Evaluation of the Prospective Hydrogen Resources for Lily Rock Project in Eastern Kansas

(As of June 1, 2024)

Think Energy. Discover Value

Sproule

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EXECUTIVE SUMMARY

At the request of Longhorn Exploration Corp. (“Longhorn”) Sproule International Limited (“Sproule”), an independent sub-surface consultancy based in Calgary, Canada, has conducted an independent evaluation of the hydrogen prospectivity in the Kansas counties of Riley, Geary and Morris.

Longhorn Exploration Corp. (TSXV: LEX) entered into an arm’s length natural hydrogen lease acquisition agreement dated April 17, 2024 with PureWave Hydrogen Corp. (“PureWave”), whereby Longhorn has been granted the exclusive right and option to acquire PureWave’s rights and obligations under the Lease covering approximately 519.7 net acres of land located in Kansas, USA.

This report evaluates the prospective hydrogen resources of PureWave, of which Longhorn has the exclusive right and option to acquire. Throughout the report, specific mentions are made of PureWave and Longhorn, while other times mentions are made of the “Company” which can be interpreted as an interchangeable term for Longhorn or PureWave.

This evaluation is a geologic and engineering evaluation, based on the analysis methodology described herein using technical and economic data supplied by the Company, and has an effective date of June 1st, 2024. This evaluation does not include estimates of recoverable hydrogen volumes from either Reserves or Contingent Resources. Prospective Resources carry significant exploration risks.

The evaluation contained in this report is prepared in accordance with the COGEH guidance and the principles of NI 51-101 and provides a review under a set of assumptions deemed most appropriate by a practitioner. Sproule’s evaluation is based upon data supplied by the Company, supplemented where necessary by Sproule’s corporate awareness of current US industry costs and best practices.

Resource Estimates

Sproule reviewed the technical workflows and assumptions of the Company in its exploration assessment of the hydrogen prospects of its Lily Rock Project in Eastern Kansas, USA and has independently derived its own volumetric analysis of these prospects as shown in Table S-1 and Table 1. The volumetric analyses were conducted using a probabilistic methodology.

Table S-1
Company Interest Low, Best, and High Estimates of Undiscovered Gas Initially-In-Place and Prospective Resources in the Lily Rock Prospect
(as of June 1, 2024)

Gross Volumes (100% WI)

Prospect	**Fluid Type**[7,8]	**Undiscovered Gas Initially-In-Place** [9]			**Prospective Hydrogen Resources** [4]			
		Unrisked			**Unrisked**			**Risked**[5,6]
		Low[1]	**Best**[2]	**High**[3]	**Low**[1]	**Best**[2]	**High**[3]	**Best**[2]
Lily Rock	Raw Gas (MMcf)	107	1186	3885	55	642	2222	40.125
	Liquid Hydrogen equivalent (Kg)[10]	221,896	2,459,515	8,056,674	113,849	1,332,979	4,610,874	83,211

(1) Low represents the P90 volume estimate

(2) Best represents the P50 volume estimate

(3) High represents the P10 volume estimate

(4) Prospective Resources are sub-classified as Prospective - Prospects (Risked = Best*6.75%)

(5) It is mathematically invalid to determine a risked success-case distribution for any probability level other than the mean itself by multiplying an unrisked success case by the geological chance of success

(6) Risked: A 6.75 percent geological chance of success 93.25 percent chance of no discovery)

(7) Oil resources are presented in **thousands of barrels**

(8) Gas (raw) resources are presented in **millions of cubic feet before processing (i.e., shrinkage and natural gas liquid recovery)**

(9) UGIIP represents that quantity of petroleum that is estimated, as of July 15, 2023, to be contained in accumulations yet to be discovered

(10) Sproule has additionally made note that it has become common practice to state hydrogen volumes in liquid weight equivalents. These Unrisked Recoverable Prospective Hydrogen Resources may also be reported as weight equivalents as shown in Table S-1

There is no certainty that any portion of the resources will be discovered. If discovered, there is no certainty that it will be commercially viable to produce any portion of the resources.

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INTRODUCTION

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Evaluation Scope

Estimation Guidelines

The prospective resource data presented in this report was prepared in accordance with the Canadian Oil and Gas Evaluation Handbook (the “COGE Handbook”). It adheres in all material aspects to the principles and definitions established by the Calgary Chapter of the Society of Petroleum Evaluation Engineers. The COGE Handbook is incorporated by reference in National Instrument 51-101 (“NI 51-101”).

Properties

This report presents an evaluation of the Longhorn Kansas Prospective Resources of the Company's interests in North America.

Specific properties evaluated in this report are listed in the table of contents and consist of a selection of properties which include property types as presented in the following table.

Property type	Included	Excluded	Not Applicable
Active	✓	-	-
Inactive	-	-	✓

Taxation

An estimate of income taxes payable has not been included in the Company totals.

Future Development

No development forecast presented in this evaluation as the Lily Rock Project is at a Prospect Level stage at this time and is yet to be drilled or classified as a discovery.

EVALUATION DATA AND PROCEDURES

Sources of Data

Various data, pertinent to the evaluation of the Company's oil and gas reserves, were obtained from public data sources and the Company as follows:

Public sources of Data

- historical test information
- other well information including primarily pressures, gas analyses and depths
- geoscience information such as logs and core analyses

Company sources of Data

- property descriptions and operations
- production, well and geoscience data where such data was not available in the public realm
- interests and burdens

Accuracy and Reliance on Data

Property descriptions, details of interests held, and well data, as supplied by the Company, were accepted as represented. No investigation was made into either the legal titles held or any operating agreements in place relating to the subject properties.

Lessor and overriding royalties and other burdens were obtained from the Company. No further investigation was undertaken by Sproule.

Economic Evaluation

To date there is no historical production, revenue and expense data, product prices, or other data pertaining to the drilling for or production of natural hydrogen either that can be obtained from the Company or from public sources as there are no commercial hydrogen fields, either in the state of Kansas, within the USA or anywhere known on earth.

No economics have been evaluated. Operating costs, capital costs, abandonment, decommissioning and reclamation costs, carbon taxes, maintenance costs, investment hurdles, and product prices have not been considered in this report.

Field Inspections

In the preparation of this evaluation, field inspections of the properties were not performed. The relevant engineering and geoscience data were made available by the Company or obtained from public sources and the non-confidential files at Sproule. No material information regarding the resource evaluation would have been obtained by an on-site visit.

Purchase and Sale Agreements

The effect of purchase and sale agreements the Company has entered into has been included in this evaluation only when the transaction closed prior to the effective date of this report.

EVALUATION RESULTS AND PRESENTATIONS

Report Contents

This report is included in one (1) volume which consists of an Executive Summary, Introduction, Discussion, and Appendices. The Executive Summary includes high-level summaries of the evaluation; the Introduction includes the summary of evaluation standards and procedures and pertinent author certificates; and the Discussion includes general commentaries pertaining to the evaluation of the prospective resources. Resource definitions are included in Appendix A. A representation letter prepared by Officers of PureWave, Appendix B, confirms the accuracy, completeness and availability of data requested by and furnished to Sproule during the preparation of this report.

Erroneous Data

Sproule reserves the right to review all calculations made, referred to, or included in this report and to revise the estimates as a result of erroneous data supplied by the Company or information that exists but was not made available to us, which becomes known subsequent to the preparation of this report.

CAUTIONARY STATEMENTS

Aggregation

The analysis of individual entities as reported herein was conducted within the context and scope of an evaluation of a unique group of entities in aggregate. Use of this report outside of this scope may not be appropriate. The estimates of resources for individual entities or properties may not reflect the same confidence level as estimates of resources for all entities, due to the effects of aggregation.

Data Quality

The accuracy of resource estimates is, in part, a function of the quality and quantity of available data and of engineering and geological interpretation and judgment. Given the data provided at the time this report was prepared, the estimates presented herein are considered reasonable. However, they should be accepted with the understanding that reservoir and financial performance subsequent to the date of the estimates may necessitate revision. These revisions may be material.

Forward-Looking Statements

The evaluation process involves modeling to reasonably predict future outcomes. Inherent in the modeling process, however, are limitations which may indirectly affect the forecast of future events.

This report contains forward-looking statements including expectations of future production revenues and capital expenditure. Information concerning reserves may also be deemed to be forward-looking as estimates involve the implied assessment that the reserves described can be profitably produced in the future. These statements are based on current expectations that involve a number of risks and uncertainties, which could cause actual results to differ from those anticipated. These risks include, but are not limited to: the underlying risks of the oil and gas industry (i.e., corporate commitment, regulatory approval, operational risks in development, exploration and production); potential delays or changes in plans with respect to exploration or development projects or capital expenditures; the uncertainty of reserves estimations; the uncertainty of estimates and projections relating to production; costs and expenses; health, safety and environmental factors; commodity prices; and exchange rate fluctuation.

Equivalent Volumes

BOE's (or 'McfGE's' or other applicable units of equivalency) may be misleading, particularly if used in isolation. A BOE conversion ratio of 6 Mcf:1 bbl (or 'An McfGE conversion ratio of 1 bbl:6 Mcf') is based on an energy equivalency conversion method primarily applicable at the burner tip and does not represent a value equivalency at the wellhead.

Rounding

Due to rounding, certain totals may not be consistent from one presentation to the next.

CERTIFICATION

Report Preparation

This report entitled “Prospective Hydrogen Resources for Lily Rock Project in Eastern Kansas” was prepared by and is authenticated by the following Sproule personnel:

Project Leader and

Geological Interpretations

ID 278930

Jun. 12, 2024

Jeffrey Aldrich, P.Geo., L.P.G.

Senior Geoscientist

Preparation of:

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ID 80169

Jun. 12, 2024

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Managing Director, Reservoir Services

Sproule

Responsible Member Validation

This report has been reviewed and validated in accordance with the Professional Practice Management Plan of Sproule by the following Responsible Member of Sproule International Limited (APEGA Permit # P-06151).

Alexey Romanov, Ph.D., P. Geo.
Senior Manager, Geoscience
DATE: Jun. 12, 2024 **RM APEGA ID#:** 112313

DISCUSSION

ASSET OVERVIEW

Location

The Company has conveyed to Sproule that it has under current lease 594 gross acres in eastern Kansas (Figure 1). These leases are in Wabaunsee County.

These leases currently sit above a single prospect, as shown in Figure 2 below. Sproule has evaluated the leases and does retain maps on each of the leases and the structural position of each of the leases along with the well positions and penetrations. The Lily Rock Prospects sit on the southeast side of the crest of a mapped four-way dip basement closure that itself sits upthrown along the major north-east to south-west trending Humbolt Fault Zone. Its' area is presented in Table 1.

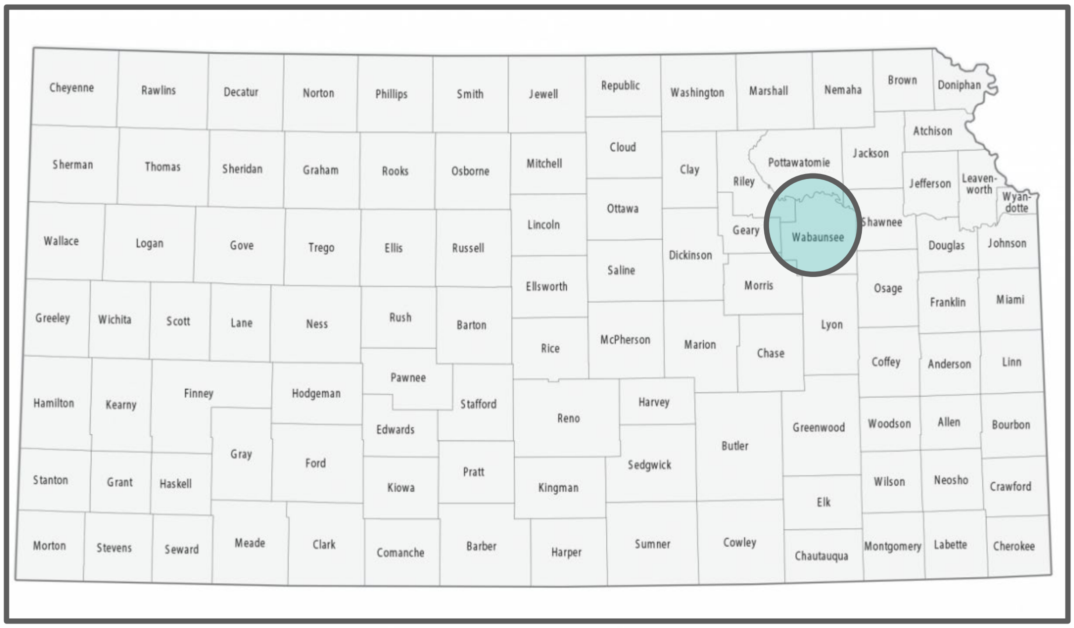


Figure 1: Location Map of the Lily Rock Project

Table 1: Longhorn Exploration Gross and Net Acres of the Lily Rock Project

Prospect	Gross Acres	Net Acres
Lily Rock	594	519.7
Total	**594**	**519.7**

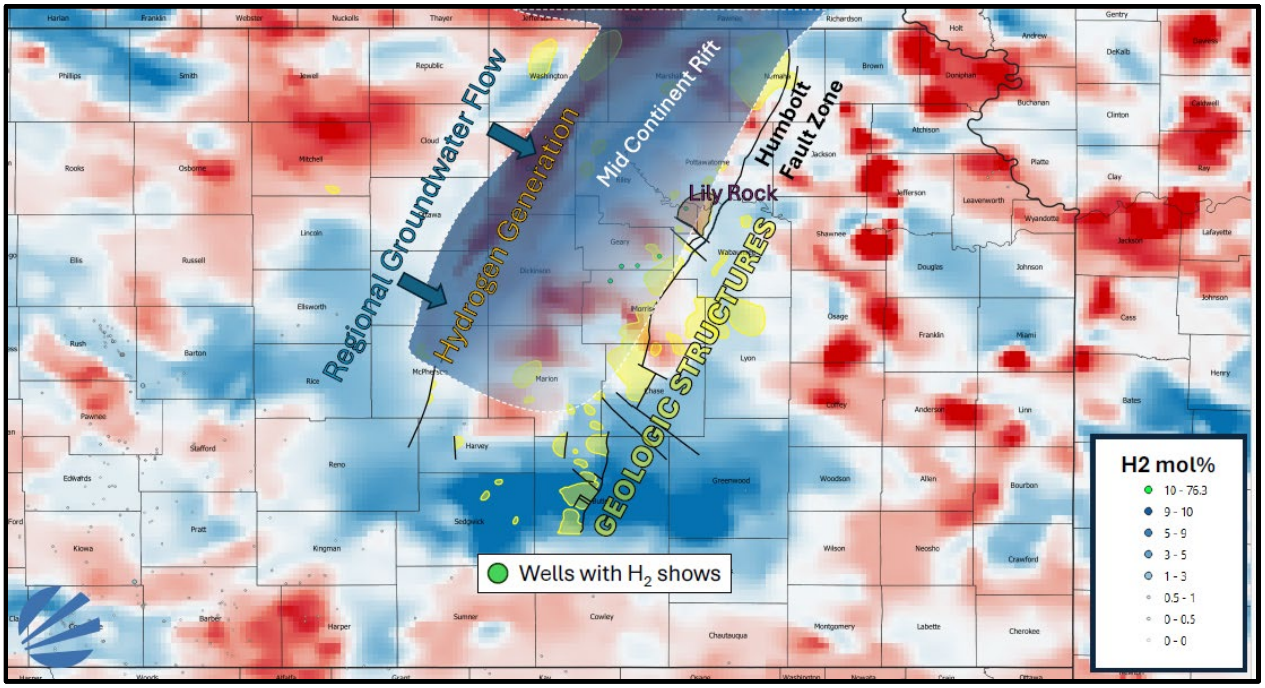


Figure 2: Regional Gravity Map Showing Major Structural Features and the Lily Rock Prospect

(Map sourced from Company)

GEOLOGIC OVERVIEW

Regional Stratigraphy

In eastern Kansas, the sedimentary section includes Cambrian through Cenozoic deposits, as depicted in Figure 3. The region primarily consists of carbonate and siliciclastic sedimentary rock layers resting on fractured Precambrian bedrock comprising alkali-rich granites, syenites, and ultra-mafic gabbros and peridotites. It is this fractured basement that is the current focus of the Company's exploration efforts and where the assessed volumes of prospective resources are located.

Cenozoic deposits, including Pliocene and Pleistocene glacial, alluvial, and fluvial deposits, thinly cover the entire sedimentary column. Beneath these lie Mesozoic strata, starting with the Permo-Triassic erg deposits that once covered continental North America, followed by the shallow seas of the great interior Cretaceous Seaway. However, substantial erosion has removed much of the Jurassic and Cretaceous layers, leaving remnants of Permian to Pennsylvanian formations beneath the Cenozoic cover.

Multiple reservoirs for hydrogen and helium traps are found within the Paleozoic formations; and may include future exploration targets by the Company. These include Cambrian and Ordovician dolomites, with gross thicknesses of 120 to 150 feet, and the Viola Formation of the Upper Ordovician and the Hunton Formation of the Silurian, with thicknesses ranging from 160 to 300 feet, known to contain hydrogen accumulations. These formations, situated close to the basement-derived gas sources, are considered key migration pathways to the shallower reservoirs.

Above the Ordovician unconformity, Devonian to Mississippian black marine shales, usually around 80 feet thick, act as top seals. The Upper Mississippian and Lower Pennsylvanian sequences, spanning 220 to 400 gross feet, offer potential reservoirs for both helium and hydrogen. Notably, the Lansing Formation of the Upper Pennsylvanian, with a gross thickness of 300 to 350 feet, is a primary exploration target, known for its hydrogen reservoirs.

The Company’s prospect area, located in fault-bounded structures adjacent to the Nemaha Ridge, is significant. It sits within the Mid-Continent Rift Zone, where Paleozoic reservoirs, closely associated with hydrogen generation and migration, are concentrated, making it an attractive site for further investigation.

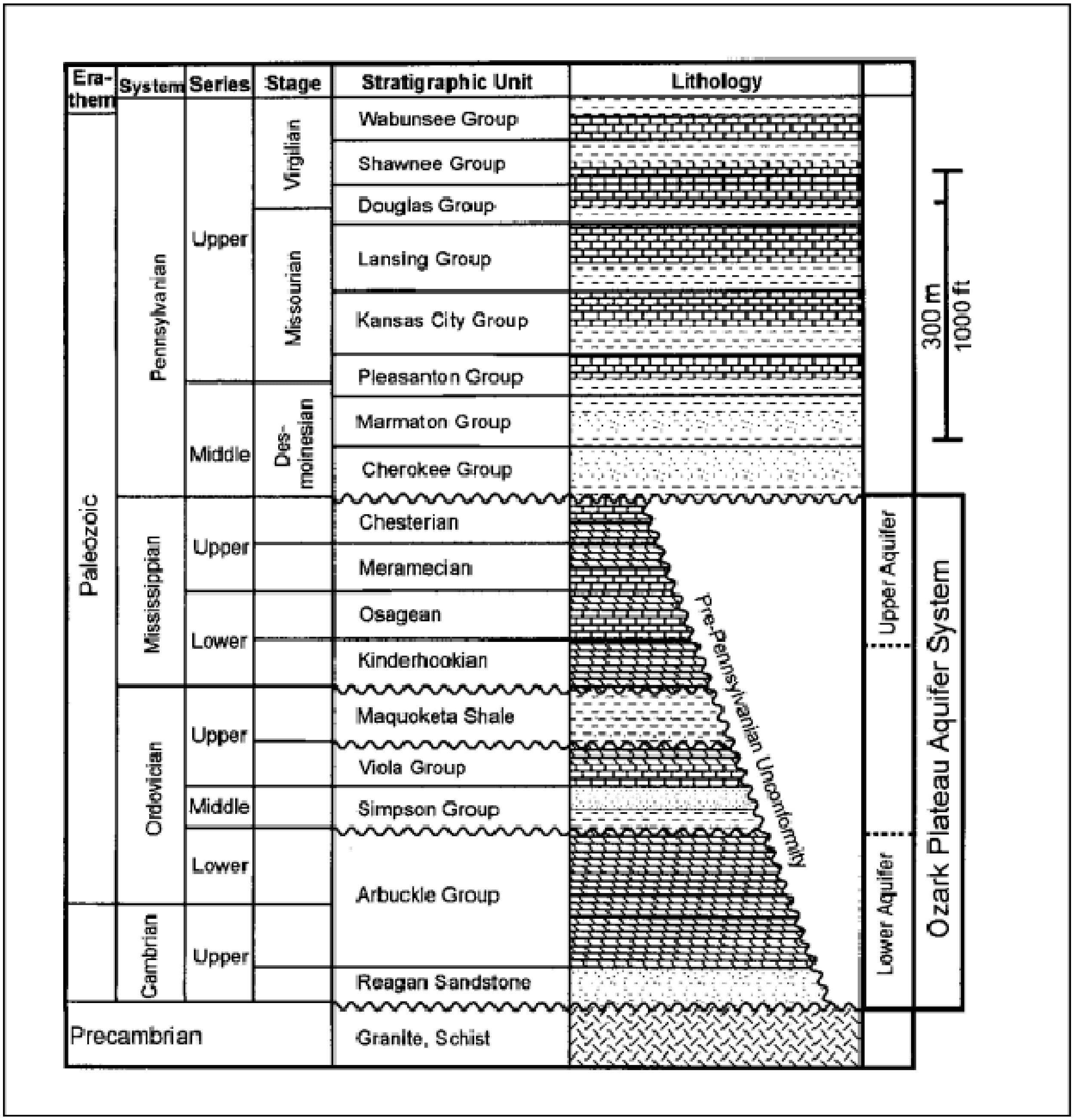


Figure 3: Stratigraphic Chart

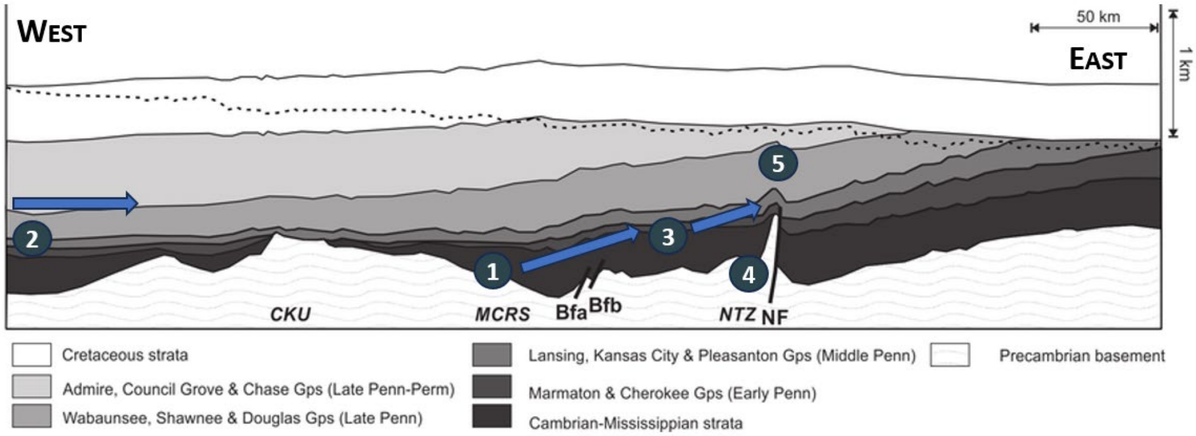
From Carr, 2005

Structural Framework

In the regional structural cross-section (Figure 4) provided, the Nemaha Ridge is a prominent basement structural high adjacent to an eastern basement trough. The Precambrian basement, although not uniform, hasn't been meticulously mapped. Stretching in a long, NNE to SSW trend, the Nemaha Ridge exhibits significant relief, surpassing 3,000 feet in certain locales and typically maintaining at least 2,000 feet of elevation change. Situated east of the Mid-Continent Rift Zone, which harbors Precambrian basalts, gabbros, and peridotites, this ridge is believed to have originated as a structural high in the Precambrian era, experiencing reactivation during the Laramide Compressional event.

The Kansas Geological Survey characterizes the Nemaha Anticline as follows:

> "*Probably the most famous of all Kansas structures, is a major pre-Desmoinesian post-Mississippian element that crosses Kansas from Nemaha County on the north to Sumner County on the south and extends into Nebraska and Oklahoma. Since 1914, when oil was discovered along its trend in Butler County, the Nemaha has been subjected to intense exploration. It is recognizable in surface rocks of Permian and Pennsylvanian age along most of its length, but it is more pronounced in the subsurface. Dips as steep as 5 degrees are not uncommon in the surface beds. The anticline is faulted along the east side in several areas, and seemingly there are both high-angle reverse and normal faults. The relatively narrow Nemaha Anticline separates the Forest City and Cherokee Basins on the east from the Salina and Sedgwick Basins on the west. The Precambrian granite along the crest of the uplift lies within 600 feet of the surface near the Nebraska line but it plunges southward, so that at the Oklahoma border it is about 4,000 feet below the surface. The basement-rock core of the anticline is characterized by a series of knobs along the crest of the structure. Pre-Pennsylvanian strata are upturned, truncated, and overstepped by Pennsylvanian sediments along the flanks, and on the crest of the structure the Pennsylvanian beds rest on rocks as old as Precambrian.*"



1. **Source**

   Iron-rich rocks from the Mid-Continent Rift System (MCRS), 1.1 billion year old crustal fracture

2. **Generation**

   Water enters the system in the Rocky Mountains of Colorado and travels through the fractured basement where it interacts with the MCRS Iron-rich rocks

3. **Migration**

   The generated hydrogen is carried to the Nemaha Uplift

4. **Trap**

   The Nemaha Uplift located about 65 miles each of the MCRS is the result of tectonics more than 300 million years ago

5. **Confirmation of hydrogen presence**

   Several wells including the Heins 1, Scott 1 and Sue Duroche 2 have hydrogen

Modified from Burberry et. al, 2015

Figure 4: West to East Regional Cross-Section (Supplied by the Company)

The Company has undertaken detailed gravity and magnetic analysis and mapping of the Nemaha Ridge and located various anomalies of different rock types within both the basement complex and within the sedimentary strata. Figure 5, below, is a basement structure map based on the gridded well tops and the interpreted gravity and magnetic data. It is generally in the area of these fault bounded structures that Longhorn Exploration has defined its Lily Rock Prospect.

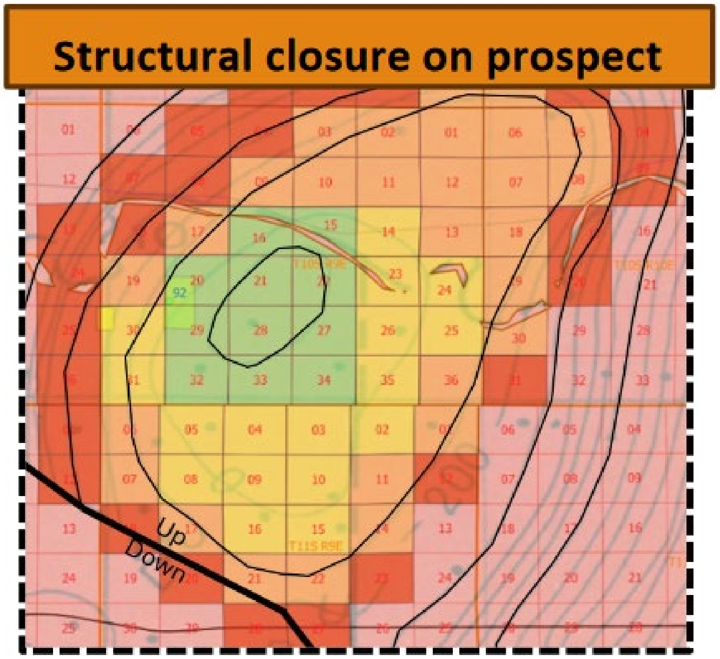


Figure 5: Basement Structure Map from Combined Well, and Reprocessed Gravity and Magnetic Data

Image from the Company

HYDROGEN SYSTEM ANALYSIS

Hydrogen Occurrence

Zgonnik, 2020, has pointed out that most USA and global databases have seriously undercounted hydrogen gas estimates due to both operators not testing for the gas and for the technical difficulty in sampling and retaining hydrogen from the wellsite to the laboratory. When there have been deliberate sampling protocols in place hydrogen concentrations 5% in Ukraine to 30% in the US Mid Continent and 75% in Poison Bay, New Zealand. Gabor Tari (2023) in an SPE Lecture has pointed out hundreds of hydrogen occurrences from around the world as shown in Figure 6.

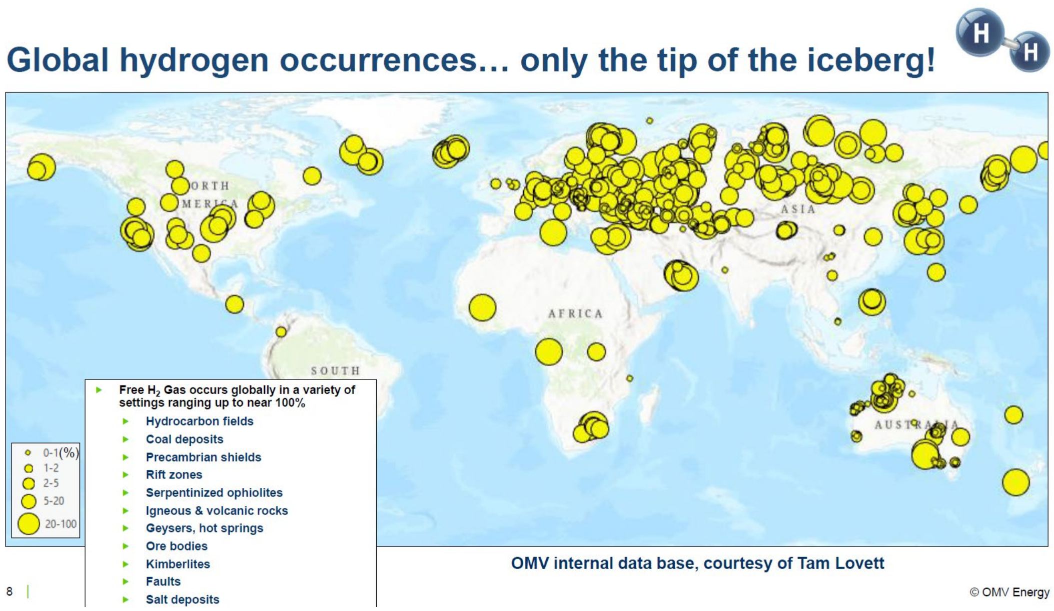


Figure 6: Hydrogen Occurrences from Around the World

From Tari (2023)

Dugamin, 2019, describes the primary abiotic hydrogen system as one where alkaline meteoric groundwater is able to come into contact with ultra-mafic assemblages (such as serpentinite or peridotite) which can produce both H2 gas and CO2, Figure 7, below. With sufficient water circulation and iron rich rock the H2 gas can migrate to shallower reservoirs and become trapped in sufficient concentrations to warrant commercial exploration.

In order for there to be a viable hydrogen system exploration play the following elements need to be in place: A) a known iron rich mafic formation that is either porous enough or fractured enough to allow circulation of meteoric groundwater, B) a meteoric groundwater system that will circulate to the mafic formation(s) and back to the shallower formation through either a fault system or a system of permeable pathways, C) sufficient reservoir volume to hold the produced hydrogen in commercially viable quantities, and D) seals sufficient to trap and to hold the hydrogen in place once it enters the reservoir. All of these elements have to be in place at the correct geological time and maintain their geological integrity to the present day.

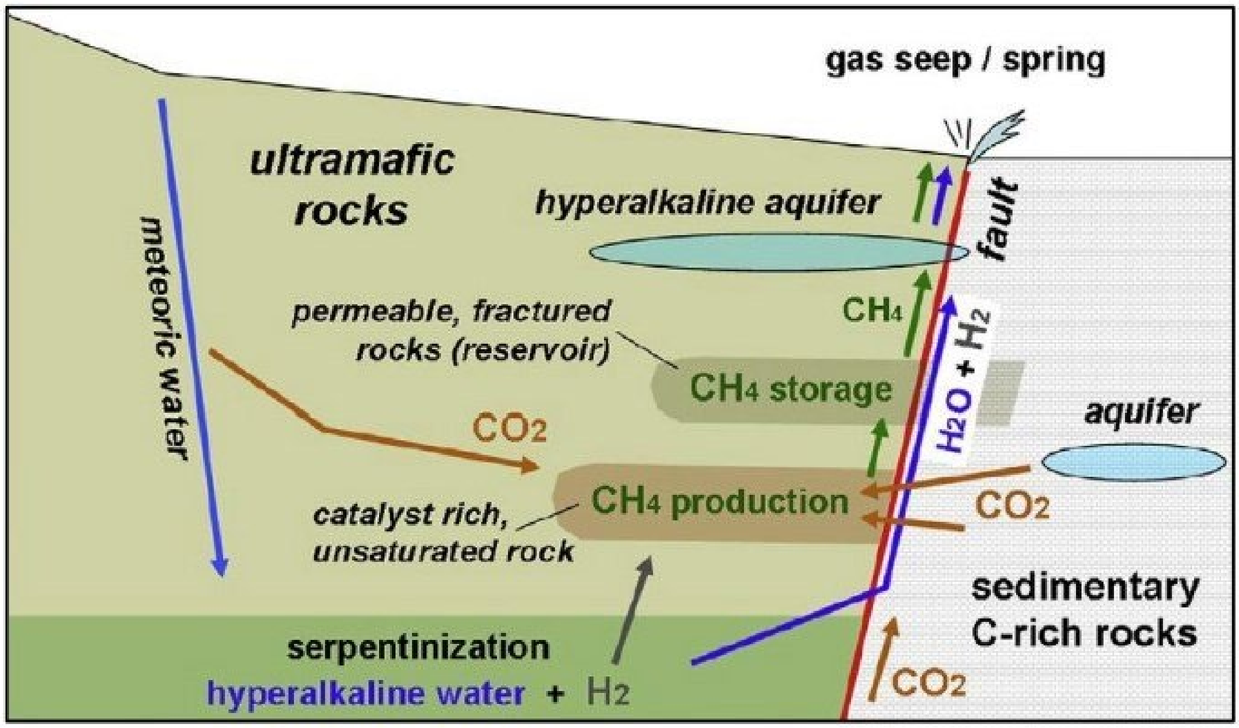


Figure 7: Primary Abiotic Hydrogen System Diagram

After Dugamin, 2019

The Company, with its Eastern Kansas Hydrogen Play, has documented that the Nemaha Ridge has mafic intrusives and the Central Rift System also has a thick succession of mafic sequences.

The Kansas Geological Survey states that "*Ten areas of mafic igneous rocks are known at present. In most places only one well penetrated this rock type although nearby wells encountered other Precambrian rock. … Most of the areas of mafic rock are located along the Cambridge Arch and the Central Kansas Uplift; [and] two areas located just west of the Nemaha Anticline are exceptions. The association of this rock type and positive structural features strongly suggests a genetic relationship. These igneous bodies may have been emplaced along fracture systems developed in the rigid basement. Woollard (1959) found that the gravity anomalies are arranged parallel to structural features, suggesting structural control of intrusions along fracture lines*.

The dark, mafic igneous rocks are described as peridotite, diabase, diorite, basalt, gabbro, mafic rock, and basic igneous rock. Much of the rock is weathered. The greatest penetration of this material is about 100 feet. In one well, mafic igneous rock was encountered below quartzite and granite ". (taken from the KGS website)

https://www.kgs.ku.edu/Publications/Bulletins/162/03_strat_e.html

The Upper Paleozoic sequences extend westward to the Rocky Mountains, where they contribute to aquifer recharge, fostering long-term meteoric replenishment. Additionally, localized fault systems along the Nemaha Ridge enhance groundwater circulation dynamics.

Drawing from documented hydrogen-tested zones, Sproule utilized data from three known reservoirs—the Lansing, Hunton, and Viola Formations—to assess the hydrogen potential within the leasehold. The petrophysical analysis also identified top seals for these formations, enabling Longhorn Exploration to establish favorable conditions for hydrogen prospectivity within their Eastern Kansas Play Area.

While other potential target zones exist, the Company is currently focused on the fractured basement play. Sproule has used its experience in other fractured basement plays plus analysis of the few wells with petrophysical logs that penetrated basement to determine the range of reservoir characteristics to use in the stochastic analysis as described below.

PROSPECT ANALYSIS

Prospect Description

The Lily Rock Prospect has been defined by structural mapping and are fault bounded closures on the western side of the Nemaha Ridge in Eastern Kansas. The play is set up by the Scott #1 well which tested between 42.6 and 56% hydrogen in high quality laboratory tests. The Sue Duroche #2 well has a reported test with a hydrogen content of over 90%. In addition, there are 11 wells with sufficient well log data in which to petrophysically analyze the reservoirs. The Type Log is the Sue Duroche #2, shown in Figure 8. The well basemap is shown in Figure 9 below.

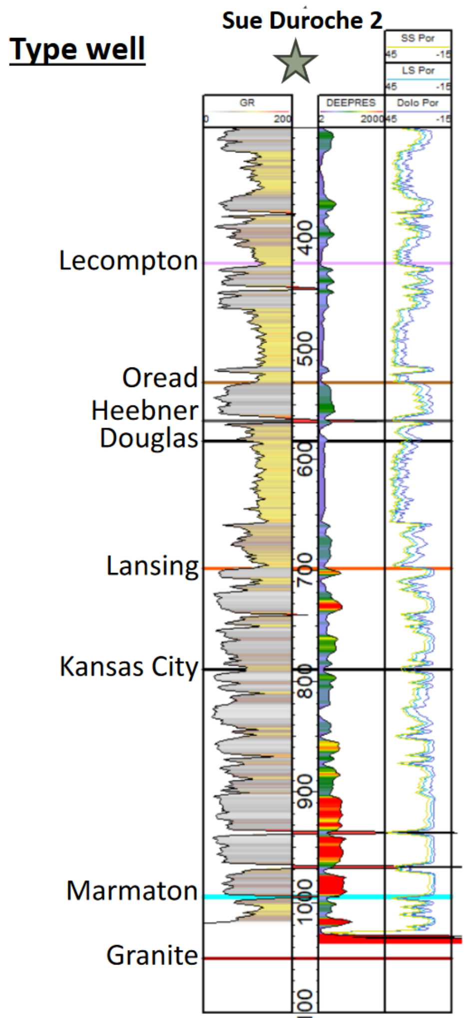


Figure 8: Type Log: Sue Duroche #2

(from the Company)

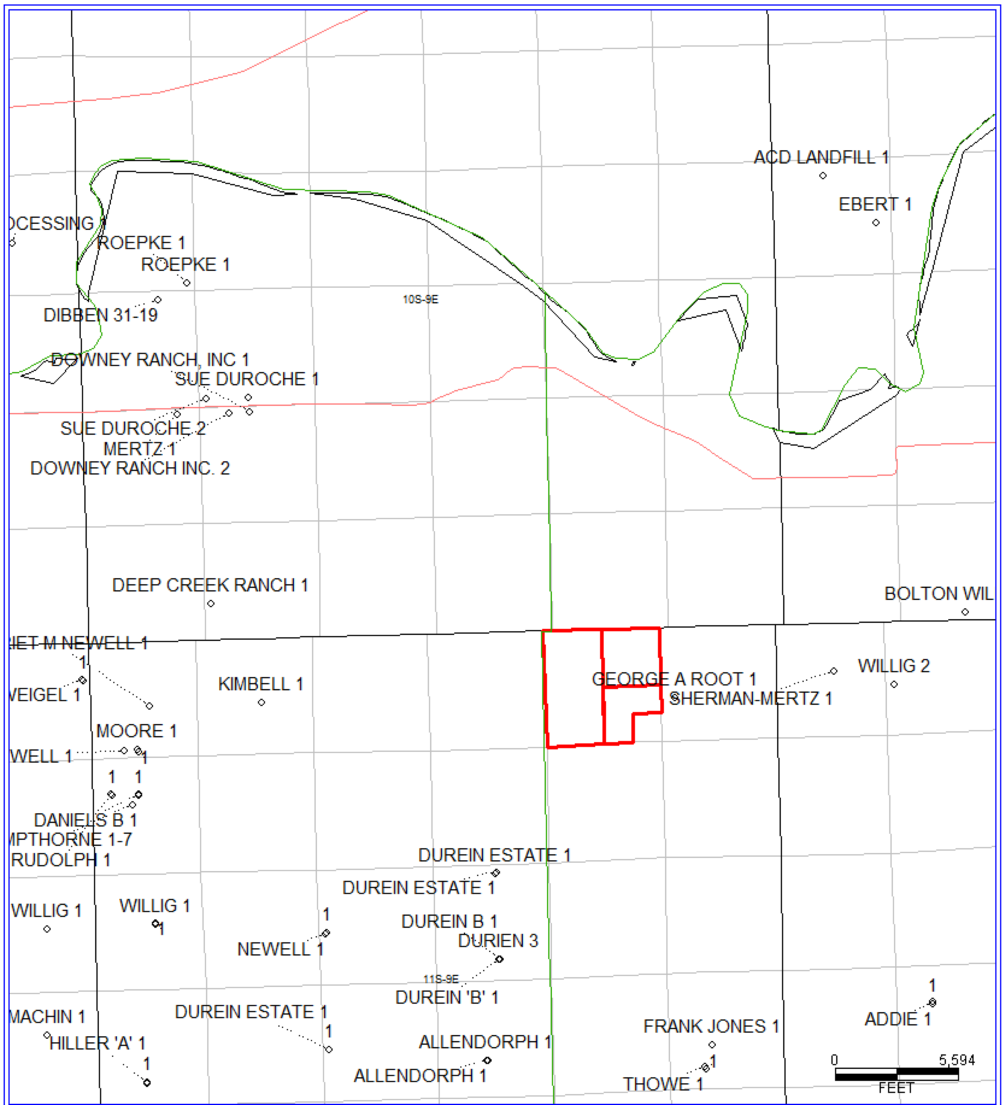


Figure 9: Well Basemap With the Company's Lease Position

The Company has supplied a structural Cross-section that runs North-West to South-East and it is shown in Figure 10 below.

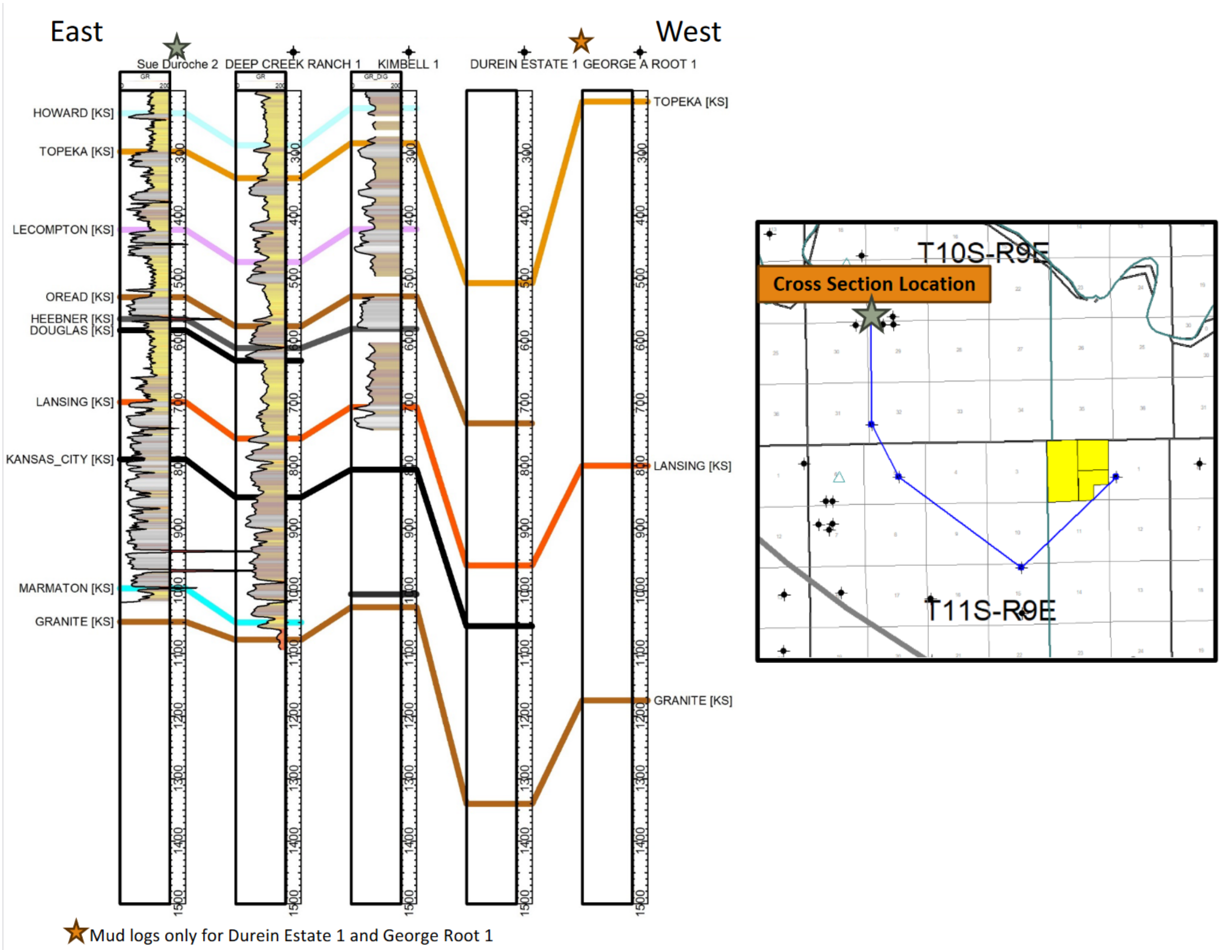


Figure 10: North-West to South-East Structural Cross Section

Hydrogen Resource Assessment

Methodology

Sproule has followed industry standard guidelines for evaluating frontier prospectivity to evaluate both the play potential and the individual prospect potential. The hydrogen play has not been commercially proven to date although there are tests of hydrogen in commercially viable percentages and there are structural features and reservoirs of volumetric size to be of commercial interest if they have trapped sufficient quantities of hydrogen, thus, the hydrogen play that the Company has defined is warranted.

Sproule has utilized a probabilistic model (Monte Carlo Simulation) to calculate prospective Hydrogen resource volumes for each prospective reservoir in each of the Company's prospect areas. A discussion and summary of the inputs to the model and the calculated results are shown in the tables below.

Hydrogen Prospective Resource Inputs

Area: The Company has not used seismic data, or has not delivered to Sproule, seismically derived structural maps. However, the gravity and magnetic maps that the Company has used have defined prospect areas that currently exceed their leased position on each prospect. Thus, Sproule has used the lease acreage position for the area of each prospect as a given value without any variation. The net area inputs used in the resource calculations are shown in Table 2.

Table 2: Net Area Inputs for Hydrogen Resource Calculations

Prospect	Net Area (acres)
Lily Rock	**519.7**

Net Pay: Sproule has used previous public domain work that estimates the fracture porosity of basement reservoirs in Eastern Kansas. This factor has one of the largest ranges of uncertainty and until it is adequately drilled and tested it will remain as a major factor contributing to the large distribution of values between the low case (1U) and high case (3U) volumes. The net pay thicknesses used in the resource calculations are shown in Table 3.

Table 3: Net Pay Thickness Inputs for Hydrogen Resource Calculations

Prospect	Reservoir	Net Pay (ft) Low Case (P90)	Net Pay (ft) Best Case (P50)	Net Pay (ft) High Case (P10)
Lily Rock	**Basement**	**10**	**50**	**100**

Porosity: The porosity values used in the resource calculations are shown in Table 4.

Table 4: Porosity Inputs for Hydrogen Resource Calculations

Prospect	Reservoir	Porosity (%) Low Case (P90)	Porosity (%) Best Case (P50)	Porosity (%) High Case (P10)
Lily Rock	Basement	0.5	4.0	8.0

Gas Saturation: The gas saturation values used in the resource calculations are shown in Table 5.

Table 5: Gas Saturation Inputs for Hydrogen Resource Calculations

Prospect	Reservoir	Sg (%) Low Case (P90)	Sg (%) Best Case (P50)	Sg (%) High Case (P10)
Lily Rock	Basement	40	60	80

Gas Deviation Factor (Z-factor)

Sproule calculated gas deviation factors (Z-factors) using the AGA8 PVT correlation, which allows for the input of multiple non-hydrocarbon components, including Hydrogen. For calculation of Z-factors, the hydrogen percentage used for all cases was 25%. Based on several wells sampled and summarized in the J. Guelard et.al. “Natural H2 in Kansas: Deep or shallow origin?”, other components in the gas stream were assumed to be 65% nitrogen, 5% carbon dioxide, and 5% oxygen. The calculated Z-factors did not vary significantly when using higher percentages of hydrogen, as used in the hydrogen percentage distribution discussed below.

Gas Formation Volume Factor (Bg)

The standard formula for gas formation volume factor (Bg) was used, assuming standard conditions of 14.65 psia and 60 deg.F. Bottomhole temperature was calculated based on a temperature gradient from the nearest well with available date from the Kansas Geological Society. This was 1.7 deg.F/100ft plus a mean surface temperature of 54.5 deg.F. There were no bottomhole pressure data available, therefore a normal pressure gradient was assumed, or 0.433 psi/ft.

The calculated gas formation volume factor for the Basement reservoir was 0.0118 ft^3/scf.

Hydrogen Percentage

The Comapny provided laboratory analysis with hydrogen analysis on five wells (Scott #1, Heins#1, #2, #3, and Sue Duroche #2) from Eastern Kansas. Based on the percentage of oxygen some of the samples were considered as contaminated and thus the hydrogen values were a minimum reading. Sproule deliberately chose to use a wide range of hydrogen percentage at this early-stage exploration to capture the degree of uncertainty. The hydrogen percentage values used in the resource calculations are shown in Table 6.

Table 6: Hydrogen Percentage Inputs for Hydrogen Resource Calculations

Hydrogen %	Low Case (P90)	Best Case (P50)	High Case (P10)
Basement	25	50	75

Recovery Factor

Recovery factors, or the ultimate gas recovery divided by the original gas in place, were based on a typical recovery range of recovery factors expected from dry gas reservoirs with moderate permeability, and some water production. The recovery factor values used in the resource calculations are shown in Table 7.

Table 7: Recovery Factor Inputs for Hydrogen Resource Calculations

Recovery Factor, %	Low Case (P90)	Best Case (P50)	High Case (P10)
Basement	45	60	75

HYDROGEN PROSPECTIVE RISK ANALYSIS

In assessing prospective hydrogen systems, a comprehensive risk analysis hinges on evaluating the source, migration path and timing, reservoir, and seals. The crux lies in determining the Play Geologic Chance of Success (GCoS), which equates to 1.0 if a commercial hydrogen field exists within the play area, or conversely, reaches 0.0 if none are present. However, if commercial hydrogen fields are absent, both the Play GCoS and individual prospect GCoS necessitate separate evaluation.

Within the Company's Eastern Kansas Prospect Area, the absence of current commercial hydrogen fields underscores the imperative to scrutinize the hydrogen play GCoS. While white or native hydrogen fields are not currently commercially viable anywhere in North America, the incipient stage of exploration holds promise, hinting at a vast potential for such fields. Consequently, meticulous assessment of the hydrogen play GCoS becomes imperative.

In the broader context, the adequacy of the source potential is underscored by measured hydrogen samples extracted from wells within the play area, such as the Sue Duroche #2, Scott #1 and the Heins #1, exhibiting commercial-grade attributes. These samples validate the existence of a hydrogen source, migration systems, reservoir, and seal at the play level. Moreover, the Company's identification of the Lily Rock prospect properly categorized within the COGEH guidance attests to the thoroughness of their approach. With all requisite data in hand, the Company is poised to commit to drilling an exploration well, having meticulously selected a suitable drilling location, the Day Lily #1 site.

Nevertheless, the foremost risk confronting each lead appears to be the reservoir, encompassing factors like areal extent (closure), net pay (thickness), reservoir continuity, pressure, and performance. Additionally, the uncertainty surrounding the hydrogen percentage within trapped gas compounds the second most significant risk and presents a substantial challenge. As uncertainties are systematically addressed and mitigated, project maturation will ensue, with prospects evolving into Contingent Resources and, upon demonstration of commercial viability, into Reserves.

The Geologic Risk assessment of the Lily Rock Prospect is the following: Source Chance of Success (COS) of 90% due to the proximity of the Sue Duroche #2 well with a lab certified test of 70+% hydrogen; Trap COS of 75% as the structural mapping with an integrated map combining gravity, magnetic and well stratigraphic tops all lead to an interpretation of a four-way closure of considerable size at the Lily Rock Prospect location; Reservoir COS of 50% as there is limited information on the amount of basement fracturing in the area and the range of fracture porosity that might be contained within the fractured basement; and finally the COS of the overlaying seal is estimated to be 20% due to the presence of either the Marmaton or the Regan Sandstone which is not an effective hydrogen seal. The combined Geologic COS is 6.75% and conversely the geologic risk is defined as 93.25%, which is shown in Figure 11 and Table 8.

Table 8: Geologic Risk

Element	Source	Trap	Seal	Reservoir	Total Pg
Chance of Success	90%	75%	20%	50%	**6.75%**

Figure 11: Eastern Kansas Helium Play Summary

Chance of Development (CoD) must also be defined. To date there is not a single commercial natural hydrogen field operating in the world. This concept is at the beginning of the technological evaluation process yet the methodology to commercialize a natural gas flow of 66% to 80% pure hydrogen is understood, whether through the methylation process or turning the hydrogen into ammonia; either process would stabilize the hydrogen at the wellsite and make it easier to transport. However, at this early stage of exploration the development costs and the sales prices have yet to be determined. Thus, the CoD if a large, high grade hydrogen deposit is found has a great deal of uncertainty at this stage. Given the degree of uncertainty a CoD of 50% is assigned. The combined Chance of Commerciality (CoC) is thus 3.375% which is understandable for a first of its kind exploration effort that requires additional information in order to reduce the uncertainty.

HYDROGEN PROSPECTIVE RESOURCE RESULTS

The standard volumetric equations for Undiscovered Gas Initially-In-Place (GIIP) and Prospective Gas Resources were used in the probabilistic model. Gross Prospective Hydrogen Resources were calculated by multiplying Gross Prospective Gas Resources by the hydrogen percentage. Net Unrisked Prospective Hydrogen Resources were calculated by multiplying the Gross Prospective Hydrogen Resources by 0.875, assuming a 1/8th lease royalty. Table 9 through Table 13 show the calculated volumes for Unrisked Undiscovered Gas Initially-In-Place, Gross Unrisked Prospective Gas Resources, Gross Unrisked Prospective Gas Resources, and Net Unrisked Prospective Gas Resources, respectively.

Table 14 through Table 18 show the calculated volumes for Risked Undiscovered Gas Initially-In-Place, Gross Risked Prospective Gas Resources, Gross Risked Prospective Gas Resources, and Net Risked Prospective Gas Resources, respectively.

There is no certainty that any portion of the resources will be discovered. If discovered, there is no certainty that it will be commercially viable to produce any portion of the resources.

Table 9: Unrisked Undiscovered Gas Initially-In-Place

Prospect	Reservoir	MMscf P90	MMscf P50	MMscf P10
Lily Rock	Basement	**237**	**2,507**	**7,414**

Table 10: Gross Unrisked Prospective Gas Resources

Prospect	Reservoir	MMscf P90	MMscf P50	MMscf P10
Lily Rock	Basement	**137**	**1,416**	**4,359**

Table 11: Gross Unrisked Prospective Hydrogen Resources

Prospect	Reservoir	MMscf P90	MMscf P50	MMscf P10
Lily Rock	Basement	**55**	**642**	**2,222**

Table 12: Net Unrisked Prospective Hydrogen Resources

Prospect	Reservoir	MMscf P90	MMscf P50	MMscf P10
Lily Rock	Basement	**48**	**562**	**1,944**

Table 13: Net Unrisked Prospective Hydrogen Resources (Kg)

Prospect	Reservoir	Kg P90	Kg P50	Kg P10
Lily Rock	Basement	**113,849**	**1,332,979**	**4,610,874**

Sproule

BIBLIOGRAPHY

(Ballentine, C.) Lollar, B., Regional Groundwater Focusing of Nitrogen and Noble Gases into the Hugoton-Panhandle Giant Gas Field, USA. Geochimica et Cosmochimica Acta, 66(14), 2483-2497, 2002.

(Ballentine, C.) Burnard, P., Production, Release and Transport of Noble Gases in the Continental Crust, Geology, Environmental Science, DOI:10.2138/RMG.2002.47.12, 2002

(Burberry, C.) Joeckel, R., and Korus, J., Post-Mississippian tectonics of the Nemaha Tectonic Zone and Mid-Continent Rift System: The Mountain Geologist, v. 52, no. 4, p. 47–73. 2015

(Carr, T.) Merriam, D. and Bartley J., Use of Relational Databases to Evaluate Regional Petroleum Accumulation, Groundwater Flow, and CO2 Sequestration in Kansas: AAPG Bulletin, 89, 1670–1627 , 2005.

(Piper, L.) Corredor, J., Holditch, S. and McCain, W., Compressibility Factors for Naturally Occurring Petroleum Gases, SPE 24864, 1992

(Dugamin, E.) Truche, L., and Donze, F., Natural Hydrogen Exploration Guide. Geonum Ed.: ISRN GEONUM-NST--2019-01--ENG, 2019.

(Franseen, E.) Byrnes A., Cansler J., Steinhauff, D., and Carr T., The Geology of Kansas – Arbuckle Group: Current Research in Earth Sciences, Kansas Geological Survey Bulletin 250, part 2, 2004.

(Hugo, P.) Helium in the Orange Free State Gold-Field. Pretoria: The Government Printer, 1963.
(Jones, M.) Virgin Rock Temperatures and Geothermal Gradients in the Bushveld Complex, J. S. Afr. Inst. Min. Metall. vol 118, no. 7 Johannesburg July 2018

(Tari, G.) Natural (Gold) Hydrogen Exploration: Similarities and Differences with Oil and Gas Exploration, SPE Hydrogen Section Online Lecture, November 2023.

(Piper, L.) McCain, W., Holditch, A. and Corredor, J., Compressibility Factors for Naturally Occurring Petroleum Gases, SPE 26668, 1993.

(Ohl, D.) Raef, A., Watnef, L., and Bhattacharya, S., Rock formation characterization for CO 2-EOR and Carbon Geosequestration; 3D Seismic Amplitude and Coherency Anomalies, Wellington Field, Kansas, USA, SEG Technical Program Expanded Abstracts: 1978-1983, 2011.

(Zgonnik, V.) The Occurrence and Geoscience of Natural Hydrogen: A comprehensive review, Earth-Science Reviews, Volume 203, 103140, April 2020.

(Danabalan, D.) Gluyas, J., Macpherson, C., Abraham-James, T., Bluett, J., Barry, P. and Ballentine, C., The Principles of Helium Exploration, Petroleum Geoscience, Vol.28, Petgeo2021-029, 2022.

APPENDIX A : RESOURCE DEFINITIONS

Appendix A —Resources Definitions

The table below identifies the categories that form the basis of our classification of resources and values presented in this report. The definitions used in this report are those set out in the Petroleum Resources Management System (PRMS) as sponsored by Society of Petroleum Engineers ("SPE"), World Petroleum Council ("WPC"), American Association of Petroleum Geologists ("AAPG"), Society of Petroleum Evaluation Engineers ("SPEE"), Society of Exploration Geophysicists ("SEG"), Society of Petrophysicists and Well Log Analysts ("SPWLA"), and the European Association of Geoscientists & Engineers ("EAGE").

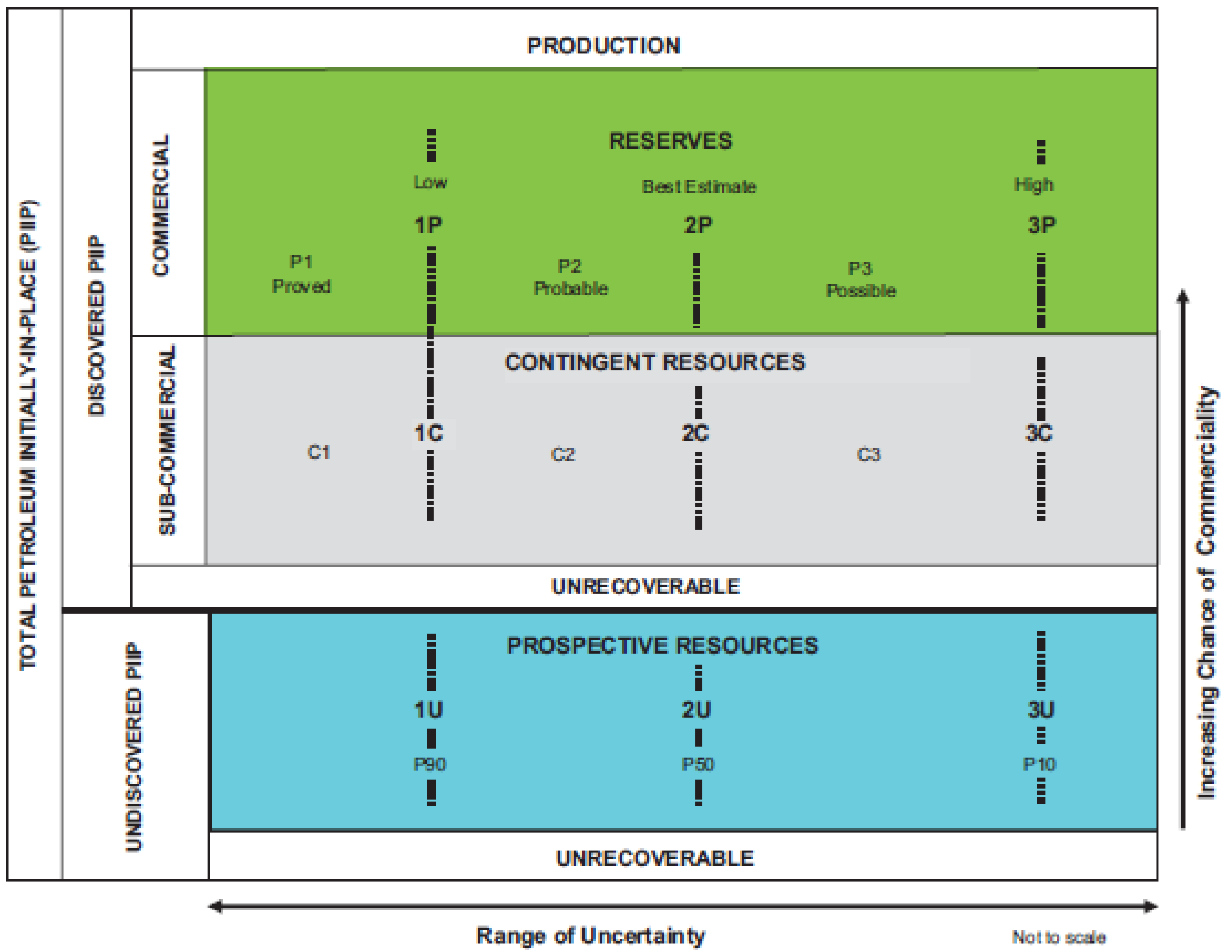
These definitions have been adopted by the Canadian Oil and Gas Evaluation Handbook as amended from time to time (the "COGE Handbook"), maintained by the Society of Petroleum Evaluation Engineers (Calgary Chapter) and incorporated into Canadian National Instrument 51-101 (NI 51-101) by reference. The product types are as defined in NI 51-101 and are only applicable to reports prepared according to NI 51-101 requirements as identified in the Introduction section of this report.

Although not all the definition groupings may be applicable to this report, they have been included here to ensure appropriate context of the definitions that do apply to this report. Guidance on the application of, and further explanation of, the definitions in this Appendix can be found in either PRMS or the COGE Handbook as applicable.

Resources Categories	Included	Excluded
Petroleum Initially-in-Place	✓	-
Prospective Resources	✓	-
Contingent Resources	✓	-
Reserves	✓	-

1. **Resources** encompass all petroleum quantities that originally existed on or within the earth's crust in naturally occurring accumulations, including discovered and undiscovered plus quantities already produced. Total Resource is equivalent to Petroleum Initially-in-Place (PIIP).

The following figure illustrates the relationship of the different resources within the PRMS Resources classification framework and aids in placing the subsequent definitions in context.



2. Total **Petroleum Initially-in-Place** is that quantity of petroleum that is estimated to exist originally in naturally occurring accumulations and is potentially producible. It includes that quantity of petroleum that is estimated, as of a given date, to be contained in known accumulations, prior to production, plus those estimated quantities in accumulations yet to be discovered.

3. **Undiscovered Petroleum Initially-in-Place** is that quantity of petroleum that is estimated, on a given date, to be contained in accumulations yet to be discovered. The potentially recoverable portion of Undiscovered PIIP is referred to as Prospective Resources; the remainder is unrecoverable

4. **Discovered Petroleum Initially-in-Place** is that quantity of petroleum that is estimated, as of a given date, to be contained in known accumulations prior to production. Discovered PIIP includes production, Reserves and Contingent Resources; the remainder is unrecoverable.

5. **Discovery** is the confirmation of the existence of an accumulation of a significant quantity of potentially recoverable petroleum.

6. A **Known Accumulation** is one that has been penetrated by a well that has demonstrated the existence of a significant quantity of potentially recoverable petroleum.

7. **Prospective Resources** are those quantities of petroleum estimated, as of a give date, to be potentially recoverable from undiscovered accumulations by application of future development projects. Prospective Resources have both an associated chance of geologic discovery and a chance of development. Prospective Resources are further categorized in accordance with the range of uncertainty associated with recoverable estimates, assuming discovery and development, and may be sub-classified based on project maturity.

8. **Contingent Resources** are those quantities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations, by the application of development projects not currently considered to be commercial due to one or more contingencies. Contingent Resources have an associated chance of development.

9. **Reserves** are estimated remaining quantities of oil and natural gas and related substances anticipated to be recoverable from known accumulations, from a given date forward, based on:

   - analysis of drilling, geological, geophysical and engineering data;
   - the use of established technology;
   - specified economic conditions, which are generally accepted as being reasonable, and shall be disclosed; and
   - Note the COGE Handbook applies a maximum remaining life to reserves, of the next 50 years. (PRMS does not have restrictions)

   Reserves are classified according to the degree of certainty associated with the estimates.

10. **Proved Reserves** are those reserves that can be estimated with a high degree of certainty to be recoverable. It is likely that the actual remaining quantities recovered will exceed the estimated proved reserves.

11. **Probable Reserves** are those additional reserves that are less certain to be recovered than proved reserves. It is equally likely that the actual remaining quantities recovered will be greater or less than the sum of the estimated proved plus probable reserves.

12. **Possible Reserves** are those additional reserves that are less certain to be recovered than probable reserves. It is unlikely that the actual remaining quantities recovered will exceed the sum of the estimated proved plus probable plus possible reserves. Possible reserves have been considered in this report.

Other criteria that must also be met for the categorization of reserves are provided in Section 3.1 of PRMS or Section 1.4.7.2.1 of the COGE Handbook.

Each of the reserves categories (proved, probable, and possible) may be divided into developed or undeveloped categories.

13. **Developed Reserves** are those reserves that are expected to be recovered from existing wells and installed facilities or, if facilities have not been installed, that would involve a low expenditure (e.g., when compared to the cost of drilling a well) to put the reserves on production. The developed category may be subdivided into producing and non-producing.

14. **Developed Producing Reserves** are those reserves that are expected to be recovered from completion intervals open at the time of the estimate. These reserves may be currently producing or, if shut in, they must have previously been on production, and the date of resumption of production must be known with reasonable certainty.

15. **Developed Non-Producing Reserves** are those reserves that either have not been on production, or have previously been on production, but are shut in, and the date of resumption of production is unknown.

16. **Undeveloped Reserves** are those reserves expected to be recovered from known accumulations where a significant expenditure (e.g., when compared to the cost of drilling and completing a well) is required to render them capable of production. They must fully meet the requirements of the reserves classification (proved, probable, possible) to which they are assigned and are expected to be developed within a limited time.

In multi-well pools, it may be appropriate to allocate total pool reserves between the developed and undeveloped categories or to subdivide the developed reserves for the pool between developed producing and developed non-producing. This allocation should be based on the estimator’s assessment as to the reserves that will be recovered from specific wells, facilities, and completion intervals in the pool and their respective development and production status.

Levels of Certainty for Reported Reserves

The qualitative certainty levels contained in the definitions 10, 11 and 12 are applicable to individual reserves entities, which refers to the lowest level at which reserves estimates are made, and to reported reserves, which refers to the highest level sum of individual entity estimates for which reserve estimates are made.

Reported total reserves estimated by deterministic or probabilistic methods, whether comprised of a single reserves entity or an aggregate estimate for multiple entities, should target the following levels of certainty under a specific set of economic conditions:

a. There is a 90% probability that at least the estimated proved reserves will be recovered.

b. There is a 50% probability that at least the sum of the estimated proved reserves plus probable reserves will be recovered.

c. There is a 10% probability that at least the sum of the estimated proved reserves plus probable reserves plus possible reserves will be recovered.

A quantitative measure of the probability associated with a reserves estimate is generated only when a probabilistic estimate is conducted. The majority of reserves estimates will be performed using deterministic methods that do not provide a quantitative measure of probability. In principle, there should be no difference between estimates prepared using probabilistic or deterministic methods.

Levels of Certainty for Resources

The same levels of certainty as described above for reserves, represented by a probability distribution of the low, best and high volume estimates, can be applied to Contingent and Prospective Resources as reflected with the 1C, 2C, 3C, C1, C2 and C3; or 1U, 2U and 3U resources categories and shown on the resources classification figure on the horizontal axis.

Additional clarification of certainty levels associated with resources estimates and the effect of aggregation is provided in Sections 2.2 and 4.2 of PRMS or Section 5.7 of the COGE Handbook. Whether deterministic or probabilistic methods are used, evaluators are expressing their professional judgement as to what are reasonable estimates.

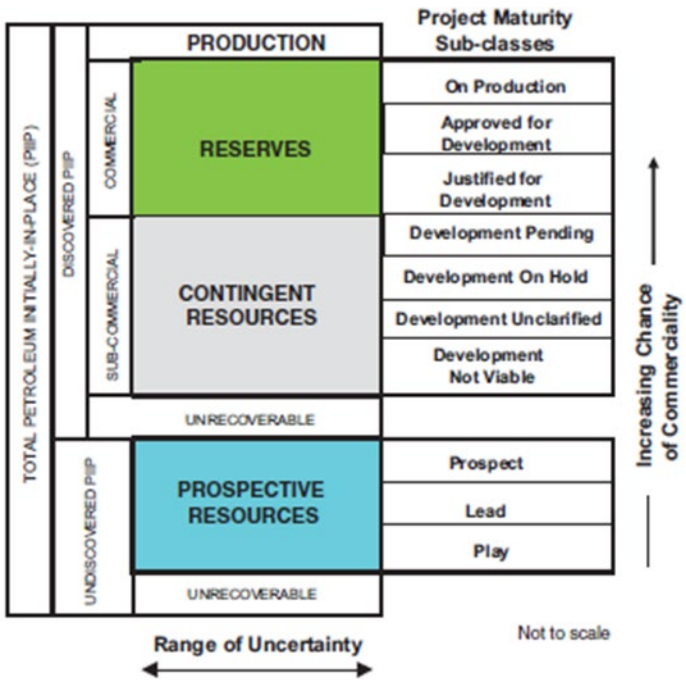
17. **Chance of Commerciality** is the product of the chance of geologic discovery and the chance of development and is used to estimate risked resources by multiplying with the resource volumes. The chance of geologic discovery for Contingent Resources is 100 percent, thus the Chance of Commerciality of Contingent Resources is equal to the chance of development. The Chance of Commerciality is used to estimate the level of maturity of the resource classification as reflected by its' use as an axis on the right side of the Resources Classification Framework as shown in the following figure.

18. **Chance of Development** is the estimated probability that a known accumulation, once discovered, will be commercially developed. The Chance of Development is the product of the contingencies applicable to a particular project. The applicable contingencies may include one or more of the following:

a. **Evaluation Drilling –** the geological continuity of the reservoir needs to be confirmed to reduce the distance from proven productivity;
b. **Regulatory Approval** – Approval from the applicable regulatory agency or agencies has not been received;
c. **Economic Factors –** The future product pricing and capital costs may not be at a level or sufficiently defined - and may also include other underlying factors including market conditions, exchange rates, fiscal terms and taxes - to establish the economic viability of the project;
d. **Corporate Commitment –** The final investment decision and endorsement from the Company and / or the project co-venturers has not been made, nor is there a reasonable expectation these can be arranged in a reasonable time frame, such that the project can move forward. A technically mature and feasible field development plan may also need to be developed;
e. **Timing of Production or Development –** The current development plan may not commence within a reasonable time period;
f. **Market Access –** Infrastructure or access to existing facilities may not be in place or sales contracts have not been executed that will allow the production products to access viable markets;
g. **Technology Under Development –** The technology required to commercially develop the area is not currently available nor is it under active development;
h. **Legal Factors –** Factors that have been brought forward regarding the ability to explore, produce and sell the hydrocarbons;
i. **Political Factors –** Political unrest may impede the development in the area;
j. **Social License –** One or more of the jurisdictions in which the project area is located has policies in place that restrict certain types of development due to environmental concerns.

19. **Chance of Geologic Discovery** (or just Chance of Discovery) is the estimated probability that exploration activities will confirm the existence of a significant accumulation or potentially recoverable petroleum. The Chance of Geologic Discovery is the product of one or more applicable geologic factors which include:
    a. **Source** – The presence of source rock in reasonable proximity to the target that has generated, or is generating, hydrocarbon from organic material trapped in the rock;
    b. **Migration –** There is a path that allowed for the migration of the hydrocarbon from the source to the reservoir;
    c. **Reservoir** – The presence of rock with sufficient thickness, porosity, and permeability to be commercially productive;
    d. **Trap (or Seal) –** The reservoir rock is bounded by impermeable layers prior to the time of migration that has allowed the migrating hydrocarbon to accumulate within the reservoir rock;
    e. **Structure –** the geometry of the anticipated accumulation is able to contain the migrating hydrocarbons in the form of a stratigraphic and / or structural trap. This factor may not apply to unconventional resources, or accumulations that are pervasive throughout a large area and

not significantly affected by hydrodynamic influences such as coal-bed methane, gas hydrates, natural bitumen, tight oil, tight gas or oil shale.



The **Project Maturity Sub-class** represents the maturity of the project and sets out the associated actions required to move the project towards commercial production. The boundaries between the different levels of project maturity are normally project decision gates and can vary from organization to organization dependent upon the established internal approval process for project expenditures.

20. A **Play** is the lowest and least defined level of Prospective Resources and is a project associated with a prospective trend of potential prospects, but which requires more data acquisition and/or evaluation to define specific leads or prospects.

21. A **Lead** is the next level or Prospective Resources and is a project that is poorly defined and requires additional data acquisition and/or evaluation.

22. A **Prospect** is the best defined level of Prospective Resources and represents a project that is sufficiently well defined to represent a viable drilling target, although remains undiscovered.

23. **Development Not Viable** is the lowest level of Contingent Resources and represents a discovered accumulation for which there are contingencies resulting in there being no current plans to develop or acquire additional data at the time due to limited commercial potential.

24. **Development Not Clarified** is the second lowest level of Contingent Resources and is a discovered accumulation where project activities are under evaluation and where justification as a commercial development is unknown based on available information. A plan for future evaluation should exist but further study or appraisal work will be ongoing in order to establish the actions necessary to move the project forward to commercial maturity.

25. **Development On Hold** is the second highest level of Contingent Resources and represents a discovered accumulation where project activities are on hold and/or where justification as a commercial development may be subject to significant delay.

26. **Development Pending** is the highest level of Contingent Resources and represents a discovered accumulation where development activities are ongoing to justify commercial development in the foreseeable future.

27. **Justified for Development** is the lowest level of Reserves and represents a development project that has reasonable forecast commercial conditions at the time or reporting and there are reasonable expectations that all necessary approvals/contracts will be obtained.

28. **Approved for Development** is the second level of Reserves and represents a development project that is commercial under the current and/or forecast conditions, has received all approvals and/or contracts necessary for development including the commitment of capital funds and implementation of the development of the project is underway.

29. **On Production** is the highest level of Reserves and reflects the operational execution phase of one or more development projects with the Reserves currently producing or capable of production, including Developed Producing and Developed Non-Producing Reserves.

30. **Remaining Recoverable Reserves** are the total remaining recoverable reserves associated with the acreage in which the Company has an interest.

31. **Company Gross Reserves** are the Company’s working interest share of the remaining reserves, before deduction of any royalties.

32. **Company Net Reserves** are the gross remaining reserves of the properties in which the Company has an interest, less all Crown, freehold, and overriding royalties and interests owned by others plus all royalty interest volumes received.

33. **Net Production Revenue** is income derived from the sale of net reserves of oil, non-associated and associated gas, and gas by-products, less all capital and operating costs.

34. **Fair Market Value** is defined as the price at which a purchaser seeking an economic and commercial return on investment would be willing to buy, and a vendor would be willing to sell, where neither is under compulsion to buy or sell and both are competent and have reasonable knowledge of the facts.

35. **Barrels of Oil Equivalent (BOE) Reserves** is the sum of the oil reserves, plus the gas reserves divided by a conversion factor, plus the natural gas liquid reserves, all expressed in barrels or thousands of barrels. Equivalent reserves can also be expressed in thousands of cubic feet of gas equivalent (McfGE) using the same conversion factor. Normally the conversion factor represents an approximation of the nominal heating content or calorific value equivalent to a barrel of oil.

36. **Oil (or Crude Oil)** is a mixture consisting mainly of pentanes and heavier hydrocarbons that exists in the liquid phase in reservoirs and remains liquid at atmospheric pressure and temperature. Crude oil may contain small amounts of sulphur and other non-hydrocarbons, but does not include liquids obtained from the processing of natural gas. Crude oil volumes are further divided into Product Types, for reporting purposes.

37. **Gas (or Natural Gas)** is a mixture of lighter hydrocarbons that exist either in the gaseous phase or in solution in crude oil in reservoirs, but are gaseous at atmospheric conditions. Natural gas may contain sulphur or other non-hydrocarbon compounds. Natural Gas volumes are further divided into Product Types, for reporting purposes.

38. **Non-Associated Gas** is an accumulation of natural gas in a reservoir where there is no crude oil.

39. **Associated Gas** – the gas cap overlying a crude oil accumulation in a reservoir.

40. **Solution Gas** – gas dissolved in crude oil.

41. **Natural Gas By Products** – those components that can be removed from natural gas including, but not limited to, ethane, propane, butanes, pentanes plus, condensate, and small quantities of non-hydrocarbons.

Product Types sub-classify the principle product types of petroleum, crude oil, gas and by-products, into specific groupings based on the properties of the hydrocarbon and the properties of the accumulation and reservoir rock from which it is found. Regulatory agencies may define in legislation the production types they require to be used for reporting purposes in their jurisdiction. The Canadian Securities Associations (CSA) defines the following Product Types for reporting purposes in National Instrument 51-101, effective July 1, 2015.

Crude Oil

I) **Light Crude Oil** means crude oil with a relative density greater than 31.1 degrees API gravity;

II) **Medium Crude Oil** means crude oil with a relative density greater than 22.3 degrees API gravity and less than or equal to 31.1 degrees API gravity;

III) **Heavy Crude Oil** means crude oil with a relative density greater than 10 degrees API gravity and less than or equal to 22.3 degrees API gravity;

IV) **Tight Oil** means crude oil:

   a. contained in dense organic rich rocks, including low-permeability shales, siltstones and carbonates, in which the crude oil is primarily contained in microscopic pore spaces that are poorly connected to one another, and

   b. that typically requires the use of hydraulic fracturing to achieve economic production rates;

V) **Bitumen** means a naturally occurring solid or semi-solid hydrocarbon:

   a. consisting mainly of heavier hydrocarbons, with a viscosity greater than 10,000 millipascal-seconds (mPa·s) or 10,000 centipoise (cP) measured at the hydrocarbon's original temperature in the reservoir and at atmospheric pressure on a gas-free basis, and

   b. that is not primarily recoverable at economic rates through a well without the implementation of enhanced recovery methods;

VI) **Synthetic Crude Oil** means a mixture of liquid hydrocarbons derived by upgrading bitumen, kerogen or other substances such as coal, or derived from gas to liquid conversion and may contain sulphur or other compounds;

Natural Gas

VII) **Conventional Natural Gas** means natural gas that has been generated elsewhere and has migrated as a result of hydrodynamic forces and is trapped in discrete accumulations by seals that may be formed by localized structural, depositional or erosional geological features;

VIII) **Coal Bed Methane** means natural gas that

   a) primarily consists of methane, and

   b) is contained in a coal deposit;

IX) **Shale Gas** means natural gas:

   a) contained in dense organic-rich rocks, including low-permeability shales, siltstones and carbonates, in which the natural gas is primarily adsorbed on the kerogen or clay minerals, and

   b) that usually requires the use of hydraulic fracturing to achieve economic production rates;

X) **Synthetic Gas** means a gaseous fluid:

a) generated as a result of the application of an in-situ transformation process to coal or other hydrocarbon-bearing rock, and

b) comprised of not less than 10% by volume of methane;

XI) **Gas Hydrate** means a naturally occurring crystalline substance composed of water and gas in an ice-lattice structure;

By-Products

XII) **Natural Gas Liquids** means those hydrocarbon components that can be recovered from natural gas as a liquid including, but not limited to, ethane, propane, butanes, pentanes plus, and condensates.

XIII) **Sulphur** is a non-hydrocarbon elemental by-product of gas processing and oil refining.