

ISO/TR 27926:2024-12 (E)

Carbon dioxide capture, transportation and geological storage - Carbon dioxide enhanced oil recovery (CO₂-EOR) - Transitioning from EOR to storage

Contents	Page
Foreword.....	v
Introduction.....	vi
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Abbreviated terms and symbols.....	3
4.1 Abbreviated terms.....	3
4.2 Symbols.....	4
5 Overview.....	4
6 CO₂ operational scenarios addressed.....	5
7 Technical and operational aspects of transition.....	6
7.1 General considerations.....	6
7.1.1 Storage volume assessment and estimation of pore volume.....	6
7.1.2 Current fluid saturations, including CO ₂ , in the reservoir/storage zone at the time of transition.....	7
7.2 Mechanisms for additional storage.....	8
7.3 Assessing containment assurance in modified operations.....	8
7.4 Reservoir management.....	9
7.4.1 General.....	9
7.4.2 New CO ₂ volumes — Increase of supply.....	9
7.4.3 Management of displaced water.....	9
7.4.4 Redesign of patterns.....	9
7.5 Well operations.....	10
7.5.1 General.....	10
7.5.2 Creating a well inventory.....	10
7.5.3 Repurposing wellbores for storage injection.....	10
7.6 Application of operational modifications — Illustrative analysis.....	11
7.6.1 Containment assurance assessment in base case — Typical EOR.....	11
7.6.2 Assessing containment assurance in modified operations.....	12
7.6.3 Project IWR exceeds 1 (case 2).....	12
7.6.4 Change in storage assurance assessment related to long term stabilization change during transition (case 3).....	13
7.7 Wells.....	13
7.7.1 Re-use.....	13
7.7.2 Abandonment.....	14
7.8 Facility operations.....	14
7.8.1 Design assessment.....	14
7.8.2 Facility integrity testing.....	14
7.8.3 Measurement.....	15
7.8.4 Projects that are not currently CO ₂ -EOR projects.....	15
7.8.5 Recycle compression capacity.....	15
7.9 Monitoring.....	16
7.9.1 Monitoring design.....	16
7.9.2 Role of baseline.....	17
7.9.3 Development of model(s) prior to storage.....	17
7.10 Quantification.....	17
7.10.1 Existing quantification practices.....	17

	7.10.2 Application to transitioning CO ₂ storage scenarios.....	18
8	Case studies	18
	8.1 General.....	18
	8.2 Case study no. 1: Optimization of CO ₂ storage in an actively producing CO ₂ -EOR project.....	19
	8.2.1 General.....	19
	8.2.2 Storage phase 1: Discontinuation of WAG and implementation of continuous CO ₂ injection.....	20
	8.2.3 Storage phase 2: Additional pattern development.....	20
	8.2.4 Storage phase 3: Reservoir operating pressure.....	21
	8.2.5 Wells during the additional storage phases.....	23
	8.2.6 Other facilities during the additional storage phases.....	23
	8.3 Case study no. 2: Engineered CO ₂ storage following termination of CO ₂ -EOR hydrocarbon recovery operations.....	24
	8.3.1 General.....	24
	8.3.2 Points to consider in using existing CO ₂ -EOR infrastructure.....	25
	8.3.3 Areas of the oil field considered for transition to engineered CO ₂ storage.....	26
	8.3.4 Analysis of case study no. 2.....	28
	8.4 Case study no. 3: Conversion of an off-shore gas field to CO ₂ storage with associated hydrocarbon recovery.....	30
	8.4.1 General.....	30
	8.4.2 Initial phase: CO ₂ capture and injection.....	31
9	Comparison of ISO 27914 and ISO 27916	31
	9.1 Purpose.....	31
	9.2 Scope and coverage of ISO 27914 and ISO 27916.....	32
	9.3 Application of ISO 27916.....	33
	9.4 Application of ISO 27914.....	33
	9.5 Conclusion.....	34
10	Legal, regulatory and permitting issues	34
	10.1 General.....	34
	10.2 Pre-existing legal and regulatory paradigm.....	34
	10.2.1 General.....	34
	10.2.2 Comparison of legal and regulatory frameworks for mineral recovery versus frameworks for managing geological injections for storage.....	35
	10.2.3 Pore space ownership and access.....	42
	10.3 Legal and regulatory aspects of reuse of existing infrastructure.....	45
	10.3.1 Review of property instruments and contractual agreements.....	45
	10.3.2 Regulatory compliance review.....	46
	10.4 Review of case study scenarios.....	48
	10.4.1 Case study variations in 8.1 : Maximization or optimization of CO ₂ storage in an actively producing CO ₂ -EOR project.....	48
	10.4.2 Case study variations in 8.2	49
	10.4.3 Case study variations in 8.3	51
	Annex A (informative) Transition scenarios and comparison of ISO 27914 and ISO 27916	53
	Bibliography	62