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

GB/T 46871-2025

**Carbon dioxide capture, transportation and geological storage -
Carbon dioxide storage using enhanced oil recovery
(CO₂-EOR)**

**二氧化碳捕集、运输和地质封存 提高原油采收率的二氧化碳封存
(English Translation)**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is equivalent to ISO 27916:2019, "Carbon dioxide capture, transport and geological storage for enhanced oil recovery." "Sealed off".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed and is under the jurisdiction of the National Technical Committee on Standardization of Environmental Management (SAC/TC207).

Introduction

Carbon dioxide enhanced oil recovery (CO₂-EOR) is a technology that enhances oil recovery by injecting CO₂ into oil fields.

The process involves injecting CO₂ under pressure using a well, typically mixed with oil, altering the oil's properties to make it easier to flow to production wells.

In most cases, CO₂-EOR projects are designed as a closed-loop system, where some of the injected CO₂ is co-produced with oil and stored on-site.

The CO₂ is separated in the surface recovery facility and then reinjected into the reservoir. The CO₂ injected into the project reservoir is an inherent element of the injection and production operations.

This document requires proof of such storage. CO₂ injected and remaining in the project reservoir (or EOR complex) after the end of oil production activities.

It will not be released into the atmosphere afterward; this type of trapping is called "associated storage." Appendix A provides a detailed description of the CO₂-EOR process, including when...

Previous use and potential "next-generation" uses, and associated storage that occurs as an integral part of these operations. Although methane is commonly found in...

The EOR project reservoir is included, but this document does not specifically address issues such as the monitoring and quantification of emission reductions for methane or other greenhouse gases. Through trap assessment...

Cost and leakage path analysis demonstrate that the CO₂-EOR meets the long-term safe storage requirements of the demonstration project. As described in Appendix A, CO₂-EOR has already been internationally recognized.

Deployed for decades and with the potential to expand, CO₂-EOR is commercially valuable because it allows for the additional recovery of hydrocarbon resources.

The source, as part of the process, safely and long-term captures the injected CO₂.

This document applies to the quantification and recording of total CO₂ stored in relation to CO₂-EOR (and optionally the anthropogenic portion of CO₂).

This document recognizes that CO₂-EOR is primarily an oil recovery operation. Related to this oil recovery is the safe and long-term generation of CO₂.

Storage. The lack of universally accepted standards to demonstrate the long-term safety and capacity of CO₂-EOR associated sequestration constitutes a challenge to expanding CO₂-EOR storage.

The obstacle of scale. The purpose of this document is to remove this obstacle by providing a method to demonstrate the long-term nature of CO₂ associated with CO₂-EOR.

The document outlines the safe storage and determination of the amount of CO₂ stored, aiming to promote services and trade related to CO₂-EOR. This document does not cover record-keeping.

Financial consequences, or non-existent consequences, of CO₂ storage associated with CO₂-EOR operations.

This document does not provide requirements for the selection, characterization, and licensing of CO₂-EOR project sites, as these sites are subject to regulations applicable to the petroleum and...

The requirements and standards for natural gas exploration and production are used for selection, characterization, and licensing. Similarly, this document does not specify requirements applicable to all hydrocarbon compounds.

Regulations and standards governing production operations provide environmental, health, and safety protections, corrective actions, and mitigation requirements (many applicable to CO₂ injection).

A list of existing standards for well and oil and gas operations is provided in the references. This document does indeed provide evidence that the site in question is adequate.

To meet the requirements for safe, long-term storage of CO₂ associated with the CO₂-EOR complex, demonstrate that CO₂ injection is essential for ensuring CO₂ capture.

This is done in a specific manner, and the associated storage is quantified.

This document provides a quantification of CO₂ storage levels associated with CO₂-EOR operations. The quantification results presented in this document can be used to...

Greenhouse gas emissions, reductions, or mitigation measures that comply with other standards, agreements, or plans such as ISO 14064-1, ISO 14064-2, and ISO 14064-3.

A small amount of quantification or reporting input is required. Specifically, this document provides methods for identifying and quantifying CO₂ losses (including fugitive emissions) and quantifying...

Guidance on CO₂ storage associated with CO₂-EOR projects. This quantification can be used for emissions and emissions throughout the entire carbon capture, transport, and storage chain.

In a broader scheme for quantifying and validating emission reductions. Specifically, using this document will provide a method that can be used as described in ISO/T R27915.

The quantization result of the input method is used for quantization and verification (Q).

The quantification of storage can be combined with the quantification results generated according to ISO 27920, CO₂ capture, transport and geological storage---quantification and Verification is currently under development. Storage associated with the CO₂-EOR project, as part of the CCS project chain, can be linked to one or more...

The quantification of individual capture, transport, and geological storage systems is combined to generate a total quantification of the entire CCS project chain. This includes

certain emissions quantification and reporting.

Under this system, CO₂ storage associated with CO₂-EOR is considered unemitted and excluded from calculations or offsets.

Carbon dioxide capture, transport and geological storage Carbon dioxide sequestration for enhanced oil recovery

1.1 Applicability

This document applies to CO₂ injections in enhanced oil recovery (EOR) operations involving petroleum and other hydrocarbons. In CO₂-EOR projects, it is necessary to...

The quantification of long-term, safely stored CO₂ is considered. This takes into account that some CO₂-EOR projects combine non-anthropogenic CO₂ emissions with anthropogenic CO₂ emissions.

This document also provides instructions on how to use allocation ratios to selectively calculate the artificially generated portion of associated CO₂ sequestration (see Appendix B).

1.2 Inapplicability

This document does not apply to the quantification of CO₂ injection into reservoirs where hydrocarbon production is anticipated or ongoing.

ISO 27914 applies to the sequestration of CO₂ in the geological structure of compounds, whether located above or below hydrocarbon-producing reservoirs. If the sequestration is carried out within the reservoir...

CO₂ sequestration; the reservoir previously produced hydrocarbons but no longer produces them in paid or commercial quantities, or the purpose of CO₂ injection is not...

To improve hydrocarbon recovery, this storage must also comply with the requirements of ISO 27914.

1.3.1 Includes

The conceptual boundaries of CO₂ related to CO₂-EOR storage contained in this document include.

- a) Safe and long-term control of CO₂ within the EOR geological body;
- b) CO₂ leaking from the EOR geological body via leakage paths;
- c) CO₂ lost from wells, equipment or other facilities in on-site CO₂-EOR projects.