### FOCUS ON EXPLORATION AND DEVELOPMENT IN A PROLIFIC ZINC DISTRICT

#### TSX: TI

BMO CAPITAL MARKETS 2019 GLOBAL METALS & MINING CONFERENCE FEBRUARY 24-27, 2019

TITAN

# **Forward-Looking Information**

This presentation contains "forward-looking information" within the meaning of Canadian securities laws. In some cases, forward-looking information can be identified by the use of forward-looking terminology such as "plans", "targets", "expects", "is expected", "unique investment opportunity", "is positioned" or "assumes", or variations of such words and phrases or state that certain actions, events or results "may", "could", "would" or "will" occur or be achieved. In addition, any statements that refer to expectations, predictions, indications, projections or other characterizations of future events or circumstances contain forward-looking information. Statements containing forward-looking information are not historical facts, but instead represent management's expectations, estimates and projections regarding future events.

Forward-looking information includes, among other things, statements relating to: estimated C1 cash costs and AISC; future financial or operating performance and condition of the Company, including its ability to continue as a going concern, and its business, operations and properties; the Company's ability to implement its growth strategy to maximize the value of its property holdings; the Company's planned exploration and development activities; costs, timing and results of future exploration and drilling; forecasted trends in the global zinc market, including in respect of the price of zinc; capital and operating cost estimates; economic analyses (including cash flow projections) from the Technical Report; the adequacy of the Company's financial resources; the estimation of mineral resources; the realization of mineral resource estimates; the probability of inferred mineral resources being converted into measured or indicated mineral resources; the production schedule for the Empire State Mines ("ESM") #4 mine; the timing of completion and results of drift rehabilitation and refurbishment of ESM #4 mine; production estimates for ESM #4 mine; the Company's plans for marketing of zinc concentrate produced at the Empire State Mine and mill; any updates to the mine plan for ESM #4 mine and continuation of the drill program at the Empire State Mine; timing, receipt and maintenance of approvals, consents and permits under applicable legislation; the Company's ability to re-negotiate expired leases and the timing thereof; environmental, permitting, legal, taxation, title, socio-economic, community relations or political issues that may adversely affect the Company's current and anticipated operations; the Company's expectations with respect to the payment of dividends; the Company's ability to make scheduled payments of the principal, or to pay interest on or refinance its indebtedness; the Company's expectations with respect to principal shareholders; and the Company's expectation that it will be able to continue to locate and retain employees and consultants with required skills and knowledge.

Forward-looking information is based on opinions, assumptions and estimates made by the Company in light of its experience and perception of historical trends, current conditions and expected future developments, as well as other factors that the Company believes are appropriate and reasonable in the circumstances, as of the date of this presentation, including, without limitation, assumptions about: equity and debt capital markets; the ability to raise any necessary additional capital on reasonable terms; future prices of zinc and other metals; the timing and results of exploration and drilling programs; the likelihood of discovering new mineral resources in the Balmat-Edwards district; the accuracy in the Technical Report of the mine production schedule; the estimated time of completion of drift rehabilitation and refurbishment of ESM #4 mine; the production estimates; the geology and geophysical data of ESM; the accuracy of any mineral resource estimates; the successful integration of ESM into the Company's business; availability of labour; the accuracy of drill sample results at ESM; future currency exchange rates and interest rates; operating conditions being favourable;

political and regulatory stability; the receipt of governmental and third party approvals, licenses and permits on favourable terms; obtaining required renewals for existing approvals, licenses and permits and obtaining all other required approvals, licenses and permits on favourable terms; sustained labour stability; stability in financial and capital goods markets; availability of equipment and the condition of existing equipment being as described in the Technical Report; the absence of any long-term liabilities created by the mining activity in the Balmat region beyond those described in the Technical Report; the accuracy of the Company's accounting estimates and judgments; the impact of adoption of new accounting policies; the Company's ability to satisfy the terms and conditions of its indebtedness; and the timing of a revised mine plan for ESM. There can be no assurance that such estimates made by management prove to be incorrect, actual results and developments are likely to differ, and may differ materially, from those expressed or implied by the forward-looking information contained in this presentation. Accordingly, readers of this presentation are cautioned not to place undue reliance on such information.

Forward-looking information is necessarily based on a number of the opinions, assumptions and estimates that, while considered reasonable by the Company as of the date such statements are made, are subject to known and unknown risks, uncertainties, assumptions and other factors that may cause the actual results, level of activity, performance or achievements to be materially different from those expressed or implied by such forward-looking information, including but not limited to the following factors described in greater detail under the heading "Risks and Uncertainties" in the Company's Management's Discussion and Analysis for the year ended December 31, 2017, available at www.sedar.com: limited operating history; dependence on ESM; refurbishment of the mine and mill; inherent risks of mining; estimates of mineral resources; production decisions based on mineral resources; uncertainty in relation to inferred mineral resources; fluctuations in demand for, and prices of, zinc; production projections and cost estimates for ESM #4 mine may prove to be inaccurate; future requirements for additional capital; profitability of the Company; ability to attract and retain qualified management; title; competition; governmental regulations; market events and general economic conditions; environmental laws and regulations; threat of legal proceedings; rights, concessions and permits; social and environmental activism; land reclamation requirements; Tailings Management Facility and environmental reclamation; insurance; undisclosed liabilities; health and safety; dependence on information technology systems; zinc hedging activities; conflicts of interest; risks inherent in the Company's indebtedness; risks inherent in acquisitions; integration of the mine assets; labour and employment retention/relations; anti-corruption and bribery regulation, including ESTMA reporting; infrastructure; enforceability of judgments; absence of a market for the common shares; fluctuations in price of the common shares; loss of entire investment; significant ownership by Richard W. Warke; future sales of common shares by Richard W. Warke and other directors and officers of the Company; use of proceeds; payment of dividends; currency exchange rate risks; pro forma financial information; public company status; financial reporting and other public company requirements; dilution; and securities analysts' research or reports could impact the price of the common shares. These factors and assumptions are not intended to represent a complete list of the factors and assumptions that could affect the Company. These factors and assumptions, however, should be considered carefully.

Donald Taylor, MSc., PG, Titan's Chief Executive Officer, is a Qualified Person under NI 43-101, and has reviewed and approved the technical contents of this presentation on behalf of Titan.



#### **Overview**

- 100%-owned Empire State Mine ("ESM") in New York State
- Part of the Augusta Group strong track record in exploration and development
- Zinc production in historic mining district
- Focus on exploration and development; driven by best-in-class leadership

Empire	State	Mine,
	New	/ York

Toronto Stock Exchange Symbol	ті
Shares Outstanding	102.0 million
Fully Diluted Shares Outstanding	111.9 million
Market Capitalization (as of 2/21/2019)	C\$87 million

Currency is in US dollars and tonnage is in short tons unless otherwise indicated



# Investment Highlights

Best-in-Class Leadership	<ul> <li>Demonstrated track record in exploration and development. Executive Chair, Richard Warke, and the Augusta Group have generated extraordinary shareholder value</li> <li>Award-winning. CEO Donald Taylor is the recipient of PDAC's 2018 Thayer Lindsley Award for the 2014 discovery of the world-class Taylor lead-zinc-silver deposit in Arizona</li> </ul>
Focus on Optimizing Cash Flow	<ul> <li>Strong board. Experienced, well-rounded and connected directors</li> <li>New mine plan expected H1/19. To include higher-grade New Fold zone in ESM #4 mine and #2D zone</li> <li>Focus on development and exploration. Infill drilling in #2D zone and #4 mine as well as district drilling</li> </ul>
World-Class Exploration Potential	<ul> <li>Highly-prospective district. 100 years of historical data, many new untested ideas and a modern approach to exploration</li> <li>Potential for significant discoveries. Target new discoveries in the 15-30Mt range, grading 10% zinc</li> </ul>



# Our Strategy

# Mission: To deliver extraordinary shareholder value through exploration, development and operational excellence

#### **BEST-IN-CLASS LEADERSHIP**

- Leverage experienced management and directors
- Remain aligned with shareholders – management/directors own 49% of Titan shares
- Attract and retain top talent

Leaders in building long-term value

#### **PRUDENT GROWTH**

- Maximize NAV per share through risk-adjusted returns
- Advance pipeline of low-risk, high-return organic projects
- Realize external opportunities to enhance our North American portfolio
- Maintain a conservative capital structure

#### **OPERATIONAL EXCELLENCE**

- Deliver on expectations
- Innovate to capture efficiencies and lower costs
- Operate to high health, safety and environmental standards
- Invest in our workforce and support skill development for advancement and growth

#### SUSTAINABLE DEVELOPMENT

- Build relationships based on respect, trust and transparency
- Mitigate the impacts of our actions to ensure safety and environmental well-being
- Jointly create long-term positive legacies with our host communities

# **Λ**ΤΙΤΛΝ

# The Right People



 Consistent record of creating shareholder value at Augusta Group



- 25+ years of mineral exploration experience
- Discovered world-class Taylor sulphide deposit winner of PDAC's 2018 Thayer Lindsley Award

15 years' experience

**Richard Warke Executive Chairman** 

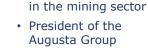


Purni Parikh President

**Jacqueline Allison** 

VP. Investor Relations

and Strategic Analysis





CEO

**Michael McClelland** CFO

- with global mining companies Former CFO of Bisha
  - Mining Share Company, a Nevsun Resources subsidiary



 20 years of capital markets and corporate experience



Kevin Torpy VP, Operations

- 20+ years' experience in mine building and operations
  - Strong focus on safety, efficiency, cost control



#### **Key directors**

• John Boehner, Len Boggio, James Gowans William Mulrow, George Pataki, Robert Wares



Scott Burkett

VP, Exploration

- 10+ years' experience in exploration and ore control
- Instrumental in discovering world-class deposit at Arizona Mining's Hermosa project



### The Augusta Group – Track Record in Exploration and Development



La Bodega gold project (Colombia)

SOLD in 2011 for ~C\$1.6B

12,960% share price increase



Rosemont copper project (Arizona)

#### SOLD in 2014 for ~C\$666M

3,300% share price increase



Hermosa-Taylor zinc-lead-silver project (Arizona)

SOLD in 2018 for ~C\$2.1B

6,100% share price increase



Castle Mountain gold project (California)

MERGED into EQX in 2017 for ~C\$200M

700% share price increase

#### **Current companies:**

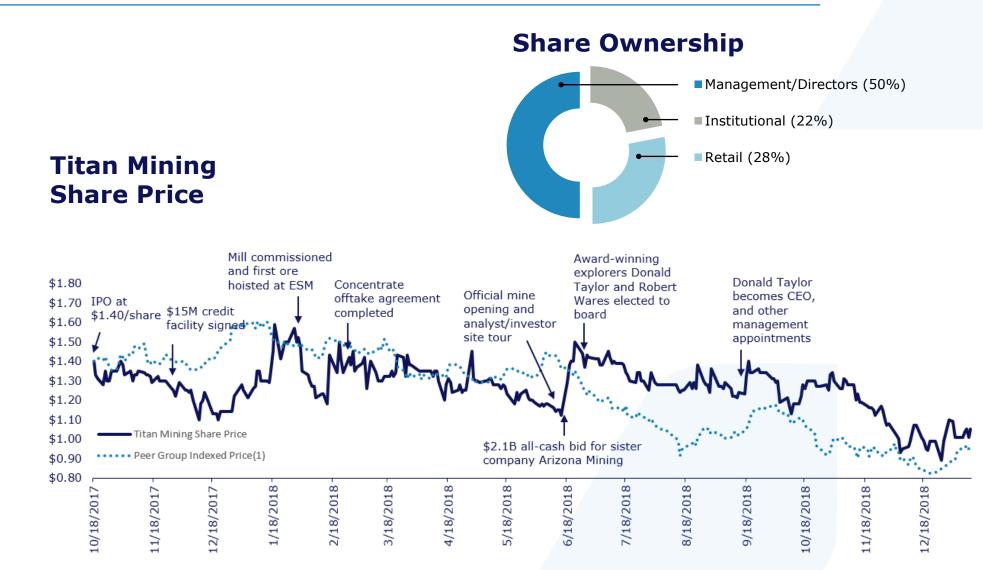




Note: The results for Ventana Gold Corp., Augusta Resource Corp., NewCastle Gold Ltd. and Arizona Mining Inc. are independent of the results of Titan Mining Corp. and Tethyan Resources plc and are no guarantee of the future performance of these companies. Undue reliance should not be placed thereon when considering an investment in Titan Mining Corp. or Tethyan Resources plc.



# **Consistently Aligned** with Shareholders

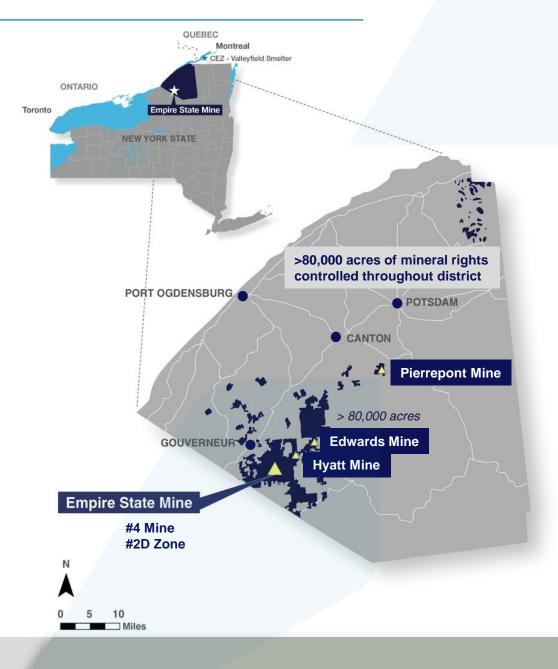


(1) Peer group includes Ascendant Resources, Capstone Mining, Copper Mountain Mining, Ero Copper, Hudbay Minerals, Imperial Metals, Nexa Resources, Sherritt International, Taseko Mines and Trevali Mining.



# **Empire State Mine: Focused on Exploration** in a 100-Year-Old Zinc District

- Producing zinc concentrate
- Local employer, benefiting St. Lawrence County in northern New York
- Long-term zinc concentrate offtake agreement with Glencore – transportation within North America
- Historic production 44M tons milled at average grade of 9.4% zinc from 7 mines within 30-mile radius of mill





Shipment of zinc concentrate leaving site



# **Near-Mine and District Exploration**

- Production supported by current mineral resources with potential for near-mine resource additions
  - Current source is ESM #4 mine multiple zones; Mahler and Mud Pond zones in production, New Fold zone in development
  - New development frontier in #2 mine #2D zone to be incorporated in new mine plan in mid-2019
  - Future discoveries expected through near-mine exploration
  - Targeting large, high-grade deposits (15 to 30+ Mt at 10% zinc) new ideas and modern approach to exploration led by award-winning<sup>1</sup> team



Underground crusher at 3,100 level

<sup>1</sup>: Donald Taylor is the recipient of PDAC's 2018 Thayer Lindsley Award



Office building and 3,800 tpd shaft



5,000 tpd processing plant



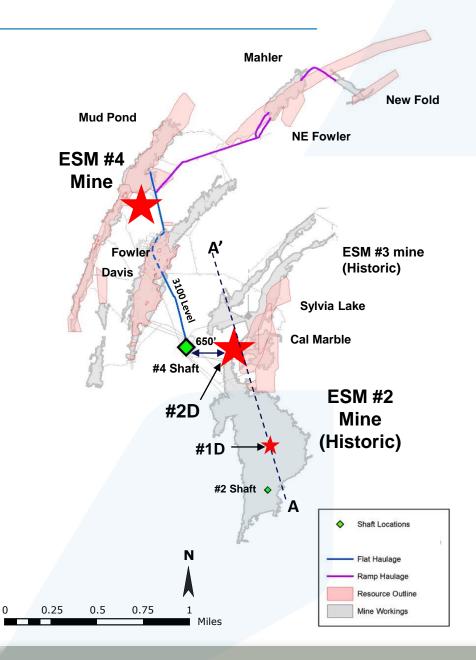
Fully equipped maintenance shop capable of servicing all equipment



# Excellence in Exploration

# Plan view of ESM #4 mine and #2D zone

- #4 mine drilling potential zone extensions and increasing confidence for mine design
- #2D zone<sup>1</sup> major extension of zone mined in historic #2 mine; 650 feet east of #4 shaft; historic infrastructure in place; open downplunge and laterally
- #1D potential extension of historically-mined zone

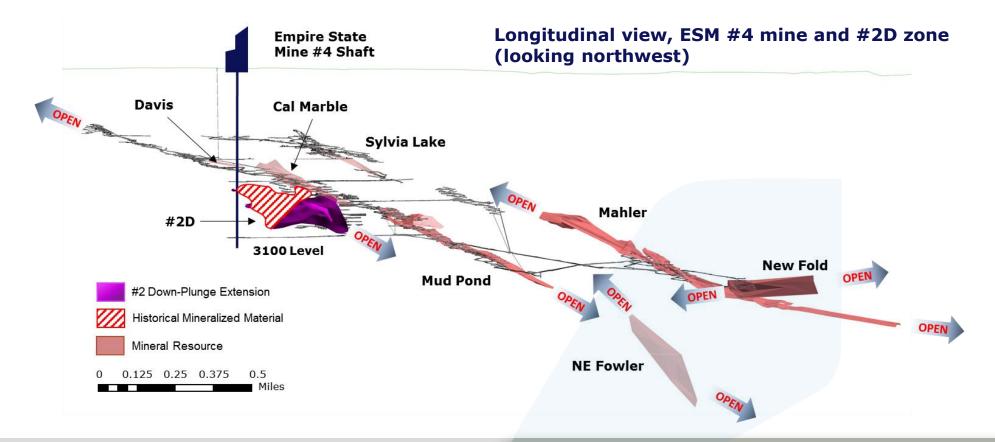


<sup>1</sup> New mine plan to incorporate #2D – expected mid-2019

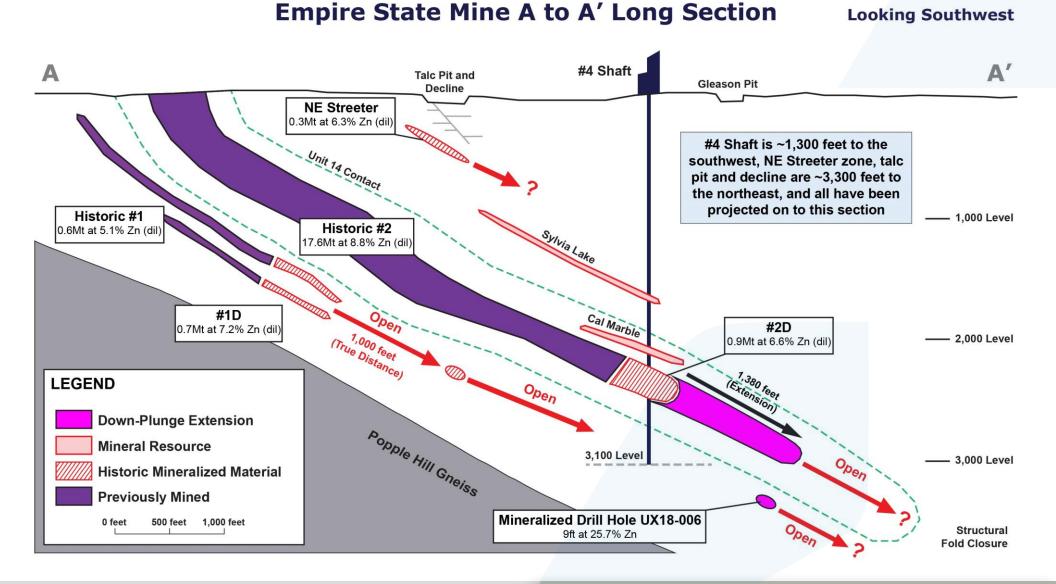


# Realizing Mineral Resource Expansion Potential at ESM #4 Mine and #2D Zone

- #4 mine mineralized zones generally plunge to northeast; potential to extend zones upand down-plunge
- #2D zone More than 2,000 feet of strike length and open down-plunge and laterally; connected by historic infrastructure on 2500 level to the #4 shaft



# Major Down-Plunge Extension of #2D Zone (Longitudinal View)

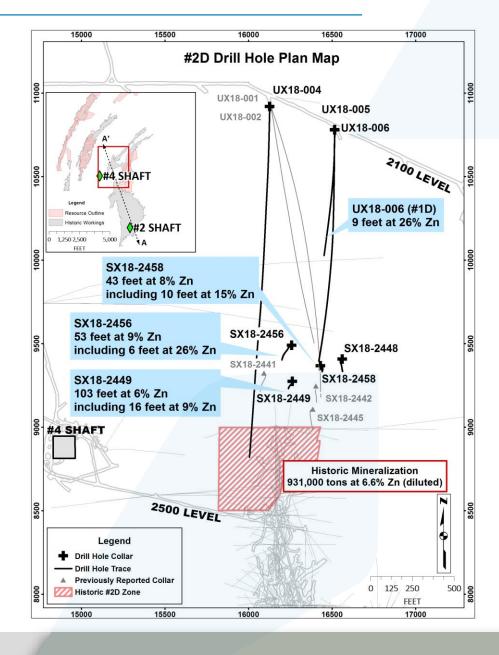


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#### OPERATIONAL EXCELLENCE

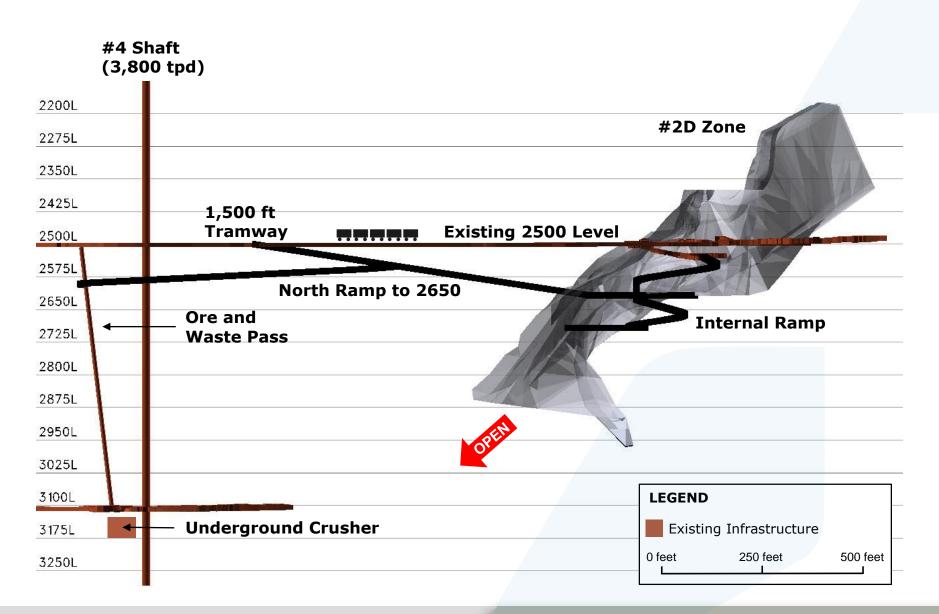
### **#2D Zone –** Focus on Near-Term Expansion and Development

- Mineralization remains open in several directions
- Bulk-minable area of thicker, high-grade mineralization extends down-plunge and may be associated with a fold hinge
- Preliminary engineering design underway





#### **#2D Zone –** Longitudinal View Looking Northeast





#### **#2D Zone – Existing Infrastructure Connected to #4 Shaft**



Locomotive and rail cars on 1,500-ft tramway on 2500 level



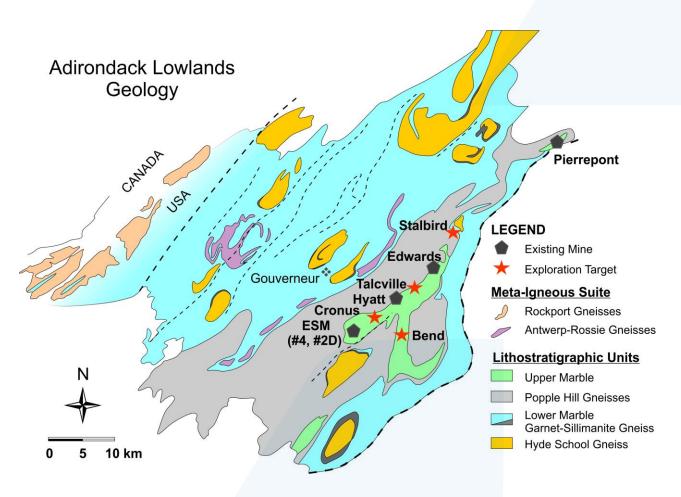
Rehab underway at #2D zone



## **New Ideas for a Prolific Zinc District**

#### **Exploration targets** throughout district

- Targeting large, high-grade deposits in the 15 to 30+ Mt range
- Multiple targets identified along trend northeast of ESM and south of Hyatt
- Target areas exhibit favourable host rocks, prospective structures and surface expressions of zinc mineralization
- Untested geophysical targets generated from 2008 VTEM survey
- Drill site selection from ongoing compilation and review of existing data within target areas





#### **Our Catalyst-Rich Path**

~	Recommissioning (Q4 2017)	<ul> <li>Refurbishment of existing infrastructure and equipment</li> <li>Reconditioning and restarting the mobile equipment fleet</li> <li>General rehabilitation of the underground workings</li> </ul>
✓	First ore skipped (January 2018)	<ul> <li>Development of new ramps, drifts and stopes concurrent with capitalized pre-commercial production</li> </ul>
~	Concentrate offtake agreement	<ul> <li>Long-term contract with Glencore</li> <li>Concentrate to be transported within North America – simple, low-risk logistics</li> </ul>
~	Mineral resource update (Q1 2018)	<ul> <li>Mineral resource expansion completed in Q1 and announced early April</li> <li>Updated PEA filed in May<sup>(1)</sup></li> </ul>
~	2018 exploration program (Q1 2018)	<ul> <li>\$5M budget for regional exploration, including 40,000 feet of diamond core drilling</li> <li>Success-based budget – potential to add drills</li> </ul>
1	Exploration results (Q4 2018)	Ongoing drill program and review of historical data
	Updated LOM plan (mid-2019)	Economic analysis to include #2D zone
	Exploration updates	• Ongoing

(1) Technical report "NI 43-101 Preliminary Economic Assessment Updated Technical Report, Empire State Mines, Gouverneur, New York, USA", dated May 24, 2018.



### **Our Approach to Sustainibility**

#### Guiding Approach

- Our employees are governed by a commitment to integrity, trust, community involvement as well as environment and social stewardship
- Our projects are developed with the goal of delivering long-term mutual economic benefits for employees, communities, local governments and shareholders
- We strive to minimize the environmental, social and safety impacts of our activities through innovation and the use of technology
- A key measure of a successful project is defined by direct engagement and transparent discussions by our company with the surrounding communities which we impact

#### INTEGRITY AND TRUST

- We listen, communicate and respond to community stakeholders in an open, respectful and timely manner
- We build and reinforce our relationships through transparency
- We back up our commitments with action
- We comply with both the letter and spirit of laws, regulations and permits

#### COMMUNITY INVOLVEMENT

Committed to localization and building partnerships that deliver long-term mutual benefits

#### ENVIRONMENTAL AND SOCIAL STEWARDSHIP

- We mitigate the impacts of our actions to ensure the safety and environmental, well-being of the areas in which we operate
- We work jointly with communities to create positive, long-term legacies that benefit future generations
- We carefully manage the natural resources of our projects, and minimize our environmental footprint through sound business decisions
- We promote local economic development by hiring and buying locally
- We partner and invest in workforce training so workers have the skills for future advancement and growth
- We use our projects as a catalyst to expand economic development and community investment for the benefit of local residents, community organizations and local governments



# APPENDIX



# OFFICIALLY OPENED BY

Dilution control Zinc market Analyst coverage

Empire State Mine historic production, ore types and exploration

#### TITAN

Mineral resources Historic mineralized material write-downs

Management, directors and advisors

Technical report Qualified Persons

MINING CORP. 2 JUNE 2018

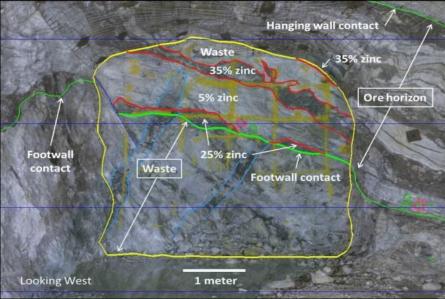
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# Dilution Control

# Rigorous grade control is key

- On-shift grade control geologist
- Disciplined approach to sourcing incremental zinc mineralization
- Implementation of optical ore/waste sorting technology
- Tighter stope design

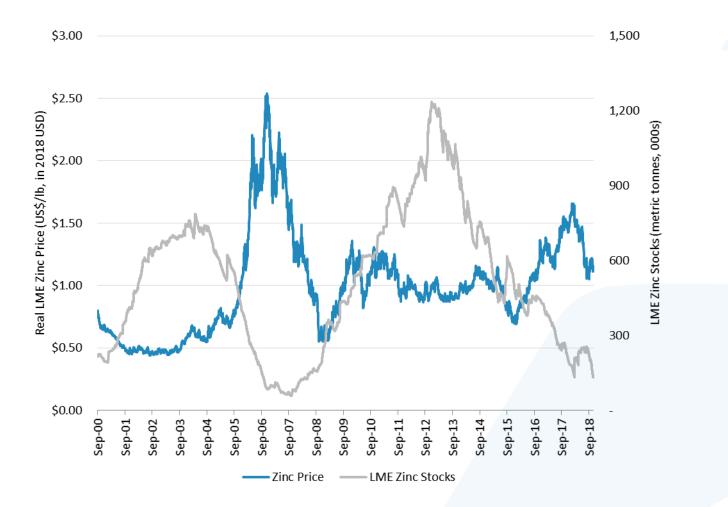






### **Outlook for Zinc Prices Remains Positive**

# As a pure zinc producer, Titan benefits from elevated zinc prices supported by low inventories



Source: LME and U.S. Federal Reserve



### Zinc Market Balance

#### Zinc Supply/Demand Forecast (`000 Tonnes)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	2023E
GROSS TOTAL MINE PRODUCTION	11,292	12,121	12,529	12,831	12,903	12,988	13,123	12,148	12,635	13,197	14,423	14,852	15,154	15,313	15,248
LESS: DISRUPTION ALLOWANCE @ 4.0%										(53)	(577)	(594)	(606)	(613)	(610)
NET TOTAL MINE PRODUCTION	11,292	12,121	12,529	12,831	12,903	12,988	13,123	12,148	12,635	13,144	13,846	14,257	14,548	14,701	14,638
Mined Zn production growth %	-2.2%	7.3%	3.4%	2.4%	0.6%	0.7%	1.0%	-7.4%	4.0%	4.0%	5.3%	3.0%	2.0%	1.1%	-0.4%
												-	_		
CONCENTRATE SURPLUS/(DEFICIT)	248	-380	-217	734	418	141	-170	-884	-270	0	0	0	0	0	0
REFINED ZINC PRODUCTION	11,175	12,715	12,969	12,453	12,935	13,233	13,716	13,582	13,520	10.750	14 407	14.055	45 474	15 244	15.301
Refined Zn production growth %	-2.7%	13.8%	2.0%	-4.0%	3.9%	2.3%	3.6%	-1.0%	-0.5%	13,759 1.8%	14,407 4,7%	14,855 3,1%	15,171 2,1%	15,344 1.1%	-0.3%
Reined 211 production growth %	-2.770	13.070	2.070	-4.070	3.370	2.370	3.070	-1.070	-0.376	1.070	4.770	3.170	2.170	1.170	-0.370
CONSUMPTION	10.102	11.626	12.390	12.645	13.029	13.534	13.670	13.974	14.232	14.321	14,435	14.633	14.879	15,146	15.413
Global consumption growth %	-9.8%	15,1%	6.6%	2.1%	3.0%	3.9%	1.0%	2.2%	1.8%	0.6%	0.8%	1.4%	1.7%	1.8%	1.8%
crobal contamption growth ye	0.070	10.170	0.070	2.170	0.070	0.070		2.270		0.070	0.070			1.070	
NET SURPLUS/(DEFICIT)	1,073	1,089	579	(192)	(94)	(301)	46	(392)	(712)	(562)	(28)	222	291	198	(112)
Total exchange inventories (LME/SHFE/Bonded)	660	1,012	1,186	1,554	1,210	885	747	741	401	201	173	394	686	884	771
Days of forw ard consumption	24	32	35	45	34	24	20	19	10	5	4	10	17	21	18
Total inventories (exchange + non-exchange)	2,448	3,683	4,334	4,141	4,048	3,746	3,793	3,399	2,684	2,122	2,094	2,315	2,606	2,804	2,692
Days of forw ard consumption	88	116	128	120	113	101	101	89	69	54	53	58	64	68	64
LME spot price (USD/lb)	\$0.74	\$0.98	\$1.00	\$0.88	\$0.87	\$0.98	\$0.88	\$0.95	\$1.31	\$1.33	\$1.20	\$1.20	\$1.15	\$1.10	\$1.05
Chinese Zn mine production	3,189	3,720	4,227	4,588	4,738	4,901	4,768	4,720	4,735	4,650	4,857	4,908	4,981	5,054	5,132
Chinese Zn mine production grow th %	1.5%	16.6%	13.6%	8.6%	3.3%	3.4%	-2.7%	-1.0%	0.3%	-1.8%	4.4%	1.0%	1.5%	1.5%	1.5%
Chinese Zn mine production as a % total	28.2%	30.7%	33.7%	35.8%	36.7%	37.7%	36.3%	38.9%	37.5%	35.2%	33.7%	33.0%	32.9%	33.0%	33.7%
Consumption Growth by Region %															
China	8.0%	14.8%	10.0%	6.5%	6.9%	5.7%	3.1%	3.9%	2.3%	1.2%	1.0%	1.5%	1.8%	2.0%	1.9%
Rest of Asia (Ex China)	-15.8%	19.5%	2.4%	1.1%	3.5%	3.4%	-2.3%	3.6%	3.8%	-1.1%	0.2%	1.7%	2.6%	2.7%	2.8%
Europe	-27.1%	20.4%	5.4%	-6.7%	-1.0%	1.9%	2.3%	-0.3%	2.3%	1.7%	0.9%	0.9%	0.9%	0.9%	0.9%
North America	-9.7%	1.9%	5.6%	6.9%	-1.3%	4.7%	-3.5%	3.2%	-4.0%	-0.1%	-0.1%	0.4%	0.5%	0.5%	0.5%
Latin America	-20.5%	11.6%	3.4%	2.8%	-1.5%	-1.4%	-5.9%	0.5%	-0.5%	3.8%	2.0%	2.0%	2.0%	2.0%	2.1%
Rest of world	-12.7%	13.8%	5.1%	-6.6%	-5.5%	0.4%	3.9%	-8.9%	0.6%	-3.6%	1.5%	1.7%	1.6%	1.6%	1.6%
Consumption Mix by Country/Region:	40.00/	40.40	44 70/	40.00/	45.00/	40.40/	47.004	47 70/	40.00/	40.00	40.004	40.40	40.404	40.50	40.00/
China Past of Asia (Ex China)	40.6% 18.9%	40.4% 19.6%	41.7% 18.8%	43.6% 18.7%	45.3% 18.8%	46.1% 18.7%	47.0% 18.1%	47.7% 18.3%	48.0% 18.7%	48.2% 18.3%	48.3% 18.2%	48.4% 18.3%	48.4% 18.5%	48.5% 18.6%	48.6% 18.8%
Rest of Asia (Ex China)	18.9%		18.8%	18.7%	18.8%	18.7%	16.8%		18.7%	18.3%	18.2%	18.3%	18.5%	18.0%	18.8%
Europe		19.5% 8.9%		9.3%	16.9%	9.0%	16.8%	16.4% 8.7%		10.7%				7.8%	
North America Latin America	10.1% 5.3%	5.1%	8.9% 5.0%	9.3%	4.8%	9.0%	4.2%	4.2%	8.2% 4.1%	4.2%	8.0% 4.2%	8.0% 4.3%	7.9% 4.3%	4.3%	7.7% 4.3%
Rest of world	6.5%	6.4%	6.3%	5.8%	4.0%	4.0%	4.2%	4.2%	4.1%	4.2%	4.2%	4.5%	4.5%	4.5%	4.5%
rvest or world	0.0%	0.4%	0.3%	0.0%	0.3%	0.1%	0.3%	4.7%	4.7%	4.0%	4.0%	4.0%	4.0%	4.0%	4.070

Source: Wood Mackenzie, Scotiabank GBM estimates – January 14, 2019



#### Western World Mine Closures vs Forecast New Supply

#### Western Mine Closures vs Chinese Growth, New Projects and Mine Restarts ('000 Tonnes)

	· · ·										
Major Mine Closures/Depletions	2014A	2015A	2016A	2017A	2018E	2019E	2020E	2021E	2022E	2023E	
Brunswick	-	-	-	-	-	-	-	-	-	-	
Century	466	393	17	-	-	-	-	-	-	-	
Lisheen	133	103	-	-	-	-	-	-	-	-	
Perseverance	-	-	-	-	-	-	-	-	-	-	
Skorpion	130	80	99	81	59	97	115	60	-	-	
Total	729	576	116	81	59	97	115	60	-	-	
YoY Change	(140)	(153)	(460)	(35)	(22)	38	18	(55)	(60)	-	
Total Chinese Production	4,901	4,768	4,720	4,735	4,650	4,857	4,908	4,981	5,054	5,132	
YoY Change	163	(133)	(48)	15	(85)	207	51	73	73	78	
Non-Chinese Zn Production Growth											
Antamina	211	229	198	372	417	421	416	404	344	344	
Bisha	-	-	41	95	115	121	136	126	76	-	
Castellanos	-	-	-	5	45	70	70	70	70	70	
Century Tailings	-	-	-	-	34	120	225	270	270	270	
Dugald River	-	-	-	12	130	170	170	170	170	170	
Gamsberg	-	-	-	-	35	200	250	250	250	250	
Kipushi						-	-	50	150	200	
Neves Corvo	67	62	70	71	75	74	125	159	154	176	
Penasquito	176	208	140	161	232	245	229	200	229	262	
Shalkiya	-	-	-	-	-	-	6	60	80	100	
Taylor						-	-	11	126	216	
Zhairem	-	-	-	-	-	-	85	130	160	160	
Total	454	499	448	717	1,083	1,421	1,712	1,900	2,079	2,218	
YoY Change	(8)	45	(50)	269	366	338	290	188	180	138	
Restarts of Idled Capacity											
Aljustrel	-	-	-	-	75	100	80	80	80	80	
Balmat-Empire State	-	-	-	-	16	34	54	60	53	60	
Middle Tennessee	47	47	-	22	44	65	70	70	70	70	
Iscaycruz	84	77	-	-	-	-	-	40	80	80	
McArthur River	74	118	12	15	34	115	120	120	120	120	
Mount Isa Pb/Zn (Lady Loretta)	437	478	288	226	280	430	450	450	450	450	
Total Restarts	642	720	300	263	449	744	774	820	853	860	
YoY Change	67	78	(420)	(37)	186	296	30	45	33	7	
All other mines	6,269	6,556	6,567	6,818	6,955	7,304	7,343	7,394	7,328	7,039	
YoY Change	2	287	11	251	137	349	39	51	(66)	(289)	
TOTAL	12,995	13,119	12,152	12,615	13,197	14,423	14,852	15,154	15,313	15,248	1
YoY Change		124	(968)	463	582	1,227	428	302	159	(65)	2
Cumulative Additions(Deletions)		124	(843)	(381)	201	1,428	1,856	2,159	2,318	2,253	

Note: Analysis is before supply disruption

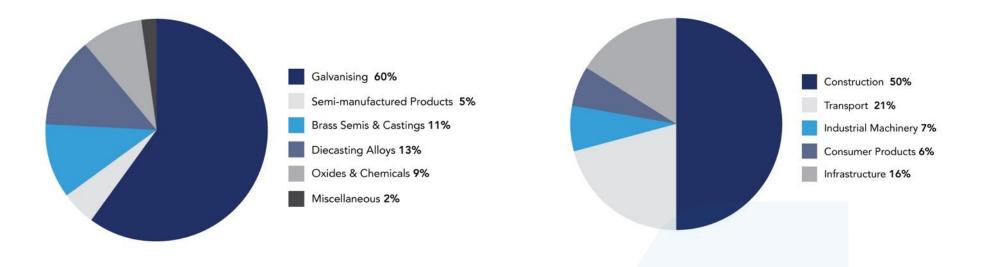
Source: Wood Mackenzie, Scotiabank GBM estimates – January 14, 2019



#### Zinc Uses

#### Global Zinc Consumption by First Use

#### Global Zinc Consumption by End Use



Source: Wood Mackenzie and RBC Capital Markets

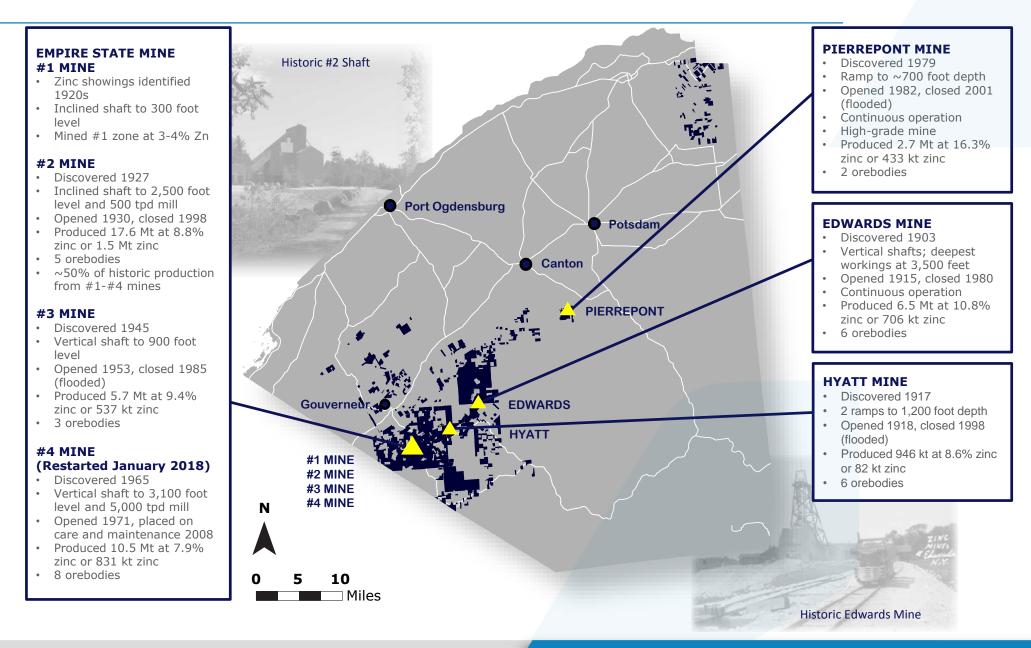




Analyst	Company
Dalton Baretto	Canaccord Genuity
Shane Nagle	National Bank Financial
Orest Wowkodaw	Scotiabank
Daniel Earle	TD Securities



# **Empire State Mine: Historic Production**





# **Empire State Mine – Types of Mineralization**

#### Primary (parent) mineralization

- Conformable lenses (175m x 750m)
- Sphalerite with pyrite and minor galena
- ~1.0-3.0 Mt @ 11.5-14.5% Zn

# Remobilized (daughter) mineralization

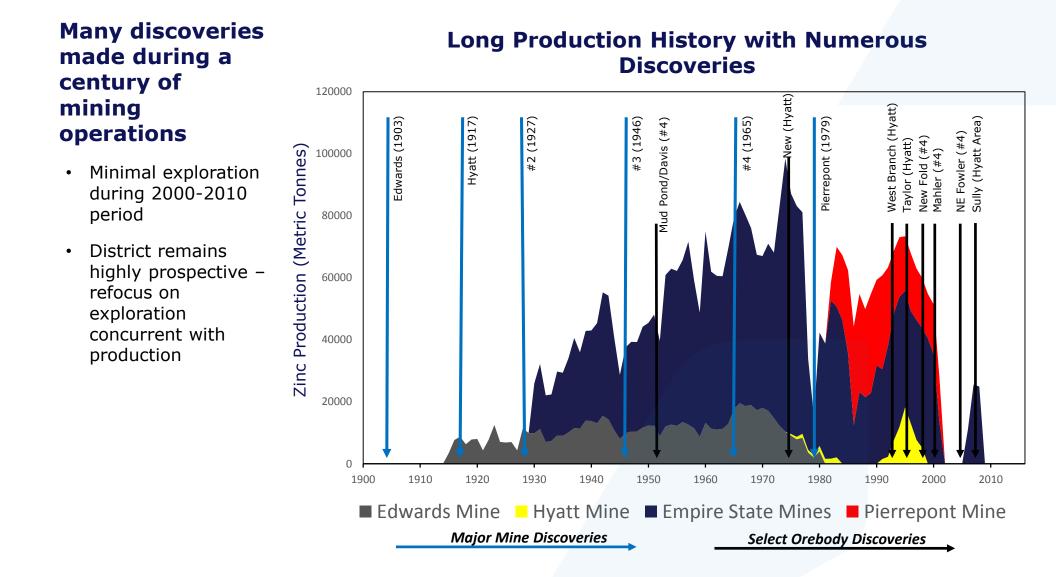
- Cross-cutting, elongate trends (125m x ~2000m)
- Sphalerite with minor pyrite
- ~1.5-4.5 Mt @ 8% Zn







### **History of Exploration Success Plus Potential for Additional Discoveries**

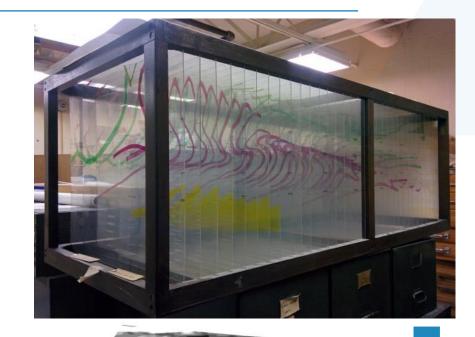




# First Priority – Mining Historical Data

# Compiling, digitizing and modelling existing data

- 100 years of historical exploration ~800 kilometers of available drill data
- Consolidating and assessing exploration data from multiple programs and operators
- Previous (re)discoveries based on examination of historical data
  - Red Lake-Dickenson (Goldcorp)
  - Sigma-Lamaque (Integra Gold)
  - Horne 5 Project (Falco)





- Inversion of airborne
   VTEM
- High precision LIDAR topo
- Digitization and synthesis of geological mapping
- Transition to modern core logging scheme
- 3D modelling of geology, ore shells and mine workings



### Mineral Resources

#### Mineral Resources at Empire State Mine #4 Mine as at January 31, 2018

	Меа	sured	Indicated		Measured	& Indicated	Inferred		
Mineralized Zones	`000 Tons	Grade (% Zn)							
Mud Pond	337.0	10.40%	285.2	10.87%	622.2	10.61%	1,390.5	10.68%	
New Fold	68.0	12.75%	249.6	11.72%	317.6	11.94%	539.4	13.97%	
Mahler	400.5	15.89%	700.9	15.27%	1,101.4	15.50%	516.6	15.59%	
Other Mineralization	44.9	10.73%	83.5	10.16%	128.4	10.36%	2,969.6	12.55%	
Total	850.4	13.19%	1,319.2	13.33%	2,169.6	13.27%	5,416.1	12.50%	

Notes:

(1) Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no certainty that all, or any part, of the mineral resources estimated will be converted into mineral reserves.

(2) The underground mining economics used operating costs of \$70/t, and a zinc price of \$1.00/pound at 96% recovery.

(3) Tonnage is reported to the nearest 100 tons, and grades are rounded to the nearest two decimal places.

(4) Rounding as required by reporting guidelines may result in apparent summation differences between tons, and grade.

(5) Mineral resources were completed by Allan Reeves, P.Geo., President of Tuun Consulting Inc.



### Historic Mineralized Material Write-Downs<sup>(1),(2)</sup>

			Proven Or	e		Probable Ore		Proven	Ore and Proba	able Ore		Inferred Ore	
Year	Area	Tons	Zinc Grade	Contained Zinc									
1985	Balmat (No. 2 and No.4)	824,225	7.11%	58,602	860,620	7.41%	63,772	1,684,845	7.26%	122,374	1,096,800	6.84%	75,021
1985	Balmat No. 2 Mine - Shaft Pillar	-	-	-	222,700	7.63%	16,992	222,700	7.63%	16,992	-	-	-
1992	Balmat Mine – Low Grade Reserves	-	-	-	130,162	7.60%	9,895	130,162	7.60%	9,895	-	-	-
2001	Mud Pond Pillars	105,000	10.30 %	10,815	-	-	-	105,000	10.30%	10,815	-	-	-
1976	Balmat No.3 Mine – Upper Gleason Pillars	20,000	12.00 %	2,400	-	-	-	20,000	12.00%	2,400	-	-	-
1985	Pierrepont	6,800	6.00%	408	123,100	6.97%	8,575	129,900	6.92%	8,983	-	-	-
1998	Hyatt Mine	79,246	7.78%	6,166	101,533	4.75%	4,818	180,779	6.08%	10,984	315,969	6.37%	20,124
Total		1,035,271	7.57%	78,391	1,438,115	7.24%	104,052	2,473,386	7.38%	182,443	1,412,769	6.73%	95,145

(1) Contained zinc is expressed in tons.

(2) Refer to Table 6.5 in technical report entitled "NI 43-101 Preliminary Economic Assessment Technical Report on the Empire State Mines, Gouverneur, New York, USA", dated September 19, 2017. The Company's objective is to evaluate potential exploration targets consisting of the historical probable and proven ores and remnants at the Empire State Mines. The Company does not treat the historical estimates as a current mineral resource or mineral reserve. A Qualified Person has not done sufficient work to classify these historical estimates as a current mineral resource. The Company believes that this historic proven ore, historic probable ore and historic inferred ore are relevant to its prospects to extract additional mineralized material at the Empire State Mines, however, the Company is not basing its production decision on the historical estimates.



#### **Experienced Management**

**Donald Taylor** *Chief Executive Officer*  Purni Parikh President Michael McClelland Chief Financial Officer

#### Donald Taylor has 30 years of mineral exploration experience with precious and base metals on five continents, taking projects from exploration to mine development. He is the recipient of the Prospectors and Developers Association of Canada's 2018 Thayer Lindsley Award for the 2014 discovery of the Taylor lead-zinc-silver deposit in Arizona. Mr. Taylor has worked extensively for large and small cap companies, including Arizona Mining, BHP Minerals, Bear Creek Mining, American Copper and Nickel, Doe Run Resources and Westmont Mining Company. He is a Licensed Professional Geologist in several eastern and western states and a qualified person as defined by National Instrument 43-101. Mr. Taylor has a Bachelor of Science degree in Geology from Southeast Missouri State University and a Master of Science degree from the University of Missouri at Rolla.

Purni Parikh has more than 25 years of public company experience in the mining sector including corporate affairs and finance, legal and regulatory administration, and governance. She is President of the Augusta Group of Companies, and was previously Senior Vice President. Corporate Affairs and Corporate Secretary of Arizona Mining Inc. and Vice President, Corporate Secretary of Newcastle Gold Ltd., Augusta Resource Corporation and Ventana Gold Corp. prior to their acquisition. Ms. Parikh obtained a Certificate in Business from the University of Toronto and a Gemology degree, Ms. Parikh is also an Accredited Director, and has worked extensively with boards.

Michael McClelland has over 15 years of experience in accounting and finance. He was formerly the Chief Financial Officer of Bisha Mining Share Company, an operating subsidiary of Nevsun Resources. He previously worked for Goldcorp as the Mine General Manager at Wharf Resources (now owned by Coeur Mining), and prior to that was Director of Finance, Canada and USA. Mr. McClelland started his career at KPMG LLP as a Senior Accountant with the mining group. He is a Chartered Accountant and has a Bachelor of Arts in Economics from Simon Fraser University in British Columbia, Canada.

#### **Jacqueline Allison**

*VP, Investor Relations and Strategic Analysis* 

Jacqueline Allison has 20 years of capital markets and corporate experience. She was previously Vice President, Investor Relations for Dominion Diamond, and Director, Investor Relations for Hudbay Minerals. Prior to that, Ms. Allison served as Vice President and Research Director, Fundamental Equities for BMO Asset Management, and Vice President, Canadian Equities for Natcan Investment Management. She is a Chartered Financial Analyst and Professional Geoscientist with a PhD in Mineral Economics from McGill University in Quebec, Canada.



#### **Experienced Management, cont'd**

**Kevin Torpy** 

VP, Operations

Scott Burkett VP, Exploration

Scott Burkett has over 10 years of experience in mineral exploration, ore control, geologic modeling, resource estimation and database management. Mr. Burkett earned his BSc in Geology from the University of Idaho, and has since worked on a number of base and precious metal exploration projects at various stages, ranging from grassroots to advanced exploration. Prior to joining Titan Mining, he worked for Arizona Mining Inc. where he served as Chief Geologist for the Hermosa Project, and was instrumental in designing programs which resulted in significant expansion of the mineral resources. Mr. Burkett also brings experience in exploration and ore control from previous roles at Metal Mining Consultants Inc., First Solar, Hycroft Resources & Development, Inc. (Allied Nevada Gold) and Yamana Gold, Inc.

Kevin Torpy is a mining engineer with over 20 years of experience developing underground mines, primarily in remote northern locations. He was previously General Manager at Pretium Resources' Brucejack Mine and Project Mine Engineer with Silver Standard

Resources, Mr. Torpy has also

worked as Technical Services

Project, Operations Engineer

Superintendent at Coeur

d'Alene Mines' Kensington

at Teck's Pogo Mine and

Project Engineer for JS

Redpath.

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APPENDIX

#### **Directors**

Richard Warke Executive Chairman

John Boehner Director

#### Lenard Boggio Director

#### **Gregory Clark** Director

Richard Warke is a Vancouverbased mining executive with more than 25 years of experience in the mining industry. He is the founder and Executive Chairman of Titan Mining, part of the Augusta Group of Companies which he founded in 2005. The Augusta Group previously included Ventana Gold Corp., which sold for ~C\$1.6 billion in 2011, Augusta Resource Corporation, which sold for ~C\$666 million in 2014, and Arizona Mining Inc. which sold for ~C\$2.1 billion in 2018. In addition, Mr. Warke acquired control of Newcastle Gold Ltd. in 2016 and was Executive Chairman until its merger to form Equinox Gold in December 2017.

John Boehner served as the 53rd Speaker of the United States House of Representatives from 2011 to 2015. A member of the Republican Party, Mr. Boehner was the U.S. Representative from Ohio's 8th congressional district, serving from 1991 to 2015. He previously served as the House Minority Leader from 2007 until 2011, and House Majority Leader from 2006 until 2007. Following his career in government service, Mr. Boehner joined Squire Patton Boggs, a global law and public policy firm. He earned a Bachelor of Arts in business administration from Xavier University.

Len Boggio was formerly a partner of PricewaterhouseCoopers LLP (PwC) where he served for more than 30 years until his retirement in May 2012. During that time, he was Leader of the B.C. Mining Group of PwC, a senior member of PwC's Global Mining Industry Practice and an auditor of Canadian, U.S. U.K. and other internationallylisted mineral resource and energy clients. Mr. Boggio is a Fellow of the Chartered Professional Accountants of Canada (FCPA, FCA) and has served as president of the British Columbia Institute of Chartered Accountants and chairman of the Canadian Institute of Chartered Accountants.

Greg Clark has been retired since 2013, prior to which he was a Licensed Aircraft Technician in the Heavy Maintenance Department at Canadian Airlines and, subsequently, Air Canada.



#### **Directors, cont'd**

#### James Gowans

# William Mulrow Director

Purni Parikh Director

#### George Pataki Director

James Gowans has more than 30 years' experience in mineral exploration, feasibility studies, construction and operations, including at the Red Dog and Polaris mines. Mr. Gowans was formerly President and CEO of Arizona Mining Inc., and Co-President and EVP & COO of Barrick Gold. Prior roles include Managing Director of Debswana Diamond Company (Pty) Ltd., President & CEO of De Beers Canada Inc., COO & SVP of International Nickel Indonesia tbk PT, and EVP of Placer Dome Inc.

William Mulrow is a Senior Advisor at the Blackstone Group, an alternative asset manager. Previously, he was Director of Global Capital Markets at Citigroup, Inc., Managing Director of Paladin Capital Group, Senior Vice President and Head of New Product Development at Gabelli Asset Management (now GAMCO Investors), Managing Director in Corporate Finance for Rothschild Inc., and Managing Director and Head of Public Finance Banking for Donaldson, Lufkin and Jenrette Securities Corporation. He is a graduate of the Kennedy School of Government at Harvard University and of Yale College where he graduated Cum Laude and was a Rhodes Scholar finalist.

Purni Parikh has more than 25 years of public company experience in the mining sector including corporate affairs and finance, legal and regulatory administration, and governance. She is President of the Augusta Group of Companies, and was previously Senior Vice President, Corporate Affairs and Corporate Secretary of Arizona Mining Inc. and Vice President, Corporate Secretary of Newcastle Gold Ltd., Augusta Resource Corporation and Ventana Gold Corp. prior to their acquisition. Ms. Parikh obtained a Certificate in Business from the University of Toronto and a Gemology degree, Ms. Parikh is also an Accredited Director, and has worked extensively with boards.

George E. Pataki is the cofounder and Chairman of the Pataki-Cahill Group, a specialized development firm, and serves as Senior Counsel to the international law firm Norton Rose Fullbright. Previously, he served three terms as the 53rd Governor of the State of New York from 1995 to 2006, being elected after serving consecutively as the mayor of Peekskill, an assemblyman in the New York State Legislature, and as a senator in the New York State Senate, Mr. Pataki has vast experience serving on the boards of international conglomerates, private equity firms, and venture capital funds.



#### **Directors, cont'd, & Advisor**

#### **Directors**

#### **Donald Taylor** Director

Donald Taylor has 30 years of mineral exploration experience with precious and base metals on five continents, taking projects from exploration to mine development. He is the recipient of the Prospectors and Developers Association of Canada's 2018 Thayer Lindsley Award for the 2014 discovery of the Taylor lead-zinc-silver deposit in Arizona. Mr. Taylor has worked extensively for large and small cap companies, including Arizona Mining, BHP Minerals, Bear Creek Mining, American Copper and Nickel, Doe Run Resources and Westmont Mining Company, He is a Licensed Professional Geologist in several eastern and western states and a qualified person as defined by National Instrument 43-101. Mr. Taylor has a Bachelor of Science degree in Geology from Southeast Missouri State University and a Master of Science dearee from the University of Missouri at Rolla.

# Robert Wares

Robert Wares is the Executive Vice President of Exploration and Resource Development for Osisko Mining Inc. and cowinner of the PDAC's 2007 "Prospector of the Year Award" for the discovery of the Canadian Malartic gold deposit in Quebec. He has 35 years of experience in mineral exploration and research, and was previously President and Chief Executive Officer of NioGold Mining Corporation, Director of Arizona Mining Inc. and Director and Audit Committee member of Augusta Resource Corporation, Mr. Wares is a Professional Geologist and has a Bachelor of Science degree and an Honorary Doctorate in Earth Sciences from McGill University.

#### Advisor

#### **R. Stuart Angus** Advisor

Stuart Angus is an independent business advisor to the mining industry and was formerly Head of the Global Mining Group for Fasken Martineau. Mr. Angus was formerly the Chairman and a director of Nevsun Resources Ltd. Mr. Angus was previously Chairman of the Board of BC Sugar Refinery Limited, a Director of First Quantum Minerals until June 2005, a Director of Canico Resources Corporation until its takeover by CVRD in 2005, a Director of Bema Gold until its takeover by Kinross Gold in 2007, a Director of Ventana Gold until its takeover by AUX Canada Acquisition in 2011 and a Director of Plutonic Power until its merger with Magma Energy in 2011.



Qualified Person	Company	<b>Professional Designation</b>
Mike Makarenko	JDS Energy & Mining Inc.	P.Eng.
Matt Moss	JDS Energy & Mining Inc.	P.Eng.
Indi Gopinathan	JDS Energy & Mining Inc.	P.Eng.
Allan Reeves	Tuun Consulting Inc.	P.Geo.
Robert Raponi	TR Raponi Consulting Ltd.	P.Eng.



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