TECHNICAL DATA SHEET

TC 19: DOWNHOLE CO_2 LOGGING ASSESSMENT

Scope A: Software/Modelling/Workflow		
No	**Parameters**	**Description / Operating Envelope**
A1	Accuracy of pure CO_2 detection	Accuracy of the modelling against existing methods/techniques/benchmarking such as fluid sampling and PVT lab analysis. The accuracy also relates to the strength of detection or signal to noise ratio (SNR) of the logging measurement. It evaluates the percentage accuracy achieved in quantifying pure CO_2 saturation and volume. Target to achieve minimum 95% or higher accuracy at SNR>80%
A2	Differentiation between Hydrocarbon Gas and CO_2	Able to conceptually and theoretically distinguishing between hydrocarbon gas and CO_2. This involves understanding the distinct physical and chemical properties of each gas and applying this knowledge to accurately identify and separate them during logging measurements. Target to achieve more than 90% accuracy
A3	Quantitative Measurement of CO_2 Saturation and Volume	Able to conceptually and theoretically measure CO_2 saturation and volume with precision. This includes utilizing sound physics principles and advanced modelling techniques to quantify the amount of CO_2 present in the reservoir accurately. Target to achieve more than 90% precision
A4	Reliability & Uncertainty Management	The reliability of the modelling by evaluating correction techniques and mitigation procedures in which the model uncertainty is minimized, ensuring consistent and dependable results. Target to achieve less than 10%-15% model uncertainty
A5	Data Processing Workflow	Availability and timeliness of the database, benchmark, workflow, and calibrated model used to process raw data, interpret, and quantify CO_2 saturation and volume for the prototype/infant answer product. Target to achieve full availability and 1 year timeline to process and generate the answer product from the data acquired
Scope B: Hardware – logging tool		
B1	Easy to operate and compliance to HSE	Ease of operation of the logging tool/equipment and its compliance with country and company-specific safety regulations such as licensing, international standard certification (hazardous material), lifting, transportation, rig-up/rig-down, etc. Target to achieve full compliance with all safety regulations
B2	Versatility	The portability and flexibility of the logging tool/equipment. It measures how handy and easy to transport the tool is, and its flexibility for logging in various hole deviation, boreholes size, fluid environment, tubing/casing size, conveyance system by third party provider and combinability with other services. Target to achieve full flexibility and versatility
B3	Applicability (functionality)	The effectiveness of the logging tool/equipment to operate in varying CO_2 concentration and well environments. It evaluates the tool's ability to function under varying CO_2 conditions and its operation system. Target to achieve effective tool functionality in varying CO_2 concentration
B4	Applicability (logging measurement)	The relevance and viability of logging measurement outputs to detect and quantify CO2 concentration, volume and saturation

		under varying CO2 condition. Target to achieve measurement relevance and full application in varying CO2 condition.
B5	Calibration/Validation	The calibration and validation techniques performed on the logging tool/equipment. It measures the extent to which errors are minimized through effective calibration and validation processes. Target to achieve +/-2% error
B6	Technology Maturity	Technology or solutions meet the prototype function and tested in the lab/yard/controlled environment. Target to achieve minimum TRL 4.