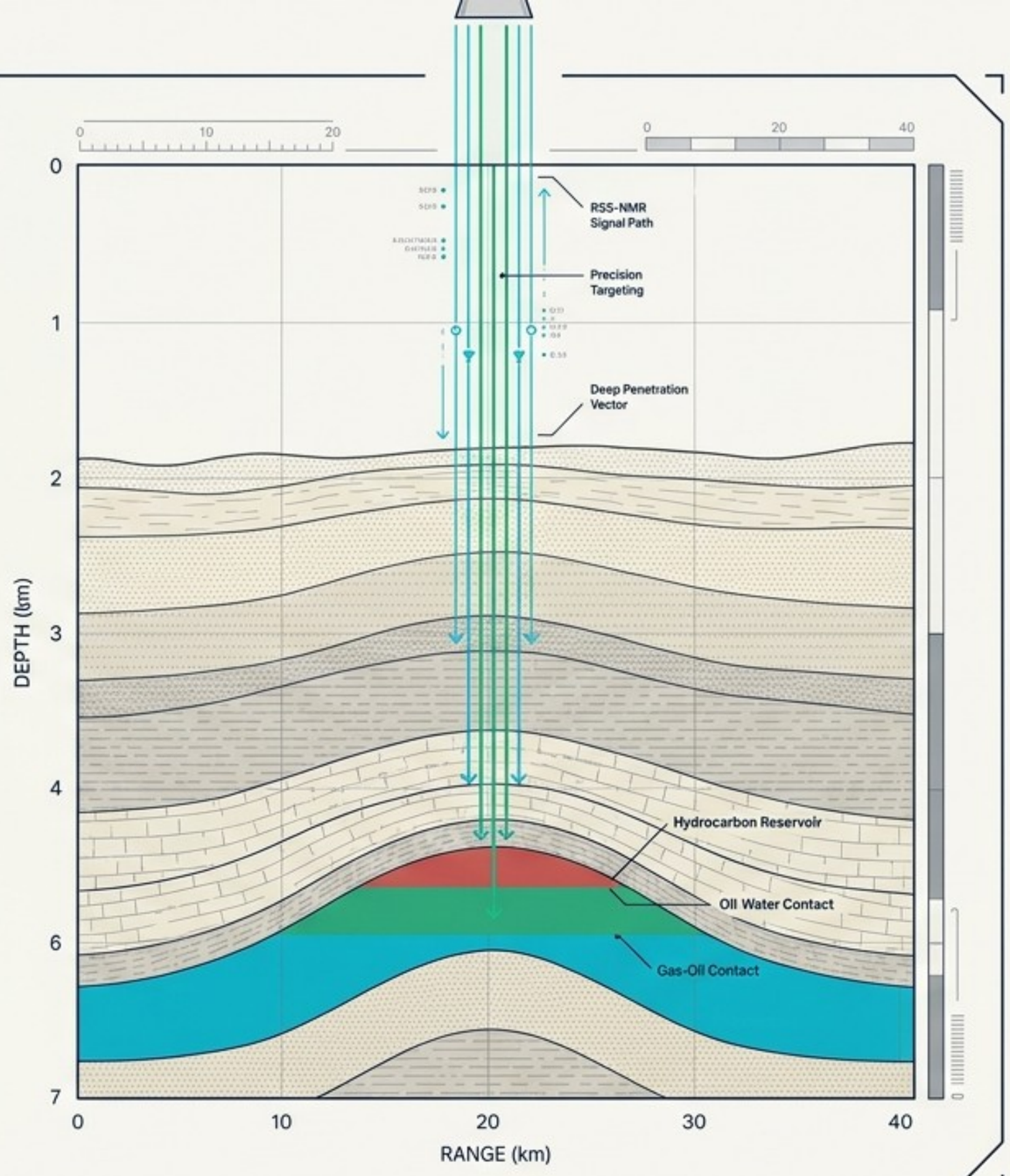
RSS-NMR

The operating mode

Leveraging RSS-NMR **Satellite** Technology for **Direct, Surgical Hydrocarbon Detection.**

Key Insight: Move from guessing structural rock geometry to directly measuring fluids down to 7km.



The Unbearable Burden of the '100% Seismic' Model

FINANCIAL DRAIN

Multimillion-dollar CapEx locked in "Pay to See" exploration permits.

Massive offshore/onshore logistical deployments.

Trapped capital with zero guarantee of return.

OPERATIONAL BUREAUCRACY

The Kafkaesque labyrinth of local permitting.

Takes 1 to 3 years of administrative red tape before data acquisition even begins.

ESG & RELIABILITY RISKS

Massive environmental footprint (marine noise, land explosions).

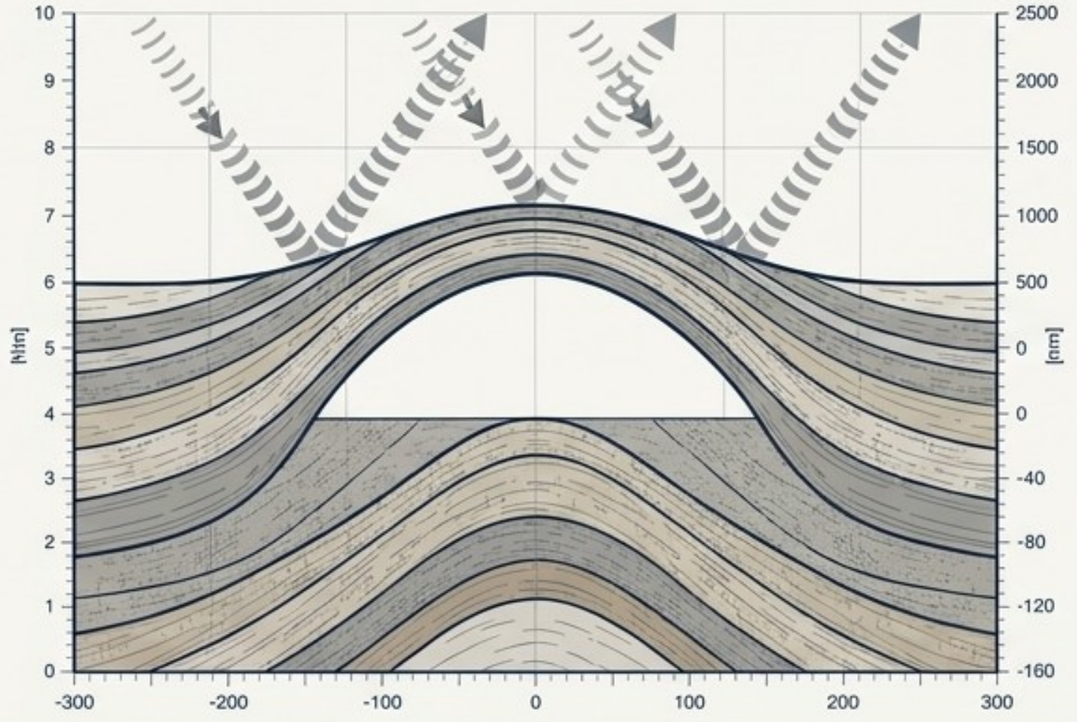
Persistent NGO interference.

Only 30-50% reliability rate derived from the subjective human interpretation of acoustic waves.

Measuring Fluids, Not Rocks

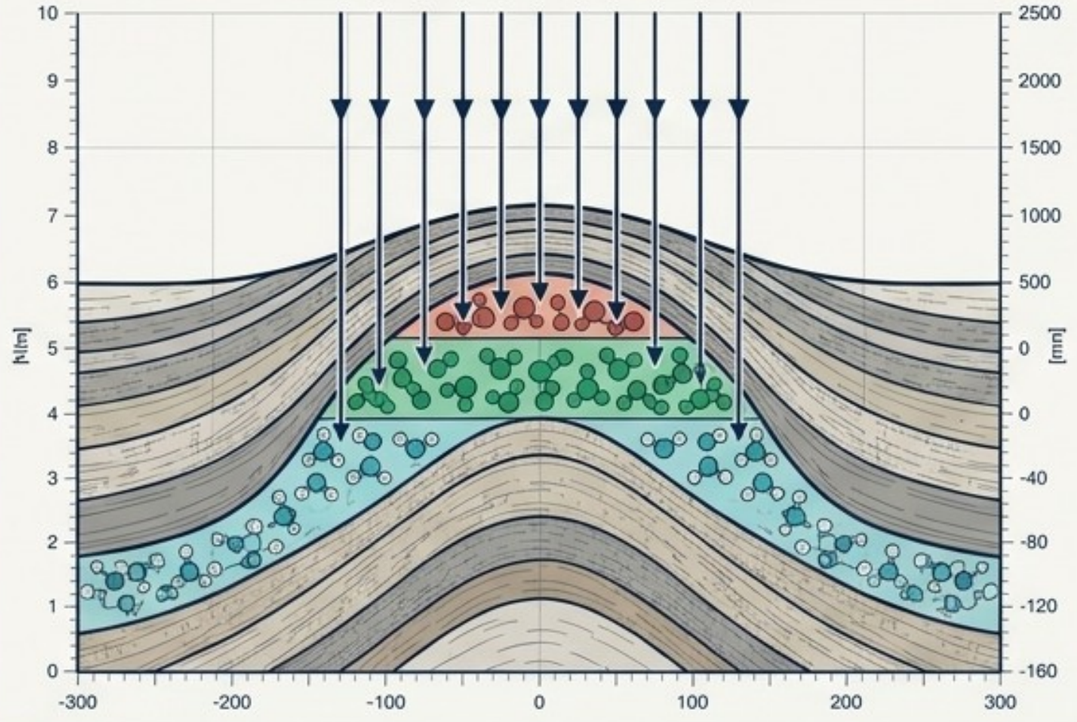
Core Principle: RSS-NMR excites hydrogen nuclei in subsurface fluids using controlled RF signals from space, measuring their exact relaxation response to confirm hydrocarbons before a single drill is deployed.

The Old Paradigm: Structural Proxy



Traditional Seismic
Asks: "Is there a structural trap?"
Result: 30-50% accuracy based on human interpretation.

The New Paradigm: Direct Fluid Signature

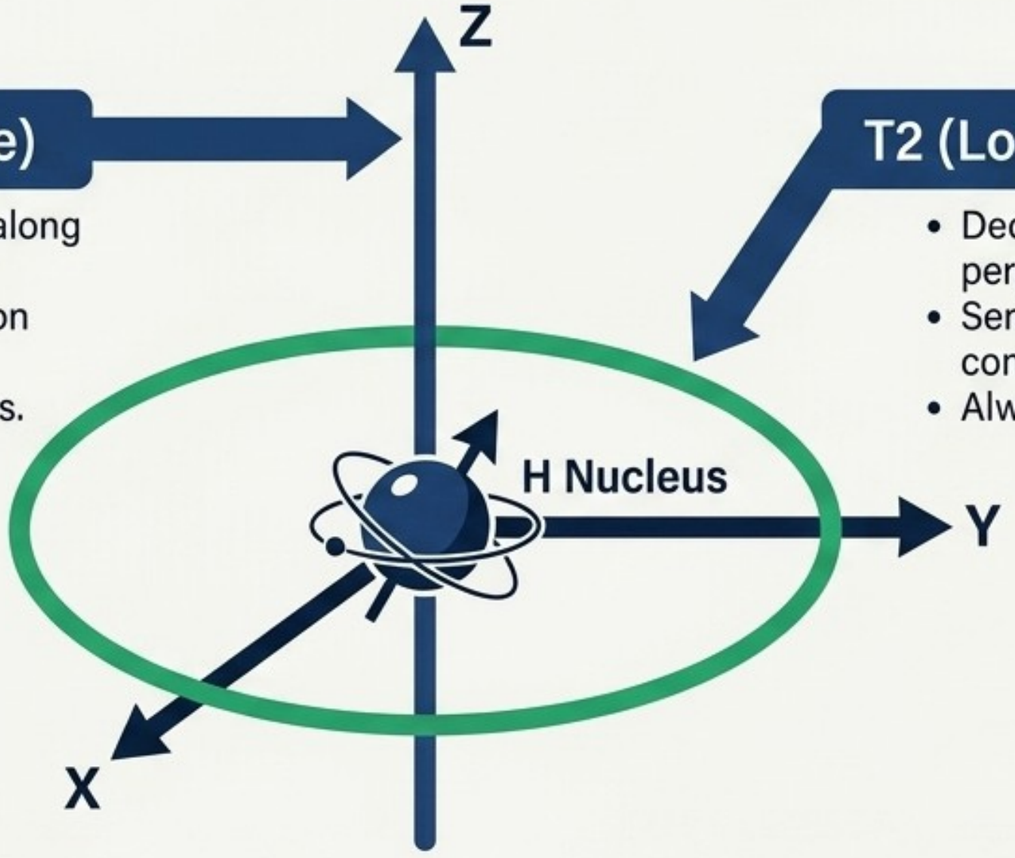


RSS-NMR Technology
Asks: "Is there oil, gas, or free water?"
Result: 90-95% accuracy down to 5-7km deep.

The Physics of Detection: Decoding Relaxation Times

T1 (Energy Exchange)

- Recovery of magnetization along the external magnetic field.
- Sensitive to molecular motion and viscosity.
- Typical values: 200–3000 ms.



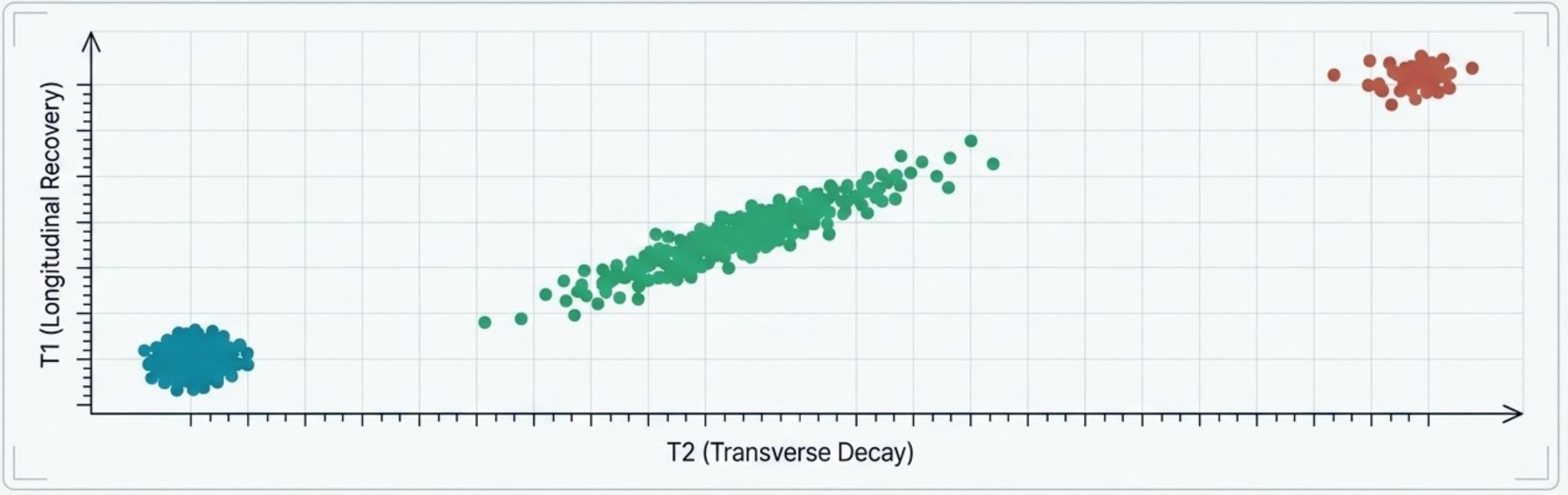
T2 (Loss of Coherence)

- Decay of magnetization perpendicular to the field.
- Sensitive to pore size and confinement.
- Always shorter than T1.

Together, T1 and T2 act as a definitive, unforgeable magnetic fingerprint for both fluid type and rock properties.

The Fluid Fingerprint Target Acquisition Map

Bypassing human bias: Algorithms plot the direct magnetic signature of fluids, eliminating the guesswork of structural interpretation.



Water

- Short T1 & Short T2.

Rapid relaxation indicates clear water saturation.

Oil

- Long T1 & Short T2.

The viscosity mismatch: oil molecules restrict spin mobility, creating a distinct diagonal signature.

Gas

- Very Long T1 & Long T2.

High molecular mobility causes very slow relaxation.

Deep Reservoir Dynamics: Accounting for Environmental Shifts

Salinity

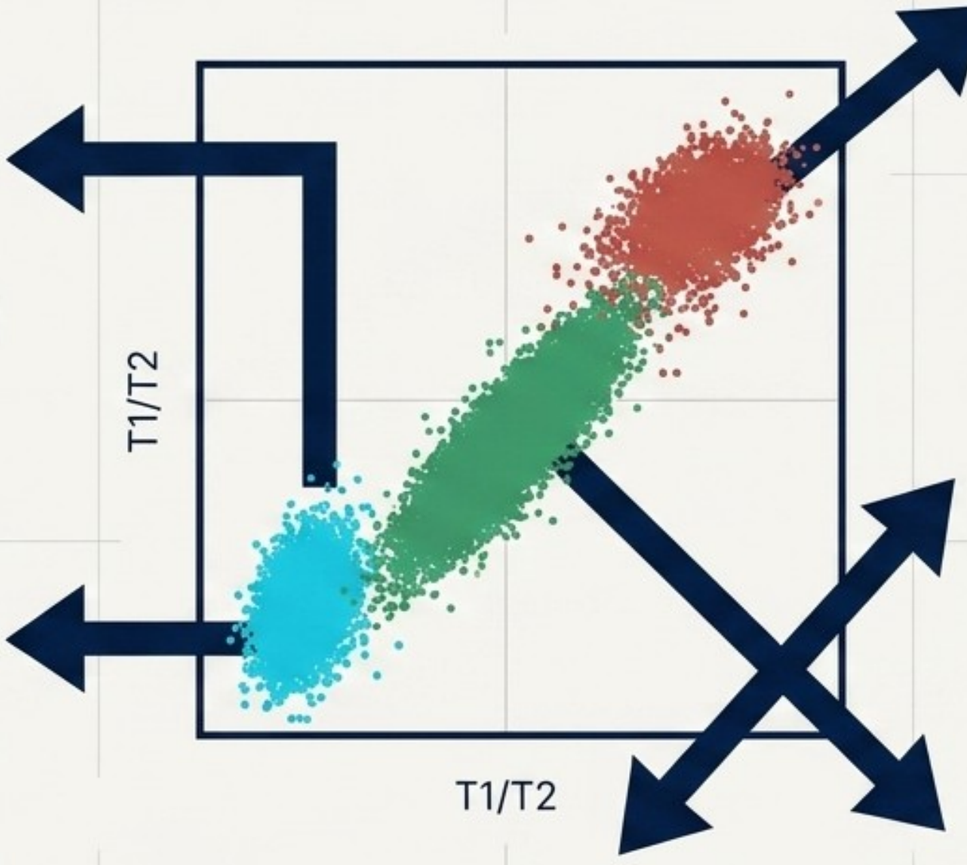
High ionic concentration enhances relaxation.

Compresses water clusters inward, distinguishing formation brine from fresh injected water.

Temperature

Increases molecular motion.

Stretches gas and oil clusters outward toward longer relaxation times.



Pressure

Compresses fluids, reducing mobility.

Shifts oil and gas inward (shorter relaxation).

Viscosity

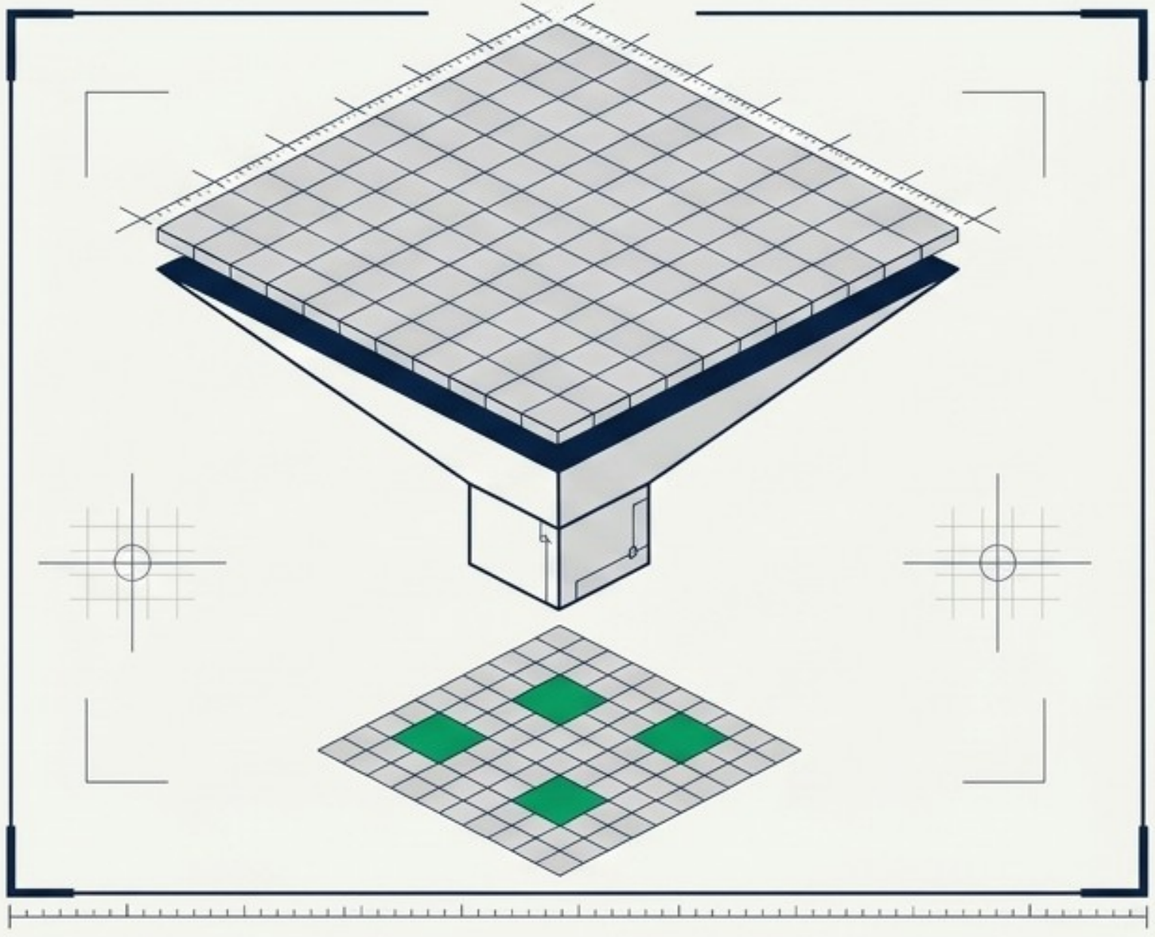
Separates hydrocarbons.

Heavy oils stretch diagonally down (short T2, moderate T1).

Light condensates shift up and right.

Introducing ‘Stage Zero’

A mandatory, remote pre-screening filter deployed before securing traditional permits or mobilizing heavy E&P equipment.



The “Spy Mode” Advantage

- Conducted 100% remotely via satellite and processed in laboratory environments.
- Zero on-the-ground ecological footprint.
- Zero disruption or extortion from local NGOs.
- Zero initial permit fees or massive upfront capital lock-ins.

Re-architecting the Exploration Timeline

The Status Quo

Bureaucratic Permitting (1-3 Years)

100% Blind Seismic (Months of Logistics)

High-Risk Drill

The New Ecology

Stage Zero RSS-NMR (4-6 Months) - Global Radar Filter

Targeted Permit

Surgical Seismic (Only on 20% Area)

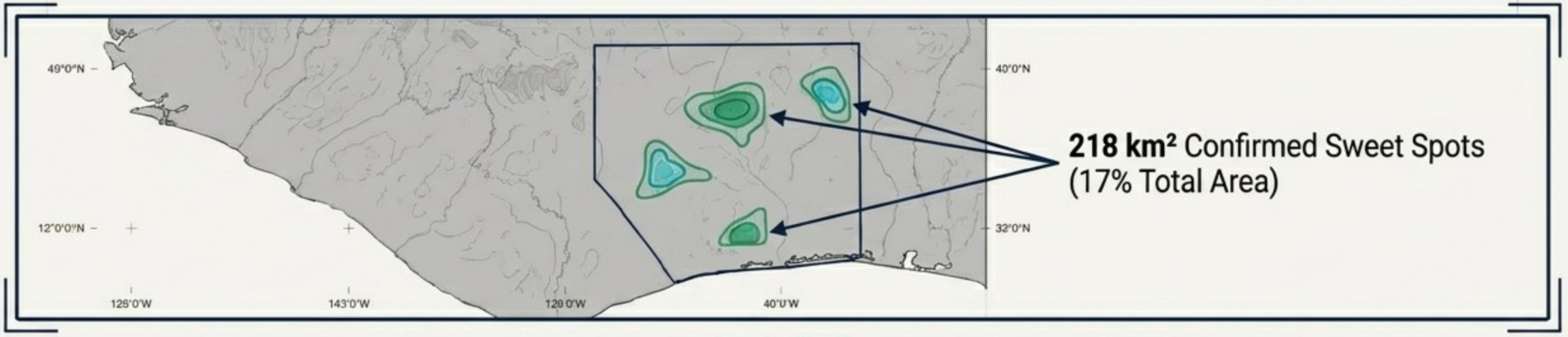
Assured Drill - Drastic reduction in dry-well systemic risk

Traditional 3D Seismic and MT are elevated from blunt instruments to surgical finishing tools, deployed only over the 20% confirmed fluid zones.

The Financial & ESG Impact Matrix

Metric	Traditional Seismic Model ⚠	Stage Zero RSS-NMR ✓
Cost	**100%** full-area exploration cost.	**5-10%** the cost of standard comprehensive seismic surveys.
Speed	Years of logistical bottlenecks and vessel shortages.	**Actionable fluid data** delivered in **90-150** days.
CapEx	Millions blindly trapped in barren mega-blocks.	**Protects** and **reallocates** capital strictly to confirmed sweet spots.
ESG Compliance	Maximum marine acoustic noise and explosive terrestrial footprint.	**Absolute alignment**. **Zero** habitat destruction during the Stage Zero filter.

Real-World ROI: West Africa Greenfield Case Study



The Old Way (Status Quo)

Classical Seismic on 1280 km² at $20,000/km²

Total Cost: $25.6 Million

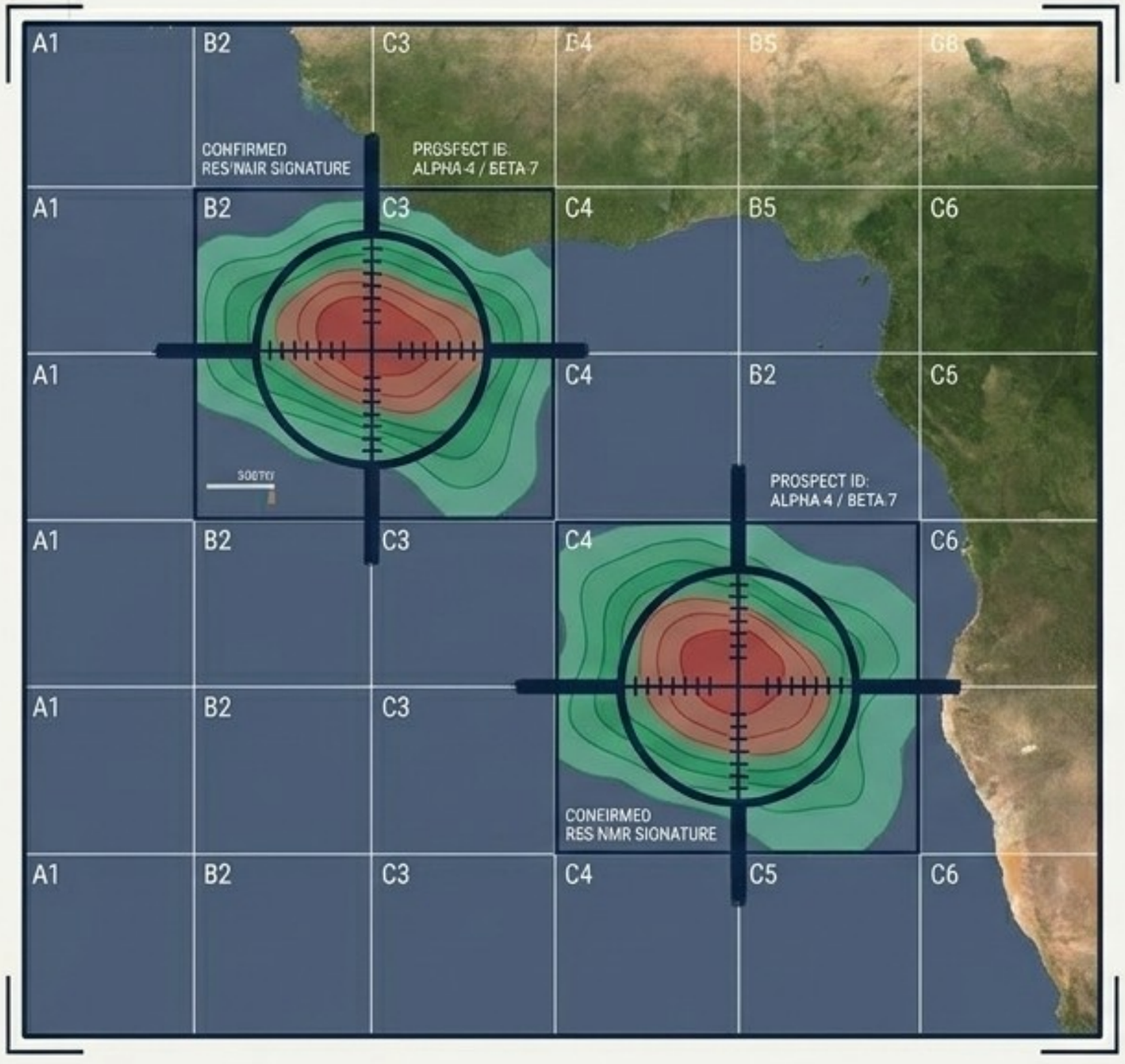
The New Way (Stage Zero)

RSS-NMR on 1280 km² at $1,000/km² = **$1.28 Million**
Targeted Seismic on 218 km² = **$4.36 Million**

Total Cost: $5.64 Million

The Outcome: The $1.28M Stage Zero investment saved **~$20 Million** by isolating 218 km² of confirmed sweet spots. "Time is Money" realized.

Strategic Application: Auction Bidding & Greenfield Diversification



Stop "Paying to See"

Scan auction coordinates remotely before submitting multi-million dollar financial bids. Eliminate capital risk in barren blocks.

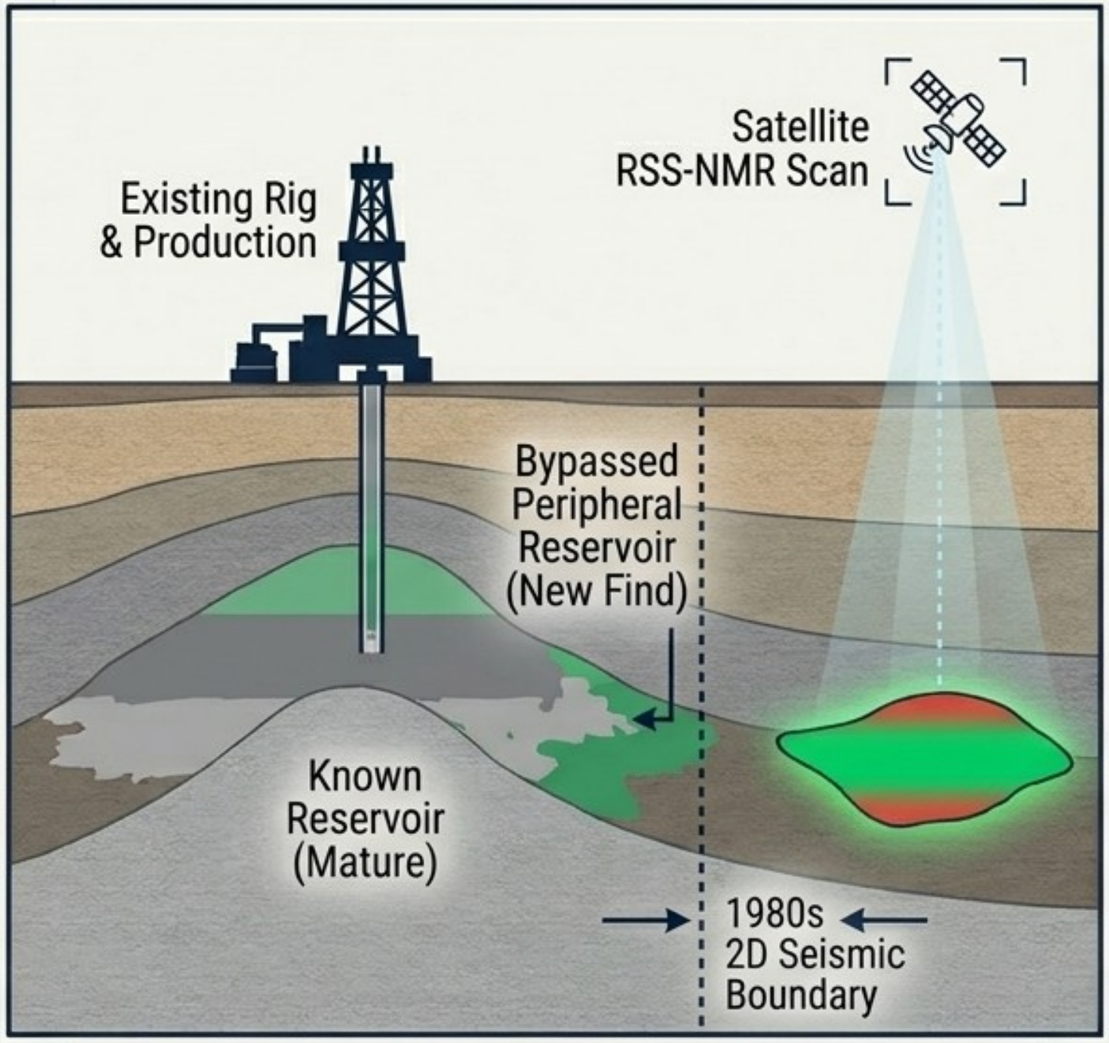
Geographic Diversification

Because RSS-NMR is vastly cheaper, E&P companies can run Stage Zero scans on multiple global blocks simultaneously, spreading political and geographical risk for the price of one localized seismic survey.

Total Leverage

Only enter bureaucratic permitting battles for blocks with confirmed, economically viable sweet spots. Maximize resource allocation and project velocity.

Strategic Application: Brownfield Revitalization & M&A Intelligence



Revitalize Legacy Assets

Scan active or mature fields to uncover bypassed peripheral reservoirs missed by archaic 1980s 2D seismic—all without pausing current production for a single second.

M&A Due Diligence

Deploy RSS-NMR in “spy mode” before entering financial negotiations for an asset. Verify the seller’s advertised reserves and uncover hidden upside potential (or barren reality) to negotiate from a position of absolute informational asymmetry.

Advanced Petrophysics: Mapping Producibility and Wettability

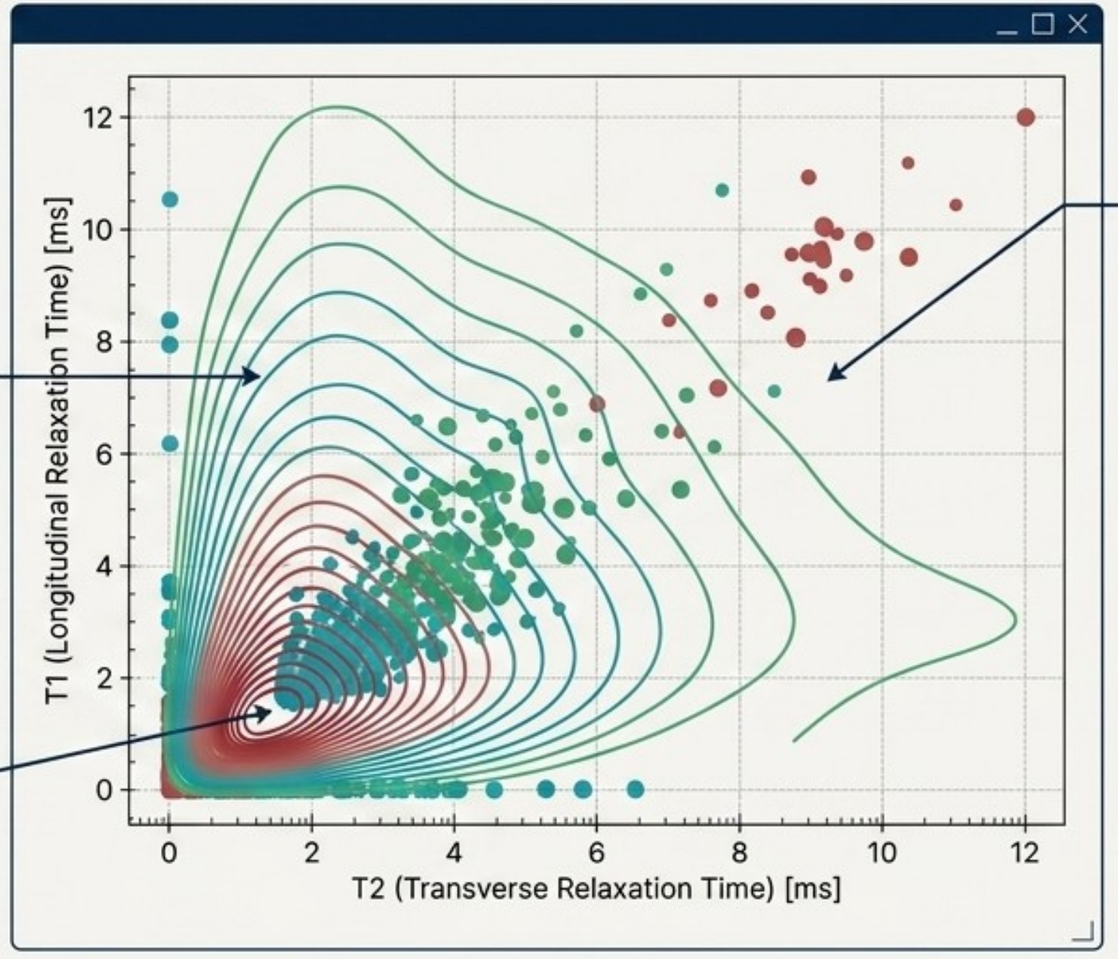
Takeaway: Bridging NMR relaxation physics with surface chemistry allows reservoir engineers to predict actual recovery efficiency before drilling.

T1/T2 ≈ 2–4
(The Transition Zone)

Capillary-bound fluids. Moderate viscosity and partial wettability.

T1/T2 ≥ 8
(The Locked Zone)

Clay-bound water or heavy oils. Strongly surface-dominated relaxation; fluids are tightly bound and largely immobile.



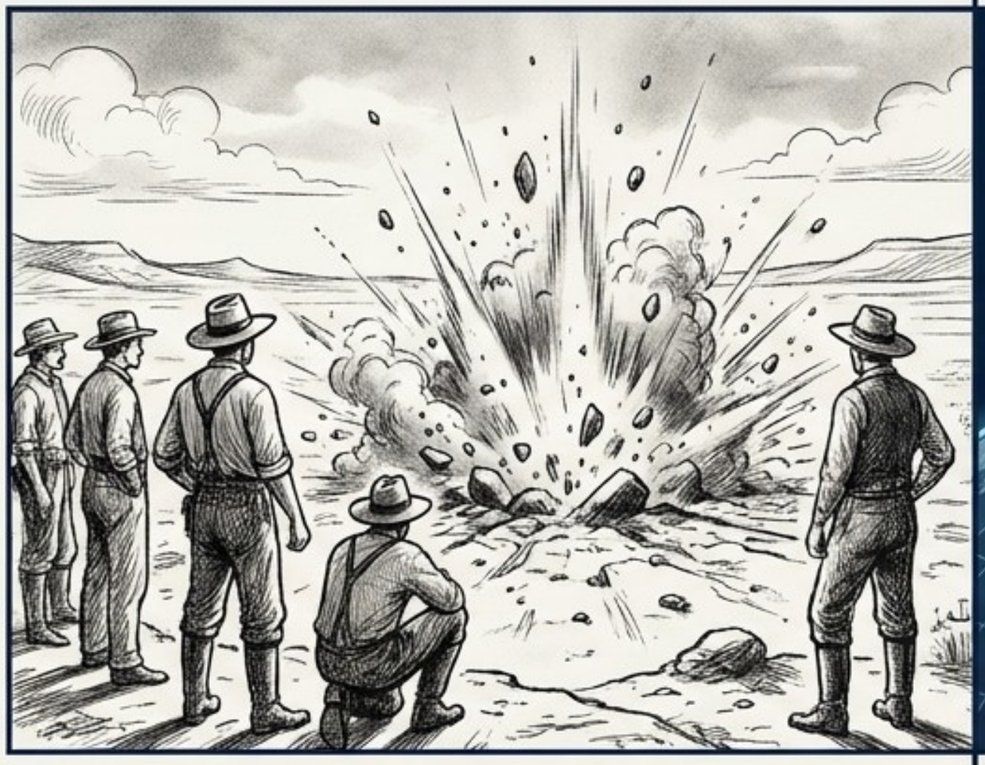
T1/T2 ≈ 1
(The Ideal Zone)

Free fluids (gas/light oil). Spins relax uniformly, indicating minimal surface interaction and highly mobile, producible hydrocarbons.

The Definitive E&P Technology Matrix

Takeaway: RSS-NMR is the ultimate pre-selection filter, elevating Seismic to a surgical finishing tool rather than a blunt instrument.

	Traditional Seismic (3D/OBN)	Magneto Tellurism (MT)	RSS-NMR (Stage Zero)
Target Measured	Physical structures/geometry	Deep resistivity	Hydrogen fluid resonance
Central Question	“Is there a structural trap?”	“What is the deep calibration?”	“Is there oil, gas, or free water?”
Depth	Variable (resolution limited)	Deep support	Delineates anomalies down to 7 km
Reliability	30-50% (Human interpretation)	Supportive	90-95% (Algorithmic direct detection)
Operational Footprint	Maximum (Noise, logistics)	Weak	Zero (100% remote satellite)
Duration	24 - 60 months	12 - 18 months	4 - 6 months



1920s: *Blunt Seismic Surveying.*

Today: *Direct Orbital Fluid Detection.*

The Inevitable Evolution of E&P

In1924, moving from blind drilling to seismic surveying was considered a radical aberration before becoming the global standard.

Today, the industry must evolve again—from blind structural seismic to direct orbital fluid detection.

Profitability Imperative

Stage Zero is no longer a technological luxury; it is a fundamental profitability imperative for any modern E&P operation.

Call to Action: Provide your target block coordinates to initiate Stage Zero. End the era of the dry well.