

SERPENTINE NATURAL HYDROGEN PROJECT

FORMAL INVITATION TO PARTNER IN A GLOBALLY SIGNIFICANT HYDROGEN RESOURCE

Early interest has been received from industry participants. This presentation outlines the play concepts, subsurface elements and resource potential to be defined and de-risked, as we open a structured farm-out process

TOP END
—ENERGY—
THE ENERGY OF TOMORROW

DISCLAIMER

This presentation (Presentation) is dated 14 July 2025 and has been prepared and authorised by Top End Energy Limited (ASX: TEE) (ACN 650 478 774) (the Company) for the sole purpose of providing preliminary background information to enable recipients to review the Company's project.

Unless otherwise stated herein, the information in this Presentation is based on the Company's own information and estimates. This Presentation has been prepared by the Company. Information in this document should be read in conjunction with other announcements made by the Company to the Australian Securities Exchange, which is available at www.topendenergy.com.au

This presentation is not a prospectus and does not constitute an invitation, solicitation, recommendation or an offer to purchase or subscribe for securities. This presentation does not purport to contain all of the information that an investor should consider when making an investment decision. The Slides and the accompanying verbal presentation do not constitute a recommendation regarding any decision to sell or purchase securities in the Company. This Presentation and its contents must not be distributed, transmitted or viewed by any person in any jurisdiction where the distribution, transmission or viewing of this document would be unlawful under the securities or other laws of that or any other jurisdiction.

This Presentation is a summary only and contains summary information about the Company and its respective subsidiaries and activities, which is current as at the date of this Presentation (unless otherwise indicated), and the information in this Presentation remains subject to change without notice. The information in this Presentation is general in nature and does not purport to be accurate nor complete, nor does it contain all of the information that an investor may require in evaluating a possible investment in the Company. This presentation has not been prepared in accordance with the requirements of the Corporations Act 2001 (Cth) (Australia) or the U.S. Securities Act of 1933, as amended, and does not constitute a disclosure document, prospectus, offering memorandum, or other offering document under either law. It has been prepared by the Company with due care but no representation or warranty, express or implied, is provided in relation to the accuracy, reliability, fairness or completeness of the information, opinions or conclusions in this Presentation by the Company, or any other party, except as required by law.

Reliance should not be placed on information or opinions contained in this Presentation and the Company does not have any obligation to finalise, correct or update the content of this Presentation, except as required by law. Certain data used in this Presentation may have been obtained from research, surveys or studies conducted by third parties, including industry or general publications.

Certain statements in the Presentation are or may be "forward-looking statements." Forward-looking statements include, without limitation, statements regarding the Company's future plans, objectives, expectations, projections, forecasts, beliefs, or intentions, including statements relating to operational and exploration results, financial performance, future development, and other anticipated outcomes. These forward-looking statements speak, and the Presentation generally speaks, only at the date hereof. The projections, estimates and beliefs contained in such forward-looking statements necessarily involve known and unknown risks and uncertainties, and are necessarily based on assumptions, which may cause the Company's actual performance, results and achievements in future periods to differ materially from any express or implied estimates or projections. Accordingly, readers are cautioned not to place undue reliance on any forward-looking statements contained herein. Relevant factors which may affect the Company's actual performance, results and achievements include changes in commodity price, foreign exchange fluctuations and general economic conditions, increased costs and demand for production inputs, the speculative nature of exploration and project development, diminishing quantities or grades of reserves, political and social risks, changes to laws and regulations, environmental conditions, and recruitment and retention of personnel.

The Company nor any of its advisers, affiliates, related bodies corporate, directors, officers, partners, employees and agents, have authorised, permitted or caused the issue, submission, dispatch or provision of this Presentation and, except to the extent referred to in this Presentation, none of them makes or purports to make any statement in this Presentation and there is no statement in this Presentation which is based on any statement by any of them. To the maximum extent permitted by law, the Company and its advisers, affiliates, related bodies corporate, directors, officers, partners, employees and agents exclude and disclaim all liability, for any expenses, losses, damages or costs incurred by you and the information in this Presentation being inaccurate or incomplete in any way for any reason, whether by negligence or otherwise. To the maximum extent permitted by law, the Company and its advisers, affiliates, related bodies corporate, directors, officers, partners, employees and agents make no representation or warranty, express or implied, as to the currency, accuracy, reliability or completeness of information in this Presentation and the statements made in this Presentation are made only as at the date of this Presentation (unless otherwise indicated). The information in this Presentation remains subject to change without notice. This Presentation is not a financial product nor investment advice or a recommendation to acquire securities in the Company. It has been prepared without taking into account the objectives, financial situation or needs of individuals. Before making any investment decision, prospective investors should consider the appropriateness of the information having regard to their own objectives, financial situation and needs and seek legal and taxation advice.

EXECUTIVE SUMMARY

SERPENTINE NATURAL HYDROGEN PROJECT

► Introduction

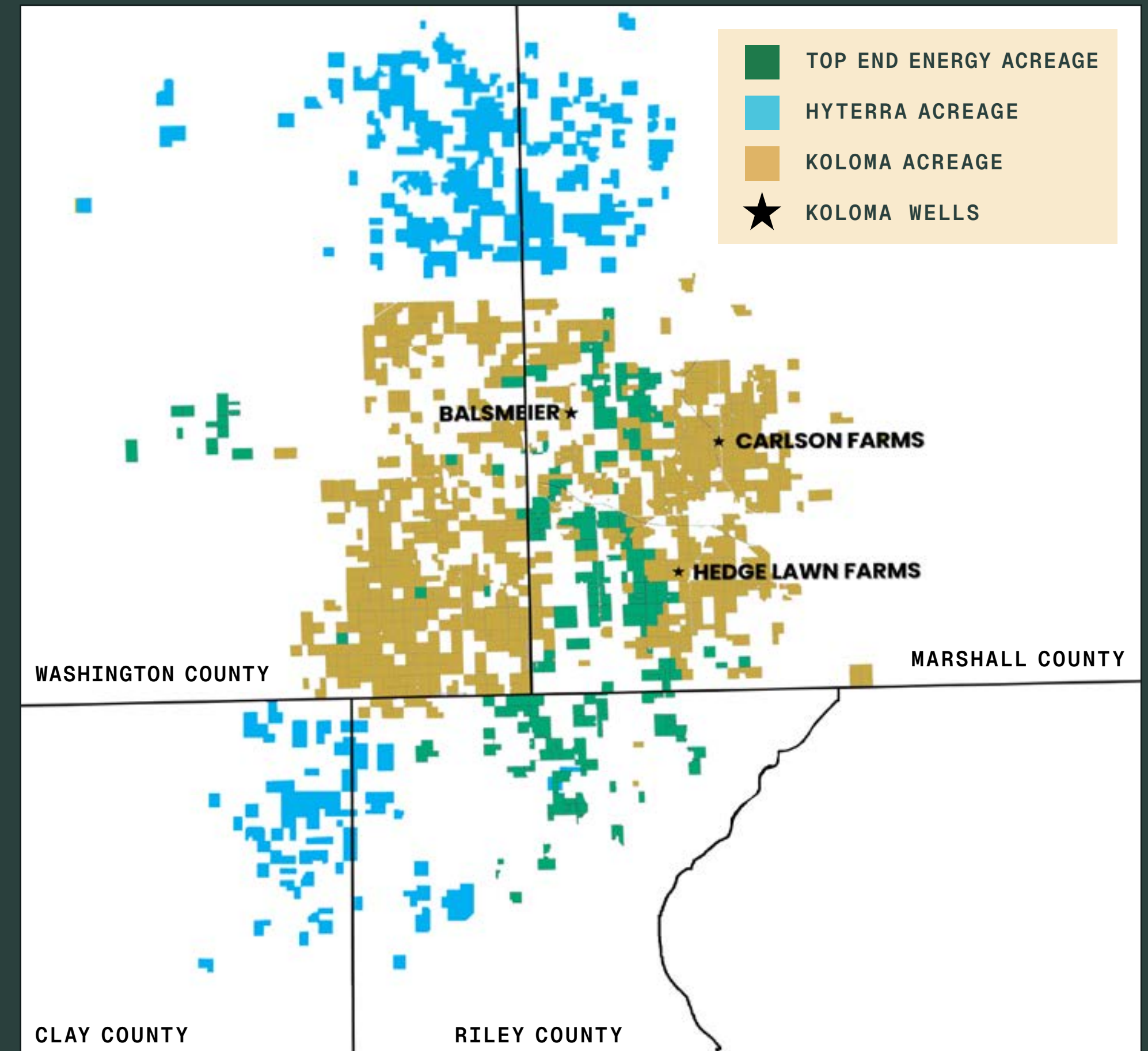
Positioned in one of the world's most prospective regions for natural hydrogen, this pioneering exploration-stage venture covers more than 30,000 acres in the heart of a competitive play. Neighbouring leases are held by Koloma — a U.S. private company and the world's leading natural hydrogen explorer, with over US\$400M raised — and HyTerra, an Australian-listed company that is 40% owned by Fortescue, one of the world's largest mining companies.

Multiple high-impact drill targets will be drill-ready in 2025 and additional leases have been negotiated for Project expansion.

Hydrogen shows have already been confirmed through exploration drilling across multiple targets, with comprehensive geophysical programs now underway.

► Farm-In Opportunity

Top End Energy formally invites partners to participate in a structured farm-out process. Qualified parties with the appropriate technical and financial capabilities will be granted access to proprietary datasets to support detailed project evaluation. Refer to pg. 29 for additional guidance and next steps.



In-house map, March 2025
HyTerra lease position sourced from their website
Koloma (High Plains Resources LLC) leases from county records

NATURAL HYDROGEN

THE FIRST SOURCE OF PRIMARY ENERGY TO BE DISCOVERED IN A CENTURY

► Why Hydrogen?

A global push towards net-zero has accelerated demand for scalable, low-carbon solutions and positioned hydrogen as a critical industrial and baseload energy source

► What is Natural Hydrogen?

Geologic processes within the Earth's crust generate hydrogen gas, which explorers aim to produce using tools and techniques developed for oil and gas

► How Does it Compare?

Unlike manufactured hydrogen, natural hydrogen is a primary energy source, not just an energy carrier, making it a low-cost, low-carbon alternative

► Why Participate?

Natural hydrogen is a transformative energy frontier, on par with the first oil and gas discoveries of the late 19th century or the shale revolution of the 2000s



AMERICA'S NEXT ENERGY BOOM

HOW SHALE EXPLORATION AND INNOVATION CHANGED U.S. OIL AND GAS PRODUCTION

► Stage 1: Proof of Concept

In the late 1990's and early 2000's, the advent of fracking combined with horizontal drilling transformed tight reservoirs into high-rate producers

► Stage 2: Scale

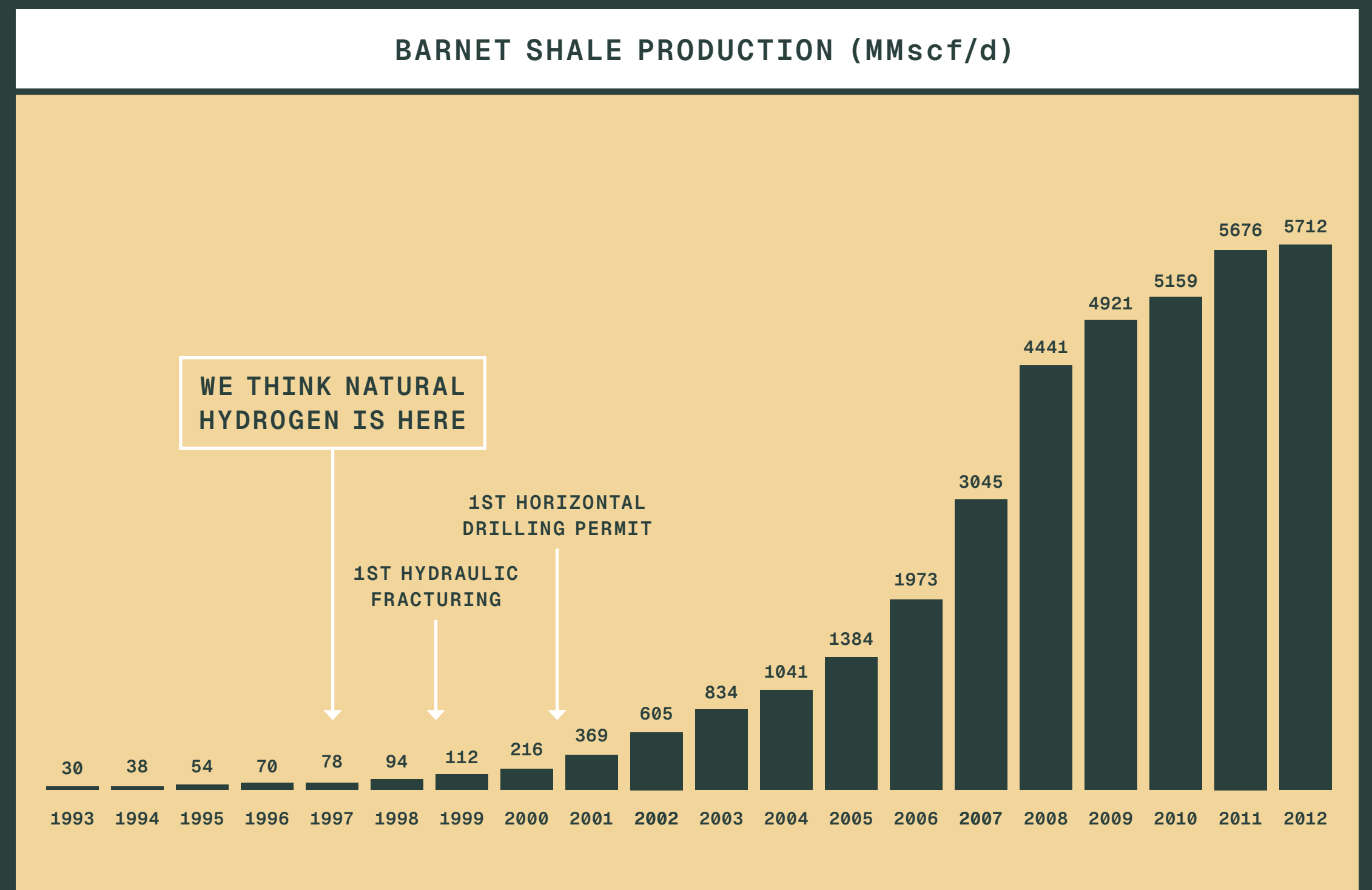
Expanding scale and cost optimisation, saw production expenses plummet and output surge

► Stage 3: Diversify

Once the playbook was defined, it was replicated and repeated, from the Marcellus to the Eagle Ford to the Bakken

► Why it Matters

After more than a century of exploration, the shale boom created an entirely new chapter in energy. **We're on the verge of the next breakthrough — an overlooked resource is now within reach through new ways of thinking and targeted exploration**



Texas RRC, Production Data Query

HYDROGEN MARKET

TARGETING EXISTING HYDROGEN DEMAND WITHIN U.S. MID-WEST

► \$5B Mid-West Hydrogen Market

Mature regional hydrogen demand driven by ammonia fertilizer and chemical refining is primed for immediate natural hydrogen supply

► Displacing Fossil Fuels

Replace fossil derived hydrogen with a carbon free solution – supplying existing demand without waiting on emerging markets and end users

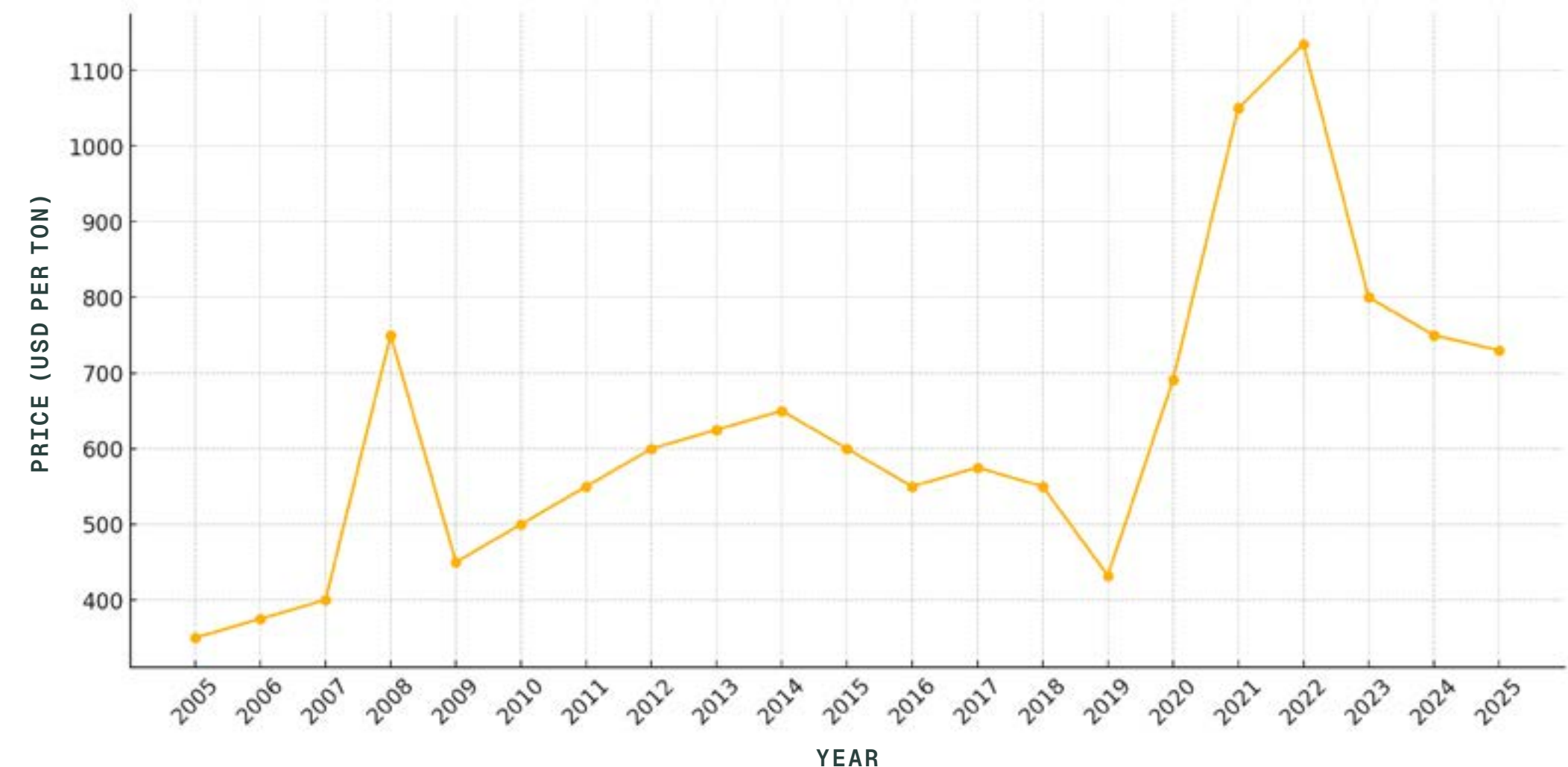
► Scale with Project

Begin with pilot-scale distributed ammonia to minimise the need for on-site hydrogen storage. Scale to fit-for-purpose plants that can compete with fossil hydrogen by eliminating SMR infrastructure. Transport network can support regional delivery across Kansas, Nebraska, Oklahoma and Iowa

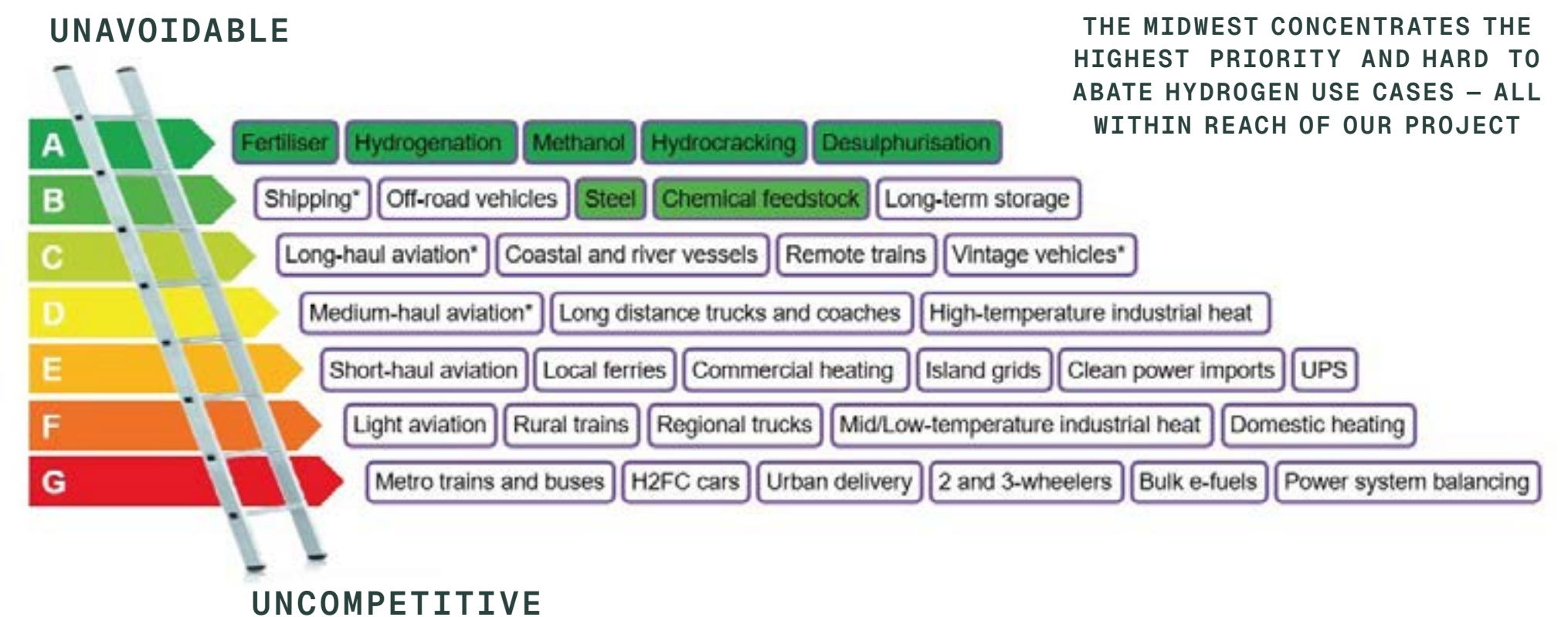
► Offtake Engagement

The Project has attracted early offtake interest, with discussions underway on terms and volumes. Given the high cost of transporting hydrogen, proximity to major regional consumers – such as Koch Industries, CF Industries and CVR Energy – is a key driver of project viability

MIDWEST U.S. ANHYDROUS AMMONIA PRICES



CLEAN HYDROGEN LADDER
VIAIBLE USES BASED ON ECONOMIC COMPETITIVENESS & NECESSITY





“

A PROJECT'S VALUE IS ONLY AS STRONG AS ITS MARKET ACCESS

In Kansas, we're at the crossroads of mature
agricultural and industrial markets - a rare
alignment of resource, infrastructure
and offtake

”

PROJECT VS POTENTIAL

REGIONAL GEOLOGY

THE MIDCONTINENT RIFT (MCR)

► Ancient Rift System

The MCR is a 1.1-billion-year-old failed rift system stretching across the central U.S. and comprising of thick volcanic and sedimentary sequences bounded by crystalline basement

► Hydrogen Generation

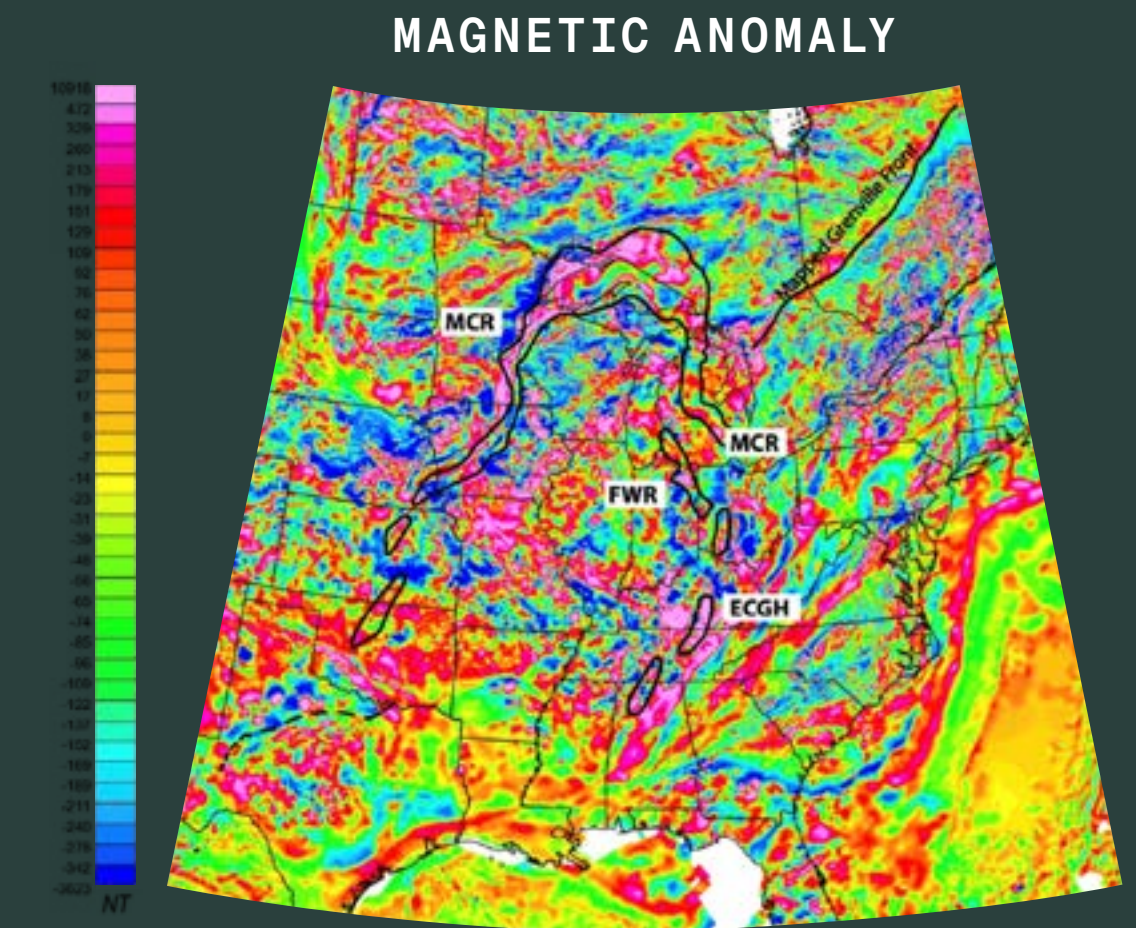
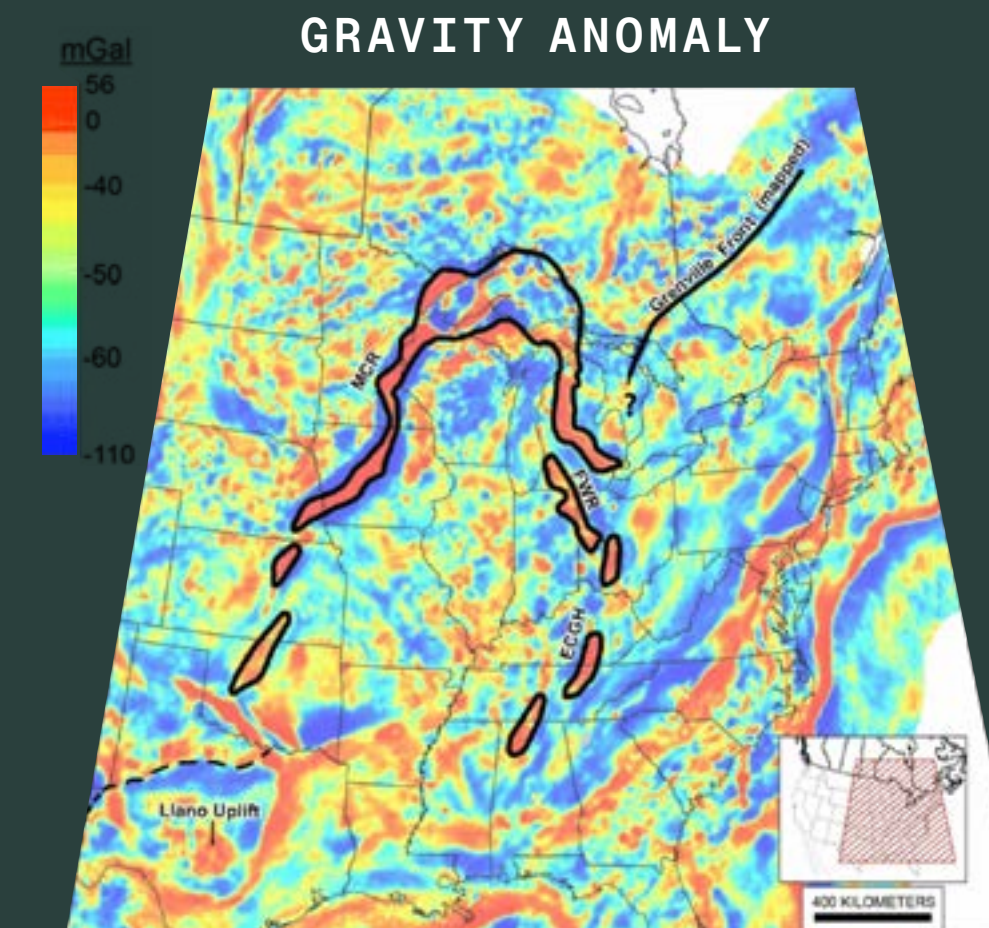
Dominated by ultramafic to mafic rocks that are rich in iron and magnesium, with deep faults and extensional features that support high rates of serpentinization

► Gas Accumulation

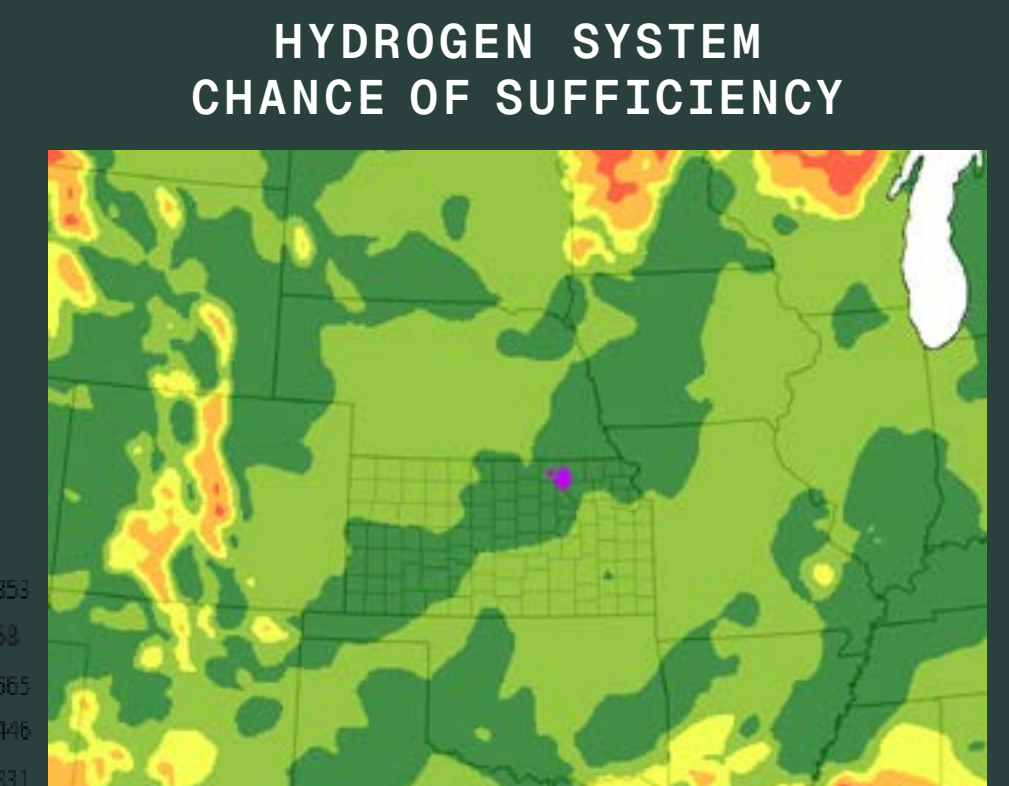
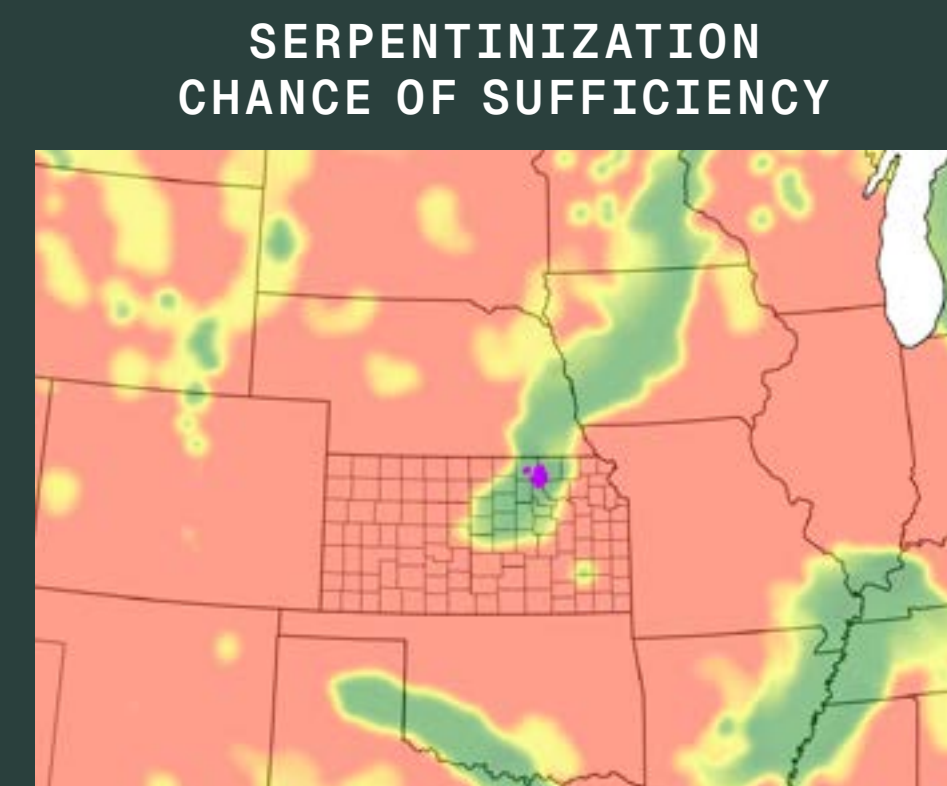
Overlying sedimentary units with proven structural closures and sealing formations, providing the necessary conditions for hydrogen entrapment

► USGS Modelling

The Project is situated in a high-probability zone as identified by USGS “Chance of Sufficiency” data with an overlap of the preferred conditions for generation, trap, seal and migration, as well as a localised peak in serpentinization potential



Stein et al, Tectonophysics, 2018



USGS, 2024

“

USGS has unveiled its natural hydrogen prospectivity map

**WE CALCULATE THE ENERGY CONTENT OF
THE ESTIMATED RECOVERABLE AMOUNT
OF HYDROGEN TO BE ROUGHLY TWICE THE
AMOUNT OF ENERGY IN ALL THE PROVEN
NATURAL GAS RESERVES ON EARTH**

”

UNITED STATES GEOLOGICAL SURVEY, 2024

HYDROGEN PLAY CONCEPTS

PAIRING CONVENTIONAL TRAPS WITH A VAST UNCONVENTIONAL BASEMENT PLAY

► Key Elements of Hydrogen System

Hydrogen exploration shares many of the same critical success factors as hydrocarbons, allowing us to leverage existing knowledge to develop prospects and reduce risk

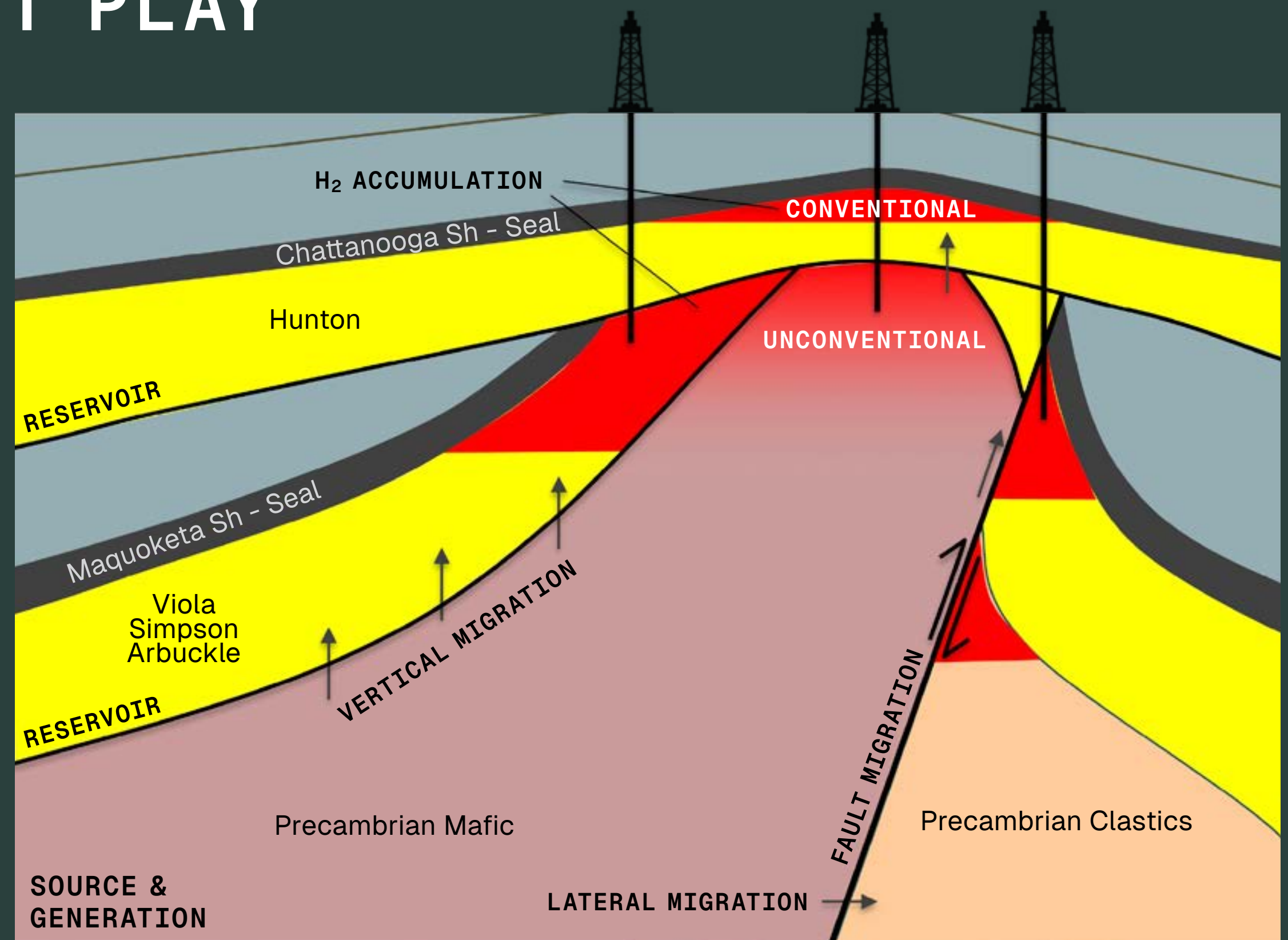
- Source
- Migration
- Reservoir
- Preservation
- Trap / Seal

► Conventional Play

Hydrogen is generated in basement source rocks and migrates into porous sedimentary sandstone and carbonate reservoirs, where it accumulates under shale seals

► Unconventional Play

Hydrogen is generated in situ and accumulates within the fractured mafic basement, forming a laterally extensive direct source-reservoir system



In-house, Play Concepts

SOURCE AND GENERATION

THE ORIGIN OF NATURAL HYDROGEN

► Source

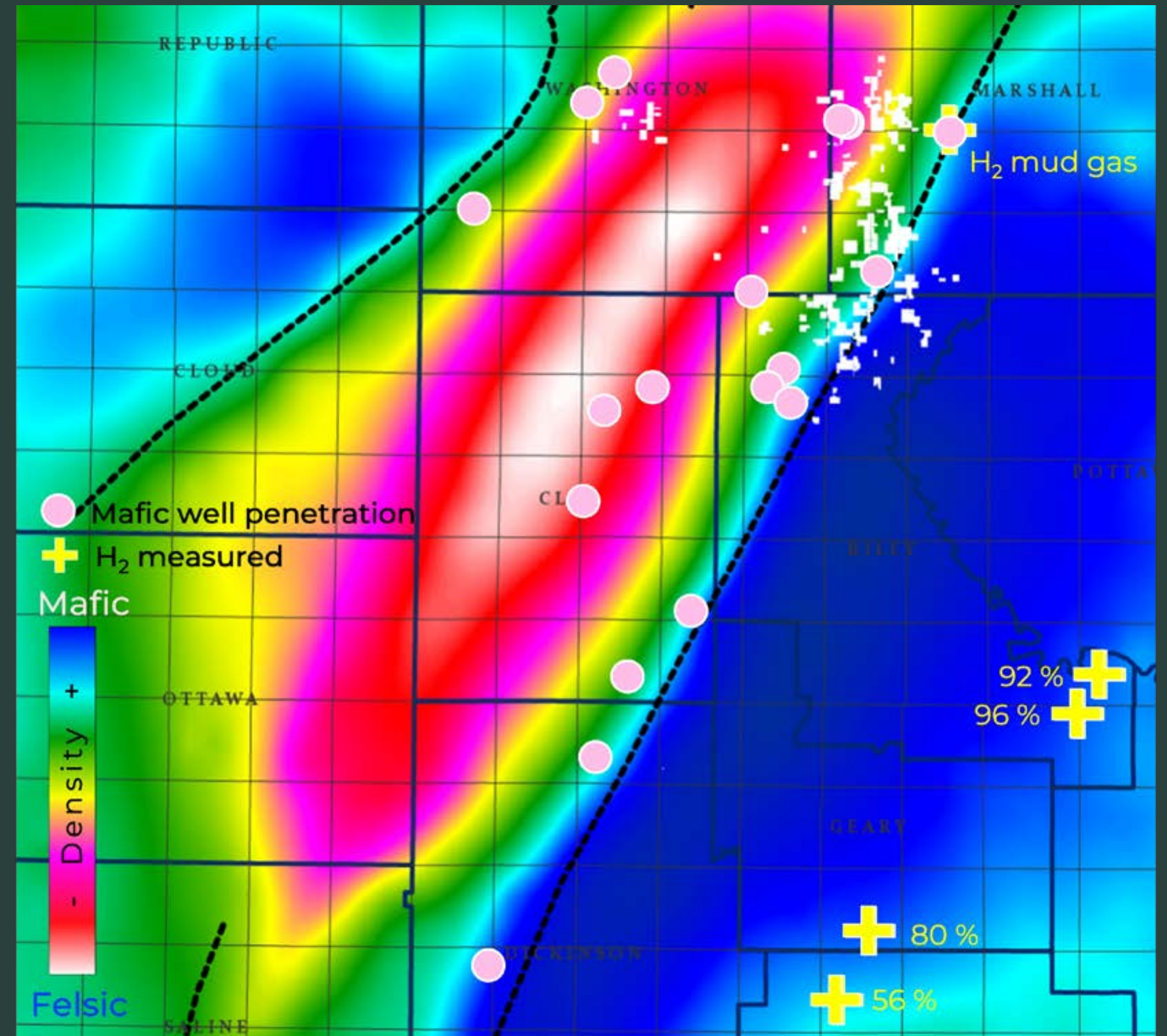
Gravity and magnetic anomaly maps reveal a prominent mafic body, interpreted as a hydrogen-generating source

► Generation

Multiple wells intersect mafic lithologies across the anomaly, consistent with ultrabasic to basaltic compositions conducive to hydrogen generation

► Proven Hydrogen System

Hydrogen has been directly detected and measured in numerous wells in high concentrations, indicating active and/or historical generation from the mafic source



Residual Bouguer Gravity (700m), KGS

RESERVOIR

MULTIPLE PROVEN HYDROCARBON RESERVOIRS WITH A TRACK RECORD OF COMMERCIALITY

► Reservoirs

In addition to producing oil and gas in other regions, these reservoirs are prospective for hydrogen

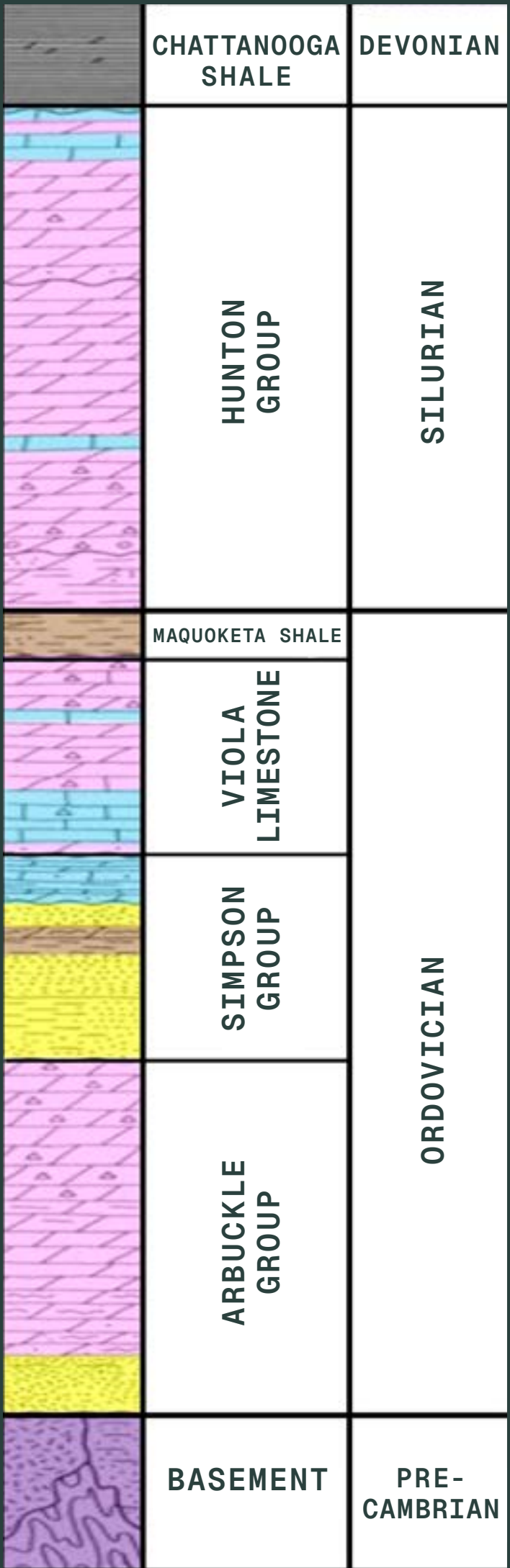
► Conventional Reservoirs

- **Hunton Group:** Mixed dolomite and limestone, with sustained field productivity
- **Viola Limestone:** Regionally extensive carbonate play with strong structural and stratigraphic traps
- **Simpson Sandstone:** Clean quartz-rich sandstones offering good vertical seals
- **Arbuckle Group:** Coarsely Crystalline Dolomite

► Unconventional Reservoir

Basement: Outcrop analogs demonstrate how cooling joint sets and tectonic stresses can cause fracture permeability within low-porosity basement formations

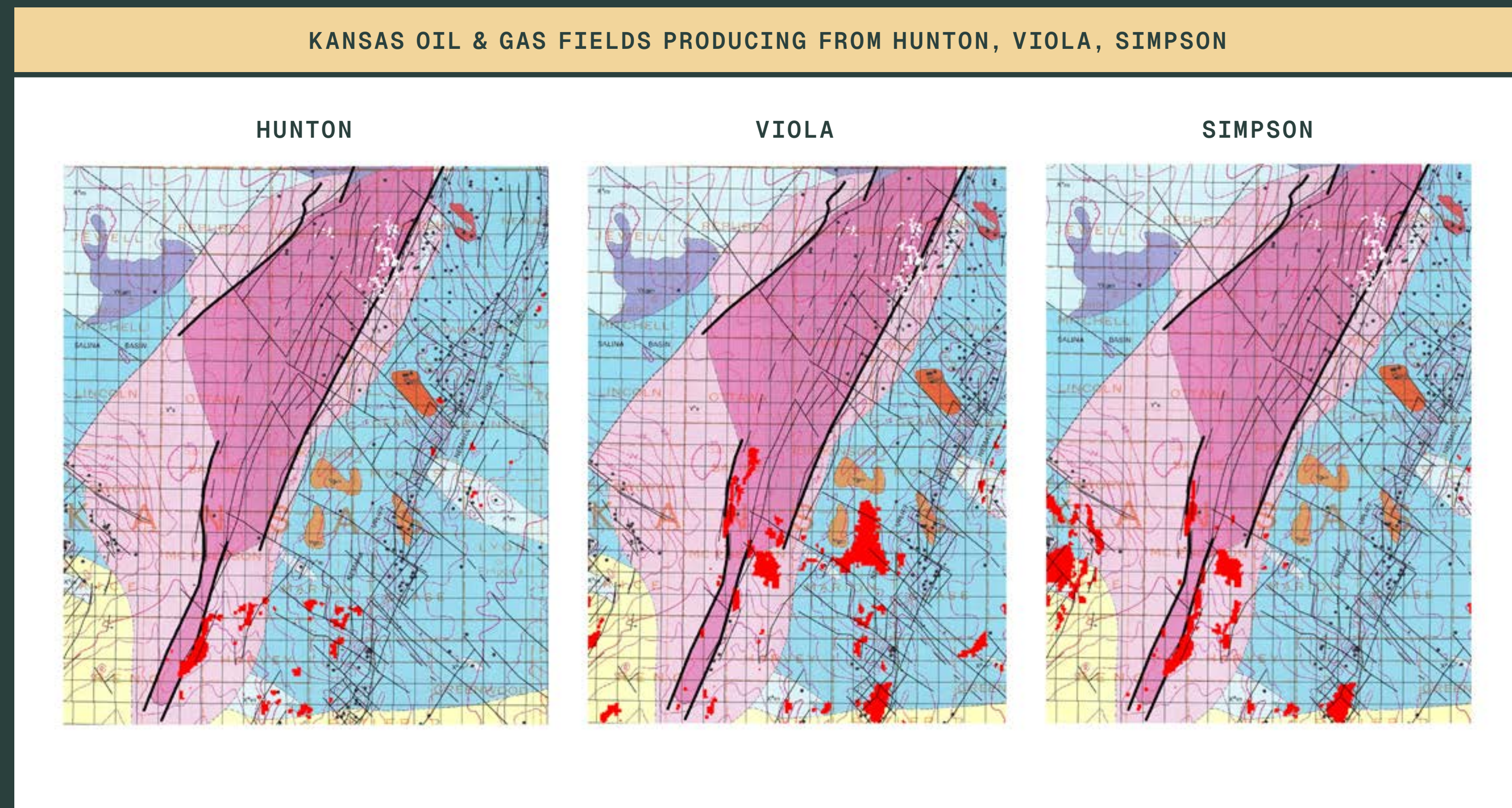
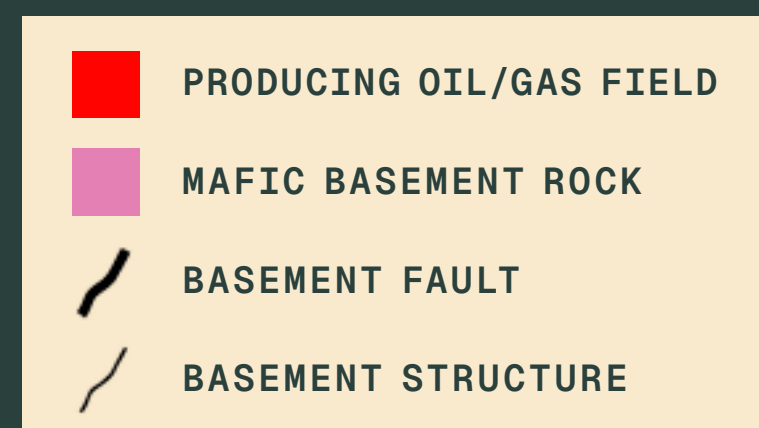
| FEATURE | LITHOLOGY/TYPE | SEAL UNIT | PRIMARY SEAL TYPE(S) |
|-----------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Hunton Group | Dolomite and Limestone | <ul style="list-style-type: none">• Chattanooga Shale• Lower Miss. Shales | <ul style="list-style-type: none">• Overlying Shales• Weathered carbonates• Unconformities• Pinch-outs |
| Viola Limestone | Limestone and Dolomite | <ul style="list-style-type: none">• Maquoketa Shale• Unconformity surface | |
| Simpson Group | Sandstones and Dolomites | <ul style="list-style-type: none">• Simpson Shale• Chattanooga Shale | |
| Arbuckle Group | Dolomite with vuggy and fracture porosity | <ul style="list-style-type: none">• Chattanooga Shale (Dev Miss.)• Simpson Shale | |



RESERVOIR POTENTIAL

USING OIL AND GAS DATA TO ASSESS RESERVOIR POTENTIAL

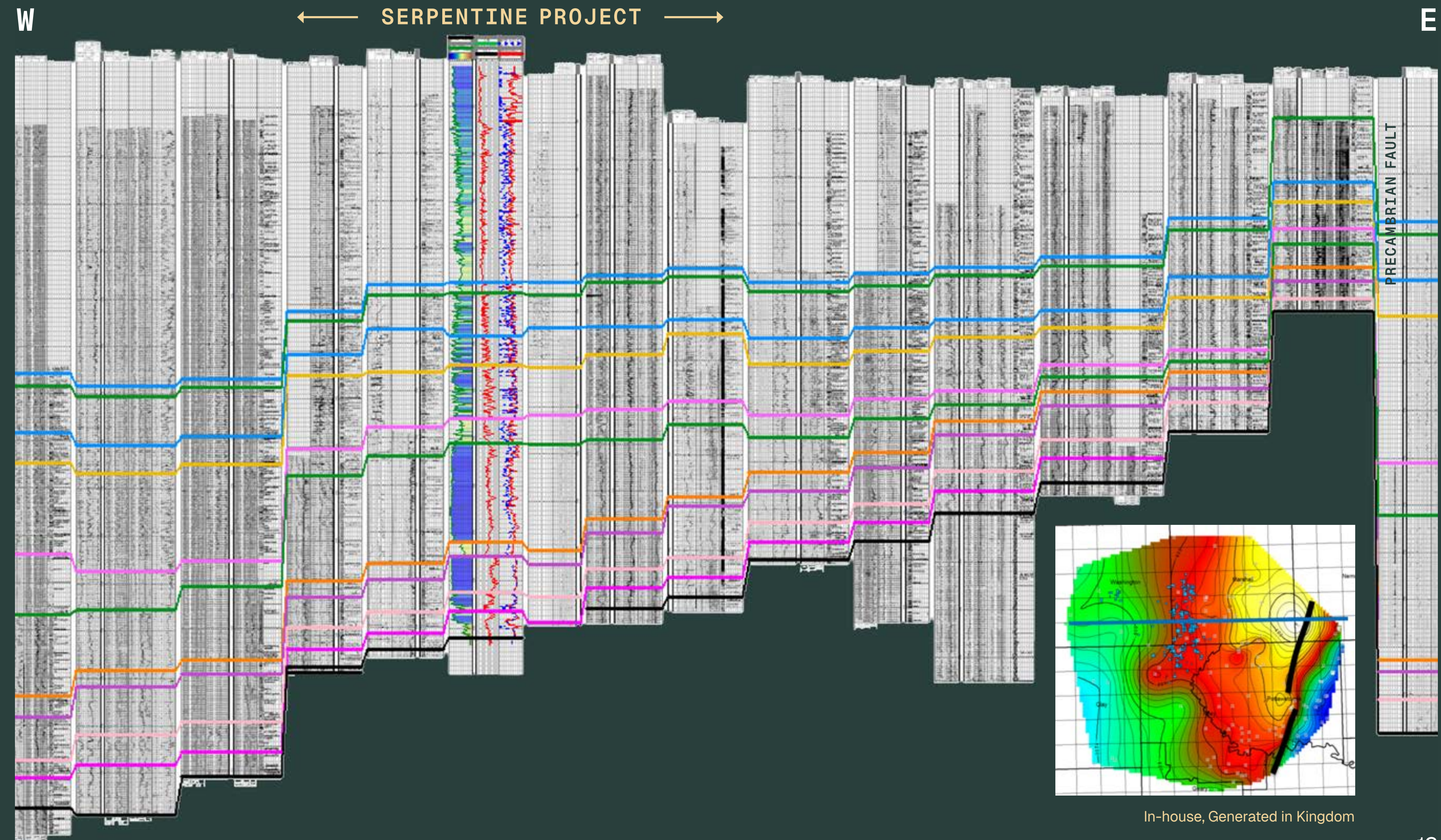
The Project is situated along a structural trend controlled by basement faults and mafic boundaries. Adjacent oil and gas fields producing from the Hunton, Viola and Simpson formations validate the presence of effective traps and seal integrity. These proven systems offer a strong analogue for natural hydrogen, which relies on similar structural and stratigraphic conditions for migration and long-term preservation



GEOLOGIC STRUCTURE

STRUCTURAL FEATURE ABOVE THE SOURCE

The Project is positioned directly above the mafic generation zone, on a localised structural high that preserves sufficient reservoir thickness before it rapidly thins toward the adjacent fault zone

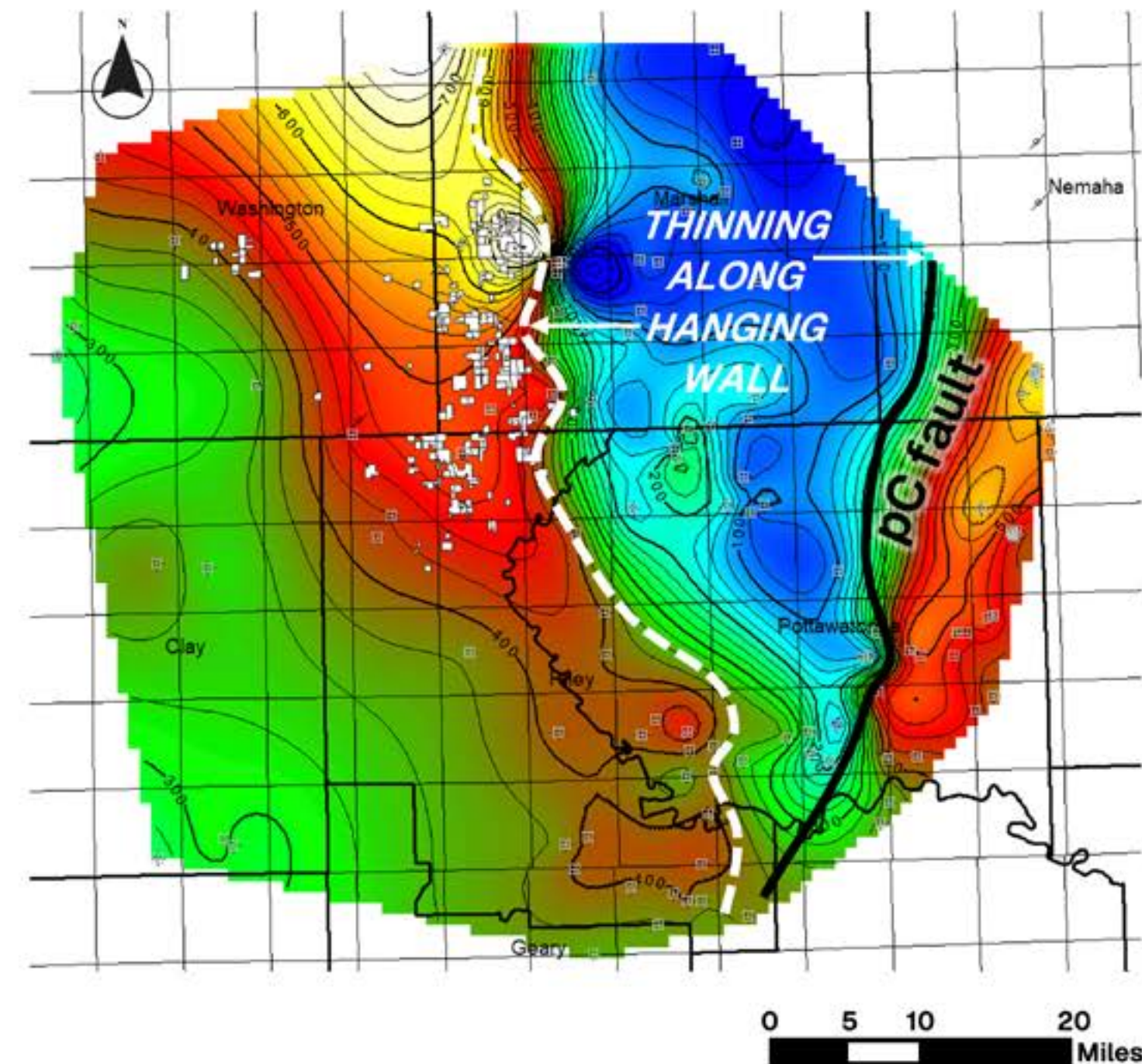


SHALLOW TARGET

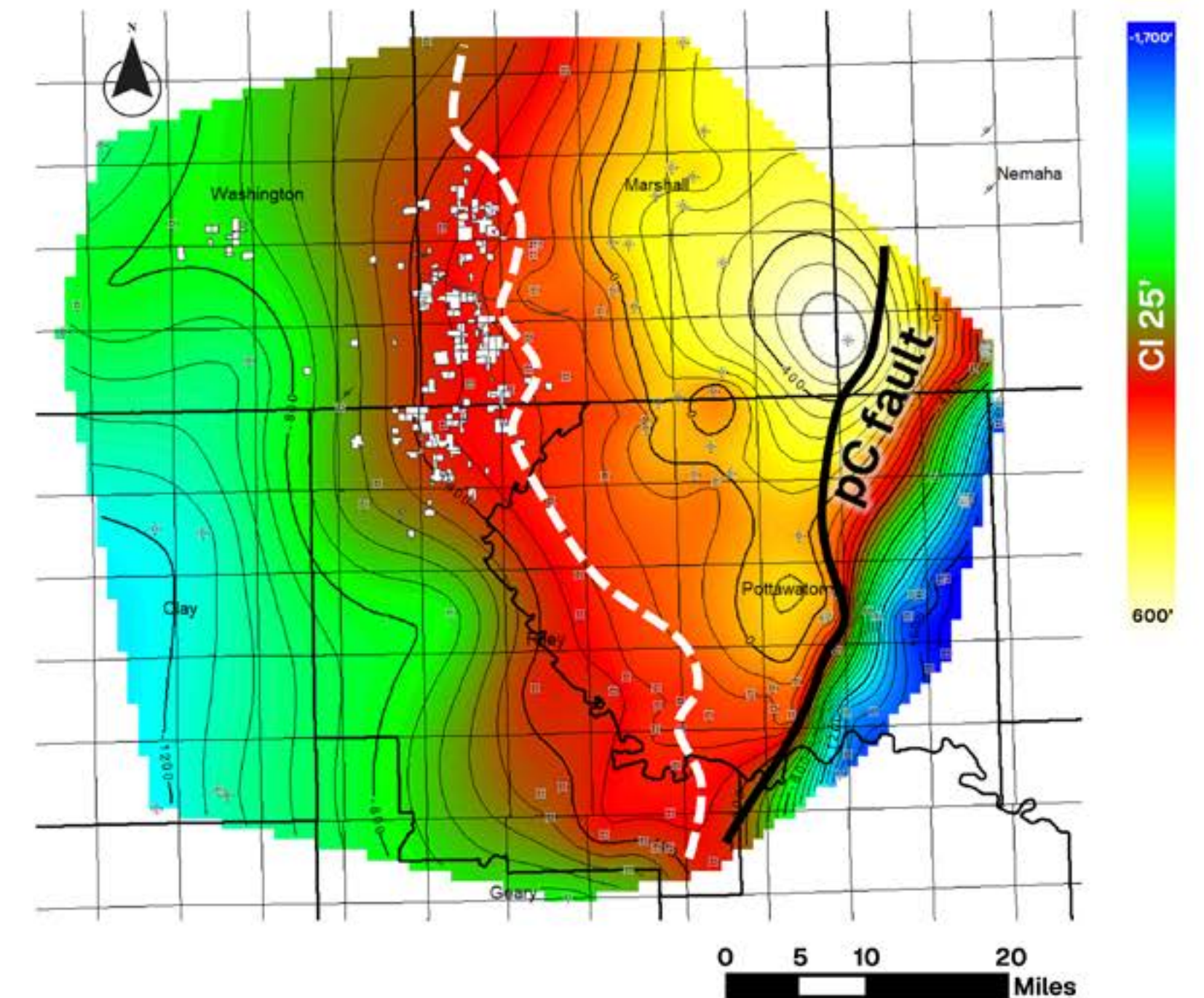
HUNTON GROUP

- ▶ Isopach map shows a clear thinning of the stratigraphic section along the hanging wall of a major Precambrian fault
- ▶ This thinning reflects erosion due to uplift, creating both a migration pathway and a preservation edge
- ▶ The Project sits where the Hunton section is thickest and directly overlies basement
- ▶ The play concept hinges on proximity to the source, a structurally controlled migration pathway and a preserved stratigraphic trap

HUNTON ISOPACH (GROSS THICKNESS, FT)



HUNTON STRUCTURE (SSTVD, FT)

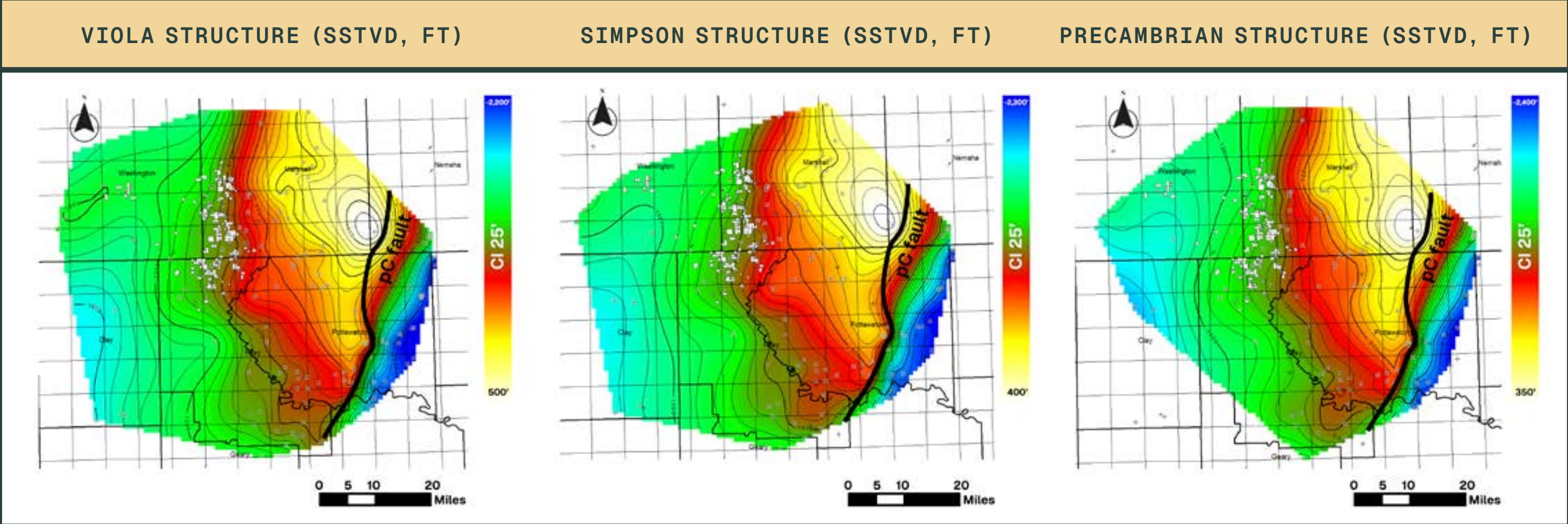


In-house, Generated in Kingdom

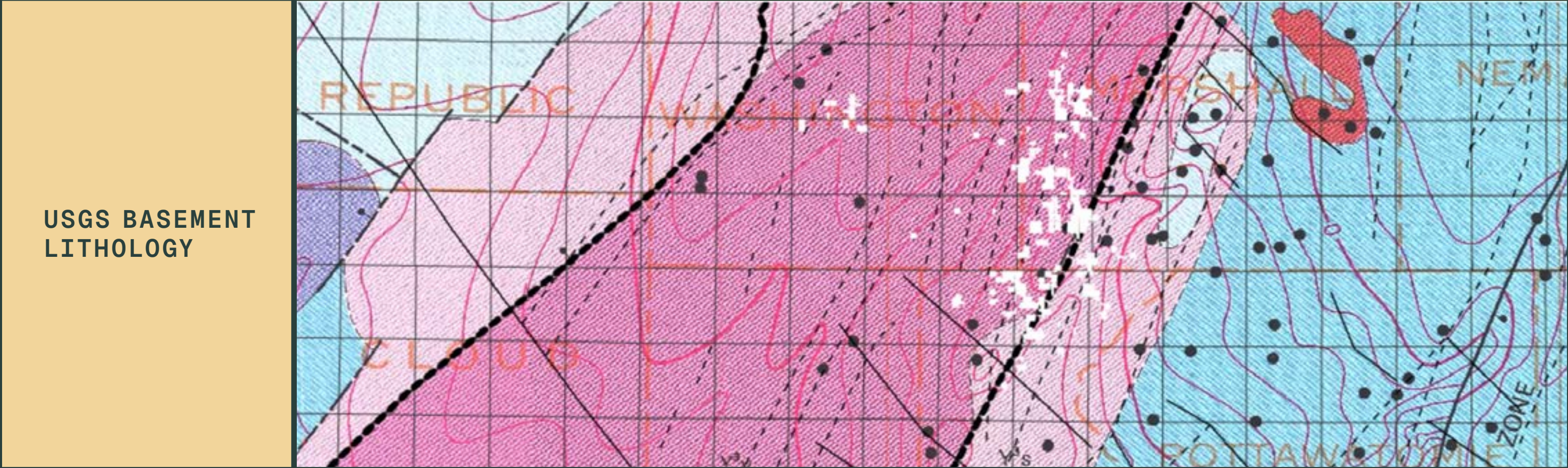
DEEPER TARGETS

VIOLA, SIMPSON AND PRECAMBRIAN

The Project predominantly overlies reactive mafic basalt basement, in contrast to non-reactive clastics as identified by USGS basement mapping



In-house, Generated in Kingdom



STRUCTURAL TRAPPING AND MIGRATION

EVOLUTION AND POTENTIAL OF THE MCR

► Structure

A structurally complex basin with extensive faulting and folding, capped by overlying shales that drape structural highs

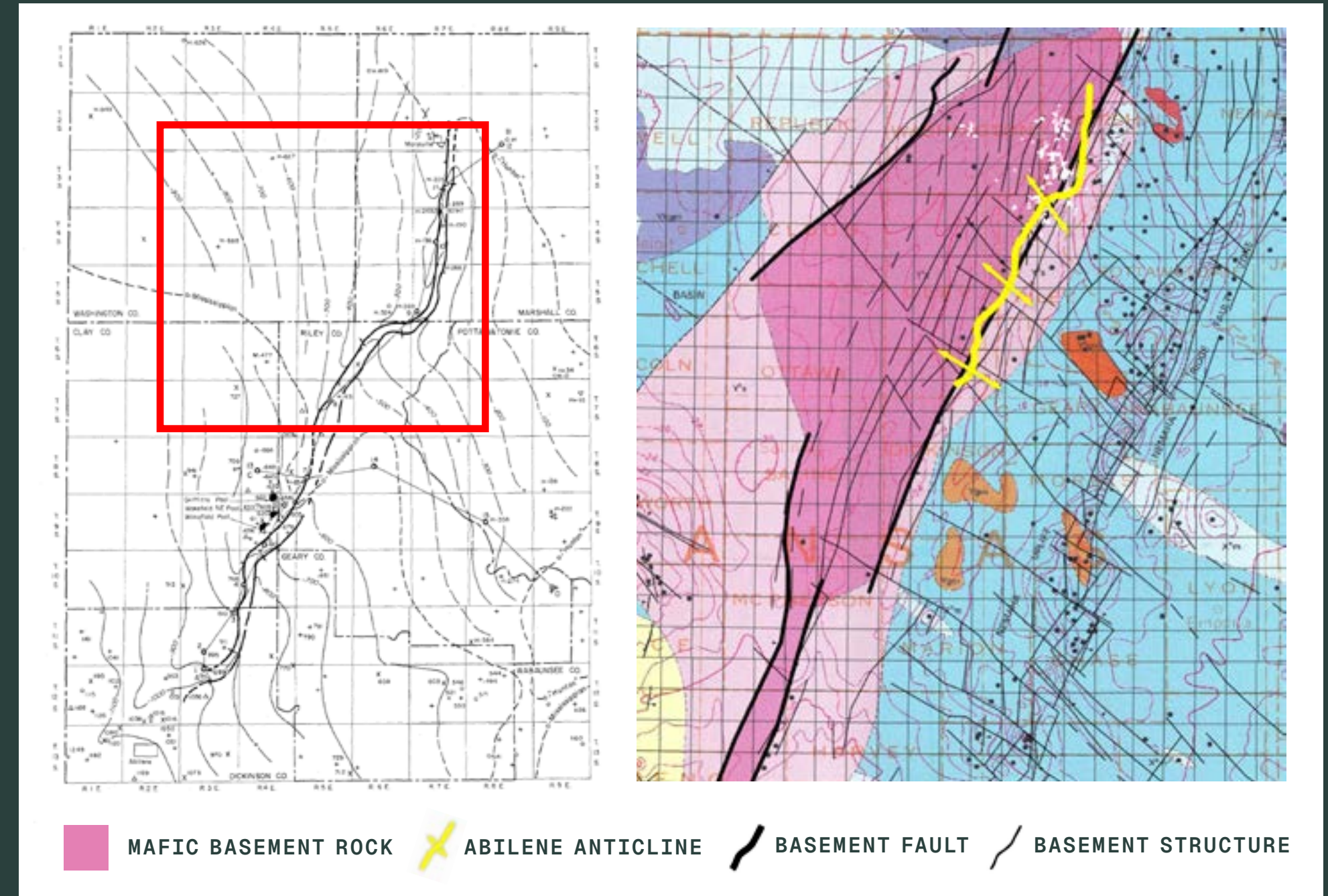
- **Fault-bounded closures:** Reactivated rift faults form horst blocks and graben margins where hydrogen can accumulate
- **Compressional folds:** Local inversion along rift margins creates anticlines and fault-propagation folds
- **Abilene Anticline:** A broad, gently folded basement-involved structural high that has historically acted as a regional trap and migration focus for hydrocarbons

► Migration

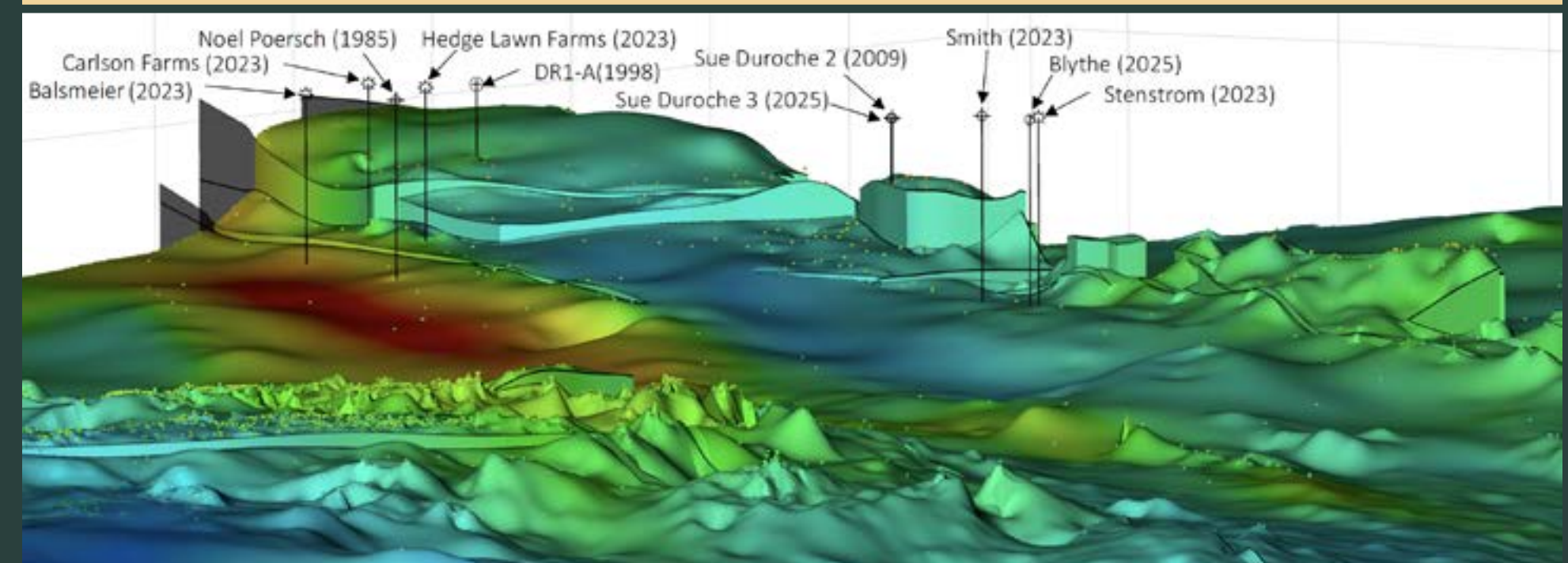
Drilling data showing high hydrogen concentrations up to 40 miles from the generation zone demonstrates sufficient vertical and lateral migration pathways

- **Intersecting fault networks:** Cross-cutting normal and strike-slip faults provide vertical conduits for H₂ migration
- **Fracture corridors around intrusives:** Thermal stresses induce vertical fracture network to channel H₂ upward

ABILENE ANTICLINE



PRECAMBRIAN BASEMENT MAPPING



Bouguer Gravity, White, M, KGS Subsurface Dynamics Laboratory, 2025



“

IF BUGS AREN'T IN YOUR RISK REGISTER – THEY SHOULD BE

**Elevated hydrogen means little without
preservation and accumulation**

We're targeting reservoirs protected from glacial
flushing and deep enough to resist microbial loss –
maximising the chance of a stable accumulation

”

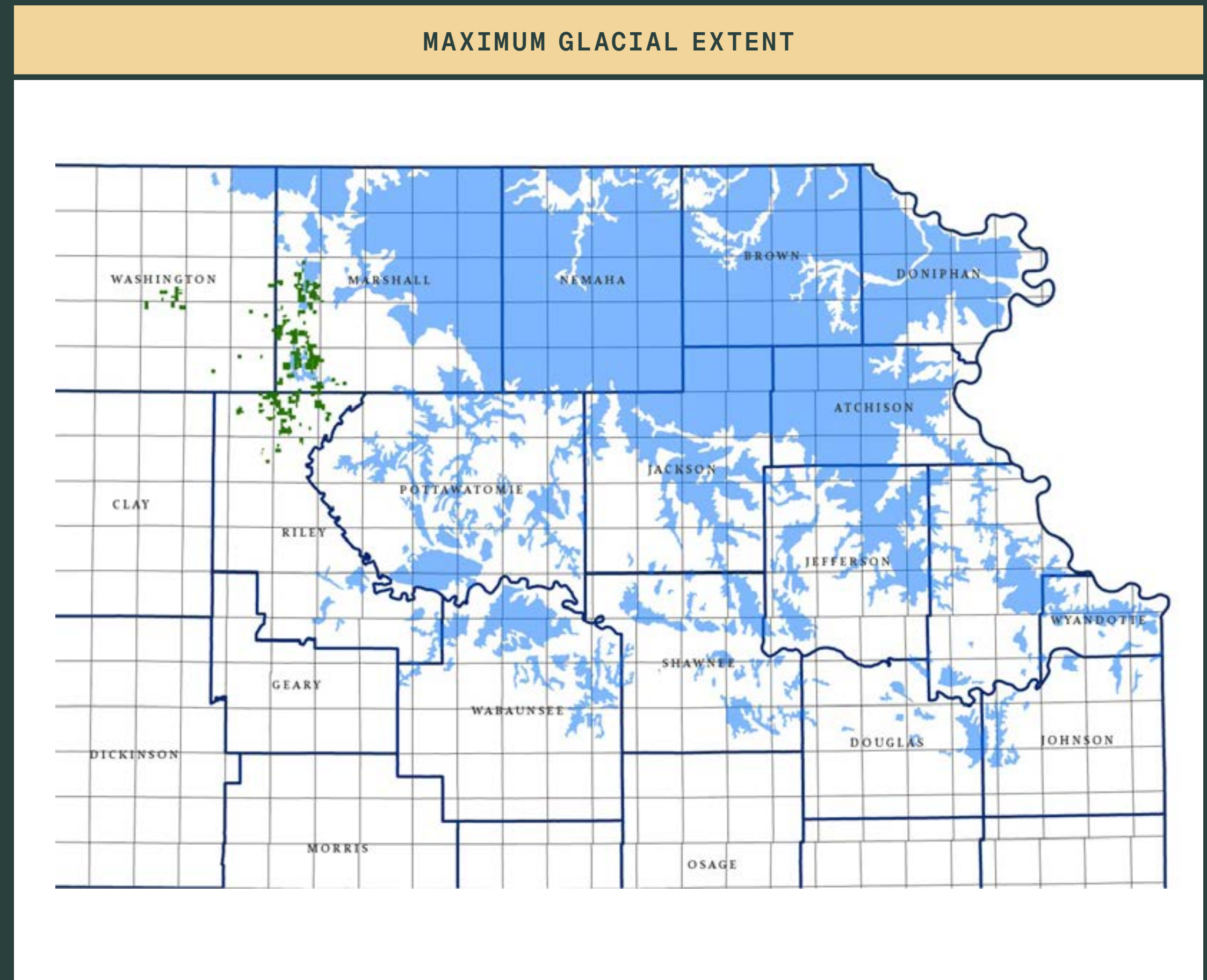
MANAGING RISK

PRESERVATION

IMPACT OF GLACIATION AND MICROBIAL ACTIVITY

► Preservation

- Hydrogen is highly susceptible to microbial consumption, which can convert it into methane or water, reducing the volume and detectability of hydrogen accumulations
- Regions within the maximum glacial extent are more likely to have experienced:
 - Recent freshwater recharge
 - Oxidizing subsurface conditions
 - Introduction of active microbial populations
 - Seal fracturing and increased vertical permeability
 - New migration pathways that lead to leakage
 - Thermal resetting which suppresses hydrogen generation reactions
- Even though the glaciers receded hundreds of thousands of years ago, the effects remain and preservation risk increases where glacial meltwater or modern meteoric water has infiltrated into the subsurface



Kansas Geological Society

RISK ASSESSMENT

A TRANSPARENT VIEW OF EACH SYSTEM ELEMENT

► Reservoir

Lower pressure regimes may limit reservoir drive, but several Kansas hydrocarbon fields successfully produce under comparable conditions

► Seal

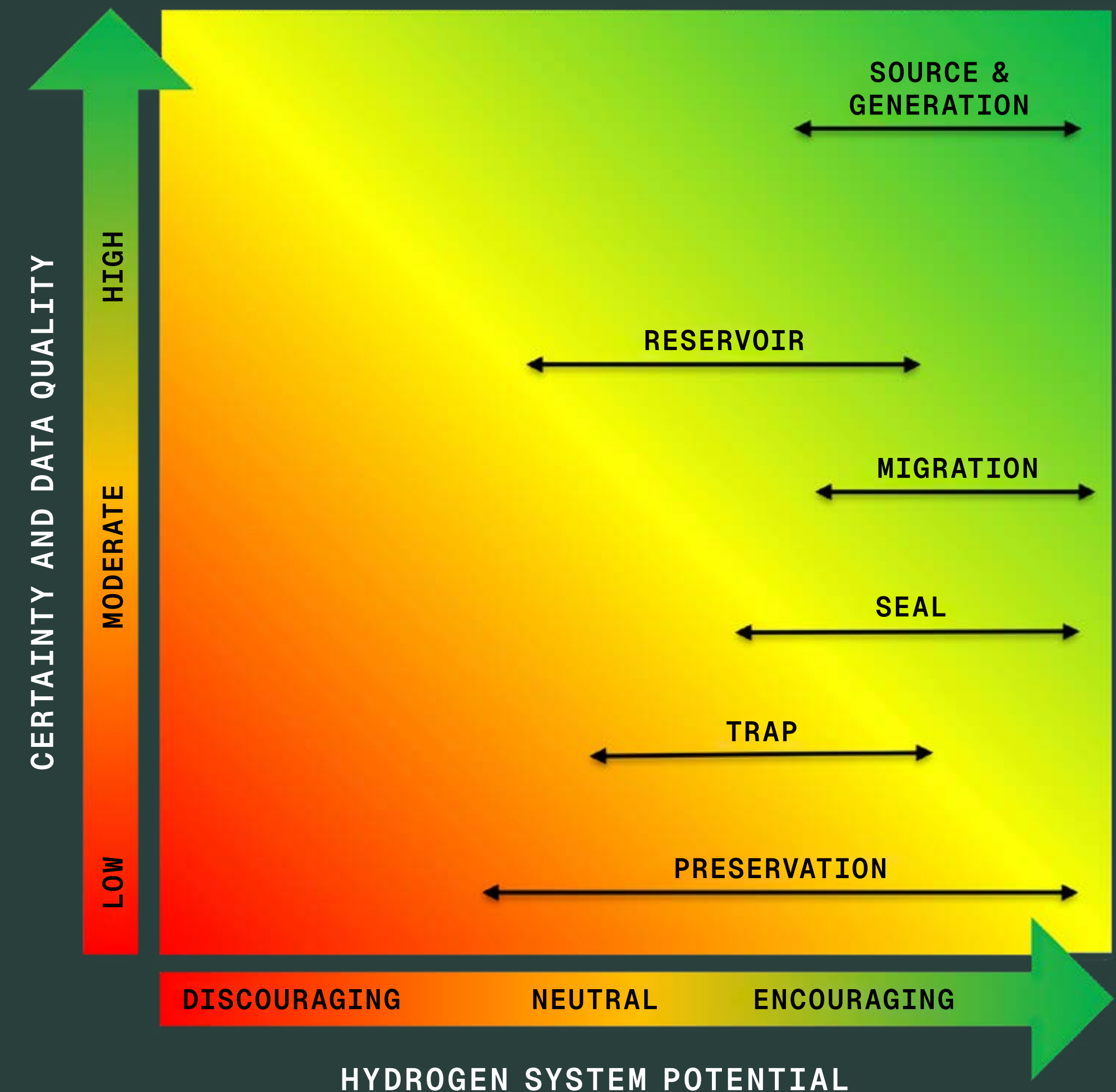
Uncertainty around hydrogen seal lithology persists, however proven hydrocarbon seals offer valuable analog confidence

► Trap

Current data limits our ability to accurately define and map trap geometries. Additional geophysical data will improve trap risk assessment in future phases

► Preservation

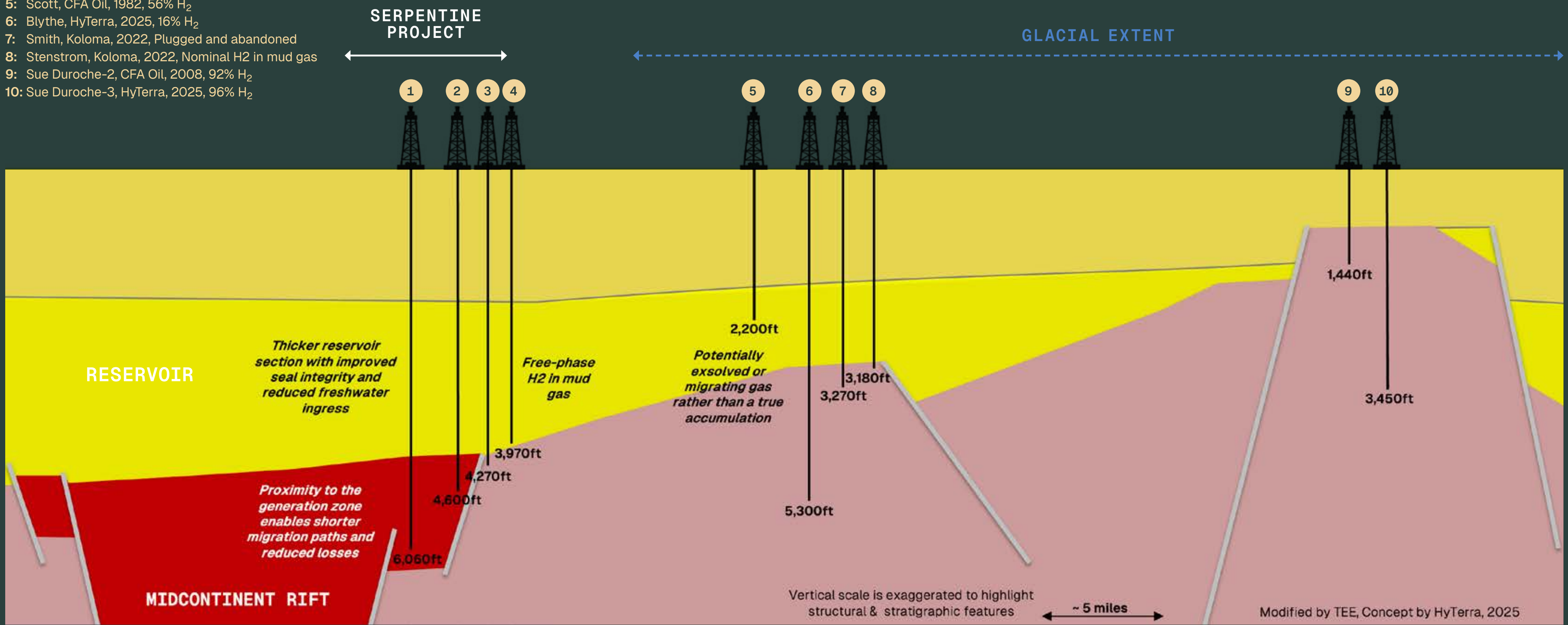
Higher subsurface temperatures are preferable to inhibit microbial activity and enhance preservation, although multiple H₂ shows in the region suggest preservation is viable



MIDCONTINENT RIFT PLAY CONCEPTS

- 1: Balsmeier, Koloma, 2023, H₂ not disclosed
- 2: Hedge Lawn Farms, Koloma, 2023, H₂ not disclosed
- 3: Carlson Farms, Koloma, 2023, H₂ not disclosed
- 4: Finn, Producers Engineering, 1986, H₂ in mud gas
- 5: Scott, CFA Oil, 1982, 56% H₂
- 6: Blythe, HyTerra, 2025, 16% H₂
- 7: Smith, Koloma, 2022, Plugged and abandoned
- 8: Stenstrom, Koloma, 2022, Nominal H₂ in mud gas
- 9: Sue Duroche-2, CFA Oil, 2008, 92% H₂
- 10: Sue Duroche-3, HyTerra, 2025, 96% H₂

FAVORABLE TRAPPING AND CHARGE CONDITIONS OVER THE GENERATION ZONE SET US APART FROM SHALLOW DISTAL TARGETS





DISCOVERIES HAPPEN IN THE FIELD, NOT BEHIND A DESK

Current models based on limited real-world data can only take us so far

Early-stage natural hydrogen exploration demands a **drilling-led strategy** grounded by targeted subsurface insight



OUR EXPLORATION APPROACH

EXPLORATION APPROACH

WHY EARLY EXPLORATION CALLS FOR A RETURN TO FIRST PRINCIPLES

► Drill Early Approach

- Most U.S. onshore oil and gas discoveries were made in the 20th century through exploratory drilling and surface geology – not complex models
- Today’s workflows are model-heavy and geophysics-led, built for data-rich and high-cost offshore and unconventional plays
- In frontier plays like natural hydrogen, we’re operating with limited data - mostly accidental discoveries, some over a century old. Even AI needs hundreds of examples to learn; we’re working with just a few
- That’s why early movers are turning to drilling-led strategies, that define the system, build confidence and accelerate learning
- Drilling remains the fastest and most cost-effective path to generate the inputs required for meaningful geological models and commercial insight
- Our approach favours capital-efficient exploration over model-heavy uncertainty, leveraging smart well placement and focused data acquisition
- **A robust geologic and geophysical model will follow - once real, calibrated data is in hand**

| FEATURE | DRILLING-LED EXPLORATION | GEOPHYSICS-CENTRIC WORKFLOW |
|-----------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Speed of Learning | Immediate feedback with each well delivering data for rapid learning and improvement | Long lead times acquiring, processing and interpreting seismic before ground-truthing can occur |
| Cost Efficiency | Lower upfront cost per well, as drilling quickly validates play elements | Moderate to high front-end investment in seismic with no guarantee of a drillable target |
| Data Certainty | Real data “on-bit” provides measurement of hydrogen shows and reservoir quality | Reliant on indirect attributes (AVO, inversion) that may misrepresent subtle signatures without sufficient calibration |
| Decision Making | Drill → test → adapt in tight feedback loops, allowing fast re-prioritization of targets | Seismic first → rank → drill, limited agility to pivot if models prove inaccurate |
| Risk Mitigation | Step out wells can de-risk key elements directly | Analog-based calibration for risk mapping hasn’t been validated |
| Flexibility | Highly adaptive, future well designs continuously refined in response to incoming data | Reprocessing seismic costs time and money which is not practical for quick pivots |
| Technology Dependency | Well-established drilling and logging tools translate directly to H ₂ evaluation | Advanced workflows (full-waveform inversion and machine learning) require extensive training datasets |

MARSHALL COUNTY EXPLORATION

KOLOMA'S DRILLING PROGRAM

- Public data for the Balsmeier, Carlson Farms and Hedge Lawn Farms wells is limited to post-confidentiality releases by Kansas Geological Society
- **Mudlogs** for the three Marshall County wells were published without hydrogen gas curves. Given Koloma's hydrogen focus and their use of mud-gas monitoring demonstrated in other wells, these measurements were almost certainly recorded
- **Wireline Logs** indicate the Simpson formation hosts promising reservoir quality and the basement is characterized by heavy fracturing. Conventional gas indicators, such as neutron-density crossover, are less reliable for hydrogen due to the low H_2 Index (about 1/10th of CH_4). Accurate log interpretation is challenging without the supporting mud gas, coring and geochemical data
- **Drill Stem Tests** indicate minimal fluid recovery and inconclusive pressure response. The wells were drilled overbalanced (mud weight up to 9.4ppg), which can suppress gas inflow and risk formation damage and fluid invasion. Koloma's most recent drilling permit proposes air-rotary drilling, acknowledging and addressing this issue

► Post Drilling Confidence Signals

Koloma's post-drill US\$250M Series B raise in 2024 — backed by Khosla Ventures, Breakthrough Energy Ventures, Amazon Climate Fund, United Airlines, Mitsubishi Heavy Industries, Osaka Gas and others — along with its aggressive lease expansion in the immediate area, signals technical validation and growing internal confidence in the play. This is reinforced by an extensive high-resolution gravity-magnetic aerial survey completed post drilling and ongoing seismic program

Top Left: Koloma drilling ahead on the Mid-Continent Rift

Top Right: 3,000 to 5,000psi wellheads were installed on all three wells

Bottom Left: New Koloma well-site, permitted for air-rotary drilling

Bottom Middle: Workover rig on Balsmeier in November 2024

Bottom Right: Thousands of 3C seismic nodes were installed next to the Project



A background image of an oil rig in a desert landscape under a cloudy sky. The rig is on the right side, and a dirt road leads towards it. The sun is low on the horizon, creating a lens flare effect.

“

**OUR DRILLING PROGRAM IS
DESIGNED TO VALIDATE PROVEN
PLAY ELEMENTS AND DE-RISK
THOSE THAT ARE UNTESTED**

Hydrogen exploration is high-risk by nature, but the upside is transformative

A proven hydrogen source matched with the key elements of a commercial hydrocarbon system enhances our confidence in the play

”

DATA DRIVEN APPROACH

TOOLS AND TESTING

APPLYING EXISTING O&G TOOLS TO HYDROGEN EVALUATION

► Drill and Post-Drill Program

Mud-gas mass spectrometry

- Real-time detection to identify spikes vs background
- Correlate shows with depth, lithology and structural breaks

Rock-volatiles stratigraphy

- Analyse drill cuttings for adsorbed and occluded gases
- Validates whether hydrogen is indigenous

Triple-combo log

(Gamma, resistivity, density/neutron)

- Differentiate reservoir and seal facies
- Highlight porous, fluid-filled zones with free-phase gases
- Detect gas-filled porosity and differentiate lithologies

Image log

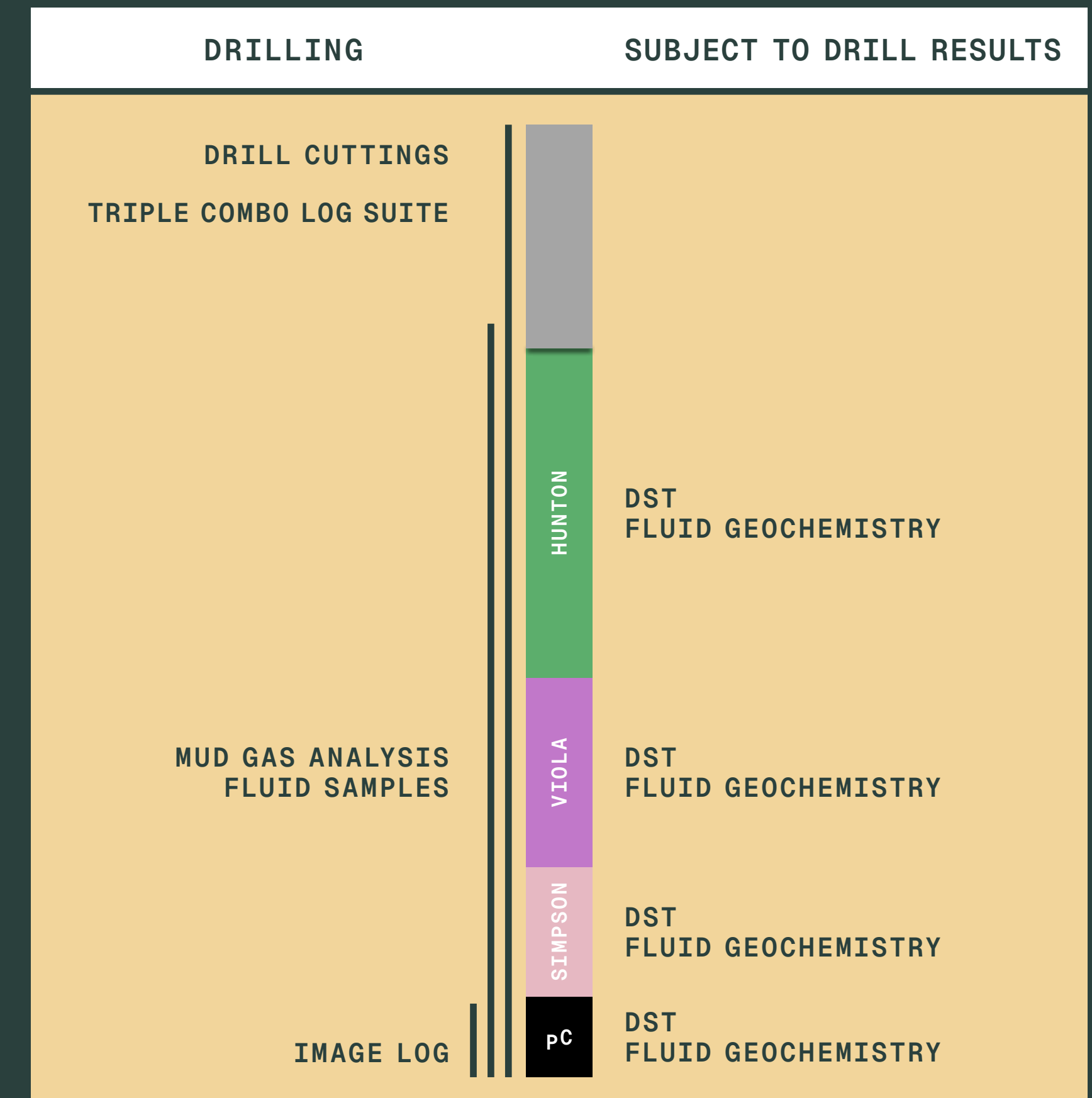
- High-resolution images of the basement
- Visualize fracture orientation, aperture and connectivity
- Quantify fracture intensity and vertical pathways

Drill-stem test (DST)

- Measure in-situ pressure, permeability, and productivity
- Identify formation damage or overbalance issues that may mask true productivity

Fluid geochemistry and microbial analysis

- Isotopic analysis to distinguish deep vs surficial hydrogen
- DNA/RNA profiling to detect microbial activity



DATA ACQUISITION PLAN

DE-RISKING KEY ELEMENTS THROUGH DRILLING DATA

| ELEMENT | OBSERVATION | VALIDATES | SCALE OF INSIGHT |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------------------|
| Source | <ul style="list-style-type: none">• Mafic lithologies in cuttings and core• Gravity and magnetic anomaly alignment• Fluid geochemistry | Presence of a reactive source for hydrogen generation | Play |
| Reservoir | <ul style="list-style-type: none">• Log porosity• Mud losses• Vuggy and fractured cuttings | Suitable porosity and permeability in target intervals | Play & Prospect |
| Fractured Basement | <ul style="list-style-type: none">• Image logs• Testing (DST/Swab) in basement | Fracture connectivity and flow potential | Play & Prospect |
| Trap | <ul style="list-style-type: none">• Hydrogen spikes in mud gas• Free gas or in-solution | Presence of a trap and possible accumulation | Prospect |
| Seal | <ul style="list-style-type: none">• Tight intervals in logs• Drop-off in hydrogen mud gas profile | Vertical seal effectiveness above reservoir | Prospect |
| Migration | <ul style="list-style-type: none">• H₂ shows in non-source zones• Alignment with structure | Active or historical hydrogen movement pathways | Play |
| Preservation | <ul style="list-style-type: none">• Reducing conditions (sulfide odor, Fe²⁺)• Microbial analysis• Production testing | Long-term hydrogen retention and commercial potential | Play |

PROSPECTIVE RESOURCE VOLUMES

INDEPENDENT ASSESSMENT OF THE RECOVERABLE HYDROGEN RESOURCE VOLUMES

► Resource Density

Recoverable volumes are based on the Project lease holding of approx. 31,000 acres and indicate a strong resource density that underpins its technical viability and supports the case to advance exploration drilling

► Additional Resource Upside

Resource volumes are based on conventional potential of the Hunton, Viola, Simpson and Arbuckle through to the unconventional potential of the basement

Additional upside in shallower intervals, such as the Lansing where HyTerra recently recorded 96% H₂ at depths of less than 1,000 ft has not been factored in

► Future Work

Ongoing evaluation, subsurface interpretation and exploration activities - including drilling and geophysics are expected to improve the risking profile, narrow resource ranges and incorporate additional volumes from shallow reservoirs

NET RECOVERABLE PROSPECTIVE HYDROGEN RESOURCE

| | | | |
|---------------|----------------|----------------|----------------|
| 1U | 2U | Mean | 3U |
| 71 BCF | 234 BCF | 304 BCF | 629 BCF |
| 168 k tonnes | 552 k tonnes | 716 k tonnes | 1,485 k tonnes |

Cautionary Statement: The estimated quantities of hydrogen that may potentially be recovered by the application of a future development project(s) relate to undiscovered accumulations. These estimates have both a risk of discovery and a risk of development. Further exploration appraisal and evaluation is required to determine the existence of a significant quantity of potentially recoverable hydrogen.

Ch 5 LR: The Prospective Resource estimates are quoted on an unrisked basis and are aggregated arithmetically by category. The Company is not aware of any new information or data that materially affects the information included in the ASX release and all material assumptions and technical parameters underpinning the estimates in the ASX release continue to apply and have not materially changed. Refer to ASX release 2 July 2025, Independent Prospective Hydrogen Resource in Kansas.



“

**WE'RE GUIDED BY A
SYSTEM-VS-CONFIDENCE
APPROACH AND MAKING SURE
EVERY DOLLAR GOES TOWARDS
BUILDING CERTAINTY**

We already know hydrogen is there –
now we need to prove its commerciality

”

MOVING FROM DISCOVERY TO DELIVERABILITY

HELIUM POTENTIAL

ADDED VALUE AND NEAR-TERM COMMERCIALISATION

► Co-Existing Gases

Natural hydrogen exploration is increasingly detecting significant helium concentrations. Both gases are generated in or adjacent to crystalline basement and migrate together along the same fracture networks and fault corridors. A coexisting H₂–He system not only enhances project economics through a high-value secondary product but also creates a pathway to near-term revenue.

Recent examples of elevated hydrogen and helium recorded from the same well include:

- **HyTerra in Kansas:** 96% H₂ / 5% He; and 16% H₂ / 4% He
- **Gold Hydrogen in South Australia:** 96% H₂ / 17% He
- **Helix Exploration in Montana:** 55% H₂ / 2% He

Isotopic analysis of hydrogen (deuterium-hydrogen ratios) and helium (³He/⁴He) provides a geochemical framework for distinguishing between mantle-derived, crustal and microbial gas origins. This is an area of active research as exploration for natural hydrogen accelerates globally.

► Kansas Drives Helium Supply

Kansas is America's leading helium state, with eight helium processing plants and discoveries dating back over a century, the state has a long history of extraction, processing and transport. The supportive state framework and established infrastructure ensure reliable production and scalable growth. With global demand surging and spot helium prices reaching \$1,000–\$1,500 Mcf, Kansas is well-positioned to deliver into a high-value and supply constrained market

INVITATION TO PARTNER

NEXT STEPS

► Expressions of Interest

Top End Energy invites partners to join a structured farm-out process and advance an exploration program to unlock value in a transformative hydrogen play.

Qualified parties with the appropriate technical and financial capabilities will be granted access to proprietary datasets to support detailed project evaluation.

► Commercial Structure

- Earn a substantial working interest via a drilling carry and/or staged capital contributions, under a Joint Operating Agreement
- A Joint Development Agreement may be offered to partners who bring technical and/or operatorship credentials
- Commercial terms will be tailored to each partner's capital commitment, technical contribution and strategic fit

► Ideal Partner

- Understands frontier exploration and risk
- Sufficient capital to fund a multi-well exploration program and subsequent appraisal
- Partners with U.S. operating experience and/or proprietary natural hydrogen technologies are viewed as beneficial
- Familiar with public company disclosure standards



Contact

Luke Velterop

Chief Executive Officer

+1 (785)-410-3840

luke@serpentineenergy.com

Top End Energy Ltd is an Australian publicly listed company focused on industrial gas exploration

Through its wholly owned U.S. subsidiaries, Serpentine Energy LLC and Downunder Ventures LLC, the Company holds a 100% working interest in the Serpentine Natural Hydrogen Project

TOP END
—ENERGY—
THE ENERGY OF TOMORROW



ASX:TEE



Top End Energy Ltd



@TopEndEnergy



topendenergy.com