition 定义	Guidelines 指南
Probable and Possible Reserves 概算和可能储量	See above for separate criteria for Probable Reserves and Possible Reserves. 参见上文概算储量和可能储量的划分标准。	The 2P and 3P estimates may be based on reasonable alternative technical interpretations within the reservoir and/ or subject project that are clearly documented, including comparisons to results in successful similar projects. 2P 和 3P 的估值，可基于明确记录的油气藏和 / 或目标项目采用的合理替代技术解释，包括与成功类似项目的结果对比。 In conventional accumulations, Probable and/or Possible Reserves may be assigned where geoscience and engineering data identify directly adjacent portions of a reservoir within the same accumulation that may be separated from Proved areas by minor faulting or other geological discontinuities and have not been penetrated by a wellbore but are interpreted to be in communication with the known (Proved) reservoir. 在常规油气聚集中，概算和 / 或可能储量可以配置给同一油气聚集油气藏中，地质科学和工程数据可以直接确定与证实储量相邻的部位，这些部位可能因小断层或其他地质不连续与证实区域分离且未被井钻遇，但解释为与已知（证实的）油气藏相连通。 Probable and/or Possible Reserves may be assigned to areas that are structurally higher than the Proved area. Possible (and in some cases, Probable) Reserves may be assigned to areas that are structurally lower than the adjacent Proved or 2P area. 概算和 / 或可能储量可以配置在构造上高于证实区域的部位。可能（以及某些情况下，概算）储量可能被配置给构造上低于邻近证实或 2P 储量的区域。 Caution should be exercised in assigning Reserves to adjacent reservoirs isolated by major, potentially sealing faults until this reservoir is penetrated and evaluated as commercially mature and economically productive. Justification for assigning Reserves in such cases should be clearly documented. Reserves should not be assigned to areas that are clearly separated from a known accumulation by non-productive reservoir (i.e., absence of reservoir, structurally low reservoir, or negative test results); such areas may contain Prospective Resources. 在将储量配置给可能被潜在封闭的主断层分隔的邻近油气藏时，应谨慎行事，直到该油气藏被井钻遇并评价为商业成熟和可经济生产。在这种情况下，配置储量的理由应明确记录在案。不应将储量配置给已知油气聚集中有明显非产层分隔的区域（例如，储层缺失、构造低部位或测试不利部位）；这些区域可以划分为远景资源量。
	See above for separate criteria for Probable Reserves and Possible Reserves. 参见上文概算储量和可能储量的划分标准。	In conventional accumulations, where drilling has defined a highest known oil elevation and there exists the potential for an associated gas cap, Proved Reserves of oil should only be assigned in the structurally higher portions of the reservoir if there is reasonable certainty that such portions are initially above bubble point pressure based on documented engineering analyses. 对于常规油气聚集，经钻井确定了已知油顶，且存在潜在伴生气顶，若根据有记录的工程分析，可合理地确定该油藏高部位初始压力高于泡点压力，那么该油藏构造高部位应仅配置石油证实储量。 Reservoir portions that do not meet this certainty may be assigned as Probable and Possible oil and/or gas based on reservoir fluid properties and pressure gradient interpretations. 油气藏中不能达到该确定性要求的部位，可以配置为油和 / 或天然气（基于油气藏流体特征和压力梯度分析）概算和可能储量。

Appendix A Glossary of Terms Used in Resources Evaluations
附录 A 资源评估术语表

This Glossary provides high-level definitions of terms used in resources evaluations. Where appropriate, sections within the PRMS document are referenced to best show the use of selected terms in context.

本术语表提供了资源评估术语的高层级定义。引用了这些术语在 PRMS 中的适用章节，以最好地呈现其在上下文中的使用。

Term 术语	See PRMS Section PRMS 章节	Definition 定义
1C	2.2.2	Denotes low estimate of Contingent Resources. 表示条件资源量的低估值。
2C	2.2.2	Denotes best estimate of Contingent Resources. 表示条件资源量的最佳估值。
3C	2.2.2	Denotes high estimate of Contingent Resources. 表示条件资源量的高估值。
1P	2.2.2	Denotes low estimate of Reserves (i.e., Proved Reserves). Equal to P1. 表示储量的低估值（即证实储量），等于 P1。
2P	2.2.2	Denotes the best estimate of Reserves. The sum of Proved plus Probable Reserves. 表示储量的最佳估值，相当于证实储量与概算储量之和。
3P	2.2.2	Denotes high estimate of reserves. The sum of Proved plus Probable plus Possible Reserves. 表示储量的高估值，相当于证实储量、概算储量与可能储量之和。
1U	2.2.2	Denotes the unrisked low estimate qualifying as Prospective Resources 表示未考虑风险的远景资源量低估值。
2U	2.2.2	Denotes the unrisked best estimate qualifying as Prospective Resources. 表示未考虑风险的远景资源量最佳估值。
3U	2.2.2	Denotes the unrisked high estimate qualifying as Prospective Resources. 表示未考虑风险的远景资源量高估值。
Abandonment, Decommissioning, and Restoration (ADR) 弃置（废弃、停运和复原）（ADR）	3.1.2	The process (and associated costs) of returning part or all of a project to a safe and environmentally compliant condition when operations cease. Examples include, but are not limited to, the removal of surface facilities, wellbore plugging procedures, and environmental remediation. In some instances, there may be salvage value associated with the equipment removed from the project. ADR costs are presumed to be without consideration of any salvage value, unless presented as “ADR net of salvage.” 生产作业终止后，将部分或全部项目复原到安全和环保状态的过程（及相关费用）。例如包括（但不限于）地面设施移除、井口填堵和环境恢复。在某些情况下，可能存在与从项目中移除设备相关的残值。通常，弃置费（ADR）不考虑任何残值，除非被称为“弃置净残值（ADR net of salvage）”。
Accumulation 油气聚集	2.4	An individual body of naturally occurring petroleum in a reservoir. 油气藏中自然形成的单体。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Aggregation 汇并	4.2.5	The process of summing well, reservoir, or project-level estimates of resources quantities to higher levels or combinations, such as field, country or company totals. Arithmetic summation of incremental categories may yield different results from probabilistic aggregation of distributions. 将单井、油气藏或项目层级的资源数量估值进行汇总合并的过程，以得到油气田、国家或公司等更高层级的资源总量。资源增量级别算术求和的结果，可能与其概率分布求和的结果有所不同。
Appraisal 评价	1.2	The phase that may follow successful exploratory drilling. Activities to further evaluate the discovery, such as seismic acquisition, geological studies, and drilling additional wells may be conducted to reduce technical uncertainties and commercial contingencies. 勘探钻探成功之后可能存在的阶段。进一步评估发现的活动，如地震采集、地质研究和钻更多井，以减少技术不确定性和商业或变因素。
Approved for Development 已批准开发	2.1.3.5, Table 1 2.1.3.5，表 1	All necessary approvals have been obtained, capital funds have been committed, and implementation of the development project is underway. A project maturity sub-class of Reserves. 已经获得所有必要的批准，投资资金已承诺，开发项目正在实施中。 是储量的一个项目成熟度亚类。
Analog 类比法	4.1.1	Method used in resources estimation in the exploration and early development stages (including improved recovery projects) when direct measurement is limited. Based on evaluator’s assessment of similarities of the analogous reservoir(s) together with the development plan. 是一种资源评估方法，在勘探和开发早期阶段 (包括提高采收率项目)，当直接获取资料有限的情况下，评价人员对类比油气藏及开发方案的相似性进行评价的资源评估方法。
Analogous Reservoir 类比油气藏	4.1.1	Reservoirs that have similar rock properties (e.g., petrophysical, lithological, depositional, diagenetic, and structural), fluid properties (e.g., type, composition, density, and viscosity), reservoir conditions (e.g., depth, temperature, and pressure) and drive mechanisms, but are typically at a more advanced stage of development than the reservoir of interest and thus may provide insight and comparative data to assist in estimation of recoverable resources. 与目标油气藏具有类似岩石性质 （如岩石物理、岩性、沉积、成岩和构造）、流体特性（如类型、组成、密度和黏度）、油藏条件 （如深度、温度和压力）和驱动机理，通常处在开发的更高阶段，提供可比较的数据，作为可采资源量估算的依据。
Assessment 评估	2.1.2	See Evaluation 参见“评估”。
Associated Gas 伴生气	Table 3 表 3	A natural gas found in contact with or dissolved in crude oil in the reservoir. It can be further categorized as gas cap gas or solution gas. 在储层中与原油接触或溶解在原油中的一种天然气，可进一步划分为气顶气和溶解气。
Basin-Centered Gas 盆地中心气	2.4	An unconventional natural gas accumulation that is regionally pervasive and characterized by low permeability, abnormal pressure, gas-saturated reservoirs, and lack of a down dip water leg. 一种区域性广泛分布的，具有低渗透率、异常压力、饱和气藏、无下倾水体的非常规天然气聚集体。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Barrel of Oil Equivalent (BOE) 桶油当量 (BOE)	3.2.9	The term allows for a single value to represent the sum of all the hydrocarbon products that are forecast as resources. Typically, condensate, oil, bitumen, and synthetic crude barrels are taken to be equal (1 bbl = 1 BOE). Gas and NGL quantities are converted to an oil equivalent based on a conversion factor that is recommended to be based on a nominal heating content or calorific value equivalent to a barrel of oil. 该术语允许使用单一值作为所有烃类产品预测资源数量的总和。通常情况下认为，凝析油、原油、沥青和合成油的桶（单位）是相等的（1 桶 =1 桶油当量）。基于转换系数，气和液化天然气体积可换算成桶油当量（为名义热焓或热值的油当量）。
Basis for Estimate 估算基础	1.2	The methodology (or methodologies) and supporting data on which the estimated quantities are based. (Also referenced as basis for the estimation.) 估算资源量的方法和支持数据的依据 (同时参见评估基础）。
Behind-Pipe Reserves 管外储量	2.1.3.6	Reserves that are expected to be recovered from zones in existing wells, which will require additional completion work or future re-completion before the start of production. In all cases, production can be initiated or restored with relatively low expenditure compared to the cost of drilling and completing a new well including hook-up to allow production. 需要追加完井作业或未来重新完井之后才能从已钻生产井段中采出的储量。无论何种情形（追加和重新完井），投产或复产的费用均比一口新井的费用（钻完井包括连接管线生产）相对更低。
Best Estimate 最佳估值	2.2.2	With respect to resources categorization, the most realistic assessment of recoverable quantities if only a single result were reported. If probabilistic methods are used, there should be at least a 50% probability (P50) that the quantities to be actually recovered will equal or exceed the best estimate. 在资源分级中，如果只报告一个估算结果，最佳估值就是最现实的可采量估值；如果使用概率法，则未来实际采出量等于或超过最佳估值的概率至少应为 50%（P50）。
C1	2.2.2	Denotes low estimate of Contingent Resources. C1 is equal to 1C. 表示条件资源量的低估值。C1 等于 1C。
C2	2.2.2	Denotes Contingent Resources of same technical confidence as Probable, but not commercially matured to Reserves. 表示与概算储量的技术置信度相当的条件资源量，但不具备储量的商业性。
C3	2.2.2	Denotes Contingent Resources of same technical confidence as Possible, but not commercially matured to Reserves. 表示与可能储量的技术置信度相当的条件资源量，但不具备储量的商业性。
Chance 几率	1.1	Chance equals 1-risk. Generally synonymous with likelihood. (See Risk) 几率等于 1- 风险。通常与可能性同义（参见术语“风险”）。
Chance of Commerciality 商业几率	2.1.3	The estimated probability that the project will achieve commercial maturity to be developed. For Prospective Resources, this is the product of the chance of geologic discovery and the chance of development. For Contingent Resources and Reserves, it is equal to the chance of development. 商业几率是项目达到商业化开发的估算概率。对远景资源量来说，是项目地质发现几率和开发几率的乘积。对于条件资源量和储量来说，等于开发几率。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Chance of Development 开发几率	2.1.3	The estimated probability that a known accumulation, once discovered, will be commercially developed. 开发几率是指一个已知油气聚集体一旦被发现，可商业开发的概率。
Chance of Geologic Discovery 地质发现几率	2.1.3	The estimated probability that exploration activities will confirm the existence of a significant accumulation of potentially recoverable petroleum. 地质发现几率指勘探活动将确认一个赋存相当规模油气聚集体存在的概率。
Coalbed Methane (CBM) 煤层气（CBM）	2.4	Natural gas contained in coal deposits. Coalbed gas, although usually mostly methane, may be produced with variable amounts of inert or even non-inert gases. [Also called coal-seam gas (CSG) or natural gas from coal (NGC).] 煤层中所含的天然气。通常，煤层气的主要成分是甲烷，但也可能在生产过程中伴生数量不等的惰性气体，甚至非惰性气体 [也称“煤层瓦斯气（CSG）”或“煤制天然气（NGC）”]。
Commercial 商业的	2.1.2	A project is commercial when there is evidence of a firm intention to proceed with development within a reasonable time-frame. Typically, this requires that the best estimate case meet or exceed the minimum evaluation decision criteria (e.g., rate of return, investment payout time). There must be a reasonable expectation that all required internal and external approvals will be forthcoming. Also, there must be evidence of a technically mature, feasible development plan and the essential social, environmental, economic, political, legal, regulatory, decision criteria, and contractual conditions are met. 有证据表明在合理的时限内有坚定进行开发的意图 , 项目就是商业的。通常情况下 , 这要求最佳估计情形达到或超过最低评价决策标准 (例如 , 收益率、投资支出时间)。必须有合理的预期 , 所有必要的内部和外部要求都将得到批准。此外 , 必须有证据表明技术上成熟、可行的开发计划及满足基本的社会、环境、经济、政治、法律、监管、决策标准和合同条件。
Committed Project 承诺项目	2.1.3.1	Project that the entity has a firm intention to develop in a reasonable time-frame. Intent is demonstrated with funding/financial plans, but FID has not yet been declared (See also Final Investment Decision.) 实体拥有坚定意源将在合理时限内进行开发的项目。实体的意愿表现为资金或财务计划，但尚未作出 FID（另见 FID“最终投资决策”）。
Completion 完井	2.1.3.6	Completion of a well. The process by which a well is brought to its operating status (e.g., producer, injector, or monitor well). A well deemed to be capable of producing petroleum, or used as an injector, is completed by establishing a connection between the reservoir(s) and the surface so that fluids can be produced from, or injected into, the reservoir. 一口井的完井。一口井通过该过程进入作业状态 (例如 , 生产井、注入井或监测)。石油生产井或注入井，是要通过完井，形成油气藏和地面的通道，使流体能够从油气藏中采出或注入油气藏。
Completion Interval 完井层段	2.1.3.6	The specific reservoir interval(s) that is (are) open to the borehole and connected to the surface facilities for production or injection, or reservoir intervals open to the wellbore and each other for injection purposes. 井下已射孔、与地面设施相连通、能够进行生产和注入的油气藏层段，或者是井下为了注入目的而打开互相连通的油气藏层段。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Concession 租让	3.3	A grant of access for a defined area and time period that transfers certain entitlements to produced hydrocarbons from the host country to an entity. The entity is generally responsible for exploration, development, production, and sale of hydrocarbons that may be discovered. Typically granted under a legislated fiscal system where the host country collects taxes, fees, and sometimes royalty on profits earned. (Also called a license.) 特定区域和时期的准入，资源国把生产油气的某些权益转让给企业，企业通常负责油气勘探、开发、开采和采出量的销售。资源国依据立法规定的财税制度收取相关的税、费，有时还要针对企业所获利润收取矿费（也称“许可证”）。
Condensate 凝析油	3.2	A mixture of hydrocarbons (mainly pentanes and heavier) that exist in the gaseous phase at original temperature and pressure of the reservoir, but when produced, are in the liquid phase at surface pressure and temperature conditions. Condensate differs from NGLs in two respects: (1) NGL is extracted and recovered in gas plants rather than lease separators or other lease facilities, and (2) NGL includes very light hydrocarbons (ethane, propane, or butanes) as well as the pentanes-plus that are the main constituents of condensate. 在原始地层温度和压力条件下以气态存在于储层的一种烃混合物（主要是戊烷及以上重组分）。但在采出时，在地面压力和温度条件下以液态存在。凝析油在两个方面不同于天然气液：（1）天然气液主要在天然气处理厂提取和回收，而不是在合同区分离器或者其他合同区设施中提取和回收；（2）天然气液既包含轻烃组分（乙烷、丙烷、丁烷），也包含作为凝析油主要组分的戊烷及以上重组分。
Confidence Level 置信度	4.2	A measure of the estimated reliability of a result. As used in the deterministic incremental method, the evaluator assigns a relative level of confidence (high/moderate/low) to areas/segments of an accumulation based on the information available (e.g., well control and seismic coverage). Probabilistic and statistical methods use the 90% (P90) for the high confidence (low value case), 50% (P50) for the best estimate (moderate value case), and 10% (P10) for the low (high value case) confidence to represent the chances that the actual value will equal or exceed the estimate. 是评估结果可信度的度量。在确定性增量法中应用时，评估师根据现有信息（如井控和地震覆盖范围）为油气聚集全区 / 部分分配相对置信度（低 / 中 / 高）。概率法和统计学法使用 90%（P90）高置信度（低估值情景）、50%（P50）为最佳估值（中位值情景）、10%（P10）为低置信度（高估值情景）来表示实际值等于或超过估算值。
Constant Case 恒定方案	3.1.2	A descriptor applied to the economic evaluation of resources estimates. Constant-case estimates are based on current economic conditions being those conditions (including costs and product prices) that are fixed at the evaluation date and held constant, with no inflation or deflation made to costs or prices throughout the remainder of the project life other than those permitted contractually. 用于描述资源估算中的经济评价。恒定方案评估是基于当前经济条件（包括成本和产品价格）在评估日保持不变的前提下，除合同允许变化外，成本和价格在项目生命期内不进行通货膨胀或通货紧缩的相应调整。
Consumed in Operations (CiO) 作业自用油气（CiO）	3.2.2	That portion of produced petroleum consumed as fuel in production or lease plant operations before delivery to the market at the reference point. (Also called lease fuel.) 在参照点交付给市场之前，产出石油中被生产作业或矿区加工厂用作燃料消耗的部分（也称“矿区燃料”）。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Contingency 或有因素	1.1	A condition that must be satisfied for a project in Contingent Resources to be reclassified as Reserves. Resolution of contingencies for projects in Development Pending is expected to be achieved within a reasonable time period. 项目中的条件资源量重新归类为储量必须满足的条件。将在开发等待的合理时间内解决开发项目存在的或有因素。
Contingent Project 或有项目	1.1	A project that is not yet commercial owing to one or more contingencies that have not been resolved. 由于一个或多个或有因素未解决而尚不具有商业性的项目。
Contingent Resources 条件资源量	1.1, Table 1 1.1, 表 1	Those quantities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations by application of development projects, but which are not currently considered to be commercially recoverable owing to one or more contingencies. 截至给定日期评估的、通过实施开发项目，从已知的石油聚集体中潜在可采的油气数量。但由于一个或多个或有条件，目前不被视为是商业可采的。
Continuous-Type Deposit 连续型沉积	2.4	A petroleum accumulation that is pervasive throughout a large area and that generally lacks well-defined OWC or GWC. Such accumulations are included in unconventional resources. Examples of such deposits include “basin-centered” gas, tight gas, tight oil, gas hydrates, natural bitumen, and oil shale (Kerogen) accumulations. 一种大面积广泛分布的石油聚集体，通常缺乏明确的油水或气水界面。这些聚集体属于非常规资源；例如盆地中心气、致密气、致密油、天然气水合物、天然沥青和油页岩（干酪根）等聚集体。
Conventional Resources 常规资源	2.4	Resources that exist in porous and permeable rock with buoyancy pressure equilibrium. The PIIP is trapped in discrete accumulations related to a localized geological structural feature and/or stratigraphic condition, typically with each accumulation bounded by a down dip contact with an aquifer, and is significantly affected by hydrodynamic influences such as buoyancy of petroleum in water. 存在于浮力压力均衡的多孔渗透性岩石中。油气原始原地量（PIIP）是圈闭在局部地质构造和（或）岩性地层中的离散的油气聚集体，通常每个油气聚集体的下倾边界有水体，受水动力效应影响明显，如石油在水中受到的浮力。
Cost Recovery 成本回收	3.3	Under a typical production-sharing agreement, the contractor is responsible for the field development and all exploration and development expenses. In return, the contractor recovers costs (investments and operating expenses) out of the production stream. The contractor normally receives an entitlement interest share in the petroleum production and is exposed to both technical and market risks. 在典型的产品分成协议中，合同者负责油田开发并承担所有的勘探开发费用，作为回报，合同者从产量中回收成本（包括投资和操作费）；合同者一般通过石油产量的形式获得权益份额收益，但要承担技术和市场双重风险。
Crude Oil 原油	3.2.9	Crude oil is the portion of petroleum that exists in the liquid phase in natural underground reservoirs and remains liquid at atmospheric conditions of pressure and temperature (excludes retrograde condensate). Crude oil may include small amounts of non-hydrocarbons produced with the liquids but does not include liquids obtained from the processing of natural gas. 原油，指天然地下油气藏以液态存在且在地面大气压力和温度条件下仍为液态（反凝析油除外）的部分。原油可以包括少量随流体产出的非烃，但不包括在天然气处理过程中得到的液体。

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续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Cumulative Production 累计产量	1.1	The sum of petroleum quantities that have been produced at a given date. (See also Production). Production is measured under defined conditions to allow for the computation of both reservoir voidage and sales quantities and for the purpose of voidage also includes Non-hydrocarbon quantities. 截至给定日期石油产量的总和（也见“产量”）。在规定条件下对产量进行计量，以便计算油气藏的亏空情况和销售数量。在计算油气藏亏空时，也可以包括非烃数量。
Current Economic Conditions 当前经济条件	3.1.2	Economic conditions based on relevant historical petroleum prices and associated costs averaged over a specified period. The default period is 12 months. However, in the event that a step change has occurred within the previous 12-month period, the use of a shorter period reflecting the step change must be justified and used the basis of constant-case resources estimates and associated project cash flows. 基于相关历史石油价格和在某一特定时期内平均相关成本的经济条件。默认期限为 12 个月。但是 , 如果在上一个 12 个月期间发生了阶梯式变化，则必须有理由使用较短期限以反映阶梯式变化，并将其作为“恒定方案”资源量估算和项目现金流的基础。
Defined Conditions 确定条件	3.0	Forecast of conditions to exist and impact the project during the time period being evaluated. Forecasts should account for issues that impact the commerciality, such as economics (e.g., hurdle rates and commodity price); operating and capital costs; and technical, marketing, sales route, legal, environmental, social, and governmental factors. 在评估阶段过程中对现有及会影响到项目的条件的预测。预测中需要解释影响商业性的因素，诸如经济性（如基准收益率、商品价格）、操作费和开发投资、技术、市场、销售途径、法律、环境、社会以及政府因素等。
Deposit 沉积	2.4	Material laid down by a natural process. In resources evaluations, it identifies an accumulation of hydrocarbons in a reservoir. (See Accumulation.) 由自然聚集形成的物质。在资源评价中，指油气藏中的一个含油气聚集体(参见“油气聚集体”）。
Deterministic Incremental Method 确定性增量法	4.2	An assessment method based on defining discrete parts or segments of the accumulation that reflect high, moderate, and low confidence regarding the estimates of recoverable quantities under the defined development plan. 一种基于油气聚集体定义下的离散部分或分段的评估方法，反映了在一定开发方案下可采量估算的高 / 中 / 低置信度。
Deterministic Method 确定性方法	4.2	An assessment method based on discrete estimate(s) made based on available geoscience, engineering, and economic data and corresponds to a given level of certainty. 一种根据可用的地球科学、工程和经济资料、基于离散估算结果的评估方法，符合一定级别的确定性。
Deterministic Scenario Method 确定性情景法	4.2	Method where the evaluator provides three deterministic estimates of the quantities to be recovered from the project being applied to the accumulation. Estimates consider the full range of values for each input parameter based on available engineering and geoscience data, but one set is selected that is most appropriate for the corresponding resources confidence category. A single outcome of recoverable quantities is derived for each scenario. 从应用于油气聚集体的项目中预测的可采量，评估师提供三种确定性估值的估算方法。基于已有的工程和地球科学数据，考虑每个输入参数的全部范围，但选定其中一组作为最合适的数值去匹配资源的置信度类别。各情景会分别得到一个可采资源量的评估结果。

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续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Developed Reserves 已开发储量	2.1.3.5, Table 2 2.1.3.5, 表 2	Reserves that are expected to be recovered from existing wells and facilities. Developed Reserves may be further sub-classified as Producing or Non-Producing. 预计可从现有井以及地面设施中采出的数量。已开发储量可进一步划分为已开发正生产储量和已开发未生产储量。
Developed Producing Reserves 已开发正生产储量	2.1.3.5, Table 2 2.1.3.5, 表 2	Developed Reserves that are expected to be recovered from completion intervals that are open and producing at the effective date. Improved recovery reserves are considered producing only after the improved recovery project is in operation. 预计将从打开并在有效之日正在生产的完井段中采出的已开发储量。提高采收率获得的储量只有进入实施阶段才能划分为已开发正生产储量。
Developed Non-Producing Reserves 已开发未生产储量	2.1.3.5, Table 2 2.1.3.5, 表 2	Developed Reserves that are either shut-in or behind-pipe. (See also Shut-In Reserves and Behind-Pipe Reserves.) “关井或管外”已开发储量（也见“关井储量”和“管外储量”）。
Development On Hold 延迟开发	2.1.3.5, Table 1 2.1.3.5, 表 1	A discovered accumulation where project activities are on hold and/or where justification as a commercial development may be subject to significant delay. A project maturity sub-class of Contingent Resources. 已发现油气聚集体的项目进展延迟或者商业开发的进度受到明显拖延。条件资源量的一个项目成熟度亚类。
Development Not Viable 开发不可行	2.1.3.5, Table 1 2.1.3.5, 表 1	A discovered accumulation for which there are contingencies resulting in there being no current plans to develop or to acquire additional data at the time due to limited commercial potential. A project maturity sub-class of Contingent Resources. 已发现油气聚集体由于经济潜力有限和存在或有因素包括目前没有开发或需要采集更多数据的计划。条件资源量的一个项目成熟度亚类。
Development Pending 待开发	2.1.3.5, Table 1 2.1.3.5，表 1	A discovered accumulation where project activities are ongoing to justify commercial development in the foreseeable future. A project maturity sub-class of Contingent Resources. 已发现油气聚集体，其项目活动正在论证其近期的商业开发合理性。条件资源量的一个项目成熟度亚类。
Development Plan 开发方案	2.1.3.6	The design specifications, timing, and cost estimates of the appraisal and development project(s) that are planned in a field or group of fields. The plan will include, but is not limited to, well locations, completion techniques, drilling methods, processing facilities, transportation, regulations, and marketing. The plan is often executed in phases when involving large, complex, sequential recovery and/or extensive areas. 在一个油田或一组油田中进行开发的设计说明、时间安排和成本评估，包括但不限于井位、完井技术、钻井方法、处理设施、运输、法规和营销等。在大型、复杂、连续开采和 / 或大型地区中，开发方案通常按阶段执行。
Development Unclarified 开发未明确	2.1.3.5, Table 1 2.1.3.5，表 1	A discovered accumulation where project activities are under evaluation and where justification as a commercial development is unknown based on available information. This sub-class requires appraisal or study and should not be maintained without a plan for future evaluation. The sub-class should reflect the actions required to move a project toward commercial maturity. A project maturity sub-class of Contingent Resources. 一个已发现油气聚集体，其开发项目正在进行评估，基于可用信息，项目商业性开发的合理性是未知的。这个亚类需要进一步评估和研究，在没有未来评估计划的情况下这亚类将不应保留。这个亚类应反映将项目推向商业成熟所需的行动。条件资源量的一个项目成熟度亚类。

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续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Discovered 发现	2.1.1	A petroleum accumulation where one or several exploratory wells through testing, sampling, and/or logging have demonstrated the existence of a significant quantity of potentially recoverable hydrocarbons and thus have established a known accumulation. In this context, “significant” implies that there is evidence of a sufficient quantity of petroleum to justify estimating the in-place volume demonstrated by the well(s) and for evaluating the potential for commercial recovery. (See also Known Accumulation.) 一口或几口探井在一个石油聚集体通过测试、取样和 / 或测井表明存在相当数量的潜在可开采烃类，从而建立的一个已知石油聚集体。“相当数量”意味着通过钻井资料确认地下存在充足的可经济开采的油气数量（也见“已知油气聚集体”）。
Discovered Petroleum Initially-In-Place 已发现石油原始原地量	1.1	Quantity of petroleum that is estimated, as of a given date, to be contained in known accumulations before production. Discovered PIIP may be subdivided into commercial, sub-commercial, and the portion remaining in the reservoir as Unrecoverable. 在给定日期所估算的已知油气聚集体在投产前所蕴藏的石油数量。已发现石油原始原地量可划分为商业的、次商业的及剩余在油气藏中的不可采的部分。
Discovered Unrecoverable 已发现不可采量	2.1.1	Discovered petroleum in-place resources that are evaluated, as of a given date, as not able to be recovered by the commercial and sub-commercial projects envisioned. 已发现不可采量指给定日期评估的已发现石油原地量中不能被可预见商业或次商业项目开采的部分。
Dry Gas 干气	3.2.3	Natural gas remaining after hydrocarbon liquids have been removed before the reference point. It should be recognized that this is a resources assessment definition and not a phase behavior definition. (Also called lean gas.) 在参照点之前脱去液烃的天然气。应该认识到，这是一个资源评估定义，而不是一个相态定义（也称“贫气”）。
Economic 经济的	3.1.2	A project is economic when it has a positive undiscounted cumulative cash flow from the effective date of the evaluation, the net revenue exceeds the net cost of operation (i.e., positive cumulative net cash flow at a zero percent discount rate). 当自评估生效之日起，未折现的累计现金流为正值、净收入超过净作业成本时（即折现率大于或等于 0 时，累计净现金流为正值），项目是经济的。
Economic Interest 经济权益	3.3	Interest that is possessed when an entity has acquired an interest in the minerals in-place or a license and secures, by any form of legal relationship, revenue derived from the extraction of the mineral to which he must look for a return. 当一个实体获得矿产原地量的权益或许可证、并以任何形式的合法关系得到采矿收入，以寻求资本回报时，即持有经济权益。
Economic Limit 经济极限	3.1.2	Defined as the time when the maximum cumulative net cash flow (see Net Entitlement) occurs for a project. 定义为项目的最大累计净现金流量 (见“净权益”) 出现的时间。
Economically Not Viable Contingent Resources 经济不可行条件资源量	2.1.3.7	Those quantities for which development projects are not expected to yield positive cash flows under reasonable forecast conditions. May also be subject to additional unsatisfied contingencies. 在合理的预测条件下，开发项目预计不会产生正现金流的那部分数量。也可能是由于额外的不利或有因素影响。

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续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Economically Viable Contingent Resources 经济可行条件资源量	2.1.3.7	Those quantities associated with technically feasible projects where cash flows are positive under reasonable forecast conditions but are not Reserves because it does not meet the other commercial criteria 经济可行条件资源量指项目在技术上可行的，在合理的预测条件下现金流为正，但由于不符合其他商业标准而不是储量的相关数量。
Economically Producible 经济可采的	3.1.2	Refers to the situation where the net revenue from an ongoing producing project exceeds the net expenses attributable to a certain entity's interest. The ADR costs are excluded from the determination. 经济可采的指在产项目净收入超过实体净权益支出的情况。判定不考虑弃置费成本。
Effective Date 生效日期	1.2	Resource estimates of remaining quantities are "as of the given date" (effective date) of the evaluation. The evaluation must take into account all data related to the period before the "as of date." 资源剩余量评估是在“给定日期（生效日期）”进行评估的。评估必须考虑到所有在截止时间之前期间的所有数据。
Entitlement 份额	3.3	That portion of future production (and thus resources) legally accruing to an entity under the terms of the development and production contract or license. 根据开发和生产合同或许可证条款，合法归属于一个实体的那部分未来产量（即资源数量）。
Entity 实体	3.0	A legal construct capable of bearing legal rights and obligations. In resources evaluations, this typically refers to the lessee or contractor, which is some form of legal corporation (or consortium of corporations). In a broader sense, an entity can be an organization of any form and may include governments or their agencies. 实体机构是指有能力承担法律权利和义务的合法机构；在资源评价中，主要是指承租人或合同者，即某种形式的合法公司（或公司联盟）；在更广意义上，实体可以是任何形式的组织，可以包括政府或其代表机构。
Established Technology 成熟技术	2.1.1	Methods of recovery or processing that have proved to be successful in commercial applications. 在商业应用中已经被证明是成功的开采或加工方式。
Estimated Ultimate Recovery (EUR) 最终可采量（EUR）	1.1	Those quantities of petroleum estimated, as of a given date, to be potentially recoverable plus those quantities that have been already produced. For clarity, EUR must reference the associated technical and commercial conditions for the resources; for example, proved EUR is Proved Reserves plus prior production. 在给定日期估算的，可能采出的石油数量加上已经采出的那些数量。为清楚起见，EUR 必须参考资源量的相关技术和商业条件；例如，证实的 EUR 是已证实储量加上之前的产量。
Evaluation 评估	3.0	The geosciences, engineering, and associated studies, including economic analyses, conducted on a petroleum exploration, development, or producing project resulting in estimates of the quantities that can be recovered and sold and the associated cash flow under defined forward conditions. (Also called assessment.) 对油气勘探、开发或生产项目进行的地球科学、工程和相关研究，包括经济分析，可得到规定未来条件下的油气可采量和销售量的估值以及相关的现金流（也称为“评估”）。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Evaluator 评估师	1.2	The person or group of persons responsible for performing an evaluation of a project. These may be employees of the entities that have an economic interest in the project or independent consultants contracted for reviews and audits. In all cases, the entity accepting the evaluation takes responsibility for the results, including its resources and attributed value estimates. 负责对项目进行评价的个人或小组。他们可以是拥有项目经济权益的实体的员工，也可以是受合同聘请、进行审查和审计的独立咨询顾问。不管何种情形，接受评估的实体要对包括资源量及其价值的评估结果负责。
Exploration 勘探	2.1.3.5	Prospecting for undiscovered petroleum using various techniques, such as seismic surveys, geological studies, and exploratory drilling. 应用地震勘测、地质研究以及勘探钻井等多种方法对未发现油气资源的勘察。
Field 油气田	1.2	In conventional reservoirs, a field is typically an area consisting of a single reservoir or multiple reservoirs all grouped on, or related to, the same individual geological structural feature and/or stratigraphic condition. There may be two or more reservoirs in a field that are separated vertically by intervening impermeable rock, laterally by local geologic barriers, or both. The term may be defined differently by individual regulatory authorities. For unconventional reservoirs without hydrodynamic influences, a field is often defined by regulatory or ownership boundaries as necessary. 在常规油气藏中，油气田是指由单个油气藏或多个地质构造特征和地层条件相同的油气藏组成的区域；一个油气田可能包含两个或多个油气藏，纵向上由不渗透岩石隔开，横向上由局部地质隔层隔开，或二者兼有；各监管机构可能对该术语有不同定义。在无水动力影响的非常规油气藏中，油气田通常被定义在管理或拥有的边界内。
Final Investment Decision (FID) 最终投资决策(FID)	2.1.3.1	Project approval stage when the participating companies have firmly agreed to the project and the required capital funding. 当参与公司一致坚定同意项目及其所需资本投入时的项目批准阶段。
Flare Gas 火炬气	3.2.2	The total quantity of gas vented and/or burned as part of production and processing operations (but not as fuel). 指生产和处理作业过程中被排放或烧掉的天然气总量（但不作为燃料气）。
Flow Test 产能测试	2.1.1	An operation on a well designed to demonstrate the existence of recoverable petroleum in a reservoir by establishing flow to the surface and/or to provide an indication of the potential productivity of that reservoir (such as a wireline formation test). May also demonstrate the potential of certain completion techniques, particularly in unconventional reservoirs. 通过将油气开采到地面和 / 或得到该油气藏潜在产能指标，为论证油气藏中存在可流动油气而设计的井中作业（例如电缆地层测试）。同时特别是在非常规油气藏中也可证明某些完井技术的潜力。
Fluid Contacts 流体界面	4.2	The surface or interface in a reservoir separating two regions characterized by predominant differences in fluid saturations. Because of capillary and other phenomena, fluid saturation change is not necessarily abrupt or complete, nor is the surface necessarily horizontal. 油气藏内将流体饱和度具明显差异的两个区域分隔开的表面或界面。由于毛细管和其他现象的影响，流体饱和度变化不一定是突变的或完全的，界面也不一定是水平的。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Forecast Case 预测方案	3.1.2	A descriptor applied to a scenario when production and associated cash-flow estimates are based on those conditions (including costs and product price schedules, inflation indexes, and market factors) forecast by the evaluator to reasonably exist throughout the evaluation life (i.e., defined conditions). Inflation or deflation adjustments are made to costs and revenues over the evaluation period. 对产量及相关现金流的评估方案是基于评估师对项目整个生命期(即定义的条件)评估条件（包括成本和产品价格剖面、通货膨胀指数和市场因素）的合理预测。评价期的成本和收入可进行通货膨胀或通货紧缩的调整。
Gas Balance 天然气产量平衡	3.2.8	In gas production operations involving multiple working interest owners, maintaining a statement of volumes attributed to each, depending on each owner's portion received. Imbalances may occur that must be monitored over time and eventually balanced in accordance with accepted accounting procedures. 在有多个权益拥有者的天然气生产作业中，依据每个权益者收到的部分，需保留一份属于每个所有者的气量分配表。可能会出现天然气产量支付时的不平衡的情形。因此，必须实时监测这些不平衡，并最终按认可的会计程序进行平衡调节。
Gas Cap Gas 气顶气	Table 3 表 3	Free natural gas that overlies and is in contact with crude oil in the reservoir. It is a subset of associated gas. 位于油气藏顶部、与原油接触的游离天然气，是伴生气的一种。
Gas Hydrates 天然气水合物	2.4	Naturally occurring crystalline substances composed of water and gas, in which a solid water lattice accommodates gas molecules in a cage-like structure or clathrate. At conditions of standard temperature and pressure, one volume of saturated methane hydrate will contain as much as 164 volumes of methane gas One volume of saturated methane hydrate will contain as much as 164 volumes of methane gas at standard temperature and pressure conditions. Gas hydrates are included in unconventional resources, but the technology to support commercial maturity has yet to be developed. 天然气水合物是由水和天然气组成的天然结晶物，其中固体水分子晶格结合气体分子而形成笼状或格状结构。在标准温度和压力条件下，单位体积的饱和甲烷水合物可包含多达 164 个单位体积的甲烷气。天然气水合物是非常规资源的一种，支撑其商业成熟的技术尚有待于开发。
Gas/Oil Ratio 气油比	4.1.4	Ratio that is calculated using measured natural gas and crude oil volumes at stated conditions. The gas/oil ratio may be the solution gas/oil ratio, R_s; produced gas/oil ratio, R_p; or another suitably defined ratio of gas production to oil production. 在规定条件下使用测量的天然气和原油体积之比。气油比可以是溶解气油比，符号为 R_s；或生产气油比，符号为 R_p；或其他适当定义的天然气产量与原油产量之比。
Geostatistical Methods 地质统计方法	4.2.2	A variety of mathematical techniques and processes dealing with the collection, methods, analysis, interpretation, and presentation of large quantities of geoscience and engineering data to (mathematically) describe the variability and uncertainties within any reservoir unit or pool, specifically related here to resources estimates. 用于收集、分析、解释和表现大量地学和工程资料、从数学方面描述任意油气藏单元的非均质性与不确定性的多种数学方法，这里特指与资源评估有关的地质统计方法。

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续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
High Estimate 高估值	2.2.2	With respect to resources categorization, this is considered to be an optimistic estimate of the quantity that will actually be recovered from an accumulation by a project. If probabilistic methods are used, there should be at least a 10% probability (P10) that the quantities actually recovered will equal or exceed the high estimate. 在资源量分级中，高估值是指项目能够从油气聚集体中实际采出的油气数量的乐观估计。如果应用概率法，则实际采出量至少有 10%（P10）的概率等于或超过高估值。
Hydrates 水合物	2.4	See Gas Hydrates. 参见“天然气水合物”。
Hydrocarbons 碳氢化合物（烃）	1.1	Hydrocarbons are chemical compounds consisting wholly of hydrogen and carbon molecules. 碳氢化合物（烃），是完全由碳、氢分子组成的化合物。
Improved Recovery 提高采收率	2.3.4	The extraction of additional petroleum, beyond primary recovery, from naturally occurring reservoirs by supplementing the natural forces in the reservoir. It includes waterflooding and gas injection for pressure maintenance, secondary processes, tertiary processes, and any other means of supplementing natural reservoir recovery processes. Improved recovery also includes thermal and chemical processes to improve the in-situ mobility of viscous forms of petroleum. (Also called enhanced recovery.) 一次采油之后，通过对天然油气藏补充能量采出更多石油的开采方式，包括水驱和注气等保持压力的二次采油、三次采油方法，以及其它增加天然油气藏可采量的方法。提高采收率方法还包括用来改善各种稠油地下原油流度的热采和化学采油方法（也称“强化采油”）。
Injection 注入	3.2.5	The forcing, pumping, or natural flow of substances into a porous and permeable subsurface rock formation. Injected substances can include either gases or liquids. 通过加压、泵送或自然流动使物质进入地下的多孔渗透性岩层，注入的物质可包括气体或液体。
Justified for Development 已论证可开发	2.1.3.5, Table 1 2.1.3.5，表 1	A development project that has reasonable forecast commercial conditions at the time of reporting and there are reasonable expectation that all necessary approvals/contracts will be obtained. A project maturity sub-class of Reserves. 储量报告（或披露）时具有合理预测商业条件的开发项目，且可合理预期会获得所有必要的审批 / 合同。是储量的一个项目成熟度亚类。
Kerogen 干酪根	2.4	The naturally occurring, solid, insoluble organic material that occurs in source rocks and can yield oil upon heating. Kerogen is also defined as the fraction of large chemical aggregates in sedimentary organic matter that is insoluble in solvents (in contrast, the fraction that is soluble in organic solvents is called bitumen). (See also Oil Shales.) 天然形成于烃源岩内的固态、不溶性有机质，在高温下可生成油。干酪根也可定义为有机沉积物中不溶于溶剂的高分子化合物（相反，溶于有机溶剂的组分叫沥青）（也见“油页岩”）。
Known Accumulation 已知油气聚集	2.1.1	An accumulation that has been discovered. 已发现的油气聚集体。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Lead 有利区	2.1.3.5, Table 1 2.1.3.5, 表 1	A project associated with a potential accumulation that is currently poorly defined and requires more data acquisition and/or evaluation to be classified as a Prospect. A project maturity sub-class of Prospective Resources. 与潜在油气聚集体相关的项目，这类油气聚集体目前尚不确定，需要更多数据采集和 / 或评价才能归为“目标区”。是远景资源量的一个项目成熟度亚类。
Learning Curve 学习曲线	2.4	Demonstrated improvements over time in performance of a repetitive task that results in efficiencies in tasks to be realized and/or in reduced time to perform and ultimately in cost reductions 证明在重复性任务执行方面随时间而有所改进 , 从而提高效率，实现和 / 或缩短执行时间和最终降低成本。
Likelihood 可能性	1.1	Likelihood (the estimated probability or chance) is equal (1- risk). (See Probability and Risk. 可能性（估算的概率或几率）等于（1- 风险系数）。（参见“概率”和“风险”）。
Low/Best/High Estimates 低 / 最佳 / 高估值	2.2.2	Reflects the range of uncertainty as a reasonable range of estimated potentially recoverable quantities. 将不确定性范围反映为评估的潜在可采量的合理范围。
Low Estimate 低估值	2.2.2	With respect to resources categorization, this is a conservative estimate of the quantity that will actually be recovered from the accumulation by a project. If probabilistic methods are used, there should be at least a 90% probability (P90) that the quantities actually recovered will equal or exceed the low estimate. 资源分级中，低估值指项目能够从油气聚集体中开采出的油气数量的保守估计。如果应用概率法，则实际采出量至少有 90% 的概率（P90）等于或超过低估值。
Lowest Known Hydrocarbons (LKH) 已知烃底	4.1.2	The deepest documented occurrence of a producible hydrocarbon accumulation as interpreted from well log, flow test, pressure measurement, core data, or other conclusive and reliable evidence. 按照测井、产能测试、压力测量、岩芯数据或其他确实可靠证据解释的具有产能的油气聚集体最深部位。
Market 市场	1.1	A consumer or group of consumers of a product that has been obtained through purchase, barter, or contractual terms. 通过购买、实物贸易或合同条款获得一个产品的消费者或一组消费者。
Marketable Quantities 可销售量	2.0	Those quantities of hydrocarbons that are estimated to be producible from petroleum accumulations and that will be consumed by the market. (Also referred to as marketable products.) 估计石油聚集体中可采出并将由市场消耗的烃类数量（也称“可销售产品”）。
Mean 均值	4.2.5	The sum of a set of numerical values divided by the number of values in the set. 一组数值的总和除以组内数的结果。
Measurement 计量	3.2	The process of establishing quantity (volume, mass, or energy content) and quality of petroleum products delivered to a reference point under conditions defined by delivery contract or regulatory authorities. 在交货合同或监管机构规定的条件下确定交付到参照点的石油产品的数量 (体积、质量或能量) 和品质的过程。

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续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Mineral Lease 矿产租约	3.3	An agreement in which a mineral owner (lessor) grants an entity (lessee) rights. Such rights can include (1) a fee ownership or lease, concession, or other interest representing the right to extract oil or gas subject to such terms as may be imposed by the conveyance of the lease; (2) royalty interests, production payments payable in oil or gas, and other non-operating interests in properties operated by others; and/or (3) those agreements with foreign governments or authorities under which a reporting entity participates in the operation of the related properties or otherwise serves as producer of the underlying reserves (as opposed to being an independent purchaser, broker, dealer, or importer). 矿产所有方（出租人）授予实体（承租人）相关权益的协议。这种权益包括：（1）收益的所有权、租赁权、租让权，或按照租约转让条款规定的其他体现油气开采权利的权益；（2）矿费、油 / 气产品支付，以及在其他作业者经营资产中拥有的其他非作业权益；（3）与外国政府或权威部门签署的协议，根据所签协议，披露实体参与相关油气资产经营或开采地下储量（不同于作为独立的买家、经纪人、经销商或进口商的情形）。
Monte Carlo Simulation 蒙特卡罗模拟	4.2	A type of stochastic mathematical simulation that randomly and repeatedly samples input distributions (e.g., reservoir properties) to generate a resulting distribution (e.g., recoverable petroleum quantities). 一种随机数学模拟方法，对输入参数（如油气藏物性）的分布进行随机、重复抽样，产生结果分布（如石油可采量）。
Multi-Scenario Method 多情景法	4.2	An extension of the deterministic scenario method. In this case, a significant number of discrete deterministic scenarios are developed by the evaluator, with each scenario leading to a single deterministic outcome. Probabilities may be assigned to each discrete input assumption from which the probability of the scenario can be obtained; alternatively, each outcome may be assumed to be equally likely. 确定性情景法的一个扩展方法。在这种情况下，评估师开发了大量的离散确定性情景，每个情景都会导致单个确定性结果。概率可以被分配到各个离散的输入假设里，从而获得方案情景中的概率；或者，可以假定每个结果的可能性是相等的。
Natural Bitumen 天然沥青	2.4	The portion of petroleum that exists in the semi-solid or solid phase in natural deposits. In its natural state, it usually contains sulfur, metals, and other nonhydrocarbons. Natural bitumen has a viscosity greater than 10,000 mPa·s (or 10,000 cp) measured at original temperature in the deposit and atmospheric pressure, on a gas free basis. In its natural viscous state, it is not normally recoverable at commercial rates through a well and requires the implementation of improved recovery methods such as steam injection. Natural bitumen generally requires upgrading before normal refining. 天然沉积矿藏中，以半固态或固态形式存在的石油。在自然状态下，通常含有硫、金属及其他非烃类物质。在原始沉积环境温度和大气压力下，脱气天然沥青的黏度超过 10000mPa·s（或厘泊）。在其自然黏度的状态下，通过井开采的常规方法通常达不到商业产量，需要实施蒸汽驱等提高采收率方法。进行常规炼制之前，通常需要对天然沥青进行改质处理。
Natural Gas 天然气	3.2.3	Portion of petroleum that exists either in the gaseous phase or is in solution in crude oil in a reservoir, and which is gaseous at atmospheric conditions of pressure and temperaure. Natural gas may include some amount of non-hydrocarbons. 一个油气藏中，以气态存在或溶解于原油，且在地面大气压力和温度条件下为气态的部分。天然气可能含有一定量的非烃组分。

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续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Natural Gas Liquids (NGLs) 天然气液	3.2.3	A mixture of light hydrocarbons that exist in the gaseous phase in the reservoir and are recovered as liquids in gas processing plants. NGLs differ from condensate in two principal respects: (1) NGLs are extracted and recovered in gas plants rather than lease separators or other lease facilities, and (2) NGLs include very light hydrocarbons (ethane, propane, or butanes) as well as the pentanes-plus that are the main constituents of condensates. 在油气藏条件下以气态存在，但在天然气处理厂作为液体回收的轻烃组分混合物。NGL 与凝析油在两个主要方面不同：（1）NGL 是在天然气处理厂、而不是在合同区分离器或其他合同区设施提取和回收；（2）NGL 既包含轻烃（乙烷、丙烷、丁烷），也包含作为凝析油主要组分的戊烷及以上重组分。
Net Entitlement 净份额	1.1, 3.3	That portion of future production (and thus resources) legally accruing to an entity under the terms of the development and production contract or license. Under the terms of PSCs, the producers have an entitlement to a portion of the production. This entitlement, often referred to as "net entitlement" or "net economic interest," is estimated using a formula based on the contract terms incorporating costs and profits. 根据开发和生产合同或许可证的条款，未来生产的这一部分（也就是资源数量）在法律上归于一个实体。在产品分成合同（PSC）中规定，生产者有权获得部分产量。这种权益，通常称为净份额或者净经济权益，是根据合并成本和利润的合同条款估算的。
Net Pay 有效厚度	4.1.1	The portion (after applying cutoffs) of the thickness of a reservoir from which petroleum can be produced or extracted. Value is referenced to a true vertical thickness measured. 一个油气藏储层厚度中可以生产或开采石油的部分（考虑有效厚度截断值之后）。其数值应为测量值的真实垂直厚度。
Net Revenue Interest 净收益权益	3.3.1	An entity's revenue share of petroleum sales after deduction of royalties or share of production owing to others under applicable lease and fiscal terms. (See also Entitlement and Net Entitlement) 根据适用的租赁或财税条款，扣除税收或其他伙伴分成后，实体在石油销售中的收益分成（参见"份额"和"净份额"）。
Netback Calculation 净回价计算	3.2.1	Term used in the hydrocarbon product price determination at reference point to reflect the revenue of one unit of sales after the costs associated with bringing the product to a market (e.g., transportation and processing) are removed. 在参照点确定烃类产品价格时使用的术语，以反映在去除与产品上市相关的成本（如运输和加工）后的一个销售单位的收入。
Non-Hydrocarbon Gas 非烃气体	3.2.4	Associated gases such as nitrogen, carbon dioxide, hydrogen sulfide, and helium that are present in naturally occurring petroleum accumulations. 天然形成石油聚集体中存在的伴生气，如氮气、二氧化碳、硫化氢和氦气。
Non-Sales 非销售量	1.1	That portion of estimated recoverable or produced quantities that will not be included in sales as contractually defined at the reference point. Non-sales include quantities of CiO, flare, and surface losses, and may include non-hydrocarbons. 按合同规定、在参照点不被销售的那部分估算的可采或已产出量。非销售量包括作业损耗、火炬气和地面损失量，也可包括非烃产品。

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续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Oil Sands 油砂	2.4	Sand deposits highly saturated with natural bitumen. Also called "tar sands." Note that in deposits such as the western Canada oil sands, significant quantities of natural bitumen may be hosted in a range of lithologies, including siltstones and carbonates. 富含天然沥青的沉积砂，也称为"焦油砂"。请注意有些沉积中，如加拿大西部油砂，大量天然沥青可能存在于粉砂岩和碳酸盐岩等多种岩性中。
Oil Shales 油页岩	2.4	Shale, siltstone, and marl deposits highly saturated with kerogen. Whether extracted by mining or in-situ processes, the material must be extensively processed to yield a marketable product (synthetic crude oil). (Often called kerogen shale.) 富含干酪根的页岩、粉砂岩和泥灰岩沉积。无论是通过露天挖掘或地下开采，都必须对油页岩进行大量加工才能获得可销售的产品（合成原油）（通常称为"干酪根页岩"）。
On Production 在生产	2.1.3.5, Table 1 2.1.3.5, 表 1	A project maturity sub-class of Reserves that reflects the operational execution phase of one or multiple development projects with the Reserves currently producing or capable of producing. Includes Developed Producing and Developed Non-Producing Reserves. 储量的一个项目成熟度亚类，反映了一个或多个有储量的开发项目目前正在生产或有生产能力的运行执行阶段，包括已开发正生产储量和已开发未生产储量。
Overlift/Underlift 超提 / 欠提	3.2.8	Production entitlements received that vary from contractual terms resulting in overlift or underlift positions. This can occur in annual records because of the necessity for companies to lift their entitlement in parcel sizes to suit the available shipping schedules as agreed upon by the parties. At any given financial year-end, a company may be in overlift or underlift. Based on the production matching the company's accounts, production should be reported in accord with and equal to the liftings actually made by the company during the year and not on the production entitlement for the year. 收到的产量权益与合同条款不同，导致超额提油或欠额提油的情况出现。产量超提 / 欠提可在年度记录中出现，因为公司打包提取份额油量必须满足伙伴们一致同意的船运计划量；在任一给定的财务年底，公司可能出现超提或者欠提；在与公司账目相符的产量基础上，披露的产量应该与公司当年实际提取的油量一致，而不是与公司当年的产量份额一致。
P1	1.1	Denotes Proved Reserves. P1 is equal to 1P. 表示证实储量，P1=1P。
P2	1.1	Denotes Probable Reserves. 表示概算储量。
P3	1.1	Denotes Possible Reserves. 表示可能储量。
Penetration 钻遇	Table 3 表 3	The intersection of a wellbore with a reservoir. 井筒与油气藏的交汇。
Petroleum 石油	1.0	Defined as a naturally occurring mixture consisting of hydrocarbons in the gaseous, liquid, or solid phase. Petroleum may also contain non-hydrocarbon compounds, common examples of which are carbon dioxide, nitrogen, hydrogen sulfide, and sulfur. In rare cases, non-hydrocarbon content of petroleum can be greater than 50%. 石油是一种自然形成的由气态、液态或固态烃类化合物组成的混合物。石油也可能包含非烃组分，其中常见的如二氧化碳、氮气、硫化氢和硫。在极少数情况下，石油中的非烃组分含量可能大于 50%。

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续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Petroleum Initially in-Place (PIIP) 石油原始原地量（PIIP）	1.1	The total quantity of petroleum that is estimated to exist originally in naturally occurring reservoirs, as of a given date. Crude oil in-place, natural gas in-place, and natural bitumen in-place are defined in the same manner. 截至给定日期估算的、原始存在于天然形成的油气藏中的石油总量。原油原地量、天然气原地量和天然沥青原地量定义的方式相同。
Pilot Project 先导项目	2.3	A small-scale test or trial operation used to assess technology, including recovery processes, for commercial application in a specific reservoir. 一种小规模的试验或试运行，用以评估应用于某一特定油气藏商业应用的技术，包括采油工艺。
Play 远景区	2.1.3.5, Table 1 2.1.3.5, 表 1	A project associated with a prospective trend of potential prospects, but which requires more data acquisition and/or evaluation to define specific Leads or Prospects. A project maturity sub-class of Prospective Resources. 与潜力目标区远景趋势相关的项目，但需要更多的数据采集和 / 或评价才能确定为具体的潜在有利区或目标区。远景资源量的一个项目成熟度亚类。
Pool 石油聚集单体	4.2.2	An individual and separate accumulation of petroleum in a reservoir within a field. 在油气田的油气藏中，单个独立的石油聚集体。
Possible Reserves 可能储量	2.2.2	An incremental category of estimated recoverable quantities associated with a defined degree of uncertainty. Possible Reserves are those additional reserves that analysis of geoscience and engineering data suggest are less likely to be recoverable than Probable Reserves. The total quantities ultimately recovered from the project have a low probability to exceed the sum of Proved plus Probable plus Possible (3P), which is equivalent to the high estimate scenario. When probabilistic methods are used, there should be at least a 10% probability that the actual quantities recovered will equal or exceed the 3P estimate. 是一种与规定的不确定性程度相关的可采估算量的一个增量级别。可能储量是通过地球科学和工程数据分析，表明其可开采的可能性低于概算储量的储量增量。项目的最终可采量超过证实储量、概算储量和可能储量之和（3P）的概率较低，这相当于高估值的情景。当采用概率法时，实际采出量等于或超过 3P 估值的概率应至少为 10%。
Primary Recovery 一次开采	2.3.4	The extraction of petroleum from reservoirs using only the natural energy available in the reservoirs to move fluids through the reservoir rock to other points of recovery. 仅利用油气藏天然能量将流体从储层驱替到井底并采出地面的石油开采方式。
Probability 概率	2.2.1	The extent to which an event is likely to occur, measured by the ratio of the favorable cases to the whole number of cases possible. PRMS convention is to quote cumulative probability of exceeding or equaling a quantity where P90 is the small estimate and P10 is the large estimate. (See also Uncertainty.) 一个事件发生的可能程度，用出现的有利案例数与所有可能案例数之比表示。PRMS 的惯用做法是引用超过或等于某一数量的累积概率，其中 P90 为低估值，P10 为高估值（见“不确定性”）。
Probabilistic Method 概率法	4.2.3	The method of estimation of resources is called probabilistic when the known geoscience, engineering, and economic data are used to generate a continuous range of estimates and their associated probabilities. 使用已知的地球科学、工程和经济数据产生连续的估值范围及其相应概率的资源评估方法称为概率法。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Probable Reserves 概算储量	2.2.2	An incremental category of estimated recoverable quantities associated with a defined degree of uncertainty. Probable Reserves are those additional Reserves that are less likely to be recovered than Proved Reserves but more certain to be recovered than Possible Reserves. It is equally likely that actual remaining quantities recovered will be greater than or less than the sum of the estimated Proved plus Probable Reserves (2P). In this context, when probabilistic methods are used, there should be at least a 50% probability that the actual quantities recovered will equal or exceed the 2P estimate. 一种与规定的不确定性程度相关的可采估算量的一个增量级别。概算储量是通过地球科学和工程数据分析，表明其采出的可能性低于证实储量，但确定性高于可能储量的储量增量。实际剩余采出量大于或小于证实储量加概算储量（2P）的可能性相同。就是说，当采用概率法时，实际采出量等于或超过 2P 估值的概率应至少为 50%。
Production 产量	1.1	The cumulative quantities of petroleum that have been recovered at a given date. Production can be reported in terms of the sales product specifications, but project evaluation requires that all production quantities (sales and non-sales), as measured to support engineering analyses requiring reservoir voidage calculations, are recognized. 截至给定日期累计采出的石油数量。产量可以按销售产品的规格进行报告，但项目评估要求所有生产数量（销售和非销售）都得到确认，以支持油藏工程分析所需的油气藏亏空计算。
Production Forecast 产量预测	2.1.3.7	A forecasted schedule of production over time. For Reserves, the production forecast reflects a specific development scenario under a specific recovery process, a certain number and type of wells and particular facilities and infrastructure. When forecasting Contingent or Prospective Resources, more than one project scope (e.g., wells and facilities) is frequently carried to determine the range of the potential project and its uncertainty together with the associated resources defining the low, best, and high production forecasts. The uncertainty in resources estimates associated with a production forecast is usually quantified by using at least three scenarios or cases of low, best, and high, which lead to the resources classifications of, respectively, 1P, 2P, 3P and 1C, 2C, 3C or 1U,2U and 3U. 产量预测是随着时间的生产预测计划。对于储量，产量预测反映了特定开采过程下的特定开发方案、一定数量和类型的油井以及特定设施和基础设施。在预测条件资源量或远景资源量时，应经常考虑项目的多个条件（如井、设施）从而确定潜在项目的范围和不确定性，从而进行关联资源的低、中、高产量预测。在与产量预测相关的资源评价时的不确定性通常通过至少三个情景或低、中、高情况来进行量化，分别为 1P、2P、3P 和 1P、2C、3P 或 1U、2U 和 3P 的资源分类。
Production-Sharing Contract (PSC) 产品分成合同（PSC）	3.3.2	A contract between a contractor and a host government in which the contractor typically bears the risk and costs for exploration, development, and production. In return, if exploration is successful, the contractor is given the opportunity to recover the incurred investment from production, subject to specific limits and terms. Ownership of petroleum in the ground is retained by the host government; however, the contractor normally receives title to the prescribed share of the quantities as they are produced. (Also termed production-sharing agreement (PSA). 在合同者与资源国政府签订的产品分成合同中，通常由合同者承担勘探、开发和生产的所有风险和费用。作为回报，如果勘探获得成功，合同者则有机会根据合同具体条款和限制从石油产量中回收投资。地下油气的所有权属于资源国政府，但一般情况下，合同者可以按规定获得石油产量分成权益 [也称“产品分成协议 (PSA)”]。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Project 项目	1.2	A defined activity or set of activities that provides the link between the petroleum accumulation's resources sub-class and the decision-making process, including budget allocation. A project may, for example, constitute the development of a single reservoir or field, an incremental development in a larger producing field, or the integrated development of a group of several fields and associated facilities (e.g. compression) with a common ownership. In general, an individual project will represent a specific maturity level (sub-class) at which a decision is made on whether or not to proceed (i.e., spend money), suspend, or remove. There should be an associated range of estimated recoverable resources for that project. (See also Development Plan.) 一个或一组确定的活动，体现了石油聚集体资源亚类与决策过程（包括财务预算拨款）之间的联系。举例来说，一个项目可能是单个油气藏或油气田的开发，或者是一个正生产大型油气田的增量开发，亦或是所有权相同的多个油气田及其地面设施（如压缩机）的综合开发。一般而言，一个独立项目将代表一个具体的成熟度水平（亚类），以此作为支持是否继续推进项目（也就是投资）、暂停或取消等的决策依据，应有一个项目可采估算量的相应范围（也见“开发方案”）。
Property 矿区资产	1.2	A defined portion of the Earth's crust wherein an entity has contractual rights to extract, process, and market specified in-place minerals (including petroleum). In general, defined as an area but may have depth and/or stratigraphic constraints. May also be termed a lease, concession, or license. 地壳内的一个特定区域，其中某实体已取得合同权利来开采、处理和出售指定地下矿产（包括油气）的规定部分。一般来说，规定为一个面积区域，但可以有深度和层位方面的限制。也可以称为租赁区、租让区、许可证区。
Prospect 目标区	2.1.3.5, Table 1 2.1.3.5, 表 1	A project associated with an undrilled potential accumulation that is sufficiently well defined to represent a viable drilling target. A project maturity sub-class of Prospective Resources. 一个与未钻潜在油气聚集体相关的项目，经充分落实，为一个可行的钻井目标。远景资源量的一个项目成熟度亚类。
Prospective Resources 远景资源量	1.1, Table 1 1.1, 表 1	Those quantities of petroleum estimated, as of a given date, to be potentially recoverable from undiscovered accumulations by application of future development projects. 截至给定日期估算的、可能从未发现的油气聚集体中通过应用未来开发项目采出的石油数量。
Proved Reserves 证实储量	2.2.2, Table 3 2.2.2, 表 3	An incremental category of estimated recoverable quantities associated with a defined degree of uncertainty. Proved Reserves are those quantities of petroleum that, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be commercially recoverable, from a given date forward, from known reservoirs and under defined economic conditions, operating methods, and government regulations. If deterministic methods are used, the term "reasonable certainty" is intended to express a high degree of confidence that the quantities will be recovered. If probabilistic methods are used, there should be at least a 90% probability that the quantities actually recovered will equal or exceed the low estimate. 不确定性程度明确的一个可采估算量的增量级别。证实储量是通过地球科学和工程数据分析，自给定日期起，在确定的经济条件、作业方式及政府规定下，能合理确定地从已知油气藏中商业开采的油气估算数量。如果采用确定法，则“合理确定性”这一术语旨在表明采出这些数量有很高的置信度。如果采用概率法，实际采出量等于或超过低估值的概率至少是 90%。

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续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Pure Service Contract 纯服务合同	3.3	Agreement between a contractor and a host government that typically covers a defined technical service to be provided or completed during a specific time period. The service company investment is typically limited to the value of equipment, tools, and expenses for personnel used to perform the service. In most cases, the service contractor's reimbursement is fixed by the contract's terms with little exposure to either project performance or market factors. No Reserves or Resources can be attributed to these activities. 纯服务合同是合同者和资源国政府之间的一种协议，其内容通常是在指定时期内提供或完成规定的技术服务。服务公司的投资一般只限于设备、工具以及执行服务的人员费用。多数情况下，服务承包商的报酬按合同条款是固定的，基本与项目执行效果或市场因素无关。服务合同中没有储量或资源量认定。
Qualified Reserves Auditor 合资格储量审计师	1.2	A reserves evaluator who (1) has a minimum of ten years of practical experience in petroleum engineering or petroleum production geology, with at least five years of such experience being in responsible charge of the estimation and evaluation of Reserves information; and (2) either (a) has obtained from a college or university of recognized stature a bachelor's or advanced degree in petroleum engineering, geology, or other discipline of engineering or physical science or (b) has received, and is maintaining in good standing, a registered or certified professional engineer's license or a registered or certified professional geologist's license, or the equivalent, from an appropriate governmental authority or professional organization. (see SPE 2007 "Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information") 储量的审计人员：(1) 至少有十年石油工程或石油生产地质学的实际经验，其中至少五年担任储量信息评估和评价工作的负责人；(2)(a) 已在具有公认地位的学院或大学取得石油工程、地质、或其它工程或物理科学专业的学士或更高学位，(b) 持有适当政府机构或者专业机构出具的注册或认证专业工程师执照、或注册或认证专业地质师执照、或具有同等资格（参见 SPE 2007"关于石油和天然气储量信息评估和审计的标准"）。
Qualified Reserves Evaluator 合资格储量评估师	1.2	A reserves evaluator who (1) has a minimum of five years of practical experience in petroleum engineering or petroleum production geology, with at least three years of such experience being in the estimation and evaluation of Reserves information; and (2) either (a) has obtained from a college or university of recognized stature a bachelor's or advanced degree in petroleum engineering, geology, or other discipline of engineering or physical science or (b) has received, and is maintaining in good standing, a registered or certified professional engineer's license or a registered or certified professional geologist's license, or the equivalent, from an appropriate governmental authority or professional organization. (modified from SPE 2007 "Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information") 储量的评估人员：(1) 至少有五年石油工程或石油生产地质学的实际经验，其中至少三年负责储量信息的评估和评价工作；(2)(a) 已在具有公认地位的学院或大学取得石油工程、地质学或其它工程或物理科学专业的学士或高级学位；(b) 持有适当政府机构或者专业机构出具的注册或认证专业工程师执照、或注册或认证专业地质师执照、或具有同等资格（修改自 SPE 2007"关于石油和天然气储量信息评估和审计的标准"）。
Range of Uncertainty 不确定性范围	2.2	The range of uncertainty of the in-place, recoverable, and/or potentially recoverable quantities; may be represented by either deterministic estimates or by a probability distribution. (See Resources Categories.) 原地量、可采量和 / 或潜在可采量的不确定性范围，可由确定性估值或概率分布来表述（参见"资源级别"）。

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续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Raw Production 井口产量	3.2.1	All components, whether hydrocarbon or other, produced from the well or extracted from the mine (hydrocarbons, water, impurities such as non-hydrocarbon gases, etc.). 从井中生产或从矿井中提取的所有成分，无论是烃类还是其他成分（烃类、水、杂质，如非烃气体等）。
Reasonable Certainty 合理确定性	2.2.2	If deterministic methods for estimating recoverable resources quantities are used, then reasonable certainty is intended to express a high degree of confidence that the estimated quantities will be recovered. Typically attributed to Proved Reserves or 1C Resources quantities. 如果使用确定法评估可采资源数量，合理确定性是指估算的数量能被采出有高置信度。通常适用于证实储量或 1C 资源量。
Reasonable Expectation 合理预期	2.1.2	Indicates a high degree of confidence (low risk of failure) that the project will proceed with commercial development or the referenced event will occur. (Differs from reasonable certainty, which applies to resources quantity technical confidence, while reasonable expectation relates to commercial confidence.). 表明该项目进行商业开发或引用事件的发生有高置信度 (失败风险低)(与合理确定性适用于资源数量的技术置信度不同，合理预期适用于商业置信度)。
Recoverable Resources 可采资源	1.1, Table 1 1.1, 表 1	Those quantities of hydrocarbons that are estimated to be producible by the project from either discovered or undiscovered accumulations. 可从已发现或未发现聚集中开采的油气数量。
Recovery Efficiency 采收率	1.2	A numeric expression of that portion (expressed as a percentage) of in-place quantities of petroleum estimated to be recoverable by specific processes or projects, most often represented as a percentage. It is estimated using the recoverable resources divided by the hydrocarbons initially in-place. It is also referenced to timing; current and ultimate (or estimated ultimate) are descriptors applied to reference the stage of the recovery. (Also called recovery factor.) 表示石油原地量中可通过特定作业或项目采出部分的数值表达（通常以百分比表示），采收率可以由可采资源数量除以油气原始原地量进行估算。采收率还与时间有关，当前和最终（或估算的最终采收率）是开采阶段的表征指标。
Reference Point 参照点	3.2.1	A defined location within a petroleum extraction and processing operation where quantities of produced product are measured under defined conditions before custody transfer (or consumption). Also called point of sale, terminal point, or custody transfer point. 石油开采与加工处理作业链中的一个指定位置，油气产品在此位置进行交付（或消费）之前对按规定条件进行计量。也称销售点、终端点或交付点。
Report 报告	2.0	The presentation of evaluation results within the entity conducting the assessment. Should not be construed as replacing requirements for public disclosures under guidelines established by regulatory and/or other government agencies. 实体的资产评估结果展示，不应解释为取代监管机构和 / 或其他政府机构准则下的公开披露要求。
Reserves 储量	1.1, Table 1 1.1, 表 1	Those quantities of petroleum anticipated to be commercially recoverable by application of development projects to known accumulations from a given date forward under defined conditions. Reserves must satisfy four criteria: they must be discovered, recoverable, commercial, and remaining (as of a given date) based on the development project(s) applied. 在确定条件下、自给定日期起，通过实施开发项目，预计能够从已知油气聚集体中商业开采的石油数量。根据所实施的开发项目，储量必须满足四个条件：已发现的、可采的、商业性的和剩余的（截至给定日期）。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Reservoir 油气藏	1.2	A subsurface rock formation that contains an individual and separate natural accumulation of petroleum that is confined by impermeable barriers, pressure systems, or fluid regimes (conventional reservoirs), or is confined by hydraulic fracture barriers or fluid regimes (unconventional reservoirs). 含有单个、独立天然石油聚集的岩性地层，受非渗透性遮挡，压力或流体系统的控制（如常规油气藏），或受到水力裂缝屏障或流态分布（如非常规油气藏）控制。
Resources 资源	1.1	A Term in broad sense, is used to encompass all quantities of petroleum (recoverable and unrecoverable) naturally occurring in an accumulation on or within the Earth's crust, discovered and undiscovered, plus those quantities already produced. Further, it includes all types of petroleum whether currently considered conventional or unconventional. 广义术语，用于包含地壳上或地壳内自然形成的所有（可采和不可采的）石油数量，包括已发现和未发现的，以及已经产出的石油数量。此外，还包括所有类型的石油，无论是目前被认为是常规的还是非常规的。
Resources Categories 资源级别	2.2, Table 3 2.2, 表 3	Subdivisions of estimates of resources to be recovered by a project(s) to indicate the associated degrees of uncertainty. Categories reflect uncertainties in the total petroleum remaining within the accumulation (in-place resources), that portion of the in-place petroleum that can be recovered by applying a defined development project or projects, and variations in the conditions that may impact commercial development (e.g., market availability and contractual changes). The resource quantity uncertainty range within a single resources class is reflected by either the 1P, 2P, 3P, Proved, Probable, Possible Reserves, or 1C, 2C, 3C or 1U, 2U, 3U resources categories. 项目可采资源估算量的相关不确定性程度的资源量细分。不同级别反映了油气聚集体内总剩余石油量（原地量）的不确定性、通过实施规定的某一（些）开发项目可采出石油原地量的那一部分数量的不确定性，以及各种可能影响商业开发的条件（如市场可获得性、合同的变化等）的不确定性。单种资源类别中资源的不确定性范围可以被反映为 1P、2P、3P、证实、概算、可能储量级别；或者 1C、2C、3C 或 1U、2U、3U 资源量级别。
Resources Classes 资源类别	2.1, Table 1 2.1, 表 1	Subdivisions of resources that indicate the relative maturity of the development projects being applied to yield the recoverable quantity estimates. Project maturity may be indicated qualitatively by allocation to classes and sub-classes and/or quantitatively by associating a project's estimated likelihood of commerciality. 所实施的开发项目采出可采估算量的相对成熟度的资源细分。项目成熟度可以定性地用类别和子类来表示、和 / 或定量地用其项目评估的商业性来表示。
Resources Type 资源类型	2.4	Describes the accumulation and is determined by the combination of the type of hydrocarbon and the rock in which it occurs. 表述一种油气聚集体，由碳氢化合物的类型以及其所在岩石的组合所决定。
Revenue-Sharing Contract 收入分成合同	3.3.2	Contracts that are very similar to the PSCs with the exception of contractor payment in these contracts, the contractor usually receives a defined share of revenue rather than a share of the production. 收入分成合同和产品分成合同非常相似，只是合同者的支付方式不同。通常合同者从这种合同得到的是规定的油气收入的分成而不是产量分成。
Risk 风险	2.1.3	The probability of loss or failure. Risk is not synonymous with uncertainty. Risk is generally associated with the negative outcome, the term "chance" is preferred for general usage to describe the probability of a discrete event occurring. 损失或失败的概率，风险不是不确定性的同义词。风险通常与负面结果有关，术语“几率”一般更常用于表述离散事件发生的概率。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Risk and Reward 风险和回报	3.3	Risk and reward associated with oil and gas production activities are attributed primarily from the variation in revenues caused by technical and economic risks. The exposure to risk in conjunction with entitlement rights is required to support an entity's resources recognition. Technical risk affects an entity's ability to physically extract and recover hydrocarbons and is usually dependent on a number of technical parameters. Economic risk is a function of the success of a project and is critically dependent on cost, price, and political or other economic factors. 与油气生产活动有关的风险和回报主要来源于技术和经济风险引起的收入变化。风险与权益相结合，保证公司资源的确认。技术风险影响公司实际开采油气的能力，且常常取决于一些技术参数。经济风险是项目成功的变数，主要取决于成本、价格和政治或其他经济因素。
Risk Service Contract (RSC) 风险服务合同（RSC）	3.3	Agreements that are very similar to the production-sharing agreements in that the risk is borne by the contractor but the mechanism of contractor payment is different. With a RSC, the contractor usually receives a defined share of revenue rather than a share of the production. 与产品分成合同很相似的协议，风险由承包方承担，但承包方的支付方式不同。在风险服务合同中，承包方通常是获得规定的收入分成而不是产量分成。
Royalty 矿费	3.3.1	A type of entitlement interest in a resource that is free and clear of the costs and expenses of development and production to the royalty interest owner. A royalty is commonly retained by a resources owner (lessor/host) when granting rights to a producer (lessee/contractor) to develop and produce that resource. Depending on the specific terms defining the royalty, the payment obligation may be expressed in monetary terms as a portion of the proceeds of production or as a right to take a portion of production in-kind. The royalty terms may also provide the option to switch between forms of payment at discretion of the royalty owner. 资源中的一种权利利益，它不受开发和生产成本和费用的影响，对特许权权益所有者来说是免费的。在授予生产者 (承租人 / 承包商) 开发和生产该资源的权利时，资源所有者 (出租人 / 东道方) 通常保留矿区使用费。根据界定特许权使用费的具体条款 , 付款义务可按货币表示为生产收益的一部分 , 或作为以实物形式获取部分生产的权利。矿区使用费条款还可提供在矿区使用费所有人酌情决定的支付形式之间切换的选择。
Sales 销售量	3.2	The quantity of petroleum and any non-hydrocarbon product delivered at the custody transfer point (reference point) with specifications and measurement conditions as defined in the sales contract and/or by regulatory authorities. 按照销售合同和 / 或监管机构规定的规格与计量条件，在交付点（参照点）交付的石油和任何非烃产品的数量。
Shale Gas 页岩气	2.4	Although the terms shale gas and tight gas are often used interchangeably in public discourse, shale formations are only a subset of all low-permeability tight formations, which include sandstones and carbonates, as well as shales, as sources of tight gas production. 尽管页岩气和致密气术语在公共交谈中常互换使用 , 但页岩储层只是所有低渗透致密储层的一个子集；低渗透致密储层，包含砂岩和碳酸盐岩以及页岩，是致密气产量的来源。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Shale Oil 页岩油	2.4	Although the terms shale oil and tight oil are often used interchangeably in public discourse, shale formations are only a subset of all low-permeability tight formations, which include sandstones and carbonates, as well as shales, as sources of tight oil production 尽管页岩油和致密油术语在公共交谈中常互换使用，但页岩储层只是所有低渗透致密储层的一个子集；低渗透致密储层，包含砂岩和碳酸盐岩以及页岩，是致密油产量的来源。
Shut-In Reserves 关井储量	2.1.3.6, Table 2 2.1.3.6, 表 2	Reserves are planned to be recovered from (1) completion intervals that are open at the time of the estimate, but which have not started producing; (2) wells that were shut-in for market conditions or pipeline connections; or (3) wells not capable of production for mechanical reasons that can be remediated at a limited cost compared to the cost of a new well. 计划从以下情形采出的储量：（1）评估时已射开，但尚未投产的完井层段；（2）由于市场条件或管线连接原因而关停的井；（3）因机械原因（相对于一口新井，修复费用较低）不能生产的井。
Split Classification 类别劈分	2.2	A single project should be uniquely assigned to a sub-class along with its uncertainty range. For example, a project cannot have quantities categorized as 1C, 2P, and 3P. This is referred to as “split classification.” If there are differing commercial conditions, separate sub-classes should be defined. 一个单独的项目应该唯一地配置一个成熟度亚类及相应的不确定性范围。例如，一个项目不能同时划分 1C、2P 和 3P 数量。这称为“类别劈分”。若存在不同商业条件，则应另行定义亚类。
Split Conditions 条件劈分	2.2	The uncertainty in recoverable quantities is assessed for each project using resources categories. The assumed commercial conditions are associated with resource classes or sub-classes and not with the resources categories. For example, the product price assumptions are those assumed when classifying projects as Reserves, and a different price would not be used for assessing Proved versus Probable reserves. That would be referred to as “split conditions.” 使用资源级别评估每个项目可采量的不确定性。假定的商业条件与资源分类或子类相关联，而不是与资源级别相关联。例如，产品价格假设是将项目分类为储量时使用的，并且不会使用不同的价格来评估已证实储量和概算储量。这称为”拆分条件”。
Stochastic 随机	4.2.3	Adjective defining a process involving or containing a random variable or variables or involving likelihood or probability, such as a stochastic simulation. 描述涉及或包含一个或多个随机变量，或包含可能性或概率过程的形容词，如随机模拟。
Sub-Commercial 次商业	1.1	A project subdivision that is applied to discovered resources that occurs if either the technical or commercial maturity conditions of project have not yet been achieved. A project is sub-commercial if the degree of commitment is such that the accumulation is not expected to be developed and placed on production within a reasonable time-frame. Sub-commercial projects are classified as Contingent Resources. 当项目的技术或商业成熟条件未满足时，针对已发现资源量的一个项目细分级。如果油气聚集体中一个项目的开发承诺程度预期不会在合理的时间框架内开发和投入生产，那么该项目就属于次商业的。次商业项目归类为条件资源量。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Sunk Cost 沉没成本	3.1.2	Money spent before the effective date and that cannot be recovered by any future action. Sunk costs are not relevant to future business decisions because the cost will be the same regardless of the outcome of the decision. Sunk costs differ from committed (obligated) costs, where there is a firm and binding agreement to spend specified amounts of money at specific times in the future (i.e., after the effective date). 在生效日期之前花费且无法通过任何未来行动收回的资金。沉没成本与未来的业务决策无关，因为无论决策结果如何， 成本都是一样的。沉没成本与承诺（义务）成本不同，即在未来特定时间（即生效日期后）有一项明确和有约束力的协议支出特定数额的资金。
Synthetic Crude Oil 合成油	3.2.9	A mixture of hydrocarbons derived by upgrading (i.e., chemically altering) natural bitumen from oil sands, kerogen from oil shales, or processing of other substances such as natural gas or coal. Synthetic crude oil may contain sulfur or other nonhydrocarbon compounds and has many similarities to crude oil. 通过油砂中的天然沥青、油页岩中的干酪根或其他物质，如通过处理天然气或煤碳等其他改质（即化学改变）而得的一种碳氢化合物的混合物。合成油可能含有硫或其他非烃化合物，与原油有许多相似之处。
Synthetic Gas (or Synthetic Natural Gas) 合成气	3.2.9	A fuel gas, whether predominately methane or carbon monoxide, derived from fossil fuels such as coal, oil shale, or other naturally occurring petroleum resources. 一种燃料气，主要成分是甲烷或一氧化碳，从化石燃料（如煤、油页岩或其他天然油气资源）中获取。
Taxes 税负	3.1.1	Obligatory contributions to the public funds, levied on persons, property, or income by governmental authority. 由政府部门对个人、财产或收入强制性征收的用作公共资金的义务费用。
Technical Forecast 技术预测	2.1.2	The forecast of produced resources quantities that is defined by applying only technical limitations (i.e., well-flow-loading conditions, well life, production facility life, flow-limit constraints, facility uptime, and the facility's operating design parameters). Technical limitations do not take into account the application of either an economic or license cutoff (See also Technically Recoverable Resources). 仅应用技术限制条件（如油井流量条件、油井寿命、生产设施寿命、流量限制、设施运行时间以及设施的操作设计参数）确定的已产资源数量的预测值。技术限制条件不考虑经济的或许可期的截断值（也见“技术可采资源”）。
Technically Recoverable Resources 技术可采资源	1.1	Those quantities of petroleum producible using currently available technology and industry practices, regardless of commercial or accessibility considerations. 利用现有技术和行业实践经验可生产的石油数量，不考虑商业性或可获得性。
Technical Uncertainty 技术不确定性	2.2	Indication of the varying degrees of uncertainty in estimates of recoverable quantities influenced by the range of potential in-place hydrocarbon resources within the reservoir and the range of the recovery efficiency of the recovery project being applied. 表明油气藏内受潜在油气原地资源量范围和项目采收率范围影响的可采估算量的不确定性程度。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Technically Ultimate Recovery 最终技术可采量	1.1	Technically Ultimate Recovery (TUR) is a term that can be applied to an accumulation or group of accumulations (discovered or undiscovered) to define the total quantities of petroleum producible using available technology and industry practices, regardless of commercial considerations. TUR, based on TRR plus prior production. 最终技术可采量（TUR），指利用现有技术和工业实践（不考虑商业因素），可从一个或一组油气聚集（已发现或未发现）中采出的石油总量。最终技术可采量（TUR），等于技术可采资源量（TRR）加上前期产量。
Technology Under Development 正研发技术	2.1.1	Technology that is currently under active development and that has not been demonstrated to be commercially viable. There should be sufficient direct evidence (e.g., a test project/pilot) to indicate that the technology may reasonably be expected to be available for commercial application. 目前正在积极开发且尚未被证明具有商业可行性的技术。应当有足够的直接证据（例如，试验项目 / 先导试验）表明可以合理地预期该技术可用于商业应用。
Tight Gas 致密气	2.4	Gas that is trapped in pore space and fractures in very low-permeability rocks and/or by adsorption on kerogen, and possibly on clay particles, and is released when a pressure differential develops. It usually requires extensive hydraulic fracturing to facilitate commercial production. Shale gas is a sub-type of tight gas. 圈闭在极低渗透岩石中孔隙空间和裂缝中，通过吸附在干酪根上或可能吸附在黏土颗粒上的气体，并在压差形成时释放出来。通常需要广泛的水力压裂来促进商业生产。页岩气是致密气的一个亚类。
Tight Oil 致密油	2.4	Crude oil that is trapped in pore space in very low-permeability rocks and may be liquid under reservoir conditions or become liquid at surface conditions. Extensive hydraulic fracturing is invariably required to facilitate commercial maturity and economic production. Shale oil is a sub-type of tight oil. 圈闭在极低渗透岩石孔隙空间中的原油，在油藏条件下可能是液体，或在表面条件下变成液体。为了促进商业成熟度和经济开发，必须进行广泛的水力压裂。页岩油是致密油的一个亚类。
Total Petroleum Initially-in-Place 总石油原始原地量	1.1	All estimated quantities of petroleum that are estimated to exist originally in naturally occurring accumulations, discovered and undiscovered, before production. 天然赋存油气聚集在投产前的原始石油估算总量，包括已发现和未发现的。
Uncertainty 不确定性	2.2	The range of possible outcomes in a series of estimates. For recoverable resources assessments, the range of uncertainty reflects a reasonable range of estimated potentially recoverable quantities for an individual accumulation or a project. (See also Probability.) 一系列可能的评估结果估值的范围。对于可采资源量的评估，不确定性范围反映单个油气聚集体或项目的潜在可采估算量的合理范围（也见“概率”）。
Unconventional Resources 非常规资源	2.4	Unconventional resources exist in petroleum accumulations that are pervasive throughout a large area and lack well-defined OWC or GWC (also called “continuous-type deposits”). Such resources cannot be recovered using traditional recovery projects owing to fluid viscosity (e.g., oil sands) and/or reservoir permeability (e.g., tight gas/oil/CBM) that impede natural mobility. Moreover, the extracted petroleum may require significant processing before sale (e.g., bitumen upgraders). 非常规资源存在于石油聚集体中，大面积普遍分布，而且缺乏明确油水或气水界面的（也被称为“连续型沉积”）。由于流体黏度（如油砂）和 / 或储层渗透率（如页岩气 / 原油 / 煤层气）阻碍了天然流动性，这种资源无法利用传统的开发项目采出。此外，采出的石油在销售前还可能需要进行大量加工处理（例如沥青改质）。

Continued
续表

Term 术语	See PRMS Section PRMS 章节	Definition 定义
Undeveloped Reserves 未开发储量	2.1.3.5, Table 2 2.1.3.5, 表 2	Those quantities expected to be recovered through future investments: (1) from new wells on undrilled acreage in known accumulations, (2) from deepening existing wells to a different (but known) reservoir, (3) from infill wells that will increase recovery, or (4) where a relatively large expenditure (e.g., when compared to the cost of drilling and completing a new well) is required to recomplete an existing well. 预计通过未来投资采出的油气数量:（1）从已知油气聚集体未钻井区域所钻的新井;（2）从加深现有井到另一不同的（已知的）油气藏;（3）从可增加可采量的加密井;（4）一口现有井的重新完井需要较大成本（如与钻一口新井和完井的成本比较）。
Undiscovered Petroleum Initially in-Place 未发现石油原始原地量	1.1	That quantity of petroleum estimated, as of a given date, to be contained within accumulations yet to be discovered. 截至给定日期在油气聚集体内尚未被发现石油估算量。
Unrecoverable Resources 不可采资源	1.1	Those quantities of discovered or undiscovered PIIP that are assessed, as of a given date, to be unrecoverable by the currently defined project(s). A portion of these quantities may become recoverable in the future as commercial circumstances change, technology is developed, or additional data are acquired. The remaining portion may never be recovered owing to physical/chemical constraints represented by subsurface interaction of fluids and reservoir rocks. 截至给定日期，当前定义的项目估算的已发现或未发现石油原始原地量中不能被开采的那部分数量。将来，随着商业环境的变化、技术的发展或获得更多的数据，部分不可采量可能会转变为可采量。由于流体和储集岩间地下相互作用的物理化学约束，剩余部分可能永远不可开采。
Upgrader 改质	2.4	A general term applied to processing plants that convert extra-heavy crude oil and natural bitumen into lighter crude and less viscous synthetic crude oil. While the detailed process varies, the underlying concept is to remove carbon through coking or to increase hydrogen by hydrogenation processes using catalysts. 应用于将超重原油和天然沥青转化为轻质原油和较低黏度的合成油的处理加工厂的一个通用术语。尽管具体处理过程不尽相同，但基本原理都是通过焦化除碳，或者通过催化剂加氢过程增加氢的含量。
Wet Gas 湿气	3.2.3	Natural gas from which no liquids have been removed before the reference point. The wet gas is accounted for in resources assessments, and there is no separate accounting for contained liquids. It should be recognized that this is a resources assessment definition and not a phase behavior definition. 在参照点之前没有去除任何液体的天然气。在资源评估中对湿气进行核算，不单独登记湿气中所含的液量。应注意这是资源评估的定义，而不是相态定义。
Working Interest (WI) 工作权益（WI）	3.3	An entity's equity interest in a project before reduction for royalties or production share owed to others under the applicable fiscal terms. 根据适用的财税条款，公司在扣除矿费或其他各方的份额产量之前所拥有的项目权益。

Appendix B Revisions and Modifications
附录 B 修订与更正

The following revisions and modifications have been made since the publication of the PRMS2018.
以下是在 PRMS2018 基础上所做的修订和更正。

No. 序号	Section/Page in PRMS V1.03 PRMS V1.03 中的页面 / 章节	Original Text 正文	After Revision 修订后
1	Page iv Paragraph 5	This document consolidates, builds on, and replaces prior guidance. Appendix A is a glossary of terms used in the PRMS and replaces those published in 2007. It is expected that this document will be supplemented with industry education programs, best practice reporting standards, future updates to the 2011 Application Guidelines.	This document consolidates, builds on, and replaces prior guidance. Appendix A is a glossary of terms used in the PRMS and replaces those published in 2007. It is expected that this document will be supplemented with industry education programs, best practice reporting standards, future updates to the 2011 Application Guidelines and **extension of PRMS principles to non-hydrocarbons.**
2	Page 1 Sec. 1.1.0.3	The system classifies resources into discovered and undiscovered and defines the recoverable resources classes: Production, Reserves, Contingent Resources, and Prospective Resources, as well as Unrecoverable Resources.	The system classifies resources into discovered and undiscovered and defines the **Production**, recoverable resources classes: Reserves, Contingent Resources, and Prospective Resources, as well as Unrecoverable Resources **(or Unrecoverable).**
3	Page 4 Sec. 1.1.0.8	A new term of 'Techinical Ultimate Recovery' included in the text.	Technically Ultimate Recovery (TUR) is not a resources category or class, but a term that can be applied to an accumulation or group of accumulations (discovered or undiscovered) to define the total quantities of petroleum producible using available technology and industry practices, regardless of commercial considerations. TUR, based on TRR plus prior production, is a term helpful for reservoir engineering analysis and the long-tern planning at company or national level.
4	Page 8 Figure 2.1	See Figure 2.1	To keep consistent with Figure 1.1: 1. The **arrow on X-axis** should be extended within the whole uncertainty range of resources quantities. 2. '**Not to scale**' should be placed as an annotation for the arrow on X-axis.
5	Page 11 Sec. 2.1.3.7.5	2.1.3.7.5 The economic status may be identified independently of, or applied in combination with, project maturity sub-classification to more completely describe the project. Economic status is not the only qualifier that allows defining Contingent or Prospective Resources sub-classes. Within Contingent Resources, applying the project status to decision gates (and/or incorporating them in a plan to execute) more appropriately defines whether the project is placed into the sub-class of either Development Pending versus On Hold, Not Viable or Unclarified.	2.1.3.7.5 The economic status may be identified independently of, or applied in combination with, project maturity sub-classification to more completely describe the project. Economic status is not the only qualifier that allows defining Contingent or Prospective Resources sub-classes. Within Contingent Resources, applying the project status to decision gates (and/or incorporating them in a plan to execute) more appropriately defines whether the project is placed into the sub-class of either Development Pending versus Development On Hold, Development Unclarified or Development Not Viable.

Continued
续表

No. 序号	Section/Page in PRMS V1.03 PRMS V1.03 中的页面 / 章节	Original Text 正文	After Revision 修订后
6	Page 12 Sec. 2.2.1.2	2.2.1.2 When the range of uncertainty is represented by a probability distribution, a low, best, and high estimate shall be provided such that: (1) There should be at least a 90% probability (P90) that the quantities actually recovered will equal or exceed the low estimate. (2) There should be at least a 50% probability (P50) that the quantities actually recovered will equal or exceed the best estimate. (3) There should be at least a 10% probability (P10) that the quantities actually recovered will equal or exceed the high estimate.	2.2.1.2 When the range of uncertainty is represented by a probability distribution, a low, best, and high estimate shall be provided such that: (1) There should be at least a 90% probability (P90) that the quantities to be actually recovered will equal or exceed the low estimate. (2) There should be at least a 50% probability (P50) that the quantities to be actually recovered will equal or exceed the best estimate. (3) There should be at least a 10% probability (P10) that the quantities to be actually recovered will equal or exceed the high estimate.
7	Page 13 Sec. 2.2.2.8	A: (1) Proved Reserves are those quantities of Petroleum that, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be commercially recoverable from known reservoirs and under defined technical and commercial conditions. If deterministic methods are used, the term “reasonable certainty” is intended to express a high degree of confidence that the quantities will be recovered. If probabilistic methods are used, there should be at least a 90% probability that the quantities actually recovered will equal or exceed the estimate.	A: (1) Proved Reserves are those quantities of Petroleum that, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be commercially recoverable from known reservoirs and under defined technical and commercial conditions. If deterministic methods are used, the term “reasonable certainty” is intended to express a high degree of confidence that the quantities will be recovered. If probabilistic methods are used, there should be at least a 90% probability that the quantities actually recovered will equal or exceed the **1P** estimate.
8	Page 41 Glossary of Terms	Term: Developed Non-producing Reserves Definition: Developed Reserves that are either shut-in or behind-pipe. (See also Shut-In Resources and Behind-Pipe Reserves)	Developed Reserves that are either shut-in or behind-pipe. (See also Shut-In **Reseves** and Behind-Pipe Reserves)
9	Page 50 Glossary of Terms	Term: Shut-In **Resources** Definition: Resources planned to be recovered from (1) completion intervals that are open at the time of the estimates, but which have not started producing; (2) wells that were shut-in for market conditions or pipeline connections; or (3) wells not capale of production for mechanical reasons that can be remediated at a limited cost compared to the cost of the well.	The term is modified as ‘Shut-In **Reserves**’. Definition: **Resrves** planned to be recovered from (1) completion intervals that are open at the time of the estimates, but which have not started producing; (2) wells that were shut-in for market conditions or pipeline connections; or (3) wells not capale of production for mechanical reasons that can be remediated at a limited cost compared to the cost of **a new well.**

Continued
续表

No. 序号	Section/Page in PRMS V1.03 PRMS V1.03 中的页面 / 章节	Original Text 正文	After Revision 修订后
10	Page 12 Sec. 2.2.1.5	2.2.1.5 Project resources are initially estimated using the above uncertainty range forecasts that incorporate the subsurface elements together with technical constraints related to wells and facilities. The technical forecasts then have additional commercial criteria applied (e.g., economics and license cutoffs are the most common) to estimate the entitlement quantities attributed and the resources classification status: Reserves, Contingent Resources, **and** Prospective Resources.	2.2.1.5 Project resources are initially estimated using the above uncertainty range forecasts that incorporate the subsurface elements together with technical constraints related to wells and facilities. The technical forecasts then have additional commercial criteria applied (e.g., economics and license cutoffs are the most common) to estimate the entitlement quantities attributed and the resources classification status: Reserves, Contingent Resources, **or** Prospective Resources.
11	Page 18 Sec. 3.1.1.1 F	The application of an appropriate discount rate applicable to the entity at the time of the evaluation.	**An** appropriate discount rate applicable to the entity at the time of the evaluation.
12	Page 18 Sec. 3.1.2.1	The ADR costs are excluded from the economically producibility determination.	The ADR costs are excluded from the **economic** producibility determination.
13	Page 19 Sec. 3.1.3.1	The economic limit is defined as the production rate at the time when the maximum cumulative net cash flow occurs for a project. The entity's entitlement production share, and thus net entitlement resources, includes those produced quantities up to the earliest truncation occurrence of either technical, license, or economic limit.	The economic limit is defined as the production rate at the time when the maximum cumulative net cash flow occurs for a project. The entity's entitlement production share, and thus net entitlement resources, includes those **to be produced** quantities up to the earliest truncation occurrence of either technical, license, or economic limit.
14	Page 19 Figure 3.1	See Figure 3.1.	The **Legend** Modified.
15	Page 51 Glossary of Terms	A new term of 'Techinical Ultimate Recovery' included in the glossary.	Term: Technically Ultimate Recovery (TUR) Definition: **Total quantities of petroleum producible within an accumulation or group of accumulations (discovered or undiscovered) using available technology and industry practices, regardless of commercial considerations. TUR, based on TRR plus prior production.**

Postscript

The development of the PRMS English-Chinese Version is an important work plan of SPE Oil and Gas Reserves Committee (OGRC). On May 9th 2019, the OGRC assigned YANG Hua (Past OGRC member) to establish a specific Technical Taskforce (hereinafter 'the Task Force') and kick off necessary fundamental studies and preliminary preparation. In January 2020, SPE granted authorization officially to the Technical Taskforce for developing the PRMS English-Chinese Version. From 2019 to 2023, with five years' international cooperation and collaboration, the development of the PRMS English-Chinese Version has been completed and passed the examinations of OGRC plenary meetings twice a year, three rounds of OGRC specific technical reviewing processes, and achieved OGRC's final approval on its publication on May 5th, 2023.

Keypoints are summarized as below.

1. Technical Taskforce and AD Hoc Expert Committee

According to SPE's authorization, the CNPC Research Institute of Petroleum Exploration and Development and China National Oil and Gas Exploration and Development Company Ltd. have played a leading role for organizing and supporting the development of the PRMS English-Chinese Version.

(1) Technical Advisers

The development of the PRMS English-Chinese Version was advised by:

Prof. William John LEE, Chairman of the SPE Oil and Gas Reserves Committee, Academician of the American National Academy of Engineering and Academician of the Russian Academy of Natural Sciences;

Prof. JU Jianhua, Head of the China Association of Mineral Resources Appraisers and former General Director of the Mineral Resources Protection and Supervision Department of the Ministry of Natural Resources of the People's Republic of China;

Prof. ZHU Qingzhong, Head of the CNPC Research Institute of Petroleum Exploration and Development and Chief Geologist of the PetroChina Oil, Gas & New Energies Company;

后　记

《PRMS》英汉版的编制是SPE油气储量委员会（OGRC）的一项重要工作计划。在2019年5月9日的OGRC会议上，OGRC委派往届委员杨桦组建专项技术研发工作组（简称“研发工作组”），启动了必要的基础研究和编制准备工作。2020年1月，SPE授权该研发工作组正式启动《PRMS》英汉版（PRMS English-Chinese Version）的编制工作。2019—2023年，经过5年国际合作与协同努力，研发工作组完成了《PRMS》英汉版的制修订工作，顺利通过OGRC每年两次的年度工作进展检查和三轮专项技术审查，并于2023年5月5日通过OGRC会议审议，获批会后出版发布。

重点工作和进展要点总结如下。

1. 技术工作组及专家委员会

根据SPE的授权，中国石油集团科学技术研究院和中国石油国际勘探开发有限公司承担了《PRMS》英汉版编制的组织协调与技术支持。

（1）技术指导专家

《PRMS》英汉版编制工作指导专家包括：

SPE油气储量委员会主席、美国国家工程院院士、俄罗斯自然科学院院士William John LEE先生；

中国矿业权评估师协会负责人、中华人民共和国自然资源部矿产资源保护监督司原司长鞠建华先生；

中国石油集团科学技术研究院书记兼中国石油油气与新能源分公司总地质师朱庆忠先生；

Prof. HE Wenyuan, President of the China National Oil and Gas Exploration and Development Company Ltd.

Prof. LI Yong, the Vice President of CNPC Research Institute of Petroleum Exploration and Development.

This task has also achieved full supports provided by OGRC members: Mr. Steven McCants, Mr. Daniel Olds, Mr. Rawdon Seager, Mr. Daniel Diluzio; and Chinese experts: Mr. DOU Lirong, Mr. ZOU Caineng, Mr. ZHA Quanheng, Ms HAN Zheng and Mr. ZHAO Zhe. In addition, SPE staff Ms Melissa Schultea, Ms Holly Hargadine, Mr. Mahesh Jayaraman and Ms TIAN Ye in the Geological Publishing House have provided helpful coordination and assistance.

(2) Technical Taskforce

Major experts involved include:

LI Erheng, from the Mineral Resources Protection and Supervision Department of the Ministry of Natural Resources of the People's Republic of China;

ZHANG Daoyong, from the Strategic Research Center of Oil and Gas Resources of the Ministry of Natural Resources of the People's Republic of China;

DUAN Xiaowen and FU Lin, from the Reserves Management Department of the PetroChina Oil, Gas & New Energies Company;

WANG Wangquan, WANG Jingchun and ZHU Guangyao, from the China National Oil and Gas Exploration and Development Company Ltd.;

YANG Hua, LIANG Kun, ZHANG Guosheng, BI Haibin, DAI Chuanrui, XIA Mingjun, LI Jia, XU Zhenyong, LUO Yutian and LEI Danni, from the CNPC Research Institute of Petroleum Exploration & Development;

ZHENG Youzhi and YANG Tao, from the Engineering Research Institute of the PetroChina Southwest Oil and Gas Field Company;

LI Qizheng, SUN Yingtao, and XU Zhongbo, from the Oil & Gas Reserves Office of the China National Offshore Oil Corporation (CNOOC);

GAO Yufei and WANG Yaqing, from the CNOOC Research Institute Limited;

GAO Shanlin and LIU Yanli, from the Oil Field Division of China Petrochemical Corporation (SINOPEC);

NA Weihong, SINOPEC International Petroleum Exploration and Production Corporation;

中国石油国际勘探开发有限公司总经理何文渊先生；

中国石油集团科学技术研究院副院长李勇先生。

此外，SPE 油气储量委员会专家委员 Steven McCants，Daniel Olds，Rawdon Seager，Daniel Diluzio 和中国专家窦立荣、邹才能、查全衡、韩征和赵喆等给予了大力支持，SPE 工作人员 Melissa Schultea 女士，Holly Hargadine 女士 和 Mahesh Jayaraman 先生以及地质出版社田野等给予的组织协调与协助。

（2）技术工作组

具体参与研发工作的专家包括：

中华人民共和国自然资源部矿产资源保护监督司：李二恒；

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中国石化国际石油勘探开发有限公司：那未红；

中国石化勘探开发研究院：黄学斌、郭鸣黎；

HUANG Xuebin and GUO Mingli, from the SINOPEC Petroleum Exploration and Production Research Institute;

GUO Li and CHEN Jinsong, from the Technology Innovation Center of Sinochem Petroleum Exploration and Development Corporation Ltd.;

Richard XU, from the NexGeo Resources Ltd.;

Shawn S ZHANG, from Weiyuan Petroleum Tech (Beijing) Co. Ltd.;

Shishen LI, from the TRC Consultants Ltd.

LI Jiang, from the Chengdu Kuyun Technology Co., Ltd.

We would like to express our sincere thanks to all experts and staff who have contributed to the PRMS English-Chinese Version.

2. Fundamental Research

A petroleum resources management system is a complex nexus, which is composed of petroleum resource management terminology, classification and categorization principles, key indexes and their connotative relationship, aiming to provide systematic theories and methods on resources evaluation, management, reporting and associated decision-making processes during the whole life cycle of petroleum projects. The petroleum resources management terminology highlights the management object and work scope; the classification and categorization principles reflect the management roadmap and approaches; and the key indexes provide the fundamental elements for policies and regulations. The system engineering of whole life cycle petroleum resource management involves emerging science and technologies such as system theory, big data, and interdisciplinarity, which are of great significance to the modernization of integrated petroleum resource management. CNPC RIPED and CNODC have set up special research projects on associated fundamental studies, which has laid a solid foundation for the development of the PRMS English-Chinese Version.

3. Revisions and Modifications

With the SPE OGRC's supervision, following new working guidelines, the Technical Taskforce has conducted in-depth study on the PRMS2018 and then put forward and made necessary revisions and modifications. For example, included a new term of Technically Ultimate Recovery (TUR) in order to better meet the requirements on material balance analysis of resource endowments and further improve PRMS' application

中化石油勘探开发有限公司技术创新中心：郭莉、陈劲松；

NexGeo 资源有限责任公司：Richard XU；

纬源石油科技（北京）有限责任公司：张社军；

TRC 咨询公司：李士申；

成都酷云科技有限公司：李江。

我们对所有为《PRMS》英汉版作出贡献的专家与工作人员致以诚挚感谢。

2. 基础研究

油气资源管理系统，是由油气资源管理术语、分类分级原则及关键指标及其关联关系所构成的复杂系统，旨在为油气项目全生命周期的资源评估、管理、报告和决策过程提供系统理论和技术方法。其中，油气资源管理专业术语反映了资源管理的工作对象与范畴；分类分级原则，体现了管理思路与途径；关键指标体系则将为管理政策制定和制度建设提供了基本要素。全生命周期油气资源管理系统工程，涉及系统理论、大数据、交叉学科等新兴学科与技术，对石油资源管理现代化机制建设具有重要意义。中国石油集团科学技术研究院和中国石油国际勘探开发有限公司设立了专项研究课题，开展基础研究，为《PRMS》英汉版的编制奠定了坚实基础。

3. 修订与更正

在 SPE 油气储量委员会监管下，研发工作组根据新的工作指导意见，对《PRMS（2018）》进行了系统研究和分析，提出了一些重要修订更正项。例如，补充了最终技术可采量（TUR）术语，以更好满足资源禀赋物质平衡分析需求，进一步完善《PRMS》对油气资源实物链的管理

role on volume chain management; revised the probabilistic definition of reserves; revised the classification of recoverable resources; and modified Figure 2.1 and Figure 3.1 & etc. (see Appendix B, Revisions and Modifications).

功能；修订了储量的概率法定义表述；修订了可采资源的划分方案；更正了图 2.1 和图 3.1 等（参见附录 B 修订与更正）。

4. Development of PRMS Chinese Version

Following PRMS2018 management concept and application approaches, the Taskforce has established the Chinese terminology of PRMS concept system and broke it down to five sub-systems: the classification & categorization, evaluation & assessment, resources attributes, asset attributes, and auxiliary & common; which will be helpful for clearly understanding on both the field-based volume chain and project-based value chain managements along the whole life cycle, and will also lead the construction of key index system and digitization of business processes. The PRMS Chinese terminology has been adopted by the Ministry of Natural Resources of the People's Republic of China to establish the Bridging Document between the National Standard of the People's Republic of China "Classifications for Petroleum Resources and Reserves (GB/T 19492-2020)" and the "United Nations Framework Classification for Resources (UNFC Update 2019)".

4. 中文版制订

研发工作组以《PRMS（2018）》的管理理念与应用流程为指引，创建了《PRMS》中文术语概念系统（含分类分级、评估评价、资源属性、资产属性、辅助通用术语五个术语概念子系统），有力支撑《PRMS》对全生命周期石油资源实物链和价值链管理，对关键指标体系建设和业务流程的数字化具有重要指引作用。《PRMS》中文版术语概念系统已被中华人民共和国自然资源部采纳，用于《中国国家标准＜油气矿产资源储量分类＞（GB/T 19492—2020）与＜联合国资源框架分类＞（UNFC Update 2019）对接文件》的建立。

5. Quality Control, Reviewing and Approval

Since the PRMS English-Chinese Version kicked off in May 2019, the SPE Oil and Gas Reserves Committee has provided all way supervision and quality control on this task, and conducted three rounds of specific technical reviewing on deliveries achieved at milestones, including:

(1) Technical reviewing on revisions and modifications

In October 2020, Steven McCants and Daniel Olds, former chairmen of the SPE Oil and Gas Reserves Committee, led the technical reviewing team and checked 17 necessary revisions and modifications raised by the Task Force, and agreed 15 updates and recommended to keep other 2 issues for further confirmation in PRMS' future updates.

(2) Technical reviewing on PRMS2018 Chinese Version

On October 9th, 2021, the Technical Taskforce submitted the final draft of PRMS English-Chinese Version for SPE OGRC reviewing and then a technical reviewing team has

5. 质量控制、审查与批准

《PRMS》英汉版的编制工作自 2019 年 5 月启动以来，SPE 油气储量委员会进行了全程监管和质量控制，并针对重要工作进展开展了三轮专项技术审查，包括：

（1）《PRMS（2018）》英文版修订与更正的技术审查

2020 年 10 月，SPE 油气储量委员会前任主席 Steven McCants 先生和 Daniel Olds 先生牵头针对研发工作组提出的 17 项修订与更正进行了逐一技术审查，确认了 15 项，保留 2 项在《PRMS》未来升级中进一步落实解决方案。

（2）《PRMS（2018）》中文版专项技术审查

2021 年 10 月 9 日，研发工作组向 OGRC 提交了《PRMS（2018）》中文版送审稿。按审查流程，OGRC 组建了专项技术审查工作组，成员包括 ZHANG been mandated with members: ZHANG He (Ryder Scott), CAI Xunyu (SINOPEC), WANG Qin (Gustavson Associate), CAO Yue (Degolyer & Macnaughton) and XIA Xiaoyang (Ryder Scott). After a comprehensive technical reviewing had been conducted on the final draft for reviewing, a specific technical reviewing meeting was held on May 18th, 2022. In summary, the Task Force clarified and/or responded all comments received, including different appellation on terms, controversial statements and necessary editorial amendments, and achieved technical consensus with the technical reviewing team.

(3) OGRC approval

On June 22nd, 2022, according to the OGRC's request, the Taskforce submitted deliveries to the SPE OGRC website for all OGRC members' further review.

On May 5th 2023, past OGRC member YANG Hua, on behalf of the Taskforce, reported the final draft for approval of the PRMS English-Chinese Version, which was highly supported by all OGRC members, and achieved OGRC's approval for publication after the meeting.

6. Prospect

Since initial publication in 2007, PRMS has proven to be essential and critical to global petroleum industry, and the PRMS2018 updates will be demonstrated more applicable and valuable. For better meeting the challenges of the energy transition era, the ever-green development of PRMS will not be "finished". Let us go on making efforts and look forward to the PRMS2028.

He（Ryder Scott）、蔡勋育（中国石化）、WANG Qin（古斯塔夫森联合公司）、CAO Yue（Degolyer & Macnaughton）和 XIA Xiaoyang（Ryder Scott），对送审稿进行了全面技术审核，并于 2022 年 5 月 18 日召开专项技术审查会议。研发工作组对审查工作组提出的不同术语方案、争议事项、编辑性修改等意见进行了逐一澄清、答复和诠释，解决了争议问题，并与技术审查工作组全面达成一致性意见。

（3）SPE 油气储量委员会审议批准

2022 年 6 月 22 日，研发工作组按要求在 SPE OGRC 网站提交了成果文件报批稿，以支持 OGRC 全体委员的审阅工作。

2023 年 5 月 5 日，OGRC 往届委员杨桦代表研发工作组在 SPE OGRC 年会报告了《PRMS》英汉版编制工作，得到全体委员的高度评价，成果文件报批稿获 OGRC 会议审议通过，批准会后出版发布。

6. 展望

自 2007 年首次发布以来，《PRMS》已被证明对全球石油行业至关重要，2018 年以来的更新将更实用、更有价值。为更好应对能源转型挑战，《PRMS》的发展将与时俱进而并非"结束"。让我们继续努力，一起期待《PRMS（2028）》的到来。

Petroleum Resources Management System

石油资源管理系统

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