# SHERRITT 2018 INVESTOR DAY

Welcome to Fort Saskatchewan

sherritt

# **Today's presenters**



**David Pathe**President and CEO



**Andrew Snowden**Chief Financial Officer



**Steve Wood**Chief Operating Officer



Elvin Saruk Senior Vice President Oil & Gas / Power



**John Marsh** *Director, Technologies Projects* 



**Lyle Trytten** *GM of Sustainability* 



# Today's agenda

Strategy & Outlook

Financial Discussion

Review of Operations

Oil and Gas Outlook

Technologies Development

History of Fort Site & Site Tour

Closing Remarks

**David Pathe** 

Andrew Snowden

Steve Wood

Elvin Saruk

John Marsh/David Pathe

Lyle Trytten

David Pathe



# Forward-looking statements

The materials and presentations comprising the 2018 Investor Day for Sherritt International Corporation ("Sherritt" or the "Corporation") presented on May 30, 2018 contain certain forward-looking statements. Forward-looking statements can generally be identified by the use of statements that include such words as "believe", "expect", "anticipate", "intend", "plan", "forecast", "likely", "may", "will", "could", "should", "suspect", "outlook", "potential", "projected", "continue" or other similar words or phrases.

Forward looking statements are not based on historical facts, but rather on current expectations, assumptions and projections about future events, including commodity and product supply, demand and prices; the level of liquidity and access to funding; share price volatility; production results; Net Direct Cash Costs; realized prices for production; earnings and revenues; market potential for electric vehicles and bitumen upgrading; capital spending; capital projects, costs and timelines; equipment availability; development and exploration wells and enhanced oil recovery in Cuba, including in relation to Block 10; environmental rehabilitation provisions; availability of regulatory approvals; compliance with applicable environmental laws and regulations; debt repayments; collection of accounts receivable; and certain corporate objectives, goals and plans. By their nature, forward looking statements require the Corporation to make assumptions and are subject to inherent risks and uncertainties. There is significant risk that predictions, forecasts, conclusions or projections will not prove to be accurate, that those assumptions may not be correct and that actual results may differ materially from such predictions, forecasts, conclusions or projections.

The Corporation cautions readers of these materials and those attending the 2018 Investor Day, in person or otherwise, not to place undue reliance on any forward looking statement as a number of factors could cause actual future results, conditions, actions or events to differ materially from the targets, expectations, estimates or intentions expressed in the forward looking statements. These risks, uncertainties and other factors include, but are not limited to, changes in the global price for nickel, cobalt, oil and gas or certain other commodities; share price volatility; level of liquidity; access to capital; access to financing; risks related to the liquidity of the Ambatovy Joint Venture; the risk to Sherritt's entitlements to future distributions from the Ambatovy Joint Venture; risk of future non-compliance with debt restrictions and covenants; risks associated with the Corporation's joint venture partners; variability in production at Sherritt's operations in Madagascar and Cuba; potential interruptions in transportation; uncertainty of gas supply for electrical generation; uncertainty of exploration results and Sherritt's ability to replace depleted mineral and oil and gas reserves; the Corporation's reliance on key personnel and skilled workers; the possibility of equipment and other failures; the potential for shortages of equipment and supplies; risks associated with mining, processing and refining activities; uncertainty of resources and reserve estimates; uncertainties in environmental rehabilitation provisions estimates; risks related to the Corporation's corporate structure; political, economic and other risks of foreign operations; risks related to Sherritt's operations in Cuba; risks related to the U.S. government policy toward Cuba, including the U.S. embargo on Cuba and the Helms-Burton legislation; risks related to Sherritt's operations in Madagascar; risks associated with Sherritt's development, construction and operation of large projects generally; risks related to the accuracy of capital and operating cost estimates; reliance on significant customers; foreign exchange and pricing risks; compliance with applicable environment, health and safety legislation and other associated matters; risks associated with governmental regulations regarding greenhouse gas emissions; maintaining the Corporation's social license to grow and operate; risks relating to community relations; credit risks; shortage of equipment and supplies; competition in product markets; future market access; interest rate changes; risks in obtaining insurance; uncertainties in labour relations; uncertainty in the ability of the Corporation to enforce legal rights in foreign jurisdictions; uncertainty regarding the interpretation and/or application of the applicable laws in foreign jurisdictions; legal contingencies; risks related to the Corporation's accounting policies; risks associated with future acquisitions; uncertainty in the ability of the Corporation to obtain government permits; risks to information technologies systems and cybersecurity; failure to comply with, or changes to, applicable government regulations; bribery and corruption risks, including failure to comply with the Corruption of Foreign Public Officials Act or applicable local anti-corruption law; uncertainties in growth management; and certain corporate objectives, goals and plans for 2018; and the Corporation's ability to meet other factors listed from time to time in the Corporation's continuous disclosure documents. Readers are cautioned that the foregoing list of factors is not exhaustive and should be considered in conjunction with the risk factors described in the Corporation's other documents filed with the Canadian securities authorities, including the Corporation's Annual information Form for the year ended December 31, 2017.

At the 2018 Investor Day, the Corporation may also make oral forward-looking statements. The Corporation advises that the above paragraph and the risk factors described in this presentation release and in the Corporation's other documents filed with the Canadian securities authorities should be read for a description of certain factors that could cause the actual results of the Corporation to differ materially from those in the oral forward-looking statements. The forward-looking information and statements contained in the 2018 Investor Day presentations are made as of the date hereof and the Corporation undertakes no obligation to update publicly or revise any oral or written forward-looking information or statements, whether as a result of new information, future events or otherwise, except as required by applicable securities laws. The forward-looking information and statements contained in and presented at the 2018 Investor Day are expressly qualified in their entirety by this cautionary statement.

#### Non-GAAP Measures

Management uses combined results, Adjusted EBITDA, average-realized price, unit operating cost to monitor the financial performance of the Corporation and its operating divisions and believes these measures enable investors and analysts to compare the Corporation's financial performance with its competitors and evaluate the results of its underlying business. These measures do not have a standard definition under IFRS and should not be considered in isolation or as a substitute for measures of performance prepared in accordance with IFRS. As these measures do not have a standardized meaning, they may not be comparable to similar measures provided by other companies.



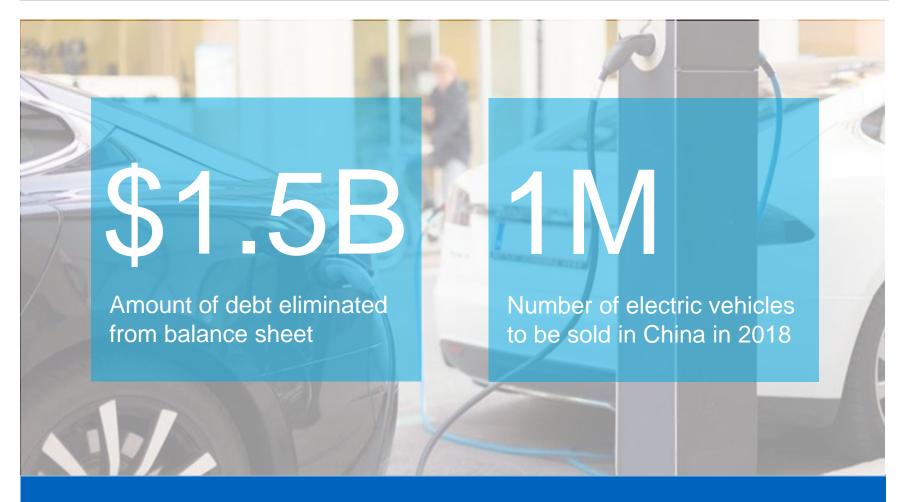
# STRATEGY & OUTLOOK

**David Pathe** 

**President and CEO** 

sherritt

# Since our last investor day...

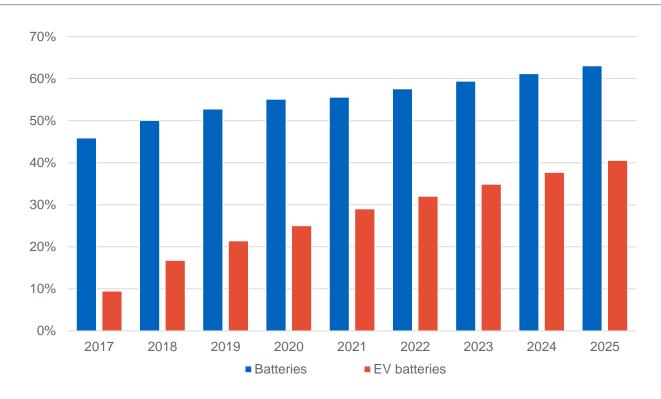


**Outlook for Sherritt is strongest in years** 



# Near-term outlook for cobalt is strong

#### Cobalt demand coming from the battery sector



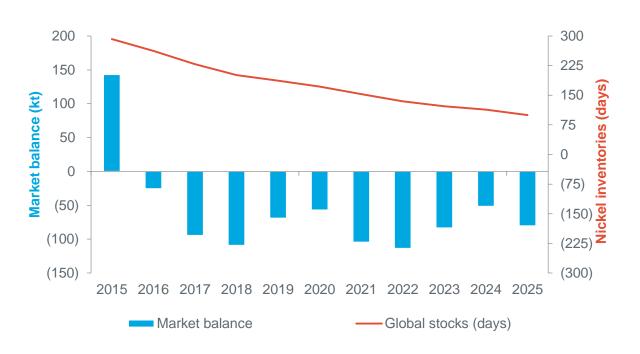
Electric vehicles will consume 40% of the world's cobalt supply by 2025

Source: CRU



# Nickel supply deficit is accelerating

#### Global nickel supply/demand market balance (kt)



- Supply deficit expected to grow through 2025
- Demand is tied to EV battery requirements
- Current LME inventory is below 300,000 tonnes

#### **Provides Sherritt with favorable outlook**

Sources: Wood Mackenzie, Q1 2018 market balance Wood Mackenzie Global nickel short-term outlook (April 2018)



#### 2018 priorities

1 Preserve liquidity and enhance balance sheet strength

Uphold global leadership in finished nickel laterite production

Optimize opportunities in Cuban energy business

#### The pillars of Sherritt's strategy



# **Strategic priorities scorecard**

Strategic Priority	2018 Results YTD
Strengthen balance sheet & preserve liquidity	<ul> <li>Cash position increased to \$237.3M – Q1</li> <li>\$121.2M debenture purchased for \$110.3M – Q1</li> <li>\$10 million debenture purchase – Q2</li> </ul>
Optimize Cuban energy business opportunities	<ul> <li>PSC at PE/Yumori extended to 2021 – Q1</li> <li>Technology for Block 10 drilling identified – Q1</li> </ul>
Uphold leadership position in nickel production	<ul> <li>Operations at Moa JV and Ambatovy JV had zero lost time incidents – Q1</li> <li>NDCC at Moa JV was \$2.06/lb; 4<sup>th</sup> consecutive quarter in the lowest cost quartile – Q1</li> </ul>
	quarter in the lowest cost quartile – Q1

# **Sherritt continues to execute against its strategy**



## Pillars are underpinned by commitment to innovation

1,700
Patents since 1948

- Pioneered commercialization of high pressure hydrometallurgy
- 35+ operations use Sherritt technology around the world
- R&D, external services and operations support

Fort Site – a centre of innovation for 60+ years



#### **Today's discussions**

1 Sherritt's transformation and balance sheet initiatives

- Near-term outlook for production and costs
- Opportunities for growth and commercialization of innovation
- 4 Site tour of our production facilities

#### Goal is to be informative and interactive







#### Today's discussion

- 1
- Recent balance sheet initiatives & strategic priorities

- 2
- Cash flow from operations How Sherritt generates cash

- 3
- **Sherritt's sensitivity to commodity prices**



# Strategic focus - balance sheet initiatives



Sold non-core coal assets for \$946M and repaid \$425M in debentures



- Extended debenture maturities by 3 years
- Repurchased \$30M of debentures at a discount - Q2 2016



- Restructured Ambatovy - Repurchased \$120M of JV & eliminated \$1.4B of debt

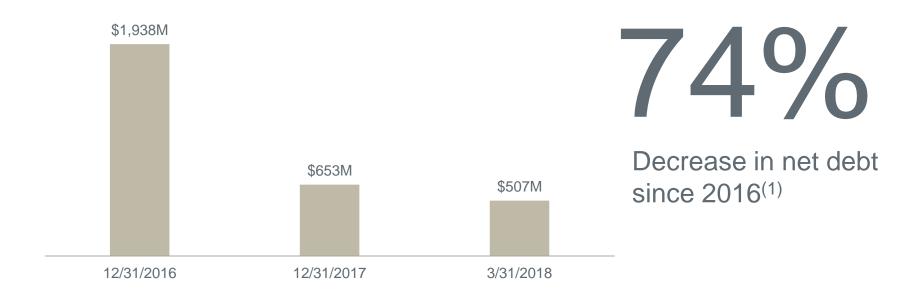


- debentures for \$110M
- Additional \$10M repurchased in May

#### Eliminated \$2 billion of debt over past 4 years



# Impact of balance sheet initiatives



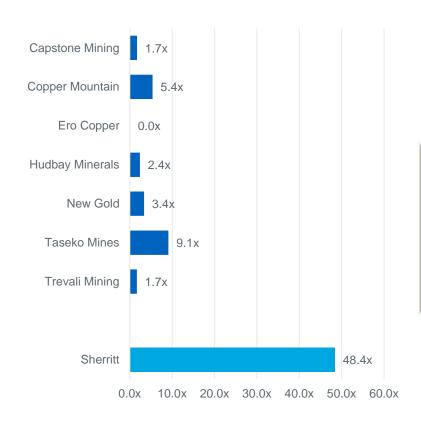
#### Reducing debt remains a key strategic priority

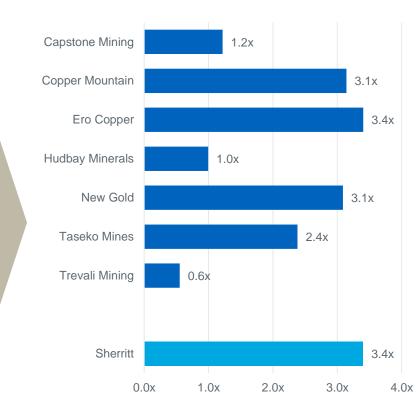


# **Debt metrics are improving**



#### Net debt / LTM EBITDA<sup>(1)</sup>





#### Sherritt's debt profile is now comparable to peer group

Source: CIQ



# 3+ year runway before major liabilities are due<sup>(1)</sup>

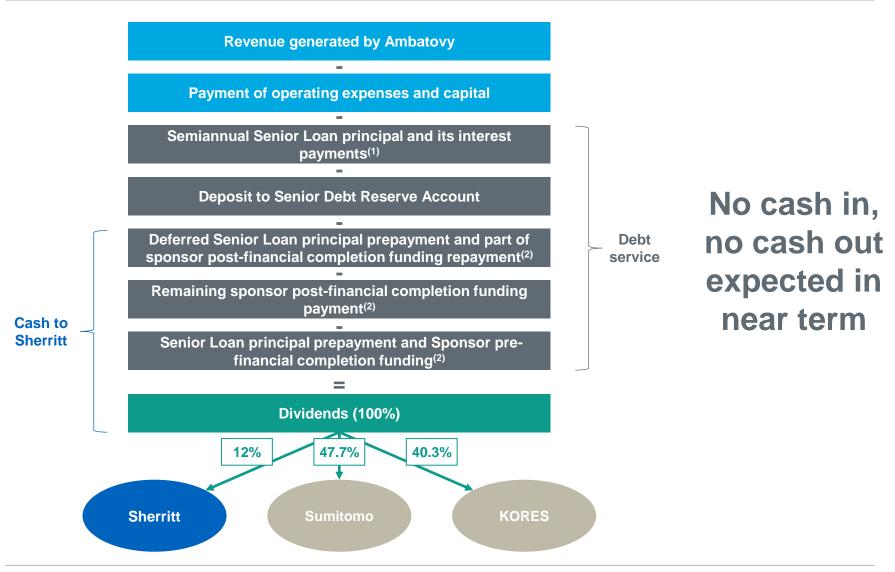


- Sherritt has the option to repay its Ambatovy partner loan in:
  - Shares;
  - Cash and shares; or
  - 10 equal semi-annual payments commencing in December 2024

#### No debt maturities until Q4 2021



#### **Ambatovy distributable cash flow**



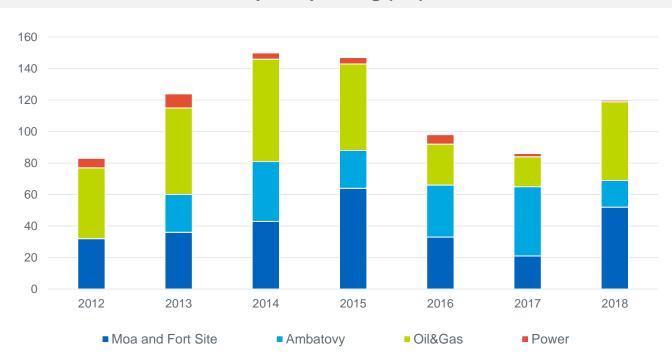


- (1) Senior Loan principal payment will resume in June 2019 and the Deferred Senior Loan principal payment will start in 2021
- (2) Those prepayments and payments are subject to cash flow generation



# **Disciplined capital allocation**





- Moa JV and Fort Site: normalized sustaining capex of ~ \$40M
- Oil & Gas: timing of capital spending will be linked to the collection of overdue receivables

#### Capital spending largely funded through joint venture cash flow



#### Reducing operating and head-office costs

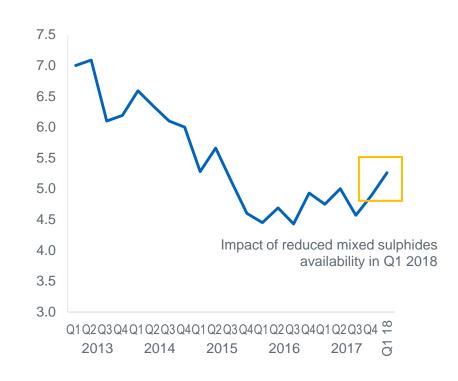
#### **Operations**

- Focus on reduction of controllable costs
  - 3rd acid plant reduced operating costs
  - New fleet to increase truck availability
- Lower NDCC aided by rising cobalt prices

#### **Corporate**

- Administrative expenses reduced by 37% between 2013 and 2017
- Annual interest expenses reduced by ~\$10M due to \$120M debenture re-purchase in February
- Additional \$10M repurchased in May
- Ongoing initiatives to reduce SG&A costs and increase efficiency
  - Relocation of the headquarters expected to generate \$1M in annual savings beginning in 2019
  - Executive compensation frozen since 2015

#### Moa MPR (1) costs (US\$/Ib, excl. by-product credits)



#### Sherritt is a low-cost, premium quality producer



# Reducing overdue receivables

US\$M	Q1 progress			
	Q4 overdue	Expected/due	Received	Q1 overdue
Oil & Gas receivables	\$41.4	\$21.5	(\$27.4)	\$35.5
Power receivables	\$91.2	\$13.3	(\$13.3)	\$91.2
Total Cuban energy receivables	\$132.6	\$34.8	(\$40.7)	\$126.7

- Overdue receivables have always fluctuated over the years
- Timing of payments linked to foreign currency availability

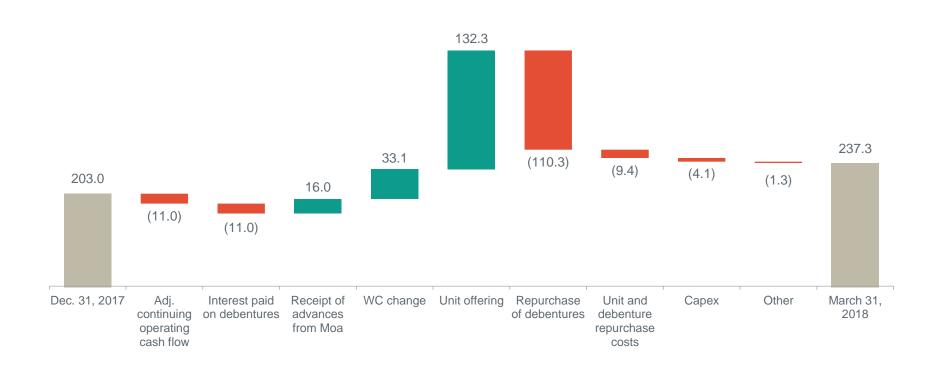
#### Sherritt has always collected 100% of overdue receivables





# Q1 impact of liquidity initiatives & working capital changes

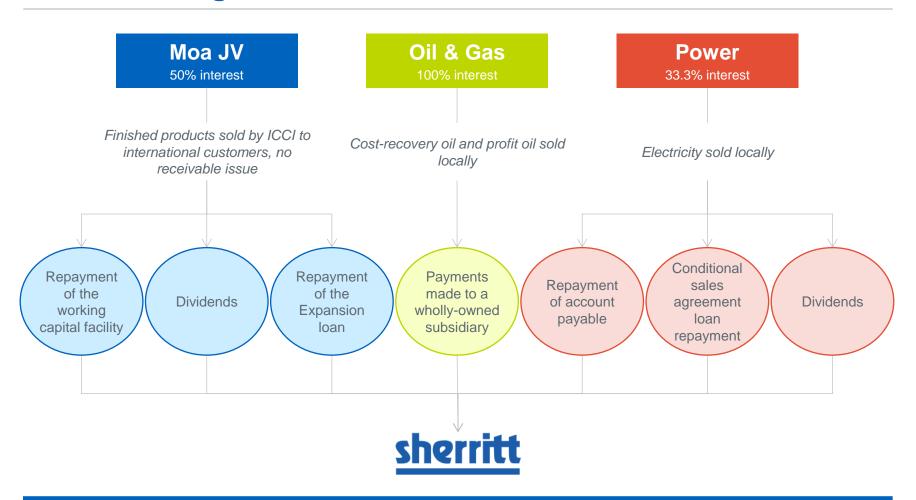
\$ millions



#### Q2 cash position will be impacted by seasonality factors



## How cash is generated from Cuba



No overdue receivables emanate from the Moa JV



#### Overview of Sherritt's financial assets(1) in Cuba

Moa JV	Power

#### **Working capital facility**

#### **Expansion loan**

# Energas conditional sales agreement (CSA)

# Outstanding amount (Q1 2018)

• \$9M

• \$242M

• \$210M

#### Interest rate

Prime + 3.50% or bankers' acceptance + 4.50%

• 6.5%

 Interest suspended until Q2 2019 • 8%

#### Description

 Working capital facility provided by Sherritt to the Moa JV

 Loan provided by the JV partners to the JV to fund the Expansion projects  CSA loan to finance construction of power facilities

Income generated by these assets is used to repay the loan

# Other considerations

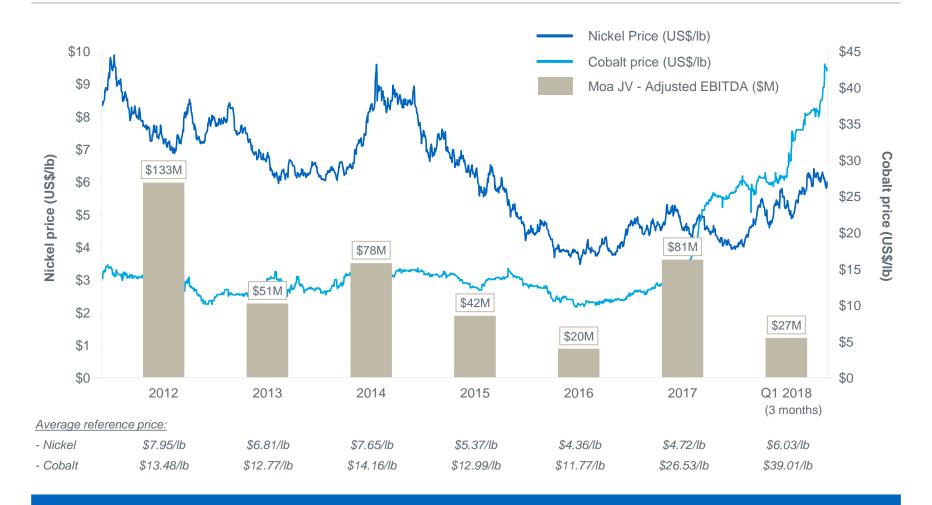
 In Jan. 2018, its maturity was extended to Jan. 30, 2019 and the maximum credit available was increased from \$39M to \$45M  Repayment based on the cash generated by the production of mixed sulphides > 33,000 tonnes  Sherritt retains title to the constructed assets until the loan is fully repaid





Sensitivity to commodity prices

# Adj. EBITDA<sup>(1)</sup> shows the sensitivity to nickel and cobalt prices



#### Sherritt is benefitting from nickel and cobalt price recoveries

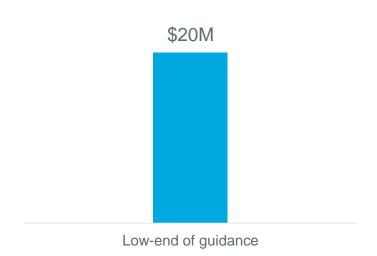


#### Moa – Cash flow sensitivity to nickel and cobalt prices

Impact of US\$1/Ib nickel price increase

Impact of US\$5/lb cobalt price increase





#### Upside leverage to improving nickel and cobalt prices



#### **Review of 2018 NDCC forecasts**



Due to higher cobalt prices



**Ambatovy** 

 Driven by higher cobalt prices offset by changes to cobalt ore grade

#### NDCC will benefit from higher than anticipated cobalt prices



# **Summary**

1 Sherritt's debt reduced and now aligned with peer group

Cost reduction and disciplined capital allocation remain key strategic priorities

Sherritt has strong upside leverage to rising nickel and cobalt prices

Balance sheet and liquidity initiatives are transforming Sherritt





# REVIEW OF OPERATIONS

Steve Wood

**EVP & Chief Operating Officer** 

sherritt

# **Today's discussion**

- 1
- **Commitment to safety and sustainability**

- 2
- Review of operations and recent progress

- 3
- **Optimization initiatives and outlook**



### Focus on safety

### **Q1 2018 results**

- Zero lost time incidents
- 7 million hours without a lost time incident
- Safest record since Q3 2005

### **Global commitment**

- Implementing Towards Sustainable Mining standards at all operations
- Significant progress made with fatality prevention measures at the Moa JV

### Moa JV - Work-related incidents



Commitment to safety driving improvements to injury and incident rates



### **Commitment to sustainability**

### **Recent efforts**

- Supported Hurricane Irma and Cyclone Ava relief efforts
- Signed 3-year partnership with UNICEF Canada for road safety for youth in Cuba
- Launched Five-year Sustainability Goals to drive continuous improvement

### **Awards and recognition**

- Corporate Knights Future 40 Responsible Corporate Leaders in Canada (2017)
- Sustainability Report received three awards from ASPC including Best Overall CSR Report
- Shortlisted for the Nature Inspiration Award for our commitment to biodiversity

# Ongoing sustainability initiatives and programs





The Extractive Sector Transparency Measures Act (ESTMA)









Commitment to sustainability resulting in stronger local stakeholder relationships and engagement





Review of operations & recent progress

### Moa joint venture overview

### 1

### Moa Nickel S.A.

- Mines and processes nickel and cobalt from lateritic ore bodies
- High cobalt-to-nickel production ratio

### 2

# Cobalt Refining Company (CRC)

- Refines Moa and 3<sup>rd</sup>-party mixed sulphides
- Produces finished nickel and cobalt in briquette and powder form
- Sherritt owns 100% of business that provides ammonia, sulphuric acid, utilities provided to CRC

### 3

### **International Cobalt Co. (ICCI)**

- Marketing arm of the JV
- · Located in the Bahamas
- Owns and sells toll refined by CRC
- Customers in Europe, Japan and China



### No overdue receivables emanate from Moa JV

Finished nickel and cobalt products



ocean vessel to

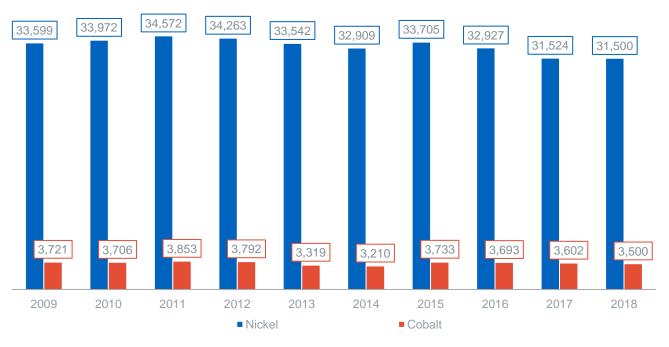
Havana

Moa Nickel

Halifax

# Moa is a long-life asset

### Nickel and cobalt production (tonnes, 100% basis)



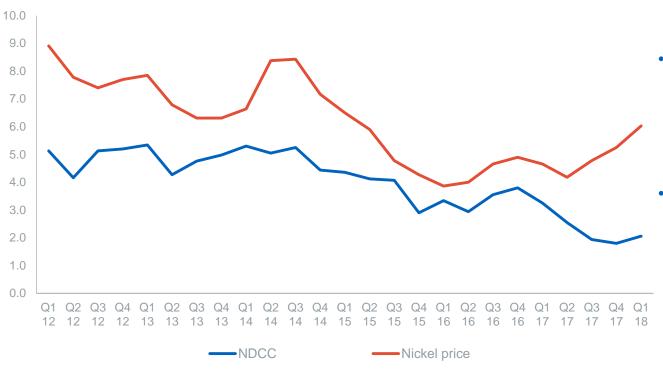
- A vertically integrated mining, processing and refining enterprise
- 60+ years HPAL experience
- 15+ years of proven reserve life
- High cobalt-tonickel production ratio

### With a long track record of stable nickel and cobalt production



### Moa is a low-cost asset

### Net direct cash cost (US\$/Ib)



- Substantial cobalt and fertilizer byproducts produced ensure the Moa JV remains competitive throughout the cycle
- Moa's NDCC has been in the lowest cost quartile for four consecutive quarters

Consistently generated positive gross margins – even in depressed price environments



### Moa production update

- Q1 mixed sulphides production and availability impacted by:
  - Heaviest rainfall in 20+ years
  - Spill-over effect from heavy rains in Q4
  - Reduced ore stockpiles
  - Higher levels of impurities due to excess water
  - Rail service delays
- Q2 developments:
  - Production at Moa back to normal
  - Ore stockpiles recovery ongoing
  - Rail issue resolved by service provider
  - Fort Site scheduled for planned shutdown in June



Moa is on track for lower end of 2018 production guidance



# **Ambatovy joint venture overview**



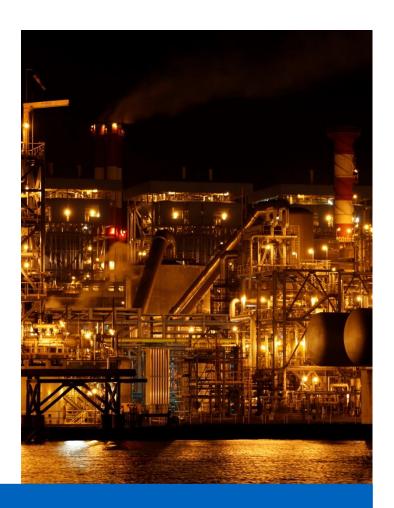
- Partnership with Sumitomo and Kores
- Integrated mining, processing and refining plant in Madagascar
- Class 1 nickel and high purity cobalt production
- Operator at least through 2024

Ownership interest reduced to 12% with JV restructuring



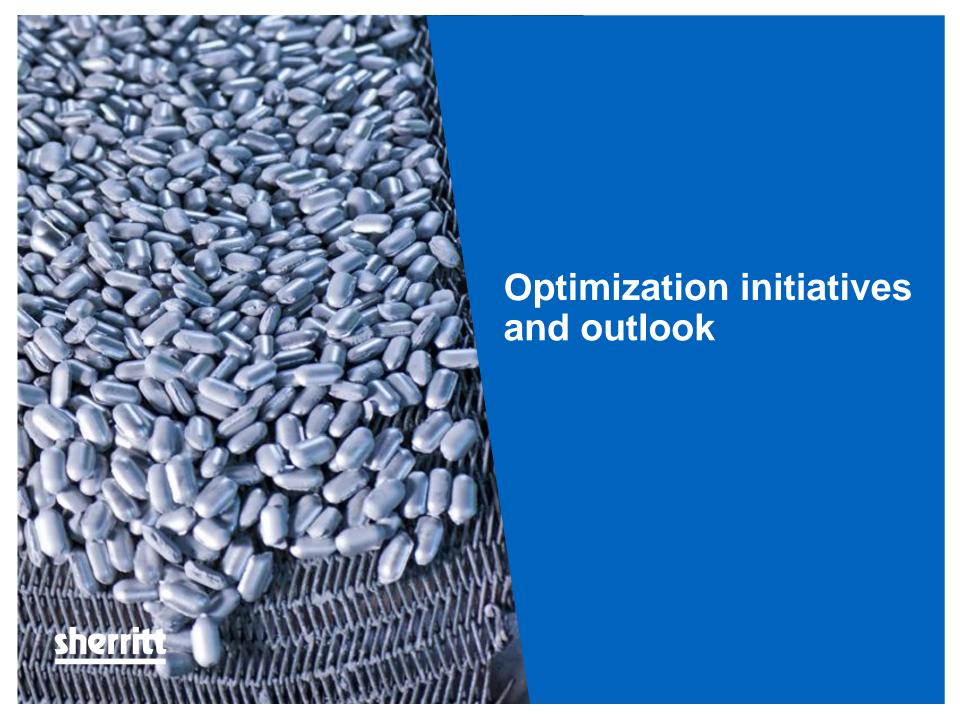
### **Ambatovy production update**

- Q1 production impacted by:
  - Cyclone Ava
  - Shutdown and repairs
  - Acid Plant 1 operating at 50% capacity
- Q2 developments:
  - Replacement of economizer in Acid Plant 1
  - Acid Plant 1 shutdown expected for ~ 3 weeks
  - Acid Plant 2 is operating normally
- Ongoing focus on improved asset reliability
  - Acid plant refurbishment
  - HPAL equipment upgrade
  - Maintenance system improvements



Ambatovy production ramp up expected through Q3





# Initiatives to optimize performance and efficiency

- Slurry preparation plant "dump pocket"
  - Goal is to improve screening of ore
  - Benefits include shorter haul distances and increased throughput
  - 54% constructed with 2005 expansion project
  - Commissioning expected in 2018
  - \$6M of capital funding (50% basis)
- Improve mining fleet availability
  - Goal is to bring fleet to best in class standards
  - Benefits include reduced maintenance and capex costs going forward
  - Truck supplier has guaranteed availability rate at 83%

# Mining fleet availability<sup>(1)</sup> (%) 90% 80% 70% 60% 50% 40% 30% 20% 10% Articulated trucks (old) Articulated trucks (including new trucks)

### **Efforts will support cost reduction focus**



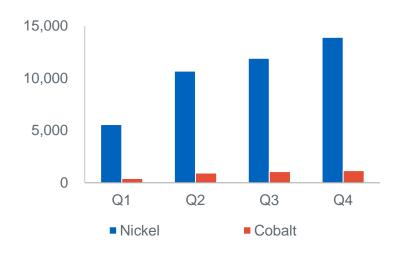
# **Review of 2018 production forecasts**

### Moa (100% basis, tonnes)(1)

# 10,000 8,000 6,000 4,000 2,000 Q1 Q2 Q3 Q4 Nickel Cobalt

- Production expected at lower range of guidance
- Planned maintenance shutdown at Fort in June

### Ambatovy (100% basis, tonnes)<sup>(2)</sup>



 Cobalt production guidance updated to grades consistent with mine plan

### Production expected to be higher in the second half of the year

# **Summary**

- 1
- Q1 weather and logistical challenges now behind us

2 Initiatives underway to optimize efficiency and lower costs

On track for 2018 production and NDCC guidance targets







# Today's discussion

- 1
- Sherritt's oil and gas experience

- 2
- **Cuba's north shore geology**

3

**Block 10 drilling and outlook** 



# Sherritt's oil and gas experience

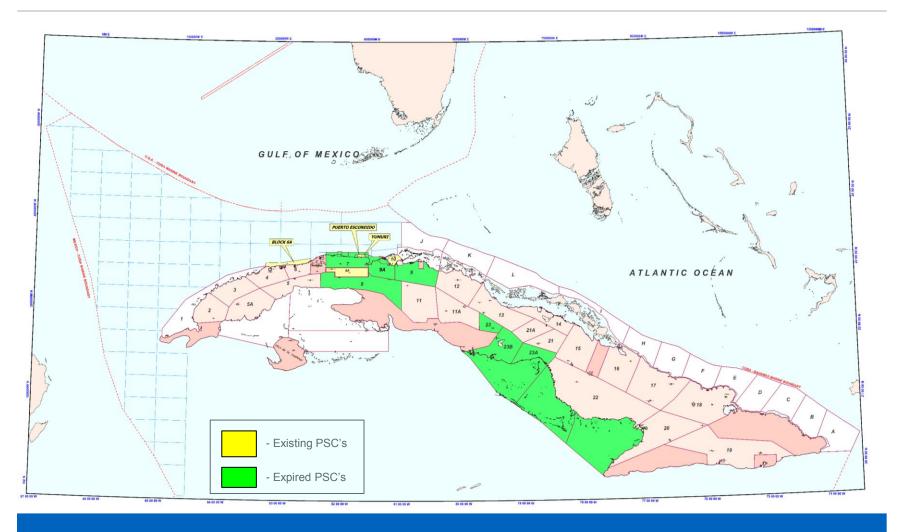
- Integrated operations in Cuba since 1992
  - Specialize in long-reach directional drilling from land-based locations
  - Own 2 drilling rigs
  - Own most of maintenance and service equipment
- Operate through Production Sharing Contracts
  - Cost recovery
  - Share of profit
- Results to date:
  - 4 Development PSCs
  - 11 Exploration PSCs
  - Drilled 210 wells



Sherritt is the largest independent oil producer in Cuba



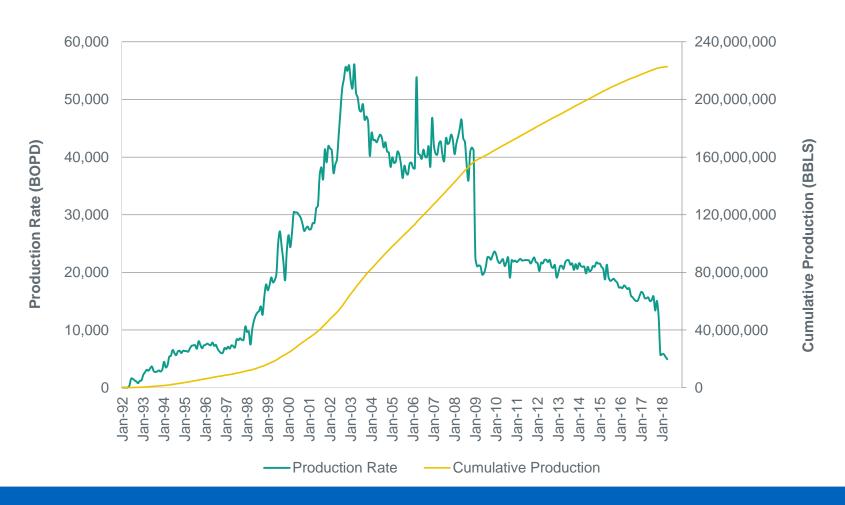
# **Target production and exploration areas**



Based on long-reach directional drilling from land-based locations



# **Sherritt's gross production in Cuba**



Production rate declines due to PSC expiration and maturing fields

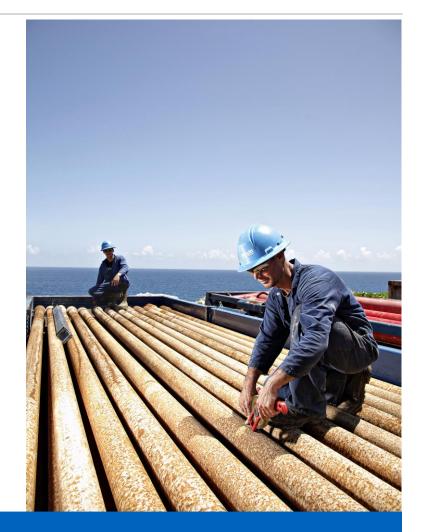




**Cuba's north shore geology** 

### **Cuba's north coast**

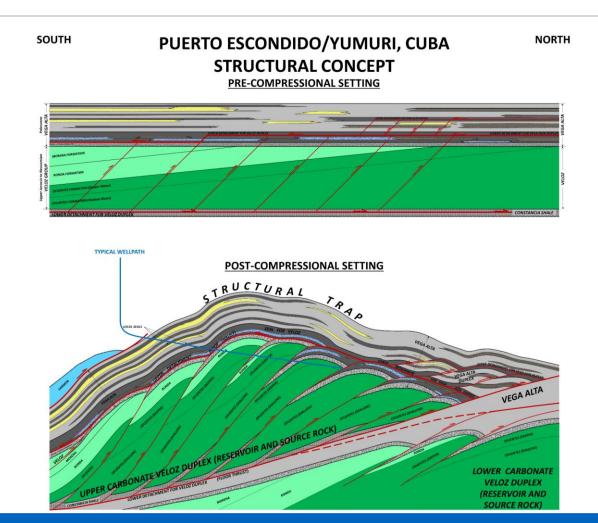
- Complex area
- Fold and thrust belt
- Multiple duplexes
- Each duplex has multiple thrusts
- Best reservoir at top of thrusts



25 years of experience has provided a thorough understanding of geology



### North coast structural model



**Complex fold and thrust geology** 





Block 10 drilling and outlook

### **Current areas of focus**

- Puerto Escondido/Yumuri PSC
  - Three-year extension to March 2021
  - Cost recovery preserved
  - Profit oil reduced to 6%
  - Main purpose of extension is to retain equipment and personnel
- Block 8A
  - Awaiting CUPET to approve seismic program
- Block 6A
  - PSC signed November 2017
  - Reprocess and interpret existing seismic and well data
- Block 10
  - Drilling to resume July 2018



Combining production, drilling and exploration activities



### **Our experience with Block 10**

- CUPEY-1X drilled in 1994 tested 3750 barrels/day
- Reprocessed seismic resulting in a better definition of the Lower Veloz and encouraged of the Upper Veloz presence
- Additional potential identified
- Drilled initial wells from land location with current technology



New drilling program to start in July



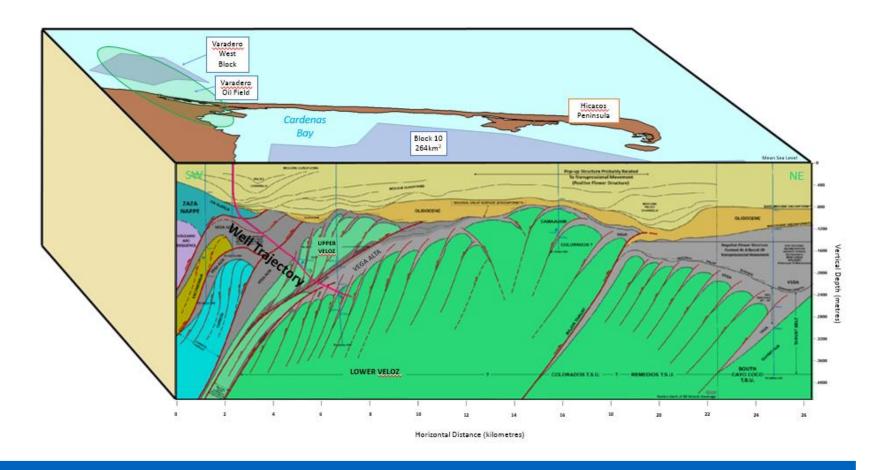
# **Block 10 target prospects**



# **Primary target is the Litoral prospect**



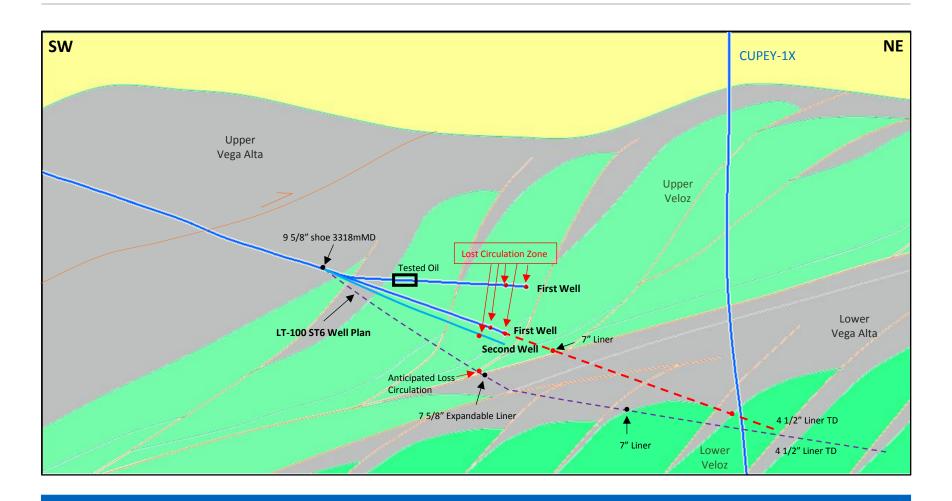
### **Overview of Block 10**



### Target area requires approximately 6,000 metres of drilling



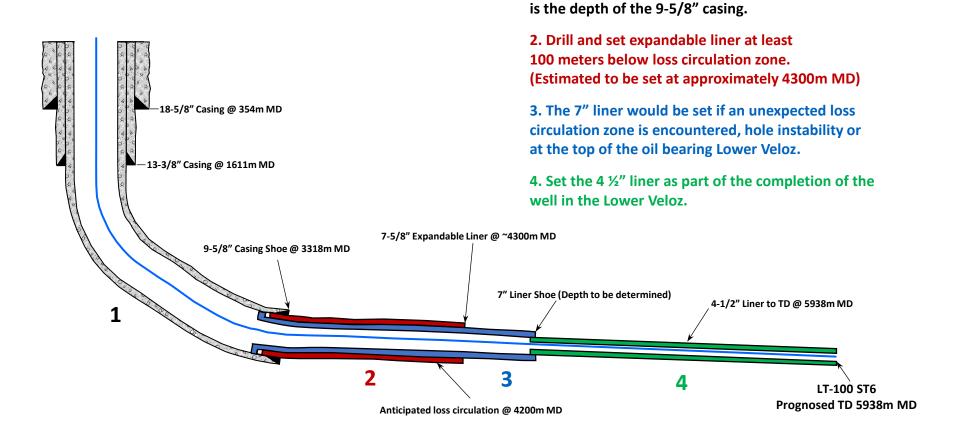
### **Block 10 well status**



Access to proven technology will help address lost circulation zone



# **Block 10 drilling profile**



1. Using the existing wellbore to 3318m MD, which



# **Block 10 development potential**

- Exploration PSC:
  - Cost Recovery
  - Profit Oil
- Two target zones:
  - Upper and Lower Veloz
- Average cost per well:
  - US\$13 to \$15 million
- Opex:
  - ~US\$10/barrel
- Potential production:
  - 25,000 bopd GWI



Development plan to be finalized pending drilling results in Q3



# **Summary**

- 1
- Sherritt has extensive oil and gas experience in Cuba

- 2
- **Block 10 development potential is significant**

- 3
- **Preliminary Block 10 drilling results expected in Q3**





# PARTIAL UPGRADING OF BITUMEN

David Pathe

President & CEO

John Marsh

Director, Technologies Projects



# **Today's discussion**

1 Why Sherritt is qualified

2 Market opportunity for bitumen upgrading

3 Overview of Sherritt's process and pilot testing results

4 Next steps and timeline



# Sherritt has a long track record of innovation

1,700
Patents since 1948

- Pioneered commercialization of high pressure hydrometallurgy
- 35+ operations use Sherritt technology around the world
- Technologies group provides R&D, external services and operations support

**Experience with coal liquefaction key to bitumen process** 



# Logical extension into hydrocarbon processing







**Direct coal liquefaction** 

sherritt

RioTinto

Proximity to Alberta's oil sands





селоуиѕ

Opportunity to capitalize on our experience and proximity to bitumen producers





#### Bitumen producers currently need diluent for transportation

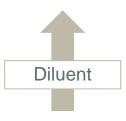
 Bitumen
 +
 Diluent
 =
 Bitumen blend

 API Gravity
 8.0
 67.5
 > 19

 Viscosity (cSt)
 > 450,000
 0.62
 < 350</td>

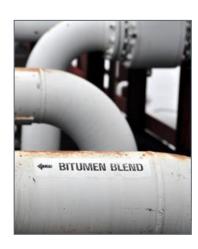


Highly viscous material at room temperature



Light, low viscosity hydrocarbon stream used to improve flow characteristics

Represents ~30% of the bitumen blend



Bitumen blend meeting all pipeline transportation specifications

Adding bitumen is expensive, impacts pipeline capacity and reduces shipment value



#### Represents huge market potential

Estimated industry benefit (US\$ bn / year) <sup>(1)</sup>							
			2017	2030			
	Diluent Avoidance	Net cost of diluent for blending with bitumen and heavy crudes	\$6bn	\$15bn			
Diluent	Transportation Benefit	Increased bitumen blend shipments occupy vacated pipeline space	\$1bn	\$3bn			
	Refining Value Premium	Value uplift as a result of improved properties derived from upgrading process	\$1bn	\$2bn			

#### Removing diluent would save bitumen producers \$billions

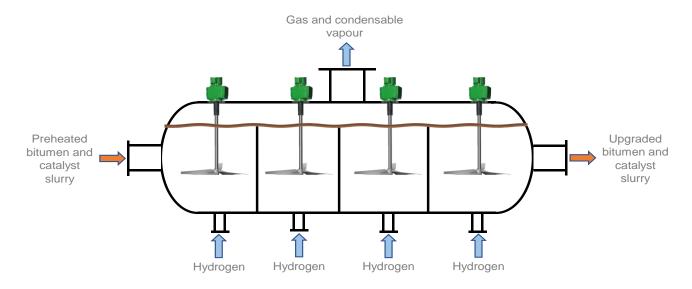




Overview of Sherritt's process and pilot testing results

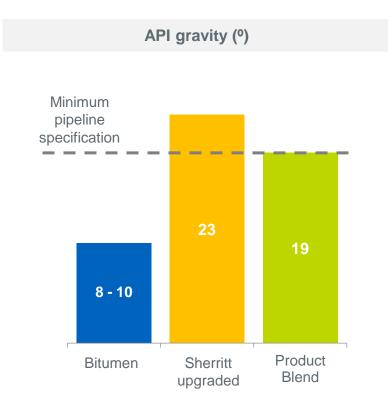
#### Sherritt's technology

- Upgrading bitumen may be accomplished by rejecting carbon or adding hydrogen
  - Carbon rejection methods produce 20%-30% of low value coke or asphaltene product and have low liquid yields
  - x Typical hydrogen addition techniques are reliant on highly active and expensive catalysts
- Sherritt's partial upgrading of bitumen is different
  - Mechanically agitated vessel is similar to those employed in many hydrometallurgical operations around the world, including the one in Fort Saskatchewan
  - Minimal coke or asphaltene product
  - Low cost catalyst and rapid dissolution of hydrogen

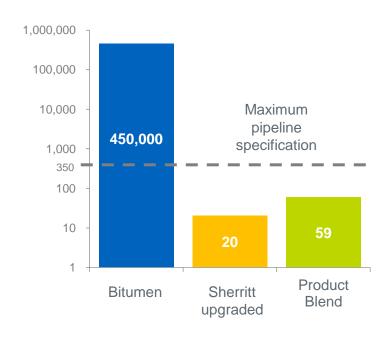




#### Pilot test results - Pipeline critical properties



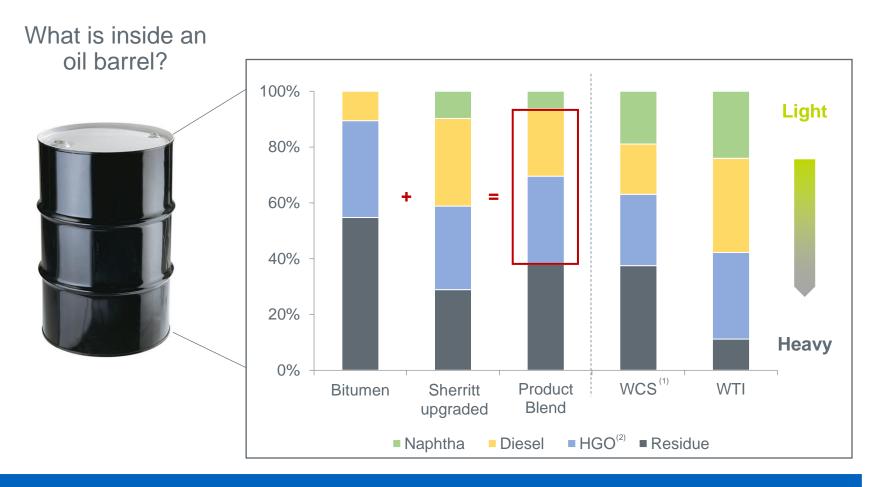
#### **Viscosity (Centistokes)**



Sherritt's process yields a product that meets required API specifications in all seasons



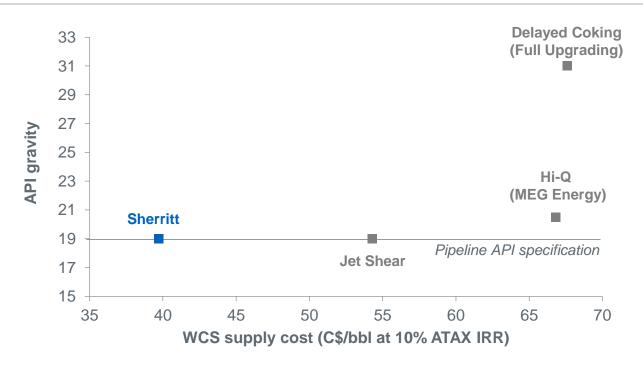
#### Pilot test results - Product yield improvement



Sherritt's product delivers higher liquid yield, lower gasoline and higher diesel production than WCS



#### Competitive advantage vs. alternatives



Process	Provider	Capex intensity (C\$/bpd)
Jet Shear <sup>(1)</sup>	Fractal Systems	c. 6,000
Hi-Q	MEG Energy	c. 30,000
Delayed coking	Many vendors	c. 60,000

Sherritt process can meet pipeline specs and eliminate diluent with 100% liquid yield at lower capex and opex than competitors

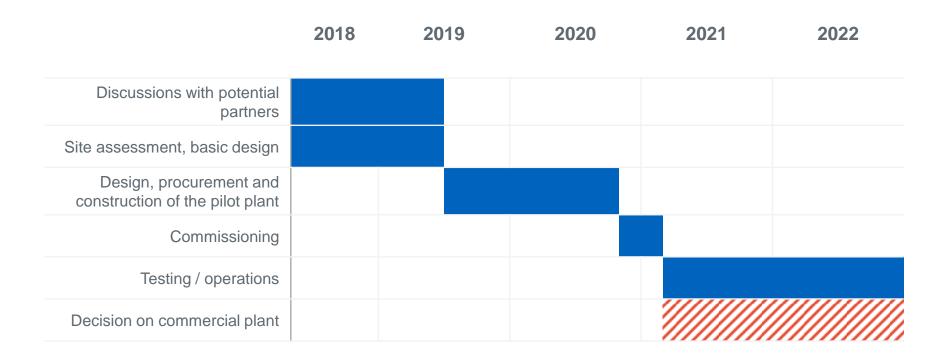
Source: Sherritt, CERI (Study Number 164 March 2017)





**Next steps and timeline** 

#### Sample timeline





#### **Next steps**

- Develop better understanding of commercial environment and potential economics
- Discussions initiated with:
  - Alberta Government agencies
  - Potential partners for demonstration plant
    - License and royalty structures to be determined



Potential to monetize process is being fully exploited



#### **Summary**

- 1
- Sherritt has developed an innovative process that addresses significant bitumen industry need
- Technology is based on Sherritt's processing capabilities and experience

3 Process has been proven in pilot testing

Timelines of additional testing and commercialization being developed





# Introduction to Sherritt Metals

Lyle Trytten

General Manager Sustainability



#### **Today's discussion**

- Sherritt and site background
- Responsible production
- JV and Metals Refinery operations
- Utilities and Fertilizers operations
- Tour of facilities



#### **Sherritt and site background**

- Sherritt Gordon Mines Ltd
  - Started as a copper miner, discovered nickel (Sherridon - 1927) (Lynn Lake - 1940s)
  - Developed hydrometallurgical technology (1950s)
- Fort Saskatchewan Refinery
  - Started operation in 1954
  - Lynn Lake mine closed mid-1970's
  - First Moa sulphides 1991



#### Long history of successful operation



#### **Development over the years**

- Developed a JV with Cuban nickel agency in 1994 to secure feed
  - 50% Sherritt, 50% General Niquel de Cuba
  - Moa Nickel mining and processing in Cuba
  - Cobalt Refinery Company refining nickel and cobalt in Canada
  - International Cobalt Company marketing nickel and cobalt products
- Multiple companies operate on original site
- Other businesses developed since 1960:
  - Metallurgical Technologies 1961 (first licensee in 1967)
  - Rolling Mill and Coinage Plant 1961
  - Fertilizer facilities 1965, 1983
  - Specialty Materials and Chemicals 1976

#### **Decades of innovation – business, products, and process**





#### Responsible production – Safety first

- The Fort Site employs ~750 workers
  - 360 Hourly Employees (Unifor) in Operations, Maintenance
  - No labour interruption in history of site (>60 yrs)
  - Culture of collaboration and being in touch with workforce
- Many long-term employees (more than 20 years of service)
  - Dedicated and committed employee base
- Safety focus on leading indicators, monitoring of lagging indicators

Fort Site 5 Year LTI-TRI Frequency/Rate								
	2013	2014	2015	2016	2017	Average		
Year End LTI	0.24	0.24	0.20	0.00	0.11	0.16		
Year End TRI	0.61	0.49	0.81	0.25	0.23	0.48		

#### Committed workforce with deep knowledge



#### **Responsible production - Environmental**

- Greenhouse gases regulated under Alberta law
  - Able to capture process CO2 emissions from Ammonia Plant for use
- Solid process "wastes" are byproducts sold to third parties
- Zero liquid effluent to river
  - Treated in regional sewage treatment plant, including storm water
- Continuous monitoring and improvement to ensure that we meet or exceed environmental standards
  - Regional management becoming the approach in Alberta
  - Smog-forming emissions, groundwater management

#### Good environmental performance, improvements continue



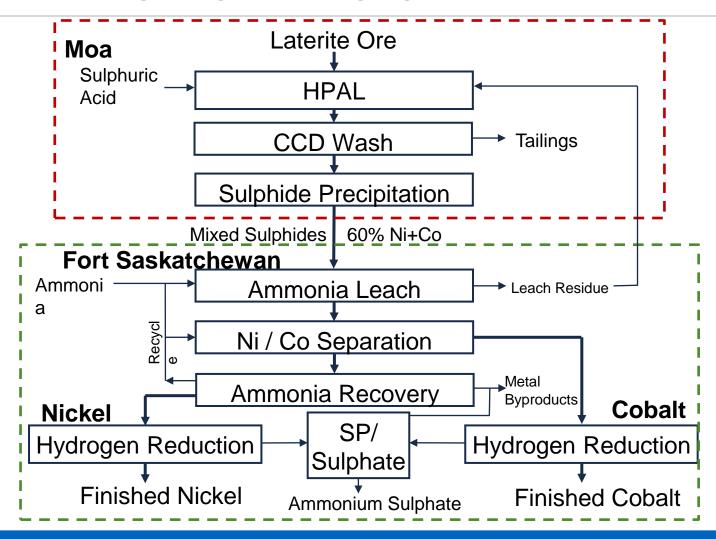
#### Responsible production – sustainable mining

- Supply chain transparency is important to our customers
- Core sustainability commitments: we will
  - Ensure our process feeds are free from human rights abuses
  - No child or forced labour
  - No feeds from identified conflict areas, artisanal and small-scale mining
  - Committed to VPSHR
- Identify risks and manage hazards throughout our business
  - Supply chain, ethics, safety, environment, production, etc.
- Contribute to development of the communities where we operate
- Implement effective engagement with our stakeholders
- Implement TSM (Towards Sustainable Mining) protocols

#### Committed to being a responsible producer



#### **JOINT VENTURE OPERATIONS**



Efficient process with high cobalt recoveries



#### Joint venture products

- Nickel Briquettes
  - Sintered, LME Grade, 99.8%
  - Unsintered, "Steel Grade", 99.4% nickel
- Nickel Powders
  - Coarse, standard and fine grades
- Cobalt Briquettes
  - Sintered, 99.9%
  - Cobalt Powder
  - Coarse grade
- Ammonium Sulphate:
  - $\sim 180,000 \text{ t/y}$
  - Coarse and fine grades







High purity products with good dissolving properties



#### **Utilities and fertilizer operations**

- Ammonia Plant
  - Produce up to 350 t/d for internal use and sale
  - Standard Haber-Bosch process
- Sulphuric Acid Plant
  - Produce up to 800 t/d for internal consumption and sale
  - Operating rate determined by external sales (managed by third party)
- Granulation Plant
  - Ammonium phosphate plant converted to ammonium sulphate in 2003
  - Produce up to 250 t/d granular ammonium sulphate for sale
- Utilities Plant
  - Provides services (steam, air, water, power) to multiple site users
  - Process site effluent, including storm water, for all site companies

#### Utilities and Fertilizers provide security and value





## CLOSING REMARKS

**David Pathe** 

President and CEO

sherritt



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