### Changing the game

September 2019

#### QUESTERRE

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#### **Presentation Outline**

- Company Strategy
- Asset Overview
  - St. Lawrence Lowlands, Quebec
  - Kakwa, Alberta
  - Isfir-Jafr, Kingdom of Jordan
- Corporate Outlook
- Financial & Operating Overview



### COMPANY STRATEGY





## Innovating to sustainably develop hydrocarbons

We are re-establishing ourselves as a clean tech energy company

We believe it is possible to make hydrocarbons a sustainable resource

We are committed to being transparent and respectful that the public must be part of making the important choices for our energy future

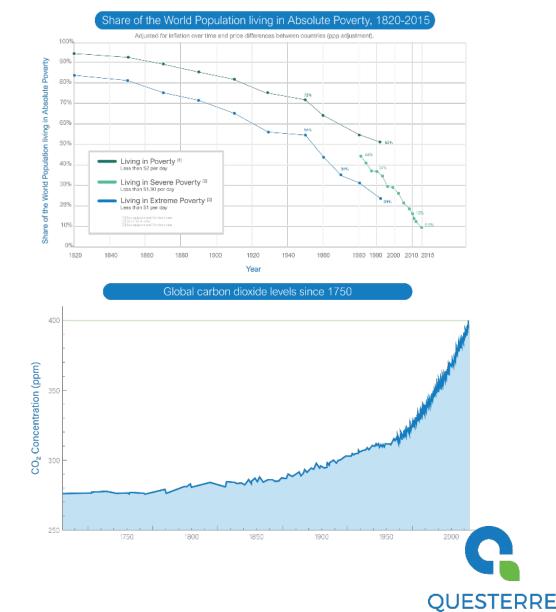


### Clean Tech Energy is the future

We believe true sustainability means maintaining human progress and protecting our ecosystem at the same time

By integrating new and existing technologies we can transition our energy mix and responsibly produce clean energy

Incrementalism is no longer good enough; to achieve what seems impossible we need to change our way of thinking



Questerre's strategy for sustainable development is underpinned by a sciencefocused approach and early experience with ESG politics Technical expertise based on early experience with tight rock reservoirs

> Early exposure to environmental, societal and governance politics

First mover on nearzero emissions clean tech natural gas and sustainable hydrocarbons

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The science-focused approach continues advancing projects by using technology to balance people, planet and profits Developing a near-zero emissions project for a 21 Tcf natural gas discovery in Quebec <sup>(1)</sup>

> Delineating a sweet spot in the Montney with two operators targeting 10,000 boe/d of net production

Advancing engineering for a 7.8 billion barrel DPIP resource in Jordan



GLJ Resource Report effective December 31, 2017. See "Forward Looking Information" for additional information
 Millcreek Resource Assessment effective September 30, 2016 See "Forward Looking Information" for additional information

### ASSET OVERVIEW





Condensate-rich Montney resource play with attractive economics

NORTH AMERICA

#### **G** SE Saskatchewan/SW Manitoba

Proven Torquay/Spearfish tight oil production with strong netbacks

#### G St. Lawrence Lowlands, Quebec

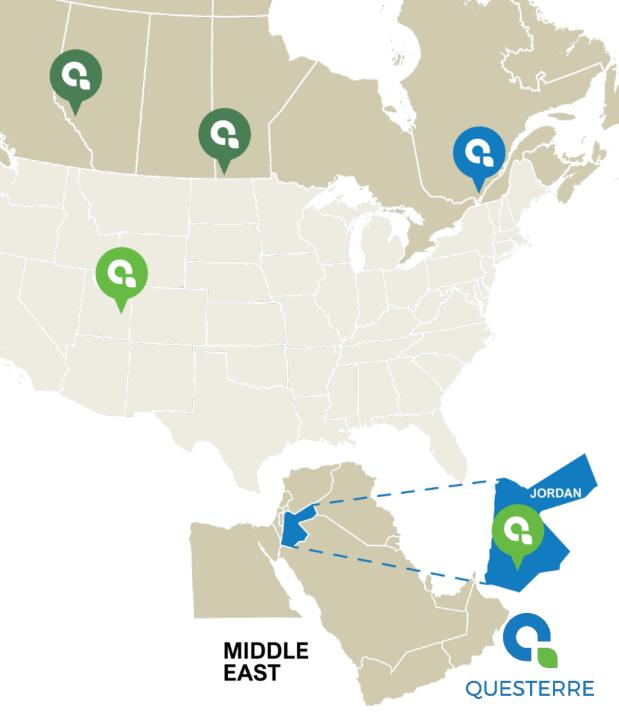
Giant Utica natural gas discovered resource with Lorraine upside

#### Kingdom of Jordan

Significant oil shale deposit being assessed for commercial development

#### Utah

Oil shale project with estimated preliminary technical costs of US\$20-\$30 per barrel<sup>(1)</sup>



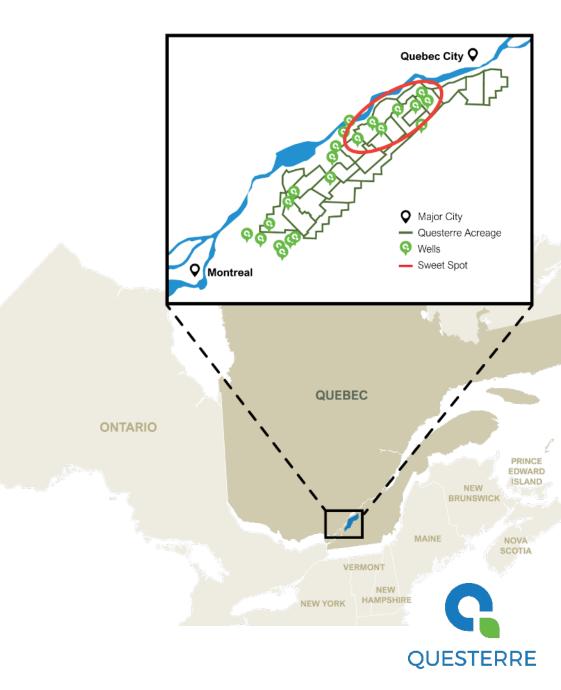
### St. Lawrence Lowlands

Quebec

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## Unlocking a significant discovery

- Regaining operatorship and ownership of ~100% of acreage with gross resources of over 21 Tcf+ <sup>(1)</sup>
  - CERI report estimates Quebec Utica could be second lowest supply gas cost in North America<sup>(2)</sup>
- Step by step approach over last 10 years has seen a regulatory framework established except for two specific regulations
- Clean Tech Energy a game changer and critical to social acceptability



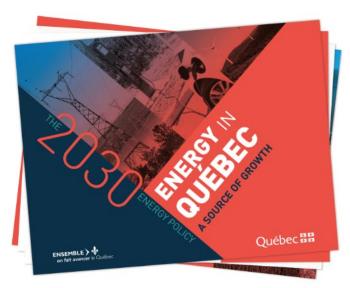
(1) GLJ Resource Report effective December 31, 2017. See "Forward Looking Information" for additional information.

(2) Canadian Energy Research Institute "An assessment of the economic and competitive attributes of oil and natural gas development in Quebec" – November 2015

### Social acceptability is the last hurdle

Industry-leading social license advocacy skills

- ☑ Original BAPE (2011)
- ☑ Strategic Environmental Assessment for shale gas
- Strategic Environmental Assessment for oil and gas in Quebec
- ☑ Green Book published
- ☑ Energy Policy (April 2016)
- ☑ Passage of new hydrocarbon legislation
- ☑ Passage of new environmental legislation
- ☑ Passage of environmental regulations
- ☑ Passage of hydrocarbon regulations
- Secure regulatory approval for Clean Tech Energy project
- Amend regulations relating to setbacks and well completions









### A game changer: Quebec Clean Tech Energy

- Vision of cleanest natural gas production in the world
- Targeting near-zero emissions, zero drinking water usage and zero toxic fluids below ground
- Aiming for 100% biodegradable chemical usage by 2030
- Clean Tech alliance developing detailed engineering
  - Formal alliance with Schlumberger and SNC Lavalin





### Progress with social acceptability

- St. Janvier de Joly council approves first natural gas project in Quebec in 10 years<sup>(1)</sup>
- Clean Gas improves social license for local development based on June 2018 IPSOS polling data
  - Polling data shows support increases from 60% to 70% with Clean Gas approach
- Revenue sharing agreement with local municipalities for clean tech energy projects
  - Municipalities to share in economic benefits with a 3% interest in projects

#### Agreement with Quebec Being a Natural Gas Producer

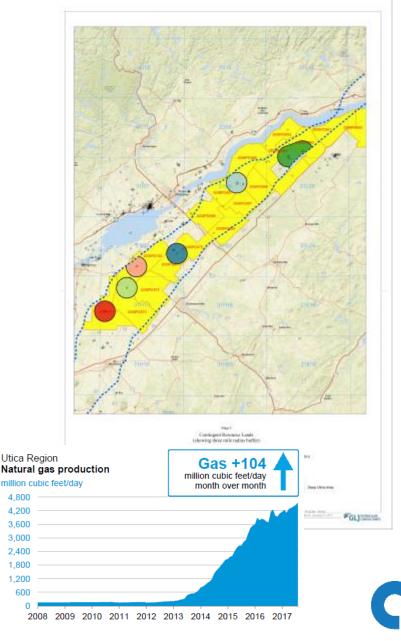


We have to take into consideration the fact that if we start to use our own resources, oil and gas in this province, that will create lots of jobs in this province, and it will also create wealth in this province.



## A proven resource with considerable potential

- Prospective resources (unrisked) of 5.8 Tcf (21.3 Tcf gross) and economic contingent resources (unrisked) of 0.9 Bcf (3.9 Tcf gross)<sup>(1)</sup>
- Acreage classified as economic contingent resources estimated at \$300 million NPV-10%<sup>(1)</sup> (Development on Hold Category only)<sup>(2)</sup>
  - Represents only 5% of total acreage in the Lowlands and based on 3 mile radius around tested wells
- Quebec Utica analogous to Ohio Utica where production has grown to over 6 Bcf/d in last six years<sup>(3)</sup>
  - Management believes potential for significant improvement in well performance based on new technology and Ohio Utica results



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(1) GLJ Resource Report effective December 31, 2017. See "Forward Looking Information" for additional information.

- (2) Areas classified as development on hold are primarily contingent on the passage of applicable hydrocarbon and environmental regulations and social acceptability
- (3) Ohio Department of Natural Resources September 2019

(4) Based on Consol Energy Feb 2016 Corporate Presentation. Questerre has not been able to confirm that this information was prepared by a qualified reserves evaluator or in accordance with the COGEH Handbook



### Outlook

- Executing GR/PR strategy for Clean Tech Energy pilot
  - Working with government and other stakeholders for social acceptability
  - Clean tech energy alliance building to achieve vision of world's cleanest natural gas production
  - Introducing the benefits of clean tech energy and revenue sharing with small towns
  - Engineering of initial pilot application underway
  - Maintaining legal position
- Work with Quebec advisory firm for strategic partner
- Close Purchase & Sale Agreement announced March 2019 to buy out our partner and regain operatorship

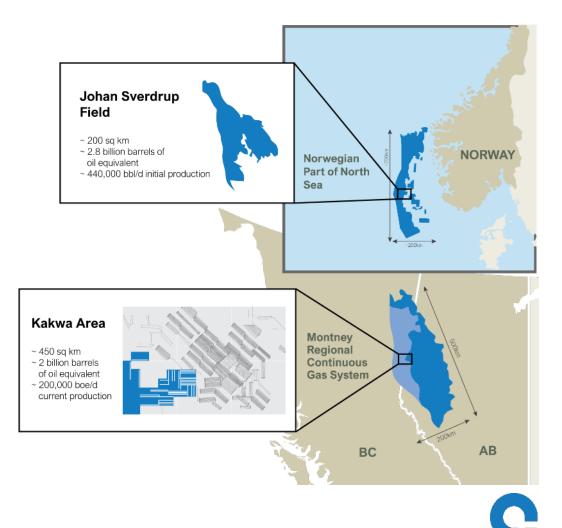
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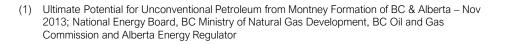


#### Condensate-rich Montney - a world-class resource

- One of the largest oil and gas fields in the world with some of the best economics
  - 449 Tcf of marketable gas, 14.5 billion barrels of NGLs and 1.12 billion barrels of oil<sup>(1)</sup>
- Sweet spots in resource plays are like discoveries in conventional oil and gas
  - In the Montney, sweet spots have right mix of condensate and natural gas to drive economics at current commodity prices

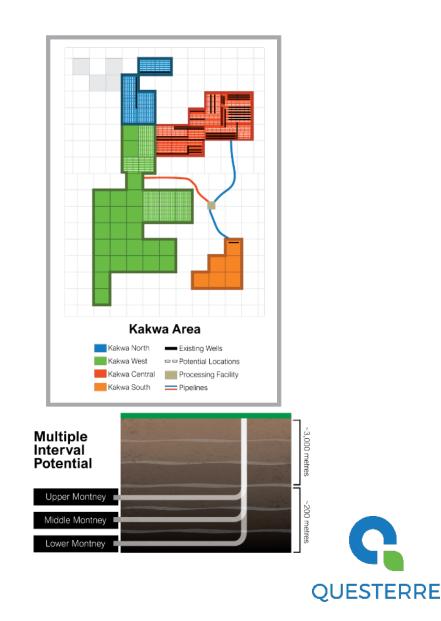


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## Expanding and delineating the sweet spot

- Questerre has established a significant land position in the sweet spot with over 30 wells drilled to date
  - Recent acquisition has doubled acreage position
  - Reserves up over 60% to 28 million boe<sup>(1)</sup>
    - Resource potential could double existing reserves
  - Positive results from Lower Montney interval offsetting acreage



## Leveraging technology to minimize the footprint

- Significant investment in infrastructure including central water storage, processing facility and pipeline network
  - Targeting reduction of up to two thirds of fresh water usage with central water facility
  - Minimizing emissions by testing wells directly into expanded pipeline network
  - Minimizing emissions from natural gas and diesel powered equipment by electrification
  - Recycle produced natural gas with gas-lift to improve recovery
- Technology and ideas proven here will be used in Quebec





## Improving economics by reducing well costs and optimizing completions

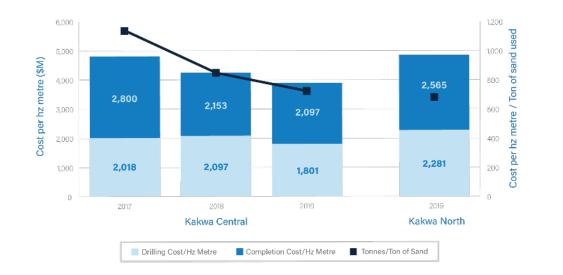
900

800

Field Production (boe/d)

Gross |

100



Continued improvement in drilling and completion costs on a per metre of horizontal basis

Promising results from optimizing completions including tighter spacing between fractures and increasing sand tonnage

Months on Production

19

Production Rate vs Time

1 mile lateral

1.5 mile latera

1P Curve

2P Curve

1.5 mile lateral with 80 stages

1.5 mile lateral with 200 stages

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(1) McDaniel Reserve Report effective December 31, 2018. See "Forward Looking Information" for additional information.

#### **Economic sensitivities**



\$2.6 million NPV-10% for 2P type well based on current commodity prices





### Outlook

- Flexible drilling program contingent on commodity prices
  - Participate in up to six to seven gross wells at Kakwa Central
  - Drilling at Kakwa North to ramp up based on results from final farm-in well
- Depending on market conditions, consider potential spin off or sale opportunity to raise capital



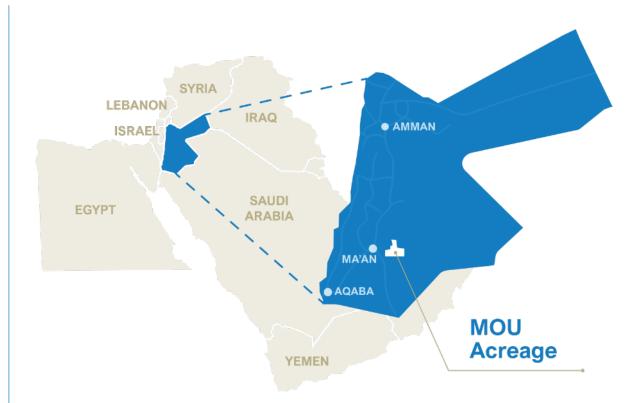
### ISFIR JAFR Kingdom of Jordan



### **Oil Shale Project**

Assessing high yield acreage in Jordan

- Best estimate of unrisked discovered petroleum initially in place of 7.8 billion barrels<sup>(1)</sup>
  - MOU covers 264 sq. km area with over 35 core holes drilled
  - Core holes indicate yields over ~40m intervals of approximately 23 gallons/ton
- Moving to next stage of engineering following positive economic and technical feasibility assessment
  - Hatch feasibility study estimates pricing of Brent plus US\$10/bbl with combined capital and operating costs of ~US\$40/bbl for a 50,000 bbl/d initial project<sup>(2)</sup>







## Balancing social, environmental and economic benefits

- Significant social and economic benefits to Kingdom of Jordan
  - Could eliminate dependence on energy imports (~100,000 bbl/d) and reduce majority of its trade deficit
  - Potential for a diversified product stream including synthetic crude oil, cement, fertilizer and power
- Leveraging technology to minimize the environmental footprint
  - Red Leaf's EcoShale process virtually eliminates need for external water for oil production
  - Questerre is evaluating alternative technologies for power plant to eliminate GHG emissions

#### Working to improve yields and economic returns

- Commencing negotiations with Government for concession agreement including fiscal terms
- Optimizing EcoShale process with Red Leaf and Hatch to improve product yields and project economics





### Corporate outlook

- Advance Montney development on both Kakwa Central and Kakwa North acreages
  - Be open to liquidity options as the market develops
- Work on social acceptability in Quebec while advancing legal motion
  - Develop a detailed pilot application
  - Continue ongoing discussions with towns and MRCs on Clean Tech Energy pilot including revenue sharing plan
  - Engage with stakeholders including government on Quebec clean tech
    energy
- Advance engineering for Jordan oil shale project



### Financial and operational overview

For the quarter ended June 30, 2019

#### Operating and Financial Results

Funds Flow from Operations (\$)	\$ 2.66 million
Working Capital Deficit (\$)	\$0.8 million
Credit facility limit (\$)	\$ 18 million

#### Capitalizing and Liquidity



Production (boe/d)	2,035
Oil + liquids weighting	60%
Revenue (\$/boe)	43.30
Operating Netback (\$/boe)	21.72

### MANAGEMENT AND BOARD



### **Board of Directors**

Michael Binnion, President & Chief Executive Officer

#### Bjorn Inge Tonnessen, Chairman

- Oil & Gas E&P experience & former senior equity research analyst
- o CEO & President, Edge Petroleum AS
- Former CEO & President, Spike Exploration AS, now part of Point Resources AS

#### Alain Sans Cartier

- o Government & Public Relations
- Former Chief of Staff for Official Opposition in Quebec; Quebec City, Quebec

#### Hans Jacob Holden

- Corporate finance experience
- Business Development, AF Gruppen, civil engineering and construction company
- Formerly Corporate Finance at Pareto Securities

#### Earl Hickok

 Professional engineer with operations, engineering and management expertise President & CEO, TSO Energy Corporation, private E&P company

#### Dennis Sykora, Chairman of Audit Committee

- Chartered Accountant and Lawyer
- Oil & gas experience primarily with service sector and international operations

### Management

Michael Binnion, President & Chief Executive Officer John Brodylo, VP Exploration (Nexen) Peter Coldham, VP Engineering (Chevron) Jason D'Silva, Chief Financial Officer (CanArgo, Flowing) Rick Tityk, VP Land (Hunt Oil)



### FORWARD LOOKING INFORMATION



This presentation contains certain forward–looking information and statements within the meaning of applicable securities laws. The use of any of the words "expect", "anticipate", "continue", "estimate", "may", "will", "project", "should", "believe", "plans", "intends", "outlook", "strategy", "potential", "forward", "defer" and similar expressions are intended to identify forward-looking information or statements. In particular, but without limiting the forgoing, this presentation may contain forward-looking information and statements pertaining to the following: corporate strategy, the transition of Questerre's energy portfolio to produce clean energy, securing regulatory approval for Clean Tech Energy project, combining new and existing technologies, developing near zero emissions natural gas project for Quebec, materially expanding and delineating Questerre's Montney acreage with two operators, moving to FEL2 engineering for Jordan along with piloting work by Red Leaf, estimated preliminary technical costs for Questerre's Utah oil shale project, regaining operatorship of approximately 100% of Questerre's Quebec acreage, environmental and economic impacts of clean tech energy development in Quebec, the target of 100% biodegradable chemical usage by 2030, finding a strategic partner in Quebec, buying out Questerre's Quebec partner, resource estimates, reduction of emissions and water usage targets, recycling of natural gas, capital costs improvements on a per metre of horizontal drilled and completed basis, potential folling locations, drilling plans and methodology, potential spin off or sale of assets, feasibility study estimates in Jordan, potential social and economic benefits to the Kingdom of Jordan, leveraging technology to minimize the environmental footprint in Jordan, optimizing the EcoShale acceptability in Quebec.

Certain information set out under the headings "Company Strategy, Asset Overview, Quebec, Kakwa, Isfir Jafr and Outlook" is "financial outlook" within the meaning of applicable securities laws. Financial outlook has been prepared by Management to provide readers with disclosure regarding the Corporation's reasonable expectations as to the anticipated results of its proposed business activities for 2019 and beyond. Readers are cautioned that this financial outlook is based upon numerous assumptions, including the assumptions discussed herein and may not be appropriate for other than indicative purposes. The actual results of operations and the resulting financial results will likely vary from the amounts set forth in the analysis presented in this presentation, and such variation may be material.

Questerre and its management believe that the financial outlook information herein has been prepared on a reasonable basis, reflecting the best estimates and judgments, and represent, to the best of management's knowledge and opinion, Questerre's expected expenditures and results of operations. However, because this information is highly subjective and subject to numerous risks including the risks discussed herein, it should not be relied on as necessarily indicative of future results. Except as required by applicable Canadian securities laws, Questerre undertakes no obligation to update any such financial outlook information.

The recovery and reserve estimates of Questerre's reserves and resources provided herein are estimates only and there is no guarantee that the estimated reserves or resources will be recovered. In addition, forward-looking statements or information are based on a number of material factors, expectations or assumptions of Questerre which have been used to develop such statements and information but which may prove to be incorrect. Although Questerre believes that the expectations reflected in such forward-looking statements or information are reasonable, undue reliance should not be placed on forward-looking statements because Questerre can give no assurance that such expectations will prove to be correct.

In addition to other factors and assumptions which may be identified herein, assumptions have been made regarding, among other things: the timing and extent of capital programs by Questerre and its partners in Alberta, the scale and scope of its investment in Red Leaf and developments with Red Leaf and its assets, the impact of increasing competition; the general stability of the economic and political environment in which Questerre operates; the timely receipt of any required regulatory approvals; the ability of Questerre to obtain qualified staff, equipment and services in a timely and cost efficient manner; drilling results; the ability of the operator of the projects in which Questerre has an interest in to operate the field in a safe, efficient and effective manner; the ability of Questerre to obtain financing on acceptable terms; field production rates and decline rates; the ability to replace and expand oil and natural gas reserves through acquisition, development and exploration; the timing and cost of pipeline, storage and facility construction and expansion and the ability of Questerre to secure adequate product transportation; future commodity prices; currency, exchange and interest rates; regulatory framework regarding royalties, taxes and environmental matters in the jurisdictions in which Questerre operates; and the ability of Questerre to successfully market its oil and natural gas products.

Past performance of Questerre or other entities referred to in this presentation is shown for illustrative purposes only, does not guarantee future results of Questerre and is not meant to forecast, imply or guarantee the future performance of Questerre, which will vary.



The forward-looking information and statements included in this presentation are not guarantees of future performance and should not be unduly relied upon. Such information and statements, including the assumptions made in respect thereof, involve known and unknown risks, uncertainties and other factors that may cause actual results or events to differ materially from those anticipated in such forward-looking information or statements including, without limitation: changes in commodity prices; changes in the demand for or supply of Questerre's products; unanticipated operating results or production declines; changes in tax or environmental laws, royalty rates or other regulatory matters; changes in development plans of Questerre or by party operators of Questerre's properties; increased debt levels or debt service requirements; inaccurate estimation of Questerre's oil and gas reserve volumes; limited, unfavorable or a lack of access to capital markets; increased costs; a lack of inadequate insurance coverage; the impact of competitors; and certain other risks detailed from time-to-time in Questerre's public disclosure documents, (including, without limitation, those risks identified in this presentation and Questerre's Annual Information Form).

The forward-looking information and statements contained in this presentation speak only as of the date of this presentation, and Questerre does not assume any obligation to publicly update or revise any of the included forward-looking statements or information, whether as a result of new information, future events or otherwise, except as may be required by applicable securities laws.

#### Oil & Gas Advisories

A boe conversion ratio of six thousand cubic feet per barrel (6 mcf/bbl) of natural gas to barrels of oil equivalent is based upon an energy equivalency conversion method primarily applicable at the burner tip and does not represent a value equivalency for the individual products at the wellhead. Such disclosure of boe's may be misleading, particularly if used in isolation. Additionally, given the value ratio based on the current price of crude oil compared to natural gas is significantly different from the energy equivalency of 6:1, utilizing a conversion ratio at 6:1 may be misleading as an indication of value.

#### **Reserves Disclosure**

#### McDaniel Reserve Report

McDaniel & Associates Consultants Ltd. ("McDaniel"), independent petroleum engineers of Calgary, Alberta prepared an Evaluation of Oil & Gas Reserves dated March 15, 2019 (the "McDaniel Reserve Report") which evaluation is effective December 31, 2018. The McDaniel Reserve Report is in respect of Questerre's conventional oil and gas properties and excludes its assets in the Quebec Lowlands and its oil shale assets to which no reserves are currently assigned.

The McDaniel Reserve Report was prepared in accordance with the standards contained in the COGE Handbook and the reserves definitions contained in National Instrument 51-101 – Standards of Disclosure for Oil and Gas Activities. The reserve estimates of crude oil, NGLs and natural gas reserves provided herein are estimates only and there is no guarantee that the estimated reserves will be recovered. Actual crude oil, NGLs and natural gas reserves may be greater than or less than the estimates provided herein. All of the Company's crude oil, NGLs and natural gas reserves are located in Canada. The estimates of reserves for individual properties may not reflect the same confidence level as estimates of reserves and future net revenue for all properties, due to the effects of aggregation.

The process of estimating reserves is complex. It requires significant judgments and decisions based on available geological, geophysical, engineering and economic data. These estimates may change substantially as additional data from ongoing development activities and production performance becomes available and as economic conditions impacting oil and gas prices and costs change. The reserve estimates contained herein are based on current production forecasts, commodity prices and economic conditions. Estimates made are reviewed and revised, either upward or downward, as warranted by the new information. Revisions are often required due to changes in well performance, commodity prices, economic conditions and governmental restrictions. Although every reasonable effort is made to ensure that reserve estimates are accurate, reserve estimation is an inferential science. Questerre's actual production, revenues, taxes, development and operating expenditures with respect to its reserves may vary from such estimates, and such variances could be material. Specifically, recent production data from wells drilled and placed on production or wells recently equipped with gas lift facilities in the Kakwa area may result in changes to the estimates of reserves. Furthermore, recent production data from wells that may be worked over in the Antler area could also result in changes to the estimates of reserves. So the operator's drilling program could impact reserve estimates. Questerre may amend the area could also reserves in the Kakwa joint venture acreage are currently non-operated, any changes to the operator's drilling program could impact reserve estimates. Questerre may amend the area could investment between its areas of operation, particularly Kakwa and Antler based on results and commodity prices.

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#### **Millcreek Report**

Questerre is in the process of completing a conceptual study, however, at this time, given the preliminary nature of the Jordan Resource Assessment, it does not contain any estimates regarding the timing or cost to obtain commercial development nor has Questerre finalized the specific recovery technology to be used. Questerre is conducting an economic feasibility analysis, which involves assessing multiple retorting processes, including two processes that have been proven at commercial scale. Also under evaluation is the Eco-Shale process. In conjunction with the assessment of retorting processes, Questerre has commissioned and finalized three engineering studies for the mining, preparation of ore and upgrading of the produced oil and other products. Two additional studies for marketing the finished products and infrastructure including utilities are scheduled for completion in 2017. Questerre anticipates incorporating the results from these studies in a subsequent update of the Jordan Resource Assessment. DPIIP and UPIIP are the most specific assignable categories of resources at this time given the preliminary nature of the Jordan Resource Assessment, the nature of recovery of the hydrocarbons by means of mining and that a program of work to determine commercial viability using established technology has not yet been completed.

#### **Resource Disclosure**

Questerre's resources are located in Canada, in the Province of Quebec, and in Jordan. Unless otherwise indicated, all volumes of Questerre's resources presented herein are on an unrisked basis, meaning that they have not been adjusted for the chance of commerciality, and all volumes are presented on a gross basis, meaning Questerre's working interest before deduction of royalties and without including any royalty interests of Questerre.

The estimates of Questerre's resources provided herein are estimates only and there is no guarantee that the estimated resources will be recovered. Actual resources may be greater than or less than the estimates provided herein and variances could be material. With respect to Questerre's discovered resources (including contingent resources), there is uncertainty that it will be commercially viable to produce any portion of the resources. With respect to Questerre's undiscovered resources (including prospective resources), 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. Please see "Risk Factors" Page 25 in the Annual Information Form dated March 29, 2018.

#### GLJ Resource Report (St, Lawrence Lowlands, Quebec)

The GLJ Report used probabilistic methods to generate low, best and high estimates of total petroleum initially in place ("TPIIP"), both discovered and undiscovered. Recoverable Contingent and Prospective Resources over Questerre's acreage were estimated by analogy and based on available well data over the Quebec Utica and public data from US Utica and Marcellus shale plays. The evaluation consisted of the Upper Utica which includes the Indian Castle and Dolgeville members as well as the Flat Creek. The Flat Creek, the lower most member, was only evaluated to estimate undiscovered petroleum initially-in-place ("UPIIP"). No recoverable resources were assigned to the Flat Creek given the lack of test data showing established technology can support commercial development at this time.

The GLJ Report is based on the results from several vertical and horizontal wells on Questerre's acreage that have all encountered pay in the Utica. Test data from these wells in conjunction with offset development and studies of the analogous US Utica supports the prospective commercial development of these resources. Significant positive factors relevant to the estimate of Questerre's resources include the importation of all natural gas consumed in Quebec creating demand for local production, premium realized pricing due to the transportation costs associated with importing natural gas for consumption, production test data from Questerre's existing wells and the development of the analogous Utica shale in the United States. Significant negative factors include the limited number of wells on Questerre's acreage, lack of a developed service sector providing uncertainty regarding estimates of capital and operating costs, developing hydrocarbon regulations and environmental legislation and the requirement to obtain social acceptability for oil and gas operations.

While Questerre believes it will have sufficient financial capability to fund its share of costs associated with the development program in the Quebec Resource Assessment, it may not have access to the necessary capital when required. Conducting the development program is also dependent on the participation by Questerre's joint venture partners. There is no guarantee that they will elect to participate in the program to the extent required. Questerre retains the right to conduct activities without the operators' participation on an independent operations basis whereby it can fund 100% of the capital costs for certain well operations and facilities in return for net revenue equal to 400% of its capital investment before the operators can elect to either remain in a penalty position or hold a working interest.



A range of contingent resources estimates (low, best and high) was presented in the GLJ Resource Report. Contingent resources can be sub-classified based on their project maturity sub-classs which help identify a project's change of commerciality. The project maturity subclasses for contingent resources are "development pending", "development on hold", "development unclarified" or "development not viable", all as defined in the COGE Handbook. "Development pending" is when resolution of the final conditions for development is being actively pursued (high chance of development). "Development on hold" is when there is a reasonable chance of development, but there are major non-technical contingencies to be resolved that are usually beyond the control of the operator. "Development unclarified" is when the evaluation is incomplete and there is ongoing activity to resolve any risks or uncertainties. "Development not viable" is when no further data acquisition or evaluation is currently planned and hence there is a low chance of development.

Those areas classified as development on hold are primarily contingent on the passage of applicable hydrocarbon and environmental legislation and regulations as well as local acceptability. Remaining areas classified as development unclarified have additional contingency or risk associated with securing social license to operate and are thereby a lower priority for development. Additional contingencies include firm development plans, detailed cost estimates and corporate approvals and sanctioning. There is no certainty that any portion of the Contingent Resources will be economic to develop. Though pilot horizontal development plans have been proposed, the project evaluation scenario for the Contingent Resources is not sufficiently defined to make an investment decision to proceed to development.

The GLJ Resource Report estimated gross risked contingent resources with a project maturity subclass of development on hold of 18.6 million boe (low estimate) to 50.0 million boe (high estimate), with a best estimate of 30.4 million boe. The GLJ Resource Report estimated gross risked contingent resources with a project maturity subclass of development unclarified of 8.9 million boe (low estimate) to 23.8 million boe (high estimate), with a best estimate of 14.6 million boe.

The TPIIP was determined probabilistically on a permit basis with estimates of 45 to 145 Bcf per square mile for the Upper Utica. This compares favorably to analogous US shale plays with estimates of the Utica in Ohio at between 35 to 85 Bcf per square mile and 25 to 150 Bcf per square mile for the Marcellus shale in Pennsylvania. Of the TPIIP estimated over Questerre's acreage, only land within a 3 mile radius of a successfully tested well was quantified as discovered gas-in-place. Based on this qualification only 16% of the total mapped TPIIP in the Upper Utica was considered discovered Contingent Resource. The Upper Utica was considered undiscovered for approximately 84% of the total mapped TPIIP. Recovery factors of 18%, 26% and 37% were applied to the low, best and high estimates resource cases respectively.

Questerre's average working interest in its gross best estimate Contingent Resources is 25.9%. In addition to Questerre's working interest, the Company also holds a royalty interest in the acreage and associated resources. As a result, in some cases Questerre's net volumes (after royalties) exceed its working interest volumes.

The Upper Utica was considered undiscovered for approximately 84% of the total mapped TPIIP. Recovery factors of 19%, 27% and 40% were applied to the low, best and high estimates resource cases respectively. A range of prospective resources estimates (low, best and high) were prepared by GLJ.

The chance of commerciality for Prospective Resources is equal to the product of the chance of discovery and the chance of development. "Chance of discovery" is the estimated probability that exploration activities will confirm the existence of a significant accumulation of potentially recoverable petroleum. "Chance of development" is the estimated probability that, once discovered, a known accumulation will be commercially developed. Based on contingencies related to the passage of applicable hydrocarbon and environmental legislation, regulations, local acceptability, and additional risk associated with securing social license to operate, firm development plans, detailed cost estimates and corporate approvals GLJ estimated the Chance of Development at 19 percent. Proximity to extensional and compressional-related fault systems presents risk of structuring resulting in leak off and reduced pressures in some prospective regions, additionally, lack of delineation data provides reservoir risk associated with uncertainty regarding reservoir quality and rock mechanics amicable to hydraulic fracturing. Therefore, GLJ has estimated the Chance of Discovery at 81 percent. The corresponding chance of commerciality is 15 percent. This also takes into account Questerre's working interest and operatorship of its assets as Questerre is subject to the priorities of working interest partners for such assets. Production and development forecasts were not completed by GLJ as part of the prospective resources evaluation.



#### Jordan

In October 2016, Questerre commissioned an independent assessment of its oil shale resources (the "Millcreek Resource Assessment") in the Hashemite Kingdom of Jordan ("Jordan"). The Millcreek Resource Assessment was conducted by Millcreek Mining Group ("Millcreek"), an independent qualified reserves evaluator, as defined by NI 51-101 with an effective date of September 30, 2016. The Millcreek Resource Assessment was prepared in accordance with NI 51-101 and the standards contained in the COGE Handbook. The Millcreek Resource Report covers the area under Questerre's Memorandum of Understanding ("MOU") with the Ministry of Energy and Mineral Resources in Jordan. Pursuant to the MOU, Questerre has the exclusive right to conduct exploration, engineering and development over 380 square km in the Isfir-Jafr region of Jordan, approximately 200 km south of the capital, Amman. This has been categorized into three areas referred to Blocks A, B and C, separated by two highway and infrastructure corridors. Questerre holds a 100% working interest in the MOU and the resources.

The Millcreek Resource Assessment did not include any of Questerre's other properties. All anticipated results disclosed herein were prepared by Millcreek, which is an independent qualified reserves evaluator. Millcreek used probabilistic methods to generate high, best and low estimates of resource volumes.

The Millcreek Resource Assessment is based on the Modified Fischer Assay ("MFA") data from over 40 core holes, including 35 drilled by the Natural Resources Authority and 5 drilled by Questerre in the prior three years. The petroleum volumes within the area that resulted from this estimation process were classified as Discovered Petroleum Initially in Place ("DPIIP") and Undiscovered Petroleum Initially in Place (UPIIP), in accordance with the criteria of the COGE Handbook. DPIIP resources were further differentiated as Low, Best, and High based upon a statistical analysis of the thickness and grade data. It was determined that a radius of 1,000m from a core hole could satisfactorily be used for quantifying a Low resource estimate. Radii of 2,000m and 4,000m from a core hole were also determined for quantifying Best and High resource estimates, respectively. Resources classified as Undiscovered have not been assigned any levels of confidence. DPIIP and UPIIP are the most specific assignable categories of resources at this time given the preliminary nature of the Millcreek Resource Assessment, the nature of recovery of the hydrocarbons by means of mining and that a program of work to determine commercial viability using established technology had not yet been completed at the time of the Millcreek Resource Assessment. In addition, as a result of the preliminary nature of the Millcreek Resource Assessment, it did not contain any estimates regarding the timing or cost to obtain commercial development. The accuracy of resources is, in part, a function of the quality and quantity of available data and of engineering and geological interpretation and judgment. Given the data available at the time the Millcreek Resource Assessment was prepared, the estimates presented herein are considered reasonable. However, they should be accepted with the understanding that additional data and analysis available subsequent to the date of the estimates may necessitate revision. These revisions may be material. There is no certainty

The significant positive factors for estimating these resources include good well-spaced core, continuous regular resource and low structural complexity. The significant negative factors for these estimates include the coarse grid of well control reflecting the early stage nature of the project and the unknown nature of MFA quality control on the Ministry drilled cores.

The Best Estimate of the DPIIP is approximately 12.2 billion barrels of synthetic crude oil at an average grade of 20.12 gpt.



### RESOURCE DEFINITIONS



#### **Resource Definitions**

Resources encompasses all petroleum quantities that originally existed on or within the earth's crust in naturally occurring accumulations, including Discovered and Undiscovered (recoverable and unrecoverable) plus quantities already produced. "Total resources" is equivalent to "Total Petroleum Initially In Place". Resources are classified in the following categories:

Total Petroleum Initially In Place (TPIIP) is that quantity of petroleum that is estimated to exist originally in naturally occurring accumulations. 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.

Discovered Petroleum Initially In Place (DPIIP) is that quantity of petroleum that is estimated, as of a given date, to be contained in known accumulations prior to production. The recoverable portion of discovered petroleum initially in place includes production, reserves, and Contingent Resources; the remainder is unrecoverable.

Contingent Resources are those quantities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations using established technology or technology under development but which are not currently considered to be commercially recoverable due to one or more contingencies. Economic Contingent Resources (ECR) are those contingent resources that are currently economically recoverable.

Undiscovered Petroleum Initially In Place (UPIIP) is that quantity of petroleum that is estimated, on a given date, to be contained in accumulations yet to be discovered. The recoverable portion of undiscovered petroleum initially in place is referred to as "prospective resources" and the remainder as "unrecoverable."

Prospective Resources are those quantities of petroleum estimated, as of a given date, to be potentially recoverable from undiscovered accumulations by application of future development projects. Prospective resources have both an associated chance of discovery and a chance of development.

Unrecoverable is that portion of DPIIP and UPIIP quantities which is estimated, as of a given date, not to be recoverable by future development projects. A portion of these quantities may become recoverable in the future as commercial circumstances change or technological developments occur; the remaining portion may never be recovered due to the physical/chemical constraints represented by subsurface interaction of fluids and reservoir rocks. Uncertainty Ranges are described by the Canadian Oil and Gas Evaluation Handbook as low, best, and high estimates for reserves and resources as follows:

Low Estimate: This is considered to be a conservative estimate of the quantity that will actually be recovered. It is likely that the actual remaining quantities recovered will exceed the low estimate. If probabilistic methods are used, there should be at least a 90 percent probability (P90) that the quantities actually recovered will equal or exceed the low estimate.

Best Estimate: This is considered to be the best estimate of the quantity that will actually be recovered. It is equally likely that the actual remaining quantities recovered will be greater or less than the best estimate. If probabilistic methods are used, there should be at least a 50 percent probability (P50) that the quantities actually recovered will equal or exceed the best estimate.

High Estimate: This is considered to be an optimistic estimate of the quantity that will actually be recovered. It is unlikely that the actual remaining quantities recovered will exceed the high estimate. If probabilistic methods are used, there should be at least a 10 percent probability (P10) that the quantities actually recovered will equal or exceed the high estimate.

MFA is the most common analytical method applied to oil shale. It was first developed in Germany and later modified by the US Bureau of Mines as a method to evaluate oil shale potential. The analysis is a controlled pyrolysis of the sample. The pyrolysis yields distilled vapors of oil, gas, water which are cooled and then separated through centrifuging.

Certain resource estimate volumes disclosed herein are arithmetic sums of multiple estimates of DPIIP or UPIIP, which statistical principles indicate may be misleading as to volumes that may actually be recovered.



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